AO Education Institute

Education Research Output

Articles, publications, presentations, and posters (2020–2024)

Contents

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Education research is essential for finding new and better ways to educate medical professionals, and is therefore a priority for the AO Education Institute.

Since 2011, we have published peer reviewed articles in the leading journals in the field and presented at major medical educational conferences. These activities help to promote and differentiate our education and also show that our external peers acknowledge the value and quality of AO's work.

Please take the time to familiarize yourself with our most recent projects.

If you would like to contribute to our future research initiatives and you need our support, please **submit a project proposal** to the AO Education Institute.

Education research output 2020–2024

Competency-based education and curriculum

ARTICLES / PUBLICATIONS

2023

Use of digital platforms in supporting the intended learning outcomes of the educational intervention(s)

Mahmoud Abdel Karim, El-Zaher Hassan, and Monica Ghidinelli

Article: *J Ortho Trauma*, 2023; S26–S30

Read article

ABSTRACT

Summary: During the COVID-19 pandemic, medical education witnessed some remarkable changes including a digital transformation and the use of social media to maximize the learning experiences. In 2021, AO launched the AO Trauma Study Club—Middle East and North Africa where a group of local surgeons (local faculty and orthopaedic trainees) and international AO Trauma faculty would meet monthly online to discuss clinical cases and exchange experiences. In addition, this learning initiative allowed participants to access online material and interact through several additional communication channels. In this article, we describe the intervention, the learning principles followed, and the technical aspects and functionalities used to support the learning activity.

2022

Generation of cross-specialty consensus statements on soft tissue management via a modified Delphi method

Damir Matic, Joseph S. Cheng, Olivier Gauthier, Yves Harder, Salvatore C. Lettieri, Sandipan Chatterjee, Maio Chen, David Volgas

Article: *World Journal of Surgery,* 2022, Vol.46(9): 2174–2188

Read article

ABSTRACT

Background: Soft tissue management (STM) training programs for surgeons are largely tradition based, and substantial differences exist among different surgical specialties. The lack of comprehensive and systematic clinical evidence on how surgical techniques and implants affect soft tissue healing makes it difficult to develop evidence-based curricula. As a curriculum development group (CDG), we set out to find common grounds in the form of a set of consensus statements to serve as the basis for surgical soft tissue education.

Methods: Following a backward planning process and Kern's six-step approach, the group selected 13 topics to build a cross-specialty STM curriculum. A set of statements based on the curriculum topics were generated by the CDG through discussions and a literature review of three topics. A modified Delphi process including one round of pilot voting through a face-to-face CDG meeting and two rounds of web-based survey involving 22 panelists were utilized for the generation of consensus statements.

Results: Seventy-one statements were evaluated, and 56 statements reached the 80% consensus for "can be taught as is."

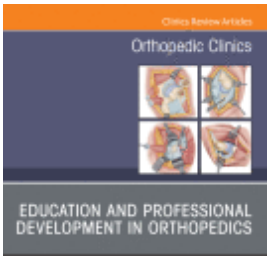
Conclusions: Using a modified Delphi method, a set of cross-specialty consensus statements on soft tissue management were generated. These consensus statements can be used as a foundation for multi-specialty surgical education. Similar methods that combine expert experience and clinical evidence can be used to develop specialty-specific consensus on soft tissue handling.

Competency-based education and curriculum

ARTICLES / PUBLICATIONS

2021

Development and implementation of international curricula for joint replacement and preservation



Kokeb Andenmatten, Florence Provence, Michael Cunningham, Aresh Sepehri, Carsten Perka, Pipsa Ylänkö, Bassam A. Masri

Article: *Orthopedic Clinics of North America*, 2021, 52: 27-39

Read article

ABSTRACT

Key points:

- AO Foundation has been delivering education to surgeons worldwide since the early 1960s and adopted a competency-based curriculum approach in 2010.
- The establishment of AO Recon in 2014 was a response to the significant global demand for high-quality arthroplasty education.
- Reports on the implementation of competency-based curricula continue to identify best practices, often from residency programs.

The journey to competency-based education

Urs Rüetschi, Michael R. Baumgaertner, Amy S. Kapatkin, Kodi E. Kojima, Teija Lund

Article: *Journal of Orthopaedic Trauma*, February 2021; S1-S4

Read article

ABSTRACT

Summary: In the middle of the 20th century, orthopaedic trauma patients were inadequately treated because of limited knowledge of bone-healing biology and fracture fixation procedures. The OTA/AO was established as an association in 1958 by a group of orthopaedic surgeons with the mission to improve patient outcomes through research, development, documentation, and education. Education has been recognized by the founders as a means to disseminate fracture fixation principles and techniques. Starting from just 69 learners at the first AO course in 1960, AO reached globally more than 50,000 learners in 2019. This achievement was possible because the AO improved its educational offerings and integrated evidence-based practices in medical education. Since its beginning, AO used simulations in combination with other educational methods, such as lectures and small group discussions. Around the year 2000, competency-based curriculum development was introduced and became a core tenet of AO education. AO's educational design today uses evidence-based concepts in needs analysis, planning and design of learning, faculty development, and assessment. In addition, the AO contributes to the medical education research with emphasis on measuring the impact of education, simulation, and development of performance assessment metrics.

2021 (continued)

Design, delivery, and evaluation of seminars and hands-on courses worldwide on intraoperative imaging in orthopedic trauma

Sven Yves Vetter, Michael Kraus, Daniel Rikli, Rodrigo Pesantez Hoyos, Paul Alfred Grützner, Michael Cunningham, Bettina Bolliger, Monica Ghidinelli, Jochen Franke

Article: *Injury, m5G;* July 10, 2021, Vol.52(11), 3264 - 3270

Read article

ABSTRACT

Introduction: Although intraoperative imaging is important for assessing the quality of several steps during fracture fixation, most trainees and surgeons have received little formal education on this topic and report they learn "on the job" and "through practice". A planning committee of orthopedic trauma surgeons was established to design a curriculum using "backward planning" to identify patient problems, identify gaps in surgeons' knowledge and skills, and define competencies as a framework for education in order to optimize patient care.

Materials and methods: The committee defined 8 competencies related to intraoperative imaging, with detailed learning objectives for each one (e.g., select the imaging modality, set up the operating room). An interactive, case-based half-day seminar to deliver these objectives for 2-D and 3 D intraoperative imaging during the fixation of common fractures was designed. The seminar was delivered in several locations worldwide over a 6-year period and evaluation and assessment data were gathered online. A full-day procedures course was added and delivered 6 times to address the skills component of competencies.

Results: 17 seminars and 6 courses were delivered and attended by an average of 26 and 17 participants respectively (ranges 13–42 and 13–20). Pre-event gap analysis and assessment question scores confirmed needs and motivation to learn in all events. 97% of the 442 seminar participants and 98% of the 100 course participants would recommend the events to colleagues. An average of 88% and 90% respectively learned something new and plan to use it in their practice (range 63%-100%). Commitment to change (CTC) statements showed intended practice improvements related to all competencies.

Discussion: The large percentages of high impact ratings for all events suggest the content met the needs of many participants. Post-event reduction in gap scores and an increase in the desired level of ability for most competencies suggests the content addressed many gaps.

Conclusions: Case-based, interactive seminars and courses addressing knowledge, skills, and attitudes to optimize the use of intraoperative imaging during the fixation of common fractures help address unmet educational needs for trainees and complements existing formal training.

2021 (continued)

Evaluating an international facial trauma course for surgeons: Did we make a difference?

