AO Trauma Course—
Advanced Principles of Fracture Management for Swiss Surgeons

December 1–6, 2019
Davos, Switzerland

Lecture room:
Schwarzhorn

Precourse online activities:
November 1–30, 2019
Postcourse online activities:
December 7–20, 2019
The AO's flagship educational event, the AO Davos Courses offer surgeons at all stages of their career outstanding educational and networking opportunities. Experience this pioneering spirit of peer-to-peer collaboration and learn skills that will help advance your career.

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**Mission**
The AO’s mission is promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders.

**Purpose statement**
AO Trauma is committed to improve patient care outcomes through the highest quality education. We strive to combine the right knowledge and surgical skills that empower the orthopedic and trauma surgeons to put theory into practice and to improve fracture management for the benefit of the patient.

**The AO principles of fracture management**

1. Fracture reduction and fixation to restore anatomical relationships.
2. Fracture fixation providing absolute or relative stability, as required by the “personality” of the fracture, the patient, and the injury.
3. Preservation of the blood supply to soft-tissues and bone by gentle reduction techniques and careful handling.
4. Early and safe mobilization and rehabilitation of the injured part and the patient as a whole.
Welcome
dear AO Trauma course participant,

Welcome to AO Trauma’s first-class schedule of activities at the AO Davos Courses 2019. We provide a wide range of relevant courses designed to meet your specific professional needs—and we are confident that you will find your course and the networking experiences professionally rewarding.

With a global reputation for innovation, leadership, and excellence in continuing medical education (CME), AO Trauma and the AO Education Institute are transforming education by expanding the educational activities available to you. CME is not just about face-to-face courses. Our educational opportunities address the specific clinical problems that you encounter daily. Visit our website (www.aotrauma.org) to discover the latest educational activities.

At the AO Davos Courses 2019, AO Trauma offers you a chance to actively engage in your course as well as opportunities to:
- Interact with over 300 international faculty
- Expand your professional network by establishing contacts and new relationships with colleagues, including faculty and participants from over 80 countries
- Meet with staff and surgeons from the AO’s clinical divisions, institutes, and initiatives.
- Visit the AO experience or take a tour of our headquarters, the AO center, to gain insight into the AO’s ongoing activities and resources available to support you in your clinical work
- Experience the AO spirit of collegiality and camaraderie that is felt by participants and faculty alike

Your current level of knowledge, attitudes, and skills will be challenged throughout the week. At the same time, our best-in-class curriculum and faculty will provide you with a memorable learning experience that will remain with you for a lifetime.

Your experiences with us over the next few days will result in the realization of new and meaningful knowledge, skills, and understanding that we hope will translate into improved patient care.

If you enjoy your experience this week and want to stay in touch, we invite you to become a member of AO Trauma. Doctors of medicine and osteopathy who have completed AO Trauma basic principles course are eligible for membership; contact us to learn more.

Yours sincerely,

Wa’el Taha
Chairperson AO Trauma
Education Commission

Kodi Kojima
Chairperson AO Trauma
International Board
Course description

This AO Trauma Course—Advanced Principles of Fracture Management for Swiss Surgeons is one of the several competency-based curriculum events in 2019 based on a specific framework of competencies and learning objectives. They feature a balanced mix of educational methods with a strong focus on interactive sessions.

Online precourse self-assessment prepares participants for the course and allows the faculty to tailor the course to the needs of the participants. Before attending the course, participants are expected to complete an online module on reduction techniques. The course will be taught in a modular format. Each module consists of several evidence-based lectures, which will cover the key information required. Discussing cases in small groups will help participants to understand decision-making and management skills. Debates and interactive sessions will promote interactivity between faculty and course participants. In practical exercises participants will be trained in the application of various techniques.

Participants are encouraged to bring their own cases for discussion with the faculty or to be presented during lectures. At the end of the course, participants shall be able to manage complex fractures according to soft-tissue management and AO principles. After the course, an online postcourse self-assessment will help participants to assess how much they have learned.

After the course, the participant will not only have a deep knowledge of the advanced trauma management but also be introduced to the trauma community in Switzerland.

Goal of the course

The AO Trauma Course—Advanced Principles of Fracture Management for Swiss Surgeons is part of the newly developed educational program teaching current concepts and fundamental principles in the treatment of injuries incorporating the latest techniques in operative fracture management. The AO Trauma Course—Advanced principles of fracture management builds upon the AO Principles and techniques learned in the AO Trauma basic principles course, and focuses on more complex injuries.

Target participants

The AO Trauma Course—Advanced Principles of Fracture Management for Swiss Surgeons is targeted at newly certified surgeons and residents in their fourth to sixth year of training intending to specialize in general surgery or in orthopedic surgery with a commitment to trauma.

All surgeons working at a Swiss hospital, including those who are not Swiss, i.e. of European or international origin, are allowed to participate in this course. It builds upon the AO Principles and techniques of the basic principles course, making it necessary for participants to have completed the AO Trauma Course—Basic principles of fracture management, and they must be actively involved in trauma management.

