Challenges for Large Orthopaedic Hospitals Worldwide—An ISOC Position Statement

Patrick S. Sussmann, M.D. • Beat R. Simmen, M.D. • Joerg Goldhahn, M.D. • ISOC participants •
Thomas P. Sculco, M.D.

Received: 14 August 2009/Accepted: 4 November 2009/Published online: 11 December 2009
© Hospital for Special Surgery 2009

Abstract Since the foundation of the International Society of Orthopaedic Centers in 2006, the group has continued to grow, with currently 11 members worldwide. During the 2008 annual meeting, the bylaws and mission of the group were approved as well as the acceptance of two additional members. Strict inclusion criteria were established to keep the group both small and effective. The goal

of the 2008 meeting and this position statement is to identify current challenges in both research and education for large-volume orthopedic hospitals and to discuss possible approaches and solutions.

Introduction

Large-volume orthopedic hospitals are faced with a number of challenges in their daily clinical practice. All countries have to solve the conflict between the best possible and most cost-effective treatment. The focus of most of the clinical research conducted at large-volume orthopedic aims to develop models for best clinical practice; yet, the consequence of economic boundary conditions must be considered at the same time.

The mission of the International Society of Orthopaedic Centers (ISOC) is to facilitate the exchange of ideas and cutting-edge practices among the premier specialty orthopedic centers in the world and to collaborate on patient care, education, and research-based programs, with the ultimate goal of improving orthopedic care on a global scale. ISOC was founded in 2006 to bring together thought leaders in orthopedic surgery from around the world [1]. Since then, the group has continued to grow, with currently 11 members worldwide. During the past annual meeting, the bylaws and mission of the group were approved as well as the acceptance of two additional members. Strict inclusion criteria were established to keep the group both small and effective [1].

The goal of this position statement is to identify current challenges in both research and education for large-volume orthopedic hospitals and to discuss possible approaches and solutions (Fig. 1).

Challenges in research

In order to focus clinical research in large orthopedic centers, e.g., in the framework of ISOC, we have to ask critically, “Which innovations are really needed and how do

Each author certifies that he or she has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article.

P. S. Sussmann, M.D. (✉) • B. R. Simmen, M.D. • J. Goldhahn, M.D.
Schulthess Klinik,
Lenggghalde 2, CH-8008, Zurich, Switzerland
e-mail: Patrick.sussmann@kws.ch

T. P. Sculco, M.D.
Hospital for Special Surgery,
535 East 70th Street,
New York, NY, USA

ISOC participants
Campbell Clinic,
Germantown, TN, USA

Clinica Alemana de Santiago,
Santiago, Chile

Endo Klinik,
Hamburg, Germany

Instituto Nacional De Rehabilitación,
Mexico City, Mexico

Instituto Ortopedico Galeazzi,
Milan, Italy

Istituto Ortopedico Rizzoli,
Bologna, Italy

Peking Union Medical College Hospital,
Beijing, China

Royal National Orthopaedic Hospital,
Middlesex, UK

Fig. 1. Factors that influence decision making in orthopedic practice, research, and education in orthopedic hospitals are illustrated

we identify them?” In an era where companies try to sell many products with attributes such as “new,” “innovative,” and “better,” we need to create guidelines and tools for the selection process.

In developing collaborative research projects, ISOC could build upon the recent developments in outcomes research. This emerging field, which focuses on the development of instruments for measuring function, activities of daily living, and quality of life, provide a framework for the quantification of patient needs [2]. These instruments help to quantify problems prior to intervention as well as the intervention effect. They can also be helpful in identifying remaining deficiencies as a motivation for further research and development [3]. Further collaboration in outcomes research, including, for example, standardized study protocols and outcome evaluations, will enable better group comparisons but requires the development of new instrument and guidelines. Consensus in the scientific community about accepted instruments is essential to compare results between different groups, hospitals, and protagonists.