Ayesha Younas, Irfan Shah, Thiam Chye Lim, Marcelo Figari, Gorman Louie, Damir Matic, Justin T. van der Tas, Eppo B. Wolvius, Iain McVicar

Article: *Craniomaxillofacial Trauma & Reconstruction*, 2021, Open Volume 6: 1-9

Read article

ABSTRACT

Study design: Retrospective data analysis study.

Objective: Attending continuing professional development (CPD) and continuing medical education (CME) activities is a necessity for practicing surgeons in most parts of the world. To enhance best practices in conducting CME/CPD, objective evaluation of these events is crucial. This article aims to evaluate one such international standardized CPD course conducted for facial surgeons across the globe. The Management of Facial Trauma course was developed by an international planning committee of experienced surgeons and has been implemented in all regions of the world.

Method: This 2-day course is delivered using a combination of short lectures, small group discussions, and practical hands-on activities. Data collected from pre- and post-course evaluations of 86 Management of Facial Trauma courses conducted worldwide from 2017-2019 were collated and analyzed.

Results: Participant demographics and experience levels varied slightly across the regions. Evaluation of the course effectiveness revealed overall high ratings for educational impact, content usefulness, and faculty performance.

Conclusion: Our results indicated that this standardized course met the audience needs and enabled participants to plan changes in clinical practice. In addition, it confirmed that the course was relevant across different specialties and across different cultures and countries.

What are learner and instructor preferences for group size and composition for a series of synchronous online case discussions for upper extremity trauma surgeons?

Nele Roels, Monica Ghidinelli, Michael Cunningham, Murat Bilici

Article: *Journal of European CME*, 2021, 10:1, 1993429

Read article

ABSTRACT

Small group discussion (SGD) is a well-known educational method to promote active learning. Best practices for running SGDs in face-to-face events are described in the literature; however, little has been reported regarding synchronous online delivery. The aim of this study was to determine learner and instructor preferences for online SGDs in terms of group size and composition and to formulate best practices based on participant and faculty feedback. We designed an 8-module online course for surgeons managing upper extremity trauma. Participants were pre-assigned into 2 types of group: 1 faculty with 5 participants or 2 faculty with 8 participants. We collected feedback from 91 participants and 34 faculty over the 8 weeks in multiple ways. Participants preferred way to run an online SGD is to have 2 faculty with 4–5 participants (80%), rotating to different faculty every week (67%), and interacting with peers from different countries (95%). Pre-course assessment questions and pre-recorded presentations enhanced the online discussions for 82%. From open text comments, we identified that cases/content, faculty, participant engagement, and technical support worked well. The course could be improved by adding more extensive technical and connectivity checks, having a different time scheduling, and integrating more supporting materials.

2020

Development of a curriculum for minimally invasive spine surgery (MISS)

Franziska A. Schmidt, Taylor Wong, BA, Sertac Kirnaz, Néstor Taboada, Richard Assaker, Christoph Hofstetter, Jin-Sung Kim, Avelino Parajón, Paul Taylor, Muhammed Assous, Roger Härtl

Article: *Global Spine Journal*, 2020, Vol. 10(2S):122S-125S

Read article

ABSTRACT

The purpose of this review is to describe how a curriculum for minimally invasive spine surgery (MISS) was developed and implemented. The authors discuss the curriculum roadmap, its target audience, and the educational process for teaching general skills and specific procedures in MISS. Initiated by AOSpine, a panel of experts within spinal surgery from multiple centers formed the minimally invasive spine surgery task force. Together, task force members redefined the standards and milestones of the MISS education and training. Therefore, we conclude that the MISS task force created a structured curriculum which will have a positive influence on daily practice for surgeons and patients worldwide.

2020 (continued)

Development and assessment of competency-based neurotrauma course curriculum for international neurosurgery residents and neurosurgeons

NEUROSURGICAL FOCUS

Sergio A. Calero-Martinez, Christian Matula, Aurelia Peraud, Francesco Biroli, José Fernández-Alén, Michael Bierschneider, Michael Cunningham, Gregory W. J. Hawryluk, Maya Babu, M. Ross Bullock, and Andrés M. Rubiano

Article: *Neurosurgical Focus,* 2020, Vol. 48(3): E13

Read article

ABSTRACT

Objective: Traumatic brain injuries (TBIs) are a significant disease burden worldwide. It is imperative to improve neurosurgeons' training during and after their medical residency with appropriate neurotrauma competencies. Unfortunately, the development of these competencies during neurosurgeons' careers and in daily practice is very heterogeneous. This article aimed to describe the development and evaluation of a competency-based international course curriculum designed to address a broad spectrum of needs for taking care of patients with neurotrauma with basic and advanced interventions in different scenarios around the world.

Methods: A committee of 5 academic neurosurgeons was involved in the task of building this course curriculum. The process started with the identification of the problems to be addressed and the subsequent performance needed. After this, competencies were defined. In the final phase, educational activities were designed to achieve the intended learning outcomes. In the end, the entire process resulted in competency and outcomes-based education strategy, including a definition of all learning activities and learning outcomes (curriculum), that can be integrated with a faculty development process, including training. Further development was completed by 4 additional academic neurosurgeons supported by a curriculum developer specialist and a project manager. After the development of the course curriculum, template programs were developed with core and optional content defined for implementation and evaluation.

Results: The content of the course curriculum is divided into essentials and advanced concepts and interventions in neurotrauma care. A mixed sample of 1583 neurosurgeons and neurosurgery residents attending 36 continuing medical education activities in 30 different cities around the world evaluated the course. The average satisfaction was 97%. The average usefulness score was 4.2, according to the Likert scale.

Conclusion: An international competency-based course curriculum is an option for creating a well-accepted neurotrauma educational process designed to address a broad spectrum of needs that a neurotrauma practitioner faces during the basic and advanced care of patients in different regions of the world. This process may also be applied to other areas of the neurosurgical knowledge spectrum. Moreover, this process allows worldwide standardization of knowledge requirements and competencies, such that training may be better benchmarked between countries regardless of their income level.

Competency-based education and curriculum

PRESENTATIONS/WORKSHOPS

2024

Is online, asynchronous education still attractive for orthopedic trauma residents? A comparative study from 2021 and 2023

Mark Lee, Khairul Faizi Mohammad, Ingmar Buffo, Narayan Ramachandran, Sue Deakin, Sandipan Chatterjee

Presentation: AMEE 2024, Basel, Switzerland, August 24–28, 2024

Designing and implementing workplace learning: In-hospital training modules for surgical and operating room personnel

Monica Ghidinelli, Chitra Subramaniam

Workshop: Annual Conference of the Alliance for Continuing Education in the Health Professions 2024, New Orleans, USA, February 5-8, 2024

2023

Including patient voice in education

Monica Ghidinelli, Celeste Kolanko, Gabor Purman

Presentation (webinar): Good CME practice group, January 26, 2023

Developing a spine surgery training curriculum using entrustable professional activities

Bryan C. Ashman, Michael Cunningham

Presentation: Spineweek, Melbourne, Australia, May 1-5, 2023

How can surgical education be scaled in low- and middle-income countries (LMICs)?