Learning objectives

Upon completion of this course, participants will be able to:

• Support and explain a treatment strategy in advanced fracture treatment
• Apply reduction techniques in fracture management with special attention to soft tissue
• Assess and treat complex fractures using advanced and specific techniques
• Demonstrate strategies for assessing and treating open fractures and soft-tissue injuries, as well as managing polytrauma patients
• Outline, classify and formulate a treatment plan for pelvic injuries, as well as acetabular fractures
• Identify and understand the reasons for complications and manage them accordingly
Chair-person

Näder Helmy
Bürgerspital Solothurn,
Solothurn, Switzerland

Co-chair-person

Christian Candrian
Ospedale Civico Lugano,
Lugano, Switzerland

National faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Location</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michele Arigoni</td>
<td>Ospedale Regionale di Locarno La Carità</td>
<td>Locarno</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Lorin Benneker</td>
<td>Inselspital, University of Bern</td>
<td>Bern</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Emanuel Benninger</td>
<td>General Hospital of Winterthur</td>
<td>Winterthur</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Christian Michelitsch</td>
<td>Kantonsspital Graubünden</td>
<td>Chur</td>
<td>Switzerland</td>
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<tr>
<td>Jochen Müller</td>
<td>Ospedale Regionale Lugano</td>
<td>Lugano</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Geert Pagenstert</td>
<td>University of Basel</td>
<td>Basel</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Daniel Petek</td>
<td>Hôpital cantonal de Fribourg</td>
<td>Fribourg</td>
<td>Switzerland</td>
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<tr>
<td>Mark Rudin</td>
<td>Kantonsspital Winterthur</td>
<td>Winterthur</td>
<td>Switzerland</td>
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<tr>
<td>Philipp Stilhard</td>
<td>Kantonsspital Graubünden</td>
<td>Chur</td>
<td>Switzerland</td>
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<tr>
<td>Moritz Tannast</td>
<td>Hôpital cantonal de Fribourg</td>
<td>Fribourg</td>
<td>Switzerland</td>
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<tr>
<td>Frédéric Vaucclair</td>
<td>Centre hospitalier universitaire vaudois</td>
<td>Lausanne</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Pia Zurmühle</td>
<td>Kantonsspital St. Gallen</td>
<td>St. Gallen</td>
<td>Switzerland</td>
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Guest lecturer

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<tr>
<th>Name</th>
<th>Institution</th>
<th>Location</th>
<th>Country</th>
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<tbody>
<tr>
<td>Christoph Aufdenblatten</td>
<td>Universitäts-Kinderspital Zürich</td>
<td>Zurich</td>
<td>Switzerland</td>
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<tr>
<td>Emanuel Gautier</td>
<td>Hôpital cantonal de Fribourg</td>
<td>Fribourg</td>
<td>Switzerland</td>
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<tr>
<td>Daniel Rikli</td>
<td>Universitätssspital Basel</td>
<td>Basel</td>
<td>Switzerland</td>
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Precourse online activities

November 1–30, 2019

**Task 1: Online precourse self-assessment (30 minutes)**

The online precourse self-assessment consists of questions on your profile and expertise as well as a set of multiple-choice questions with direct feedback. Your participation will help us to focus on your needs at the upcoming event.

Please complete the eLearning module "Fracture reduction" after the precourse self-assessment and before attending the course, because faculty will build on your newly acquired knowledge.

**Task 2: eLearning module Fracture reduction (20 minutes)**


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**Sunday**

December 1, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>15:00</td>
<td>Opening of the congress center</td>
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<tr>
<td>15:00–17:00</td>
<td>Registration of participants</td>
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<tr>
<td>17:00–19:00</td>
<td>Opening Ceremony and Founders’ Reception</td>
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</tbody>
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**Monday**

December 2, 2019

**Location: Schwarzhorn** (lectures) **Jakobshorn** (practicals)

**Module 1**

**Moderator: N Helmy**

**Review of the principles and techniques**

Upon completion of this module, participants will be able to:
- Describe the role of soft-tissue in fracture healing
- Select appropriate techniques of closed reduction with attention to the soft-tissue
- Set priorities for implant selection

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>08:00–08:15</td>
<td>Welcome and introduction</td>
<td>N Helmy, C Candrian</td>
</tr>
<tr>
<td>08:15–08:30</td>
<td>Review of principles of fracture treatment</td>
<td>D Petek</td>
</tr>
<tr>
<td>08:30–08:35</td>
<td>Discussion</td>
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<tr>
<td>08:35–08:50</td>
<td>Soft-tissue handling in fracture treatment</td>
<td>C Candrian</td>
</tr>
<tr>
<td>08:50–09:05</td>
<td>Clinical indication for locked plating</td>
<td>G Pagenstert</td>
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<tr>
<td>09:05–09:20</td>
<td>Fractures of the clavicle—surgical indications and methods of fixation</td>
<td>E Benninger</td>
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<tr>
<td>09:20–09:30</td>
<td>Discussion</td>
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<tr>
<td>09:30–09:45</td>
<td>Coffee break</td>
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</tbody>
</table>
Module 2  
**Moderator: C Candrian**  
**Fractures of the upper extremity**