However, patient needs are not always the driving force behind new treatment strategies. The funding sources and reimbursement schemes have an influence [4] as do regulatory issues, company marketing strategies, and even the news media. These cannot be neglected and have to be discussed critically. Key players in the field have more responsibility to perform clinical and translational research, which provides evidence to help in the reactions to and coping with these challenges due to their “leading opinion” function [5]. In the past, these key players have been at the

forefront, determining the tempo for changing treatment strategies, sometimes even in the absence of adequate evidence. In this context, which evidence in practice is necessary for a change in treatment strategy or philosophy should be defined. It is also important to acknowledge how different research areas like biological basic science, computational science, and applied clinical research may contribute. This question relates to the fact that a major part of academic research cannot be translated into clinical practice in a short time period. Therefore, clinical applied science is required to answer practical questions in an appropriate time frame. More extensive and specialized research should be coordinated between large centers in order to avoid duplication of effort, to provide adequately large populations for study, and to perform cost-effective research.

Challenges in education

Good orthopedic education is expensive and time consuming. In the majority of centers, education is not reimbursed by the state. Residents are hired to work rather than engage in a primarily educational role. Balancing the quality and economics of teaching time versus the demands and throughput in the operating room and on the ward has become a major challenge in the face of ever increasing economic pressure and a massive reduction of the time spent at the hospital [6]. In many European centers, work hour limitations have been whittled down to 40–50 h a week. On the other hand, there has been a continuous increase in the caseload of each centre. The increased case load has been accompanied by more structured clinical pathways. Residents, as a result, have been required to provide service as the primary labor source, replacing their role as trainees. If a resident today spends 45 h a week in the hospital, with continuously increasing case loads, there is very little room for educational down time and research. With the limited work hours, teaching time needs to be increasingly organized and efficient in order to guarantee adequate surgical education. Institutional prioritization on surgical efficiency by necessity conflicts with the educational experience of the resident in training. Ideally, the levels of reimbursements to institutions for education should be sufficient to allow for separation of these economic and educational demands. Can we honestly provide a quality education to all the residents that would be required to fulfill this patient care requirement or should we improve education by maintaining the number of residents at a level appropriate to their requirements and hire more ancillary staff to ensure adequate and efficient care?

The universal problem of limited work hours further results in a lack of continuity of care [7–10]. Residents experience only a fragment of the job. This fragmentation of our work often does not allow for adequate experience with regard to patient care. Education is separated in limited hour shifts, as is the care of patients. Therefore, in some centers, education and research is limited to the time after work. One of the clear and obvious challenges is that the

orthopedic residency curriculum needs to be adjusted in order to address the work hour limitation. Educational tools need to be re-evaluated in order to address time and generational demands. On top of work hour limitation, we face a whole new generation of residents much different from the previous generations. This upcoming generation is demanding different approaches and outcomes.

Another challenge for education is the difficulty of stimulating young colleagues to invest time in research rather than immediately go after the economic benefits of private practice. If the hours of residents are limited, the extra research time must have a clear benefit and value with regard to their future plans. Clearly, if private practice appears most attractive to the resident, research appears not the best investment. Do we need better and more effective resident selection tools to find the best match of residents whose goals coincide with the academic missions of our centers? Most of the centers do not have structured interview processes nor do they choose residents with a clear structured curriculum in mind. Residents are often chosen because of their perceived ability to fulfill the patient care need rather than for their potential to become one of the future thought leaders of our field. Defined curricula can help to provide the best orthopedic education for the right resident.

Possible research solutions

As large-volume, state-of-the-art hospitals, we are able to identify problems and patient's needs early. Large data sets allow for efficient identification of problems, research questions can be answered in short time periods, and demographic as well as comorbid factors are easily studied. Combined data allows for quantification of risk ratios, especially in rare conditions, operations, and complications. The collaboration between clinics with high caseloads allows easy conduct of randomized, prospective trials with adequate power, high evidence, and shorter study time. This corresponds to trends in clinical study design, which are already in practice in other specialties like oncology, rheumatology, and cardiology [11]. However, harmonization of study design, outcome tools, and reporting of data is required [12]. A working group will ensure synchronization of these parameters among the group members and will help to increase comparability between the participating clinics.