Catherine Mohr, Juan Carlos Puyana, Naomi Amuron, Abebe Bekele, Marisa Louridas, Monica Ghidinelli

Presentation: AMEE 2023, Glasgow, Scotland, August 26-30, 2023

Best practices in transparency in CME-CPD

Monica Ghidinelli, Celeste Kolanko, Sophie Wilson

Presentation (webinar): Good CME practice group, June 8, 2023

Competency-based education and curriculum

PRESENTATIONS/WORKSHOPS

2022

Current challenges in continuing medical education (CME)

Monica Ghidinelli, Margarita Velcheva, Sophie Wilson

Presentation (webinar): Good CME practice group, September 15, 2022

Incorporating the patient voice in education for healthcare professionals

Jonas Nordquist, Jeanette Andersen, Ricard Cervera, Monica Ghidinelli, Reinhard Griebenow, David Vodušek

Presentation: 15 European CME Forum, Barcelona, Spain, November 2-4, 2022

Current challenges in European CME

Monica Ghidinelli, Daniela Clape, Sophie Wilson, Celeste Kolanko

Workshop: 15 European CME Forum, Barcelona, Spain, November 2-4, 2022

2021

Design and implementation of an asynchronous online course on fracture management for residents

Khairul Mohammad, Mark Lee, Ingmar Buffo, Sandipan Chatterjee, Miriam Uhlmann, Alain Rickli, Barbara Niederee

Presentation: Society for Academic Continuing Medical Education (SACME) 2021, online, February 24-26, 2021

Microlearning: A new approach to continuing professional development and credentialing

Bonnie M Miller, Monica Ghidinelli, Bill Mezzetti

Presentation: AMEE 2021, online, August 27-30, 2021

Developing an accredited educational activity

Monica Ghidinelli, Celeste Kolanko, Sophie Wilson

Presentation (webinar): Good CME practice group, July 22, 2021

Competency-based education and curriculum

PRESENTATIONS/WORKSHOPS

2020

Identifying factors for success in online learning

Miriam Uhlman, Samar Aboulsad, Amy Farr, Jo Varney, Jane Wiedler

Workshop: 13 European CME forum, online, November 4-6, 2020

Rapid change and adaptivity: The new essential competencies of CME-CPD providers

Margarita Velcheva, Pamela Funes, Katy Greenland, Thomas Kleinoeder, Mia Neve, Miriam Uhlman, Sophie Wilson

Workshop: 13 European CME forum, online, November 4-6, 2020

Developing a pathway for your professional development

Steven Kawczak, Chitra Subramanian

Workshop: 13 European CME forum, online, November 4-6, 2020

POSTERS

2024

How can a global organization make education local? Workplace education for surgeons treating trauma cases

Alexandra Wentscher, Michael Baumgaertner, Wa'el Taha, Kodi Kojima, Jecca Reichmuth, Ana Maria Moreno

Poster/Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Use of virtual reality training for orthopedic trauma residents: Findings and recommendations from a pilot study in Malaysia

Sandipan Chatterjee, Khairul Faizi Mohammad

Poster/Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Competency-based education and curriculum

POSTERS

2023

Developing a global spine surgery training online program

Bryan C Ashman, Atiq Uz Zaman, Bradley Jacobs, Evan Davies, Karsten Wiechert, Klaus Schnake, Michael Cunningham, Daniela Cassini, Monica Ghidinelli

Poster/Presentation: AMEE 2023, Glasgow, Scotland, August 26-30, 2023

2022

Design and implementation of an operative near-peer learning intervention in surgical training

Alexander Papachristos, Ben Loveday, Monica Ghidinelli, Simon Kitto, Debra Nestel

Poster/Presentation: AMEE 2022, Lyon, France, August 27-31, 2022

2021

Understanding differences between spine resident training programs and evaluation of the surgical skills among residents worldwide

Franziska Anna Schmidt, Ghidinelli Monica, Wong Taylor, Julia Landscheidt, Sertac Kirnaz

Poster/Presentation: Global Spine Congress (GSC) 2021 Paris, France, May 5-8, 2021

Faculty development

ARTICLES / PUBLICATIONS

2024

Revolutionising faculty development and continuing medical education through AI-generated videos

Irene Contreras, Samia Hossfeld, Katharine de Boer, Jane Thorley Wiedler, Monica Ghidinelli

Article: *Journal of CME*, 2024, Vol.13(1)

Read article

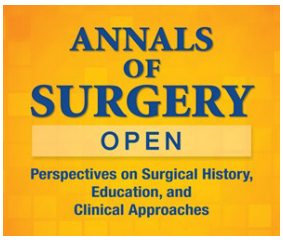
ABSTRACT

Producing high-quality and engaging educational videos for continuing medical education (CME) is traditionally time-consuming and costly. Generative AI tools have shown promise in creating synthetic videos that mimic traditional lecture videos. We conducted a comparative analysis of four AI video generation platforms HeyGen, Synthesia, Colossyan, and HourOne using the Kano model. Our analysis revealed that HeyGen met most of our requirements. We created two videos and collected feedback from 25 learners. The feedback indicated that the videos were of good quality, engaging, and well-paced for learning. Only 32% recognised the videos as AI-generated, citing limited facial expressions, hand gestures and monotone vocal expression. Importantly, only 24% considered disclosure of AI-generated content necessary. This research indicates that AI-generated videos can be a viable alternative to traditionally produced educational videos. It offers an efficient, cost-effective solution for producing educational content. Ethical considerations regarding AI content disclosure should be addressed to maintain transparency.

2024 (continued)

Near-peer coaching to enhance operative learning: An educational innovation for surgical training

Alexander J. Papachristos, Elizabeth Molloy, Juanita N. Chui, Monica Ghidinelli, Simon Kitto, Debra Nestel, Benjamin P. T. Loveday



Article: *Annals of Surgery Open*, September 2024, Vol.5(3)

Read article

ABSTRACT

Objective: To design, implement, and evaluate a near-peer coaching model to enhance operative learning in general surgery training.

Background: There is an urgent need to maximize operative learning in surgical education. Trainees find barriers to operative learning difficult to navigate and often sacrifice educational opportunities for the sake of impression management.

Methods: A prospective cohort study was conducted over a 6-month period following design and implementation of a trainee-led near-peer coaching model; "SPICE" (Set goals, Plan, Imagine, Comment and feedback, Evaluate and reflect). Semistructured interviews were conducted to explore trainees' experiences of the model.

Results: Twelve trainees participated in the study. The near-peer coaching encounters provided trainees with the psychological safety to be honest about learning needs, validated insecurities, and mitigated the pressures associated with impression management that consistently shaped consultant–trainee relationships. Trainees described improved operative performance, increased self-confidence, and a greater ability to adapt to the unexpected. Trainees adapted the use of the SPICE model to conventional consultant–trainee dynamics, which facilitated learning conversations and negotiation of operative opportunities. On a broader scale, trainees noticed an improvement in the teaching culture of the unit, describing that the use of the model legitimized the importance of perioperative learning conversations and increased consultant enthusiasm for teaching.

Conclusions: Near-peer coaching created a unique psychological safety that facilitated authentic reflection and goal setting and improved trainee confidence. The benefits of the SPICE model were translated to other contexts and facilitated entrustment in conventional consultant–trainee relationships.