Upon completion of this module, participants will be able to:
- Identify the expected outcomes and appropriate treatment options for clavicular fractures
- Evaluate evidence for fixation of proximal humeral fractures versus replacement
- Identify the indications for surgical treatment of humeral shaft fractures
- Define strategies in the treatment of elbow fracture dislocations
- Explain the key issues in the debate about treatment of distal radial fractures
- Describe the surgical approaches for open reduction and internal fixation (ORIF) of the wrist

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>09:45–10:00</td>
<td>Upper extremity fractures—indications for external fixation (Ex Fix) and pin positioning</td>
<td>C Michelitsch</td>
</tr>
<tr>
<td>10:00–10:15</td>
<td>Proximal humeral fractures—conservative versus surgical indications</td>
<td>F Vauclair</td>
</tr>
<tr>
<td>10:15–10:30</td>
<td>Distal intraarticular humeral fractures—approaches and fixation concepts</td>
<td>M Arigoni</td>
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<tr>
<td>10:30–10:45</td>
<td>Fractures of the forearm—not every fracture is the same</td>
<td>E Benninger</td>
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<tr>
<td>10:45–10:55</td>
<td>Discussion</td>
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<tr>
<td>10:55–11:00</td>
<td>Location change to practical exercise room</td>
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<tr>
<td>11:00–11:05</td>
<td>Introduction to practical exercises</td>
<td>N Helmy</td>
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</tbody>
</table>
| 11:05-12:35 | Practical exercise 1  
Proximal humerus—fixation of an 11C1 four-fragment fracture using a proximal humeral internal locking system | P Stillhard       |
| 12:35–14:00 | Lunch break                                                                                 |                   |
| 14:00–15:25 | **Practical exercise 2**                                                                     | F Vauclair        |
|           | Fixation of a type 13C3 fracture in the distal humerus using an elbow system VA-LCP perpendicular plating |                   |
| 15:25–15:30 | Location change to lecture room                                                              |                   |
| 15:30–15:45 | Distal radial fractures—non-operative or operative treatment?                               | D Rikli           |
| 15:45–15:50 | Discussion                                                                                  |                   |
| 15:50–16:00 | Location change to discussion groups                                                         |                   |
| 16:00–17:00 | **Discussion group 1**                                                                       |                   |
|           | Fractures of the upper extremity                                                            |                   |
|           | Group 1 – Landwasser 8                                                                      | G Pagenstert, F Vauclair |
|           | Group 2 – Landwasser 10                                                                     | M Arigoni, M Rudin  |
|           | Group 3 – Landwasser 12                                                                     | C Michelitsch, E Benninger |
|           | Group 4 – Landwasser 14                                                                     | P Stillhardt, N Helmy |
### Module 2
**Moderator:** C Candrian  
**Fractures of the upper extremity (continued)**

<table>
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<tr>
<th>Time</th>
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</table>
| 08:00–09:05 | **Practical exercise 3**  
Distal radius—two-column distal radius fracture | C Michelitsch |
| 09:05–09:10 | Location change to lecture room |             |

### Module 3
**Moderator:** L Benneker  
**Basic considerations in pelvic and spinal fractures**

Upon completion of this module, participants will be able to:
- Identify the expected outcomes and appropriate treatment options for acetabular fractures
- Outline emergency pelvic treatment
- Recognize and differentiate stable and unstable spinal fractures

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<th>Time</th>
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<tbody>
<tr>
<td>09:10–09:25</td>
<td>Basics in spinal fracture treatment</td>
<td>L Benneker</td>
</tr>
<tr>
<td>09:25–09:40</td>
<td>Management of pelvic ring injuries</td>
<td>M Tannast</td>
</tr>
<tr>
<td>09:40–09:55</td>
<td>Discussion</td>
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<tr>
<td>09:55–10:15</td>
<td>Coffee break</td>
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| 10:15–11:25 | **Practical exercise 4**  
Supraacetabular external fixator, C-clamp, standard external fixator for pelvis | M Tannast   |
| 11:25–11:30 | Location change to lecture room |             |
Module 4
Moderator: N Helmy
Femoral fractures

Upon completion of this module, participants will be able to:
• Outline the management of proximal femoral fractures in young patients and in the elderly
• Explain the biomechanics of the subtrochanteric region including the forces acting on the fracture fragments
• Identify the expected outcomes and appropriate treatment options for subtrochanteric fractures
• Assess the complexity of distal femoral fractures
• Compare the pros and cons of plating, screws, minimally invasive plate osteosynthesis (MIPO), and intramedullary (IM) nailing
• Determine the key factors for outcomes of femoral fractures

11:30–11:45 Femoral neck fractures—different concepts for different patients D Petek
11:45–12:00 Current treatments of trochanteric femoral fractures M Rudin
12:00–12:15 Discussion
12:15–14:00 Lunch break
14:00–14:55 Discussion group 2
  Fractures of the femur
  Group 1 – Landwasser 8
  Group 2 – Landwasser 10
  Group 3 – Landwasser 12
  Group 4 – Landwasser 14 M Arigoni, M Tannast
14:55–15:00 Location change to lecture room
15:00–15:15 Distal femoral fractures—treatment options and outcomes P Stillhard
15:15–15:30 Coffee break
15:30–16:55 Practical exercise 5
  Fixation of an intraarticular type 33C2.1 C Candrian
16:55–17:00 Location change to lecture room