Although all participating clinics run their own research departments that cover a wide range of research interests, specialization and collaboration among ISOC members will provide for more cost-effective research. Research groups need a certain critical mass to produce significant scientific outcomes. Therefore, each centre has to focus and specialize in distinguished research areas. The mapping of research areas and resources will help to pool available resources and provide the infrastructure for state-of-the-art research. Duplication of research can be avoided, and the infrastructure and exchange of ideas is fostered. The contribution of the Schulthess Klinik to the implant retrieval data base at the Hospital for Special Surgery is an example of

constructive and cost-saving scientific collaboration that arisen from the ISOC. In the future, other areas of collaboration may include tissue engineering, computer simulation or processing, and analysis of pooled data from the participating centers. Current web-based technology provides the framework for this approach and is already in place.

Possible solutions for education

Possible solutions for education are as follows:

- Creation of travelling fellowships with one or two traveling fellows per institution rotating between member clinics
- An ISOC visiting faculty network tasked with identification of educational needs leading to a common curriculum
- Specialized training for travelling fellows
- Coordinated and standardized testing of residents at member hospitals to ensure comparable quality of education
- Certificate of observership
- Joint initiatives to define the best curriculum and number of residents at our centers to optimize the educational experience

Conclusions

Both research and education are constantly changing. Good quality can only be maintained with continuous improvement. ISOC offers an excellent framework for effective collaboration and information exchange independent from industry influence or administrative restrictions.

List of participating centers as of 2008 (in alphabetical order)

- Campbell Clinic, Tennessee, USA
- Clinica Alemana de Santiago, Chile
- Endo Klinik, Hamburg, Germany
- Hospital for Special Surgery, New York, USA
- Instituto Nacional De Rehabilitación, Mexico City, Mexico
- Instituto Ortopedico Galeazzi, Milan, Italy
- Istituto Ortopedico Rizzoli, Bologna, Italy
- Peking Union Medical College Hospital, Beijing, China
- Royal National Orthopaedic Hospital, Middlesex, UK
- Schulthess Klinik, Zurich, Switzerland

References

1. Sculco TP, Klinghoffer IP. Global musculoskeletal health: inaugural meeting of the international society of orthopaedic centers. *HSS J.* 2009; 21: 24–26
2. Stucki G, Grimby G. Applying the ICF in medicine. *J. Rehabil. Med.* 2004; 44 (Suppl): 5–6

3. Simmen BR, Angst F, Schwyzer HK, Herren DB, Pap G, Aeschlimann A, Goldhahn J (2009) A concept for comprehensively measuring health, function and quality of life following orthopaedic interventions of the upper extremity. *Arch. Orthop. Trauma Surg.* 129(1):113–118
4. Okike K, Kocher MS, Mehlman CT, Bhandari M (2007) Conflict of interest in orthopaedic research. An association between findings and funding in scientific presentations. *J. Bone Joint Surg. Am.* 89–3:608–613
5. Bhandari M, Jonsson A, Buhren V (2006) Conducting industry-partnered trials in orthopaedic surgery. *Injury* 37–4:361–366
6. Kusuma SK, Mehta S, Sirkin M, Yates AJ, Miclau T, Templeton KJ, Friedlaender GE (2007) Measuring the attitudes and impact of the eighty-hour workweek rules on orthopaedic surgery residents. *J. Bone Joint Surg. Am.* 89–3:679–685
7. Friedlaender GE (2006) The 80-hour duty week: rationale, early attitudes, and future questions. *Clin. Orthop. Relat. Res.* 449:138–142
8. Zuckerman JD, Kubiak EN, Immerman I, Dicesare P (2005) The early effects of code 405 work rules on attitudes of orthopaedic residents and attending surgeons. *J. Bone Joint Surg. Am.* 87–4:903–908
9. Peabody T (2006) The effect of work hour restrictions on the education of orthopaedic surgery residents. *Clin. Orthop. Relat. Res.* 449:128–133
10. Baskies MA, Ruchelsman DE, Capeci CM, Zuckerman JD, Egol KA (2008) Operative experience in an orthopaedic surgery residency program: the effect of work-hour restrictions. *J. Bone Joint Surg. Am.* 90–4:924–927
11. Morshed S, Bhandari M (2008) Clinical trial design in fracture-healing research: meeting the challenge. *J. Bone Joint Surg. Am.* 90(Suppl 1):55–61
12. Simunovic N, Devereaux PJ, Bhandari M (2008) Design considerations for randomised trials in orthopaedic fracture surgery. *Injury* 39–6:696–704