Faculty development

PRESENTATIONS/WORKSHOPS

2024

A comprehensive approach to promoting diversity, equity, and inclusion in orthopedic surgery through unconscious bias training

Tatjana Topalovic, Pedro Jorba, Nicola Kildea

Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Blended vs. online: Comparing faculty development programs designed to prepare surgeons to chair an educational event

Jane Thorley Wiedler, Kate de Boer, Monica Ghidinelli, Emre Acaroglu, Khalid Alzahrani

Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Barriers and facilitators to cultivating communities of practice for faculty development in the field of medical education: A scoping review

Simon Kitto, Arone Fantaye, Monica Ghidinelli, Kokeb Andenmatten, Jane Thorley Wiedler, Kate de Boer

Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

A faculty development workshop for simulator-based teaching

Monica Ghidinelli, Silvana Perretta, Marisa Louridas

Workshop: AMEE Surgery Track 2024, Basel, Switzerland, August 24-28, 2024

Fear in the OR (a qualitative study): Identity enmeshment, identity resilience, and surgeons' experiences of fear in the operating room

Johanna Riesel, Melanie Hammond-Mobilio, Carol-Anne Moulton

Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Near-peer coaching to enhance operative learning—an educational innovation for surgical training

Alexander Papachristos, Elizabeth Molloy, Juanita N. Chui, Monica Ghidinelli, Simon Kitto, Debra Nestel, Benjamin P. T. Loveday

Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Faculty development

PRESENTATIONS/WORKSHOPS

2022

Coaching in surgery and in surgical practice

Monica Ghidinelli, Marisa Louridas, Alexander Papachristos, Steven Yule

Presentation: AMEE 2022, Lyon, France, August 27-31, 2022

Pooling learnings on faculty development for online teaching

Emre Acaroğlu, Jane Thorley Wiedler, Kate de Boer

Presentation: AMEE 2022, Lyon, France, August 27-31, 2022

Launching a formalized software based mentorship pilot program to increase diversity and inclusion

Tatjana Topalovic, Lynette Spalding

Presentation: AMEE 2022, Lyon, France, August 27-31, 2022

2021

Creating a faculty development program for CPD

Don Moore, Gary A. Smith, Nels L. Carlson, Yvonne Steinert, Miriam Uhlmann

Workshop: Society for Academic Continuing Medical Education (SACME) 2021, online, February 24-26, 2021

Creation and implementation of a diversity, inclusion and mentorship strategy

Tatjana Topalovic

Presentation: AMEE 2021, online, August 27-30, 2021

Alliance podcast episode 18: Spotlight on leadership

Tatjana Topalovic, Samantha Morello, Scott Weber, Pam Maso

Presentation (podcast): Alliance for Continuing Education in the Health Professions, September 13, 2021

Faculty development

PRESENTATIONS/WORKSHOPS

2020

Barriers to entry as AO faculty and for advancement in the organization for women and other underrepresented groups

Tatjana Topalovic, Samantha L. Morello, Amy Kapatkin, Matthew J Allen, Clare Allen

Presentation: AMEE 2020, online, September 7-9, 2020

Development of an international curriculum for teams of healthcare educators

Miriam Uhlmann, Jo Varney, Alvaro Margolis, Jann Balmer

Presentation: 45th Annual Conference of the Alliance for Continuing Education in the Health Professions, San Francisco, USA, January 8-11, 2020

A means to an end: Achieving patient satisfaction through culturally sensitive communication

Miriam Uhlmann, Samar Aboulsoud

Workshop: 45th Annual Conference of the Alliance for Continuing Education in the Health Professions, San Francisco, USA, January 8-11, 2020

POSTERS

2024

What can we learn from the literature on validity of learner evaluation of teaching within the continuing medical education field?

Kate de Boer

Poster: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Leveraging AI technologies for enhanced faculty & professional development

Irene Contreras, Samia Hossfeld, Katharine de Boer, Jane Thorley Wiedler, Matthias Schmidt

Poster/Presentation: AMEE 2024, Basel, Switzerland, August 24-28, 2024

Evaluation and assessment

ARTICLES / PUBLICATIONS

2024

Unravelling orthopaedic surgeons' perceptions and adoption of generative AI technologies

Matthias Schmidt, Yasmin B. Kafai, Adrian Heinze, Monica Ghidinelli

Article: *Journal of CME*, 2024, Vol.13(1)

Read article

ABSTRACT

This mixed-methods study investigates the adoption of generative AI among orthopaedic surgeons, employing a Unified Theory of Acceptance and Use of Technology (UTAUT) based survey (n = 177) and follow-up interviews (n = 7). The research reveals varying levels of AI familiarity and usage patterns, with higher adoption in research and professional development compared to direct patient care. A significant generational divide in perceived ease of use highlights the need for tailored training approaches. Qualitative insights uncover barriers to adoption, including the need for more evidence-based support, as well as concerns about maintaining critical thinking skills. The study exposes a complex interplay of individual, technological, and organisational factors influencing AI adoption in orthopaedic surgery. The findings underscore the need for a nuanced approach to AI integration that considers the unique aspects of orthopaedic surgery and the diverse perspectives of surgeons at different career stages. This provides valuable insights for educational institutions and healthcare organisations in navigating the challenges and opportunities of AI adoption in specialised medical fields.

2023

Assessment of technical competence in distal radius fracture fixation by a volar locking plate: a global Delphi consensus study

Mads Emil Jacobsen, Leizl Joy Nayahangan, Monica Ghidinelli, Chitra Subramaniam, Kristoffer Borbjerg Hare, Lars Konge, Amandus Gustafsson

Article: *The Journal of Hand Surgery*, published by Elsevier Inc. 2023, Vol.48(9), 875-885

Read article

ABSTRACT

Purpose: Volar locking plate fixation of distal radius fractures is a common orthopedic procedure and should be mastered by graduating orthopedic residents. Surgical education is transitioning from a traditional time-based approach to competency-based medical education. Valid and objective assessment is essential for successful transition. The purpose of this study was to develop a comprehensive, procedure-specific assessment tool to evaluate technical competence in volar locking plate osteosynthesis of a distal radius fracture.

Methods: International orthopedic/trauma experts involved in resident education participated as panelists in a four-round online Delphi process to reach consensus on the content of the assessment tool. Round 1 was an item-generating round, in which the panelists identified potential assessment parameters. In round 2, the panelists rated the importance of each suggested assessment parameter and reached consensus on which to include in the assessment tool. Round 3 yielded specific assessment score intervals for specific bone and fracture models and is not reported in this study. In round 4, the panelists assigned weights to the assessment parameters on a 1e10 scale to determine how each parameter should have an impact on the overall results.

Results: Eighty-seven surgeons, representing 42 countries, participated in the study. Round 1 resulted in 45 assessment parameters, grouped into five procedural steps. After round 2, the number of parameters was reduced to 39. After the final round, an additional parameter was removed and weights were assigned to the remaining parameters.

Conclusions: Using a systematic methodology, a preliminary assessment tool to evaluate technical competence in distal radius fracture fixation was developed. A consensus of international experts supports the content validity of the assessment tool.

2023 (continued)

Experiences from implementing 3 distinct types of online events for subspecialty orthopedic trauma education in the Middle East and Northern Africa

Mahmoud Abdel Karim, Yazan J. Hattar, Hashem A. Al-Qdhah, Michael Cunningham, Monica Ghidinelli, Waleed Alsaadan

JOT JOURNAL OF ORTHOPAEDIC TRAUMA

Article: *J Ortho Trauma*, 2023; S35-S41

Read article

ABSTRACT

Summary: Faced with the challenge of running face-to-face subspecialty courses for experienced surgeons in 2020 and 2021, the Middle East and Northern Africa region of Arbeitsgemeinschaft für Osteosynthesefragen Trauma decided to explore the possibility of conducting online education. Appointed faculty chairpersons were invited to design online programs and plans. Three event types were designed and implemented: live online courses delivered over multiple weeks, live online masters-level courses delivered over 3 consecutive days, and a blended course delivered over 2 consecutive days online, followed by 1 day in an anatomical specimen laboratory. Standard evaluations were implemented for each event, and faculty and participant feedback was gathered. The events were attended by 214 surgeons (averages of 42, 31, and 36 participants, respectively, for the 3 event types). The average percentages of participants who reported they "learned something new and plan to use it in my practice" were 78%, 78%, and 93%, respectively. The average percentages of participants who would recommend the event to colleagues were 94%, 97%, and 100%, respectively. The evaluation data suggest that some knowledge gaps were addressed adequately through online delivery. All 3 event types were delivered successfully, with some personal preferences by the participants for each format. Key factors for success were the relevance of the content for the participants, excellent faculty preparation, and training, low commercial bias, and strong support from event organizers and technical teams.