Module 5
Moderator: D Petek
Fractures around the knee and tibial fractures

Upon completion of this module, participants will be able to:
• Recognize patterns of injury in tibial fractures
• Evaluate indications and techniques for extreme IM nailing of the tibia
• Assess complexity and outline a staged approach to treating soft-tissue
• Describe the decision-making process for the management of articular tibial fractures
• Evaluate surgical options and techniques for open reduction and external fixation (ORIF) of the tibial plateau and pilon fractures

17:00–17:15 The periprosthetic femoral shaft fracture—is stem revision the only option? P Zumühle
17:15–17:30 Complex tibial plateau fractures—strategies for fixation M Arigoni
17:30–17:45 Combined tibial plateau and shaft fractures—treatment strategies P Stillhard
17:45–17:55 Discussion

17:45–20:30 AO Davos Courses night
Wednesday
December 4, 2019

Self-directed learning modules (morning option)
Participants will choose their own program by selecting one of the following three morning modules:

Chairpersons

Christian Candrian
Ospedale Cívico Lugano, Lugano, Switzerland

Nir Cohen
Rabin Medical Center - Beilinson Campus, Petah Tikva, Israel

Vincenzo Giordano
Serviço de Ortopedia e Traumatologia Prof. Nova Monteiro – Hospital Municipal Miguel Couto, Rio de Janeiro, Brazil

Faculty

Approaches—upper extremity

Ying-Chao Chou
Chang Gung Memorial Hospital Linkou Branch
Kwuanshia, Taoyuan, Taiwan

Nir Cohen
Rabin Medical Center - Beilinson Campus
Petah Tikva, Israel

Marcis Radzins
Hospital of Traumathology and Orthopaedics, Clinic Ortomed
Riga, Latvia

Martin Richardson
University of Melbourne, Epworth Hospital
Melbourne, Australia

Johan Scheer
University Hospital Linköping
Linköping, Sweden

Frédéric Vaucclair
Centre hospitalier universitaire vaudois
Lausanne, Switzerland

Intramedullary nailing—principles made easy

Sushrut Babhulkar
Sushrut Institute of Medical Sciences
Nagpur, India

Paulo Barbosa
Hospital Quinta D’Or
Rio de Janeiro, Brazil

Gregory Della Rocca
University of Missouri
Columbia, USA

Sergei Fischer
Universidade Federal do Paraná - Hospital do Trabalhador
Curitiba, Brazil

Vincenzo Giordano
Serviço de Ortopedia e Traumatologia Prof. Nova Monteiro
Rio de Janeiro, Brazil

Näder Helmy
Bürgerspital Solothurn
Solothurn, Switzerland

Mark Lee
University of California, Davis
Sacramento, USA

Jong-Keon Oh
Korea University Guro Hospital
Seoul, South Korea

An Sermon
University Hospitals Gasthuisberg
Leuven, Belgium

Philipp Stillhard
Kantonsspital Graubünden
Chur, Switzerland

Associated shaft and articular fractures

Christian Candrian
Ospedale Cívico Lugano
Lugano, Switzerland

Juan Concha Sandoval
Universidad del Cauca
Popayan, Colombia

Marcos Leonhardt
Instituto de Ortopedia e Traumatologia do HCFMUSP
Sao Paulo, Brazil

Eric Moghadamian
University of Kentucky
Lexington, USA

Jochen Müller
Ospedale Regionale Lugano
Lugano, Switzerland

Chang-Wug Oh
Kyungpook National University Hospital, Daegu
Daegu, South Korea

Dan Putineanu
Cliniques Universitaires St. Luc
Brussels, Belgium

Paul-Martin Sutter
Spitalzentrum Biel
Biel, Switzerland

Moritz Tannast
Hôpital cantonal de Fribourg
Fribourg, Switzerland
Wednesday
December 4, 2019

Self-directed learning modules (afternoon option)
Participants will choose their own program by selecting one of the following three afternoon modules:

Faculty

Approaches—lower extremity

Mazen Abdalla  
An-Najah University Hospital  
Nablus  
Palestinian Territory

Christian Candrian  
Ospedale Civico Lugano  
Lugano  
Switzerland

Jochen Müller  
Ospedale Regionale Lugano  
Lugano  
Switzerland

Danilo Taype Zamboni  
Hospital Italiano de Buenos Aires  
Buenos Aires  
Argentina

Jayne Ward  
University Hospital Coventry and Warwickshire  
Coventry  
United Kingdom

Christian Willy  
Bundeswehr Krankenhaus Berlin  
Berlin  
Germany

Avoiding and treating complications

Juan Concha Sandoval  
Universidad del Cauca  
Popayan  
Colombia

Vincenzo Giordano  
Servicio de Ortopedia e Traumatologia Prof. Nova Monteiro  
Rio de Janeiro  
Brazil

Kodi Kojima  
University of Sao Paulo  
Sao Paulo  
Brazil

John McMaster  
John Radcliffe Hospital  
Oxford  
United Kingdom

Marinis Pirpiris  
Epworth Hospital  
Richmond  
Australia

Spence Reid  
Pennsylvania State University College of Medicine, Milton S. Hershey Medical Center  
Hershey  
USA