2022

Evaluation of blended online learning in three spinal surgery educational courses

Emre Acaroglu, Muhammed Assous, Richard Bransford, Luiz Gustavo Dal Oglio Da Rocha, Asdrubal Falavigna, John France, Emiliano Viale, Atiq Uz-Zaman, Ginesa Aviles, Brian Amster, Michael Cunningham, Alpaslan Şenköylü

Article: *Journal of European CME*, 2022, Vol. 11(1), 2014042

Read article

ABSTRACT

COVID-19 pandemic created a need to improvise and redefine blended learning to be executed fully online. Background information on the effectiveness of fully online blended learning activities, especially for surgical disciplines is limited. This study describes a fully online blended learning course format on spinal surgery and aims to provide data regarding it effectiveness. Fully online blended courses on three topics of spinal surgery designed as six-week asynchronous and followed by 3-day live parts. Learning gaps (LGs) were identified with a survey at the beginning of asynchronous part, at its end, and at the end of the live part. The effectiveness of the asynchronous and live parts was assessed by LGs and a quiz, login statistics of learners and faculty and a post-course survey. Participants' LGs decreased in all courses, statistically significant in two. Faculty and learner login rates significantly correlated with each other. Faculty and learner satisfaction was very high. A fully online blended learning course can be delivered effectively on spine surgery with a high participant and faculty satisfaction rate. The asynchronous part contributes to learning significantly.

2022 (continued)

Analysis and recommendations based on evaluation data from AO Alliance educational events in sub-Saharan Africa and Asia

Emma Bonhomme, Wilfred Addo, Florent A. Lekina, Ramesh P. Singh, William J. Harrison, Claude Martin Jr

Article: *East and Central African Journal of Surgery*, 2021, Vol.26(3)

Read article

ABSTRACT

Background: Traumatic injuries are among the leading causes of death and permanent disability worldwide, disproportionately affecting low- and middle-income countries. The AO Alliance, a nonprofit organization, is committed to enhancing fracture care to limit the effects of trauma. They conduct courses on both operative and nonoperative trauma care in Asia and sub-Saharan Africa. This study aimed to investigate the effectiveness of 137 courses within 12 countries from January 2018 through August 2019.

Methods: An online course evaluation questionnaire was completed by participants and faculty at the end of each course. The online survey asked a mixture of multiple-choice and long-answer questions. Faculty members were asked to complete a follow-up questionnaire in addition to the course evaluation questionnaire.

Results: Participants in AO Alliance courses were mainly surgeons or operating room personnel with less than 5 years of experience. Most of the participants found the course content useful for their daily practice, that they learned something new and planned to use the new information in their practice, that the stated course objectives were met, and that faculty were effective. Having more practical exercise and discussion time and addressing the language barriers were the main areas of improvement identified. Most chairpersons have implemented the suggestions by increasing discussion time and adapting the course content to the local setting and participants. Some suggestions could not be implemented due to a lack of financial resources.

Conclusions: The overall data support the usefulness of AO Alliance courses and reaffirm that they are highly valued in low- and middle-income countries by participants and faculty. Offering more courses in Africa would allow for a smaller course setting, which could further improve overall course quality.

Kursevaluation in AO Trauma-Veranstaltungen—was haben wir gelernt? (Course evaluation in AO Trauma—what have we learned?)

Monica Ghidinelli

Article: *OP-Journal*, 2022, 38(01): 53-56—DOI 10.1055/a-1693-0639

Read article

ABSTRACT

To determine the effectiveness of educational events and improve the quality of continuing medical education (CME), course providers and medical faculty instructors must have access to structured and consistent collection and reporting of evaluation and assessment data. In 2016 the AO implemented a new streamlined and consistent evaluation and assessment system that AO Trauma Germany have used since 2019. The generated reports have helped faculty to adjust educational events to meet the needs of participants. The new system has also helped committees to plan future educational events and to improve the quality of CME on an ongoing basis. Overall, the AO Trauma Germany educational activities were effective and met participants' needs.

2022 (continued)

Monitoring and reporting gaps in spine surgery education through an international needs assessment survey

Alfredo Guiroy, Joseph Cheng, Claudius Thomé, Asdrubal Falavigna, Michael Cunningham,Monica Ghidinelli, Emre Acaroğlu, Bryan Ashman

Article: *MedEdPublish*, 2022, 12:22

Read article

ABSTRACT

Background: A critical step in curriculum development is conducting a needs assessment of learners. In spine surgery, the educational needs of trainees, and especially of practicing surgeons, evolve frequently due to changes in practice, technology, etc. To monitor these changes and adapt the educational offerings, organizations delivering continuing medical education (CME) and continuing professional development (CPD) periodically repeat needs assessments.

Methods: An international needs assessment in the form of a set of 15 online questions was designed and circulated in 2017 and in 2021 to the AO Spine community of members and registered users to gather input in five main areas: educational needs in spine pathologies and techniques, required improvements in practice, preferences for types of educational offerings, and profiling information.

Results: We received and analyzed 1,204 responses in English during the main reporting period in the 2017 needs assessment from residents, fellows, and practicing surgeons in orthopedics and neurosurgery, and 1,845 in 2021. Spine surgeons wish to improve their knowledge related to all the common pathologies, with some variability among regions and stage of career. Minimally invasive spine surgery (MISS) was the highest-rated need within surgical techniques in all regions (except North America) and all stages of career. Data show a strong preference for face-to-face courses with hands-on training, high demand for mentorship/fellowship/observership, and solid interest in online and blended education.

Conclusions: The needs assessment process pointed out general trends but also identified varying needs depending on the local situation and stage of career. For this reason, CME/CPD providers must adapt to the local situation to provide educational offerings that meet learner needs.

2022 (continued)

Discrimination, reliability, sensitivity, and specificity of metric-based assessment of an unstable pertrochanteric 31A2 intramedullary nailing procedure performed by experienced and novice surgeons

Kodi E. Kojima, Matt Graves, Wa'el Taha, Monica Ghidinelli, Bernard Struelens, Jorge Alberto Amaya Aliaga, Mike Cunningham, Alexander Joeris, Anthony G. Gallagher

Article: *Injury, m5G*, June 16, 2022, Vol.53(8), 2832-2838

Read article

ABSTRACT

Introduction: Identifying objective performance metrics for surgical training in orthopedic surgery is imperative for effective training and patient safety. The objective of this study was to determine if an internationally agreed, metric-based objective assessment of video recordings of an unstable pertrochanteric 31A2 intramedullary nailing procedure distinguished between the performance of experienced and novice orthopedic surgeons.

Materials and methods: Previously agreed procedure metrics (i.e., 15 phases of the procedure, 75 steps, 88 errors, and 28 sentinel errors) for a closed reduction and standard cephalomedullary nail fixation with a single cephalic element of an unstable pertrochanteric 31A2 fracture. Experienced surgeons trained to assess the performance metrics with an interrater reliability (IRR) > 0.8 assessed 14 videos from 10 novice surgeons (orthopaedic residents/trainees) and 20 videos from 14 experienced surgeons (orthopaedic surgeons) blinded to group and procedure order.

Results: The mean IRR of procedure assessments was 0.97. No statistically significant differences were observed between the two groups for Procedure Steps, Errors, Sentinel Errors, and Total Errors. A small number of Experienced surgeons made a similar number of Total Errors as the weakest performing Novices. When the scores of each group were divided at the median Total Error score, large differences were observed between the Experienced surgeons who made the fewest errors and the Novices making the most errors ($p < 0.001$). Experienced surgeons who made the most errors made significantly more than their Experienced peers ($p < 0.003$) and the best performing Novices ($p < 0.001$). Error metrics assessed with Area Under the Curve demonstrated good to excellent Sensitivity and Specificity (0.807–0.907).

Conclusions: Binary performance metrics previously agreed by an international Delphi meeting discriminated between the objectively assessed video-recorded performance of Experienced and Novice orthopedic surgeons when group scores were sub-divided at the median for Total Errors. Error metrics discriminated best and also demonstrated good to excellent Sensitivity and Specificity. Some very experienced surgeons performed similar to the Novice group surgeons that made most errors.

2021

Experiences from two ways of integrating pre- and post-course multiple-choice assessment questions in educational events for surgeons

Monica Ghidinelli, Michael Cunningham, Isobel C. Monotti, Nishma Hindocha, Alain Rickli, Iain McVicar, Mark Glyde

Article: *Journal of European CME*, 2021, Vol.10(1), 1918317

Read article

ABSTRACT

To examine how to optimise the integration of multiple-choice questions (MCQs) for learning in continuing professional development (CPD) events in surgery, we implemented and evaluated two methods in two subspecialities over multiple years. The same 12 MCQs were administered pre- and post-event in 66 facial trauma courses. Two different sets of 10 MCQs were administered pre- and post-event in 21 small animal fracture courses. We performed standard psychometric tests on responses from participants who completed both the pre- and post-event assessment. The average difficulty index pre-course was 57% with a discrimination index of 0.20 for small animal fractures and 53% with a discrimination index of 0.15 for facial trauma. For the majority of the individual MCQs, the scores were between 30%-70% and the discrimination index was >0.10. The difficulty index post-course increased in both groups (to 75% and 62%). The pre-course MCQs resulted in an average score in the expected range for both formats suggesting they were appropriate for the intended level of difficulty and an appropriate pre-course learning activity. Post-course completion resulted in increased scores with both formats. Both delivery methods worked well in all regions and overall quality depends on applying a solid item development and validation process.

2021 (continued)

Designing and implementing a harmonized evaluation and assessment system for educational events worldwide

Monica Ghidinelli, Michael Cunningham, Miriam Uhlmann, Alain Rickli, Urs Rüetschi

Article: *J Ortho Trauma*, February 2021; S5–S10

Read article

ABSTRACT

To determine the effectiveness of educational events and improve the quality of continuing medical education (CME), course providers and medical faculty instructors must have access to structured and consistent collection and reporting of evaluation and assessment data. In 2012, the AO Foundation (Switzerland) used a wide range of evaluation questions and processes that were inconsistent across various clinical areas. With AO's 700 educational events delivered annually in multiple geographical regions, it was therefore challenging to determine overall education effectiveness and to identify and compare trends and topics based on individual course data. This led to a decision by AO to update, align, and harmonize the various questions and processes to create a new streamlined and consistent evaluation and assessment system. A series of expert advisory group sessions and consensus meetings were convened over a 3-year period, and feedback from 8 stakeholder groups was incorporated. AO developed processes and online tools that were piloted in several educational events and then implemented worldwide. Faculty and course organizers were trained to gather and apply the information. In 2019, this new course evaluation and assessment system was applied to more than 70% of AO's yearly educational events. The generated reports have helped faculty to adjust educational events to meet the needs of participants. The new system has also helped committees and regions to plan future educational events and to improve the quality of CME on an ongoing basis.

Multicenter video recordings of minimal invasive cephalomedullary nailing of pertrochanteric femur fractures for metrics validation studies: lessons learned

Kodi E. Kojima, Wael S. Taha, Matt L. Graves, Anthony G. Gallagher, Tracy Y. Zhu, Víctor Díaz, Michael Cunningham, Monica Ghidinelli, Alexander Joeris

Article: *J Ortho Trauma*, 2021;S28-S33

Read article

ABSTRACT

Summary: Validated performance metrics are the fundamental building block of a successful and effective proficiency-based progression training program. We recently demonstrated face and content validity of the metrics for internal fixation of an OTA/AO 31-A2 pertrochanteric fracture with a short cephalomedullary nail. We then conducted an international multicenter study to determine the construct validity of the metrics. The study required recording of real orthopaedic trauma procedures performed by novice and experienced surgeons in a live operating room setting using 3 separate cameras. In this report, we present and critically discuss the main challenges in implementing the study protocol. We also report our solutions to overcome the challenges to guide future metrics validation studies.

2021 (continued)

Design and evaluation of a hospital-based educational event on fracture care for older adult

Markus Gosch, Christian Kammerlander, Emilio Fantin, Thomas Giver Jensen, Ana Milena López Salazar, Carlos Olarte, Suthorn Bavatonavarech, Claudia Medina, Bjoern-Christian Link, Michael Cunningham

Article: *Geriatric Orthopaedic Surgery & Rehabilitation*, 2021, Vol.12: 1-9

Read article

ABSTRACT

Introduction: Surgeons, internal medicine physicians, nurses, and other members of the healthcare team managing older adults with a fracture all have barriers to attending educational courses, including time away from practice and cost. Our planning group decided to create and evaluate a hospital-based educational event to address, meet, and improve the care of older adults with a fracture.

Materials and methods: A committee of surgeons and geriatricians defined 3 learning objectives to improve knowledge and attitudes in co-managed care. They designed a 1-day educational event consisting of a departmental visit, a review of cases, a planning session to identify gaps and plan changes, and presentations on selected topics. Thirteen hospitals worldwide completed an 8-question online application form, and 7 sites were selected for delivery over 3 years in Denmark, Colombia, Thailand, Paraguay, Switzerland, and the Dominican Republic.

Results: Each event was conducted by 1 or more visiting surgeons and geriatricians, and the local team leaders. The most common challenges reported in the applications were preoperative assessment or optimization, delayed surgery, lack of protocols, access to a geriatrician, teamwork, and specific aspects of perioperative and postoperative care. In each department, 4 or 5 goals and targets for implementation were agreed. The presentations section was customized and attended by 20 to 50 team members.

Discussion: Topics selected by a majority of departments were principles of co-managed care (7), preoperative optimization (7), and management of delirium (4). Follow up was conducted after 3 and 12 months to review the degree of achievement of each planned change and to identify any barriers to complete implementation.

Conclusions: Hospital-based events with visiting and local faculty were effective to engage a broader audience that might not attend external courses. A performance improvement component with goal setting and follow up was acceptable to all host departments.