Tito Rocha  
Instituto Nacional de Ortopedia e Traumatologia  
Rio de Janeiro  
Brazil

Michael Sirkin  
New Jersey Medical School  
Newark  
USA

Leonid Solomin  
Vreden Russian Research Institute of Traumatiligy  
St.Petersburg  
Russian Federation

Andrey Volna  
Ilyinsky Hospital  
Ilyinskoe  
Russian Federation

Management of bone disease and fracture

Matheus Azi  
Hospital Manoel Victorino  
Salvador  
Brazil

Igor Belenkiy  
Alexandrovsky City Hospital  
St Petersburg  
Russian Federation

Lorin Benneker  
Inselhospital, University of Bern  
Bern  
Switzerland

Nir Cohen  
Rabin Medical Center - Beilinson Campus  
Petah Tikva  
Israel

Mark Hatton  
Nottingham University Hospitals  
Nottingham  
United Kingdom

Eric Moghadamian  
University of Kentucky  
Lexington  
USA

Mauro Núñez  
Hospital del Trauma  
San José  
Costa Rica

Chang-Wug Oh  
Kyungpook National University Hospital  
Daegu  
South Korea

John Scolaro  
University of California, Irvine  
Orange  
USA

An Sermon  
University Hospitals Gasthuisberg  
Leuven  
Belgium

Yoram Weil  
Hadassah Hebrew University Medical Center  
Jerusalem  
Israel
### Approaches—upper extremity

**Location:** Davos 1

**Module**

**Moderator:** N Cohen

**Approaches and positioning of upper extremity trauma made easy**

Upon completion of this module, participants will be able to:
- Describe the different ways to position patients for surgery of the upper extremity
- Apply the different surgical approaches used for the upper extremity based on their indications
- Identify structures at risk for the different surgical exposures
- Explain how to obtain intraoperative imaging

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Instructor(s)</th>
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<tbody>
<tr>
<td>08:00–08:05</td>
<td>Introduction</td>
<td>N Cohen</td>
</tr>
<tr>
<td>08:05–08:15</td>
<td>Soft tissue in upper extremity trauma</td>
<td>YC Chou</td>
</tr>
<tr>
<td>08:15–08:40</td>
<td>Approaches to the shoulder:</td>
<td>M Richardson</td>
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<tr>
<td></td>
<td>• Deltoid split</td>
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<tr>
<td></td>
<td>• Deltoid split</td>
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<tr>
<td>08:40–09:05</td>
<td>Approaches to the humerus:</td>
<td>N Cohen</td>
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<tr>
<td></td>
<td>• Anterolateral</td>
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<td>• Posterior</td>
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<tr>
<td>09:05–09:30</td>
<td>Approaches to the elbow:</td>
<td>F Vaucclair</td>
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<tr>
<td></td>
<td>• Lateral</td>
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<td>• Medial</td>
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<tr>
<td>09:30–09:50</td>
<td>Approaches to the forearm:</td>
<td>J Scheer</td>
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<tr>
<td></td>
<td>• Volar/Henry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dorsal/Thompson</td>
<td></td>
</tr>
<tr>
<td>09:50–10:10</td>
<td>Approaches to the distal radius:</td>
<td>M Radzins</td>
</tr>
<tr>
<td></td>
<td>• Flexor carpi radialis (FCR)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dorsal (volar lateral)</td>
<td></td>
</tr>
<tr>
<td>10:10–10:40</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>10:40–11:40</td>
<td>Practical exercise—demonstration of supine, prone, beach chair, and lateral positions for upper extremity surgery with intraoperative imaging</td>
<td>N Cohen, M Radzins, M Richardson</td>
</tr>
<tr>
<td>11:40–12:00</td>
<td>Questions and closing remarks</td>
<td>N Cohen</td>
</tr>
<tr>
<td>12:00–13:30</td>
<td>Lunch break</td>
<td></td>
</tr>
</tbody>
</table>

### Intramedullary nailing—principles made easy

**Location:** Aspen 2

**Module**

**Moderator:** V Giordano

**Intramedullary (IM) nailing—principles made easy**

Upon completion of this module, participants will be able to:
- Treat fractures and other musculoskeletal problems with IM nailing when indicated
- Select the IM nailing procedure based on the fracture, the patient, and the best available evidence
- Prepare the patient for the IM nailing procedure and plan and provide postoperative care
- Recognize IM canal anatomy and the correct entry point for common situations
- Achieve reduction for diaphyseal fractures and maintain reduction during IM fixation