Evaluation and assessment

PRESENTATIONS/WORKSHOPS

2024

Defining metrics for assessing surgeon performance during a telementoring program for scoliosis treatment

Emre Acaroğlu, Alaa Ahmad, Michael Cunningham, Monica Ghidinelli

Presentation: AMEE 2024, Basel, Switzerland, August 24–28, 2024

2022

Outcomes measurement: What can we achieve in practice?

Froukje Sosef, Monica Ghidinelli, Sophie Wilson

Presentation (webinar): Good CME practice group, January 27, 2022

Procedure-specific simulation-based assessment of competence in basic principles of osteosynthesis—an international Delphi study

Mads Emil Jacobsen, Leizl Joy Nayahangan, Monica Ghidinelli, Chitra Subramaniam, Kristoffer Borbjerg Hare, Lars Konge, Amandus Gustafsson

Presentation: IMSH, Los Angeles, USA, January 15-19, 2022

Evaluation of blended learning in spinal surgery educational courses

Emre Acaroglu, Monica Ghidinelli

Presentation: AMEE 2022, Lyon, France, August 27-31, 2022

Evaluation and assessment

PRESENTATIONS/WORKSHOPS

2021

Online small group discussions in orthopedic trauma: Recommendations based on participant feedback

Nele Roels, Monica Ghidinelli, Michael Cunningham, Murat Bilici

Presentation: AMEE 2021, online, August 27-30, 2021

The landscape of CME accreditation in Europe

Margarita Velcheva, Froukje Sosef, Thomas Kleinoeder, Monica Ghidinelli, Onno Kaagman

Presentation (webinar): 14 European CME forum 2021, November 3-5, 2021

2020

Creating and implementing an evaluation and assessment system for CPD in your organization

Monica Ghidinelli, Urs Rüetschi, Michael Cunningham, Jane Wiedler, Miriam Uhlmann

Presentation: AMEE 2020, online, September 7-9, 2020

Development and evaluation of skills stations for hip and knee arthroplasty

Philipp von Roth, Bas Masri, Michael Huo, Robert Hube, Bas Wijburg, Mike Cunningham

Presentation: AMEE 2020, online, September 7-9, 2020

Evaluation and assessment

POSTERS

2022

Evaluation of blended learning in spinal surgery educational courses

Emre Acaroglu, Muhammed Assous, Jin-Sung Kim, Vincent Hagel, Ginesa Aviles, Brian Amster, Monica Ghidinelli

Poster/Presentation: AMEE 2022, Lyon, France, August 27-31, 2022

Developing multiple-choice questions for pre-course assessments in arthroplasty education worldwide

Anthony Albers, Cheng Fong Chen, Rodrigo Guimarães, Michael Huo, Plamen Kinov, Seung-Jae Lim, Sanjiv Marya, Bassam A. Masri, Aresh Sepehri, Krisztian Sisak, Philipp von Roth, Mike Cunningham, Chun Hoi Yan

Poster/Presentation: The 2022 COA/CORS/CORA Annual Meeting, Quebec City, Canada, June 8-11, 2022

Mixed topics

ARTICLES / PUBLICATIONS

2024

Beyond textbooks: Interactive learning of biomechanical principles of osteosynthesis with an online tool for orthopaedic residents

Lionel Llano, Dominic Mischler, Danilo Taype, Sandipan Chatterjee, Monica Ghidinelli, Markku Nousiainen, Simon Lambert, Peter Varga

Article: *Journal of Surgical Education*, November 2024, Vol. 82(1), 103350

Read article

ABSTRACT

Objectives: This study aimed at evaluating the effectiveness of an online interactive biomechanical teaching tool called OSapp. Our main hypothesis was that through the presentation of appropriate science-based content in an interactive, self-directed learning environment familiar to residents the OSapp could significantly improve the knowledge, comprehension, and retention of clinically relevant biomechanical principles of osteosynthesis.

Design: Thirty-one orthopaedic residents from the same institution were enrolled. Their knowledge of basic biomechanical principles of osteosynthesis was assessed using 24 multiple-choice questions, in 3 assessment rounds: at baseline; directly after a 1-week self-directed OSapp-based learning period; and 2 months later to measure retention. Results of the junior (1-3 years) and senior (4-5 years) resident groups were compared.

Setting: Orthopaedics and Traumatology Department, Italian Hospital of Buenos Aires, Argentina.

Participants: Orthopaedic residents of the same Department at the time of investigation, including residency years 1 to 5.

Results: Twenty-eight participants completed all 3 assessment rounds. Assessment scores significantly improved after the intervention compared to baseline ($p < 0.05$) and did not decline after 2 months ($p > 0.99$). Both juniors and seniors showed significant knowledge gain ($p < 0.05$) that was retained ($p > 0.99$). Although seniors were better than juniors at baseline ($p \leq 0.01$) and postintervention ($p < 0.05$), after the intervention, juniors reached the level of baseline seniors ($p > 0.21$). No difference was observed between the 2 groups after 2 months ($p > 0.21$).

Conclusions: Self-directed learning with the interactive 3D models available in the freely available online tool OSapp led to a significant and sustained improvement of residents' knowledge and understanding of the biomechanical principles of osteosynthesis. Utilizing OSapp in surgical education could help to improve the efficiency and effectiveness of training and may thus lead to decreased fracture treatment complications including failure of osteosyntheses.

2023

Surgical planning education using a digital platform

Rahul Vaidya, Brett D. Crist, Mitchell Bernstein, Mauricio Kfuri, Michael S. Sirkin, Sujith Konan, Matthieu Oliver, Michael Cunningham

JOT JOURNAL OF ORTHOPAEDIC TRAUMA

Article: *J Ortho Trauma*, 2023;S19-S25

Read article

ABSTRACT

Introduction: Formal preoperative planning increases surgical efficiency, helps communication with operating room personnel, and improves patient outcomes. The Bonesetter App (Bonesetter Solutions, Ann Arbor, MI) is a free online educational planning tool for digital images. The purpose of this study is to evaluate learner and educator efficiency with this tool in Association for the Study of Internal fixation AO courses.

Methods: The Bonesetter App was used for digital planning in 8 AO Trauma Advanced Principles courses (.500 participants), 1 AO Trauma Basic Principles course (120 participants), 1 AO Trauma North America Deformity and Nonunion course (178 participants), 2 AO Recon courses (32 participants, 16 participants), and 1 AO Trauma North America Lower Extremity Deformity and Nonunion course (32 participants). Data included saved plans, participant evaluations, and faculty feedback.

Results: In the AO Trauma North America Deformity and Nonunion, 655 entries with 3275 tasks were evaluated with 74% of the exercises performed correctly. Difficulties included understanding retrotorsion/antetorsion of the femur and total deformity calculation. The AO Trauma North America Advanced Principles had difficulty with equipment, faculty discomfort with the application which led to improvements in the equipment, software, and teaching material. Participants of the AO Recon, Deformity and Nonunion courses provided overwhelming positive feedback, but only a 40% completion rate of exercises.

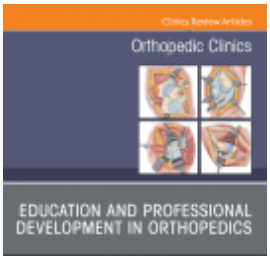
Conclusions: Remote learning platforms and digital planning are new tools for the AO courses. Hurdles develop when implementing new technology, including training faculty, making tools user friendly, and affordable. These tools can show whether participants are performing skills correctly and where educational difficulties are encountered, so teaching strategies can change.

Mixed topics

ARTICLES / PUBLICATIONS

2021

Surgical skills training using simulation for basic and complex hip and knee arthroplasty



Aresh Sepehri, Philipp von Roth, Karl Stoffel, Yves Acklin, Sam Oussedik, Bas Wijburg, Arisa Wada, Michael Cunningham, Bassam A. Masri

Article: *Orthopedic Clinics of North America*, 2021, Vol.52: 1-13

Read article

ABSTRACT

Key points:

- Skills training is important in an arthroplasty curriculum and can focus either on “part tasks” or on full procedures
- The most commonly used simulations in orthopedics including arthroplasty are anatomic specimens, dry bone models, and virtual or other technology-enhanced systems
- A course curriculum planning committee must identify the gaps to address, define what learners need to be able to do, and select the most appropriate simulation modality and assessment for delivery
- Each simulation must have a clear structure with learning objectives, steps, and take-home messages
- Feedback from learners and faculty must be integrated to improve processes and models for future learning

2020

Integrating webinars to enhance curriculum implementation: AMEE Guide no. 136

Michael Cunningham, Rudolf Elmer, Thommy Rüegg, Claudia Kagelmann, Alain Rickli, Paul Binhammer

Article: *Medical Teacher*, 2020, Vol.43(4), 372-379

Read article

ABSTRACT

Webinars have been used in medical education since 2006 and are now part of the educational offerings of many organizations, including universities, societies, and industry for healthcare trainees and professionals. They are frequently used for continuing medical education (CME) and continuing professional development (CPD) for internal medicine physicians, pharmacists, nurses, and surgeons. There is very limited evidence for the positive impact of these educational events on patient care, however, there is literature that suggests they have educational value for various audiences. Based on our own extensive experience, evaluation data, and key findings over the past decade and a review of the literature, this guide proposes best practices for planning, developing, delivering and evaluating webinars as a part of your curriculum. We propose six phases with steps and questions to help achieve the key purposes of each phase.

2020 (continued)

Metrics development for minimal invasive unilateral laminotomy for bilateral decompression of lumbar spinal stenosis with and without spondylolisthesis by an international expert panel

Carolin Melcher, Andreas Korge, Michael Cunningham, Kevin T. Foley, Roger Härtl

Article: *Global Spine Journal*, 2020, Vol.10(2): 168S-175S

Read article

ABSTRACT

Study design: Prospective study.

Objectives: To develop, operationally define, and seek consensus from procedure experts on the metrics that best characterize a reference approach to the performance of a minimally invasive unilateral laminotomy for bilateral decompression (ULBD) for lumbar spinal stenosis.

Methods: A Metrics Group consisting of 3 experienced spine surgeons (2 neurosurgeons, 1 orthopedic surgeon), each with over 25 years of clinical practice, and an educational expert formed the Metrics Group that characterized a lumbar decompression surgery for spinal stenosis as a "reference" procedure. In a modified Delphi panel, 26 spine surgeons from 14 countries critiqued these metrics and their operational definitions before reaching consensus.

Results: Performance metrics consisting of 6 phases with 42 steps, 21 errors, and 17 sentinel errors were identified that characterize the procedure. During the peer review, these were evaluated, modified, and agreed.

Conclusions: Surgical procedures can be broken down into elemental tasks necessary for the safe and effective completion of a reference approach to a specified surgical procedure. Spinal experts from 16 countries reached consensus on performance metrics for the procedure. This metric-based characterization can be used in a training curriculum and also for assessment of training and performance in clinical practice.

Mixed topics

PRESENTATIONS/WORKSHOPS

2024

Beyond textbooks: Transformative learning with an online interactive biomechanics tool for orthopaedic residents

Peter Varga, Dominic Mischler, Lionel Llano, Danilo Taype, Monica Ghidinelli, Sandipan Chatterjee, Markku Nousiainen, Simon Lambert

Presentation: AMEE 2024, Basel, Switzerland, August 24–28, 2024

Transformative learning of the biomechanical principles of osteosynthesis with an online interactive tool

Peter Varga, Dominic Mischler, Danilo Taype, Sandipan Chatterjee, Monica Ghidinelli, Markku Nousiainen, Simon Lambert, Lionel Llano

Presentation: Deutscher Kongress für Orthopädie und Unfallchirurgie 2024, Berlin, Germany, October 22–25, 2024

2021

Metrics development für die minimalinvasive unilaterale Laminotomie zur bilateralen Dekompression (ULBD) der lumbalen Spinalstenose mit und ohne Spondylolisthesis

Carolin Melcher, Andreas Korge, Mike Cunningham, Kevin Foley, Sertac Kirnaz, Rodrigo Navarro-Ramirez , Roger Härtl

Presentation: Deutscher Kongress für Orthopädie und Unfallchirurgie 2021, Berlin, Germany, October 26–29, 2021

Barriers to entry and for advancement in the organization for women and other underrepresented groups

Tatjana Topalovic, Samantha L. Morello

Presentation (webinar): Alliance for Continuing Education in the Health Professions

What does independent mean in independent medical education (IME)?

Eugene Pozniak, Diana van Brake, Monica Ghidinelli

Presentation (webinar): Good CME Practice Group, November 25, 2021

Mixed topics

PRESENTATIONS/WORKSHOPS

2020

Getting an activity accredited in Europe

Mia Neve, Camilla De Filippi, Monica Ghidinelli

Presentation: 13 European CME forum, online, November 4-6, 2020

POSTERS

2021

Metrics development for minimal invasive unilateral laminotomy for bilateral decompression (ULBD) for lumbar stenosis with and without spondylolisthesis

Carolin Melcher, Andreas Korge, Michael Cunningham, Kevin T. Foley, Roger Härtl

Poster: Global Spine Congress (GSC) 2021, Paris, France, November 3-6, 2021

2020

Video recording orthopedic trauma surgical procedures: Solutions to challenges

Monica Ghidinelli, Michael Cunningham, Alexander Joeris, Thommy Rüegg, Anthony G Gallagher, Urs Ruetschi

Poster: AMEE 2020, online, September 7-9, 2020

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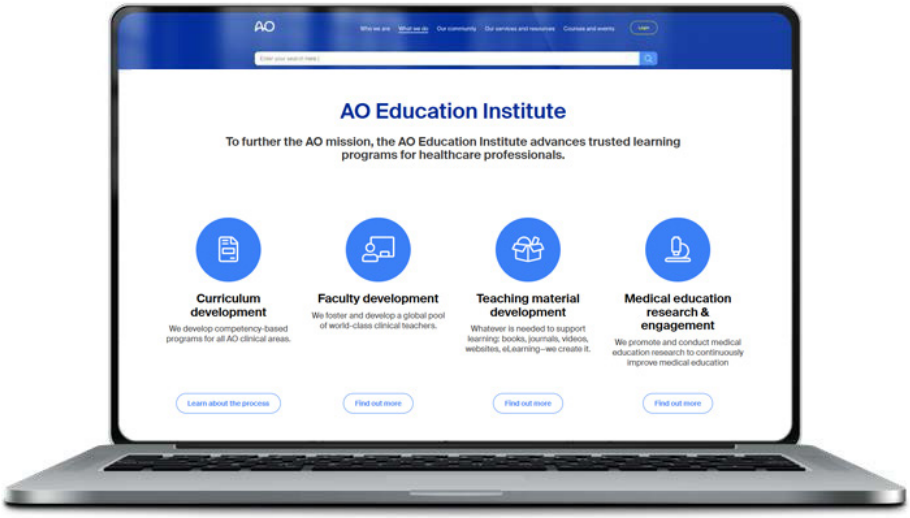

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