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00–08:05</td>
<td>Welcome and introduction</td>
<td>V Giordano</td>
</tr>
<tr>
<td>08:05–08:20</td>
<td>Biomechanical principles and nail design—how does it work?</td>
<td>A Sermon</td>
</tr>
<tr>
<td>08:20–08:35</td>
<td>Patient positioning and reduction for nailing</td>
<td>P Stillhard</td>
</tr>
<tr>
<td>08:35–08:50</td>
<td>Entry points selection—how to avoid complications?</td>
<td>S Babhulkar</td>
</tr>
<tr>
<td>08:50–09:05</td>
<td>Case-based lecture—reduction techniques for diaphyseal fractures—nailing</td>
<td>P Barbosa</td>
</tr>
<tr>
<td>09:05–10:05</td>
<td>Plenary case discussions</td>
<td>N Helmy</td>
</tr>
<tr>
<td>10:05–10:25</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>10:25–10:40</td>
<td>Fractures of the proximal 1/3 of the femur—tips to improve implant positioning and results</td>
<td>JK Oh</td>
</tr>
<tr>
<td>10:40–10:55</td>
<td>Segmentary fracture of the femoral shaft—how to ream the intercalary fragment</td>
<td>S Fischer</td>
</tr>
<tr>
<td>10:55–11:10</td>
<td>Fracture around a fixed femoral stem—extreme nailing fixation—when and how</td>
<td>M Lee</td>
</tr>
<tr>
<td>11:10–11:25</td>
<td>Nailing under plate—a good option for periplate fracture in the femur</td>
<td>V Giordano</td>
</tr>
<tr>
<td>11:25–11:40</td>
<td>Questions from the participants</td>
<td>V Giordano</td>
</tr>
<tr>
<td>11:40–11:55</td>
<td>Limits of indications for tibial fractures and “Poller screw” technique</td>
<td>G Della Rocca</td>
</tr>
<tr>
<td>11:55–12:00</td>
<td>Evaluation and summary</td>
<td>V Giordano</td>
</tr>
<tr>
<td>12:00–13:30</td>
<td>Lunch break</td>
<td></td>
</tr>
</tbody>
</table>
Associated shaft and articular fractures

Location: Schwarzhorn

Module
Moderator: C Candrian

Associated shaft and articular fractures—rationale for the management

Upon completion of this module, participants will be able to:
- Identify the injury pattern and its associated musculoskeletal problems
- Apply correct principles for fracture approach and reduction
- Discuss the management options and the adequate strategy of fracture fixation
- Avoid pitfalls and complications related to the injury itself

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00–08:05</td>
<td>Welcome and introduction</td>
<td>C Candrian</td>
</tr>
<tr>
<td>08:05–08:20</td>
<td>Associated distal clavicle and glenoid neck fracture</td>
<td>PM Sutter</td>
</tr>
<tr>
<td>08:20–08:35</td>
<td>Associated proximal and shaft humeral fracture</td>
<td>J Concha Sandoval</td>
</tr>
<tr>
<td>08:35–08:50</td>
<td>Associated distal humeral and forearm shaft fracture</td>
<td>M Leonhardt</td>
</tr>
<tr>
<td>08:50–09:40</td>
<td><strong>Case-based discussion—complex distal and shaft humeral fracture</strong></td>
<td>D Putineanu</td>
</tr>
<tr>
<td>09:40–10:00</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>10:00–10:15</td>
<td>Associated acetabular and femoral shaft fracture</td>
<td>M Tannast</td>
</tr>
<tr>
<td>10:15–10:30</td>
<td>Associated femoral neck and shaft fracture</td>
<td>CW Oh</td>
</tr>
<tr>
<td>10:30–10:45</td>
<td>Associated distal femoral and tibial shaft fracture</td>
<td>C Candrian</td>
</tr>
<tr>
<td>10:45–11:00</td>
<td>Associated tibial shaft and posterior malleolar fracture</td>
<td>J Müller</td>
</tr>
<tr>
<td>11:00–11:55</td>
<td><strong>Case-based discussion—complex femoral shaft and tibial plateau fracture</strong></td>
<td>E Moghadamian</td>
</tr>
<tr>
<td>11:55–12:00</td>
<td>Evaluation and summary</td>
<td>C Candrian</td>
</tr>
<tr>
<td>12:00–13:30</td>
<td>Lunch break</td>
<td></td>
</tr>
</tbody>
</table>

Wednesday morning
December 4, 2019
## Approaches—lower extremity

### Location: Davos 1

**Module**

**Moderator:** C Candrian

**Approaches and positioning of lower extremity trauma made easy**

Upon completion of this module, participants will be able to:
- Describe the different ways to position patients for surgery of the lower extremity
- Explain how to obtain imaging for intraoperative use
- List the different surgical approaches used in trauma surgery for the lower extremity and their indications
- Explain the limitations of exposures for the different approaches of the lower extremity

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30–13:35</td>
<td>Introduction</td>
<td>C Candrian</td>
</tr>
<tr>
<td>13:35–13:50</td>
<td>Soft tissue in lower limb trauma</td>
<td>J Ward</td>
</tr>
<tr>
<td>13:50–14:10</td>
<td>Approaches to the hip:</td>
<td>D Taype Zamboni</td>
</tr>
<tr>
<td></td>
<td>- Kocher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Anterior—Smith-Peterson</td>
<td></td>
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<tr>
<td></td>
<td>- Lateral—Watson-Jones</td>
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</tr>
<tr>
<td>14:10–14:20</td>
<td>Approaches to the femoral shaft:</td>
<td>M Abdalla</td>
</tr>
<tr>
<td></td>
<td>- Lateral extensile</td>
<td></td>
</tr>
<tr>
<td>14:20–14:30</td>
<td>Supine approaches to the knee:</td>
<td>C Candrian</td>
</tr>
<tr>
<td></td>
<td>- Anterolateral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Medial</td>
<td></td>
</tr>
<tr>
<td>14:30–14:50</td>
<td>Prone approaches to the knee:</td>
<td>C Willy</td>
</tr>
<tr>
<td></td>
<td>- Posteromedial</td>
<td></td>
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<tr>
<td></td>
<td>- Direct posterior</td>
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</tr>
<tr>
<td>14:50–15:10</td>
<td>Approaches to the ankle:</td>
<td>J Müller</td>
</tr>
<tr>
<td></td>
<td>- Anterolateral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Posteromedial</td>
<td></td>
</tr>
<tr>
<td>15:10–15:40</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>15:40–16:40</td>
<td><strong>Practical exercise</strong>—demonstration of supine, prone, and lateral positions for lower extremity surgery with intraoperative imaging</td>
<td>C Candrian, J Müller, M Abdalla</td>
</tr>
<tr>
<td>16:40–17:10</td>
<td>Questions and closing remarks</td>
<td>C Candrian</td>
</tr>
</tbody>
</table>

## Avoiding and treating complications

### Location: Aspen 2

**Module**

**Moderator:** V Giordano

**Avoiding and treating complications of fracture management**

Upon completion of this module, participants will be able to:
- Identify and discuss the methods of staged fracture care
- Apply operative care according to the location and soft-tissue condition of the fracture
- Recognize the indications and contraindications of osteotomy in the management of malunion
- Identify and discuss the indications for amputation

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:55–14:15</td>
<td>Do you need to stage all periarticular fractures?</td>
<td>M Sirkin</td>
</tr>
<tr>
<td>14:15–14:35</td>
<td>What to do when periarticular wounds break down and fractures become infected?</td>
<td>J Concha Sandoval</td>
</tr>
<tr>
<td>14:35–14:55</td>
<td>The management of open bony deficits—the place of shortening—Masquelet and transport</td>
<td>K Kojima</td>
</tr>
<tr>
<td>14:55–15:15</td>
<td>The place of external fixation in definitive management of delayed presentation of open limb injuries</td>
<td>A Volna</td>
</tr>
<tr>
<td>15:15–15:35</td>
<td>Osteotomies in the correction of diaphyseal injuries</td>
<td>S Reid</td>
</tr>
<tr>
<td>15:35–15:55</td>
<td>Questions and answers</td>
<td>V Giordano</td>
</tr>
<tr>
<td>15:55–16:15</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>16:15–16:35</td>
<td>Amputations or salvage—how to decide?</td>
<td>J McMaster</td>
</tr>
<tr>
<td>16:35–16:55</td>
<td>Osteotomies in the correction of articular fractures</td>
<td>L Solomin</td>
</tr>
<tr>
<td>16:55–17:15</td>
<td>Repair or replace?—options for cartilage resurfacing</td>
<td>M Pirpiris</td>
</tr>
<tr>
<td>17:15–17:45</td>
<td>Questions and closing remarks</td>
<td>V Giordano</td>
</tr>
</tbody>
</table>
Management of bone disease and fracture

Location: Schwarzhorn

Module
Moderator: N Cohen

Management of bone disease and fracture

Upon completion of this module, participants will be able to:

- Define the normal physiology of bone modeling and remodeling
- Explain the differences between normal bone turnover and some common bone diseases
- Discuss the current protocols for those bone diseases
- Identify the problems of fracture-related infection
- List the existing options for the management of fracture-related infection

13:30–13:35 Introduction
N Cohen

13:35–13:55 Case-based discussion—the fracture doesn’t heal—why?
J Scolaro

13:55–14:10 Bone turnover—an overview
M Azi

14:10–14:25 The diamond concept—is it affected by bone remodeling disorders?
E Moghadamian

14:25–14:40 Assessing the risk of bone disease and fracture—is there a rationale for that?
M Nuñez

14:40–14:55 Metastatic fractures—do I need to do anything special?
N Cohen

14:55–15:10 Osteoporotic fractures—what’s hot, what’s not?
L Benneker

15:10–15:25 Atypical femoral fractures—pearls and pitfalls
CW Oh

15:25–15:40 Medical management of bone remodeling disorders—what really works?
C Kammerlander

15:40–16:00 Coffee break

16:00–16:20 Case-based discussion—Fracture related infection—introduction and diagnosis
I Belenky

16:20–16:35 Hardware considerations: keep, remove, exchange
Y Weil

16:35–16:50 Antibiotic treatment and clinical strategies for post-osteosynthesis osteomyelitis
A Sermon

16:50–17:05 The role of cement beads and cement spacers in the treatment of bone defects associated with post-osteosynthesis osteomyelitis
M Azi

17:05–17:15 Case-based discussion
M Hatton

17:15–17:30 Questions and closing remarks
N Cohen

Wednesday afternoon
December 4, 2019

Case-based discussion—Fracture related infection—introduction and diagnosis
I Belenky
# Thursday

**December 5, 2019**

**Location:** Schwarzhorn (lectures) Jakobshorn (practicals)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00–9:00</td>
<td><strong>Discussion group 3</strong>&lt;br&gt;Fractures of the tibia&lt;br&gt;Group 1 – Landwasser 8&lt;br&gt;Group 2 – Landwasser 10&lt;br&gt;Group 3 – Landwasser 12&lt;br&gt;Group 4 – Landwasser 14</td>
</tr>
<tr>
<td>09:00–09:05</td>
<td>Location change to lecture room</td>
</tr>
</tbody>
</table>

## Module 5

**Moderator:** N Helmy

**Fractures around the knee and tibial fractures (continued)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:05–09:20</td>
<td>Total knee arthroplasty in complex tibial plateau fractures</td>
</tr>
<tr>
<td>09:20–09:35</td>
<td>Management of open fractures</td>
</tr>
<tr>
<td>09:35–09:45</td>
<td>Case discussion</td>
</tr>
<tr>
<td>09:45–10:05</td>
<td>Coffee break</td>
</tr>
<tr>
<td>10:05–11:10</td>
<td><strong>Practical exercise 6</strong>&lt;br&gt;Management of a type 41C3 bicondylar tibial plateau fracture using a variable angle locking compression plate (VA LCP)</td>
</tr>
<tr>
<td>11:10–11:15</td>
<td>Location change to lecture room</td>
</tr>
<tr>
<td>11:15–11:30</td>
<td>Pilon fractures—treatment options</td>
</tr>
<tr>
<td>11:30–11:45</td>
<td>Complex malleolar fractures</td>
</tr>
<tr>
<td>11:45–12:00</td>
<td>Discussion</td>
</tr>
<tr>
<td>12:00–13:30</td>
<td>Lunch break</td>
</tr>
</tbody>
</table>

## Module 6

**Moderator:** M Arigoni

**Foot fractures**

Upon completion of this module, participants will be able to:
- Identify patterns of calcaneal injuries
- Select and apply an appropriate classification system
- Request and interpret appropriate x-rays and computed tomographic (CT) scans
- Explain the risk of complications following injuries to the talus

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30–15:15</td>
<td><strong>Practical exercise 7</strong>&lt;br&gt;Management of a type 43C2.3 pilon tibial fracture using a distal tibial LCP</td>
</tr>
<tr>
<td>15:15–15:20</td>
<td>Location change to lecture room</td>
</tr>
<tr>
<td>15:20–15:35</td>
<td>Calcaneal fractures—predicting and avoiding problems</td>
</tr>
<tr>
<td>15:35–16:00</td>
<td>Talar neck fractures and complications</td>
</tr>
<tr>
<td>15:50–16:00</td>
<td>Discussion</td>
</tr>
<tr>
<td>16:00–16:20</td>
<td>Coffee break</td>
</tr>
<tr>
<td>16:20–17:45</td>
<td><strong>Practical exercise 8</strong>&lt;br&gt;Open reduction and internal fixation of intraarticular calcaneal fractures using a calcaneal locking plate</td>
</tr>
</tbody>
</table>
Friday
December 6, 2019

Location: Schwarzhorn (lectures) Jakobshorn (practicals)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00–09:00</td>
<td>Discussion group 4 Fractures of the ankle and foot</td>
<td>M Arigoni, L Benneker, C Candrian, P Zumühle, J Müller, G Pagenstert, M Tannast, D Petek</td>
</tr>
<tr>
<td>09:00–09:05</td>
<td>Location change to lecture room</td>
<td></td>
</tr>
</tbody>
</table>

Module 7
Moderator: M Rudin
Polytrauma and complications

Upon completion of this module, participants will be able to:
- Set priorities for management of injuries
- Identify patients that can safely have early total care
- Outline how to reduce infection rates
- Debate the role of surgical intervention and antibiotics in the management of infected implants
- Recognize failure to progress towards union early and analyze the reasons for such failure

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:05–09:15</td>
<td>Introduction to the week’s quiz</td>
<td>D Petek</td>
</tr>
<tr>
<td>09:15–09:45</td>
<td>Week’s quiz</td>
<td>D Petek</td>
</tr>
<tr>
<td>09:45–10:00</td>
<td>General management of non-union—why do not all fractures heal?</td>
<td>M Tannast</td>
</tr>
<tr>
<td>10:00–10:15</td>
<td>Mangled extremity management—when is salvage reasonable?</td>
<td>J Rudin</td>
</tr>
<tr>
<td>10:15–10:30</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>10:30–10:45</td>
<td>The management of multiple-injured patients</td>
<td>E Benninger</td>
</tr>
<tr>
<td>10:45–11:00</td>
<td>Case-based lecture—pediatric fractures</td>
<td>C Aufdenblatten</td>
</tr>
<tr>
<td>11:00–11:15</td>
<td>Osteoporotic fractures</td>
<td>P Zumühle</td>
</tr>
<tr>
<td>11:15–11:30</td>
<td>Infection after ORIF—when to keep the implants?</td>
<td>N Helmy</td>
</tr>
<tr>
<td>11:30–11:45</td>
<td>The past, the present (...and the future) of fracture treatment</td>
<td>E Gautier</td>
</tr>
<tr>
<td>11:45–12:00</td>
<td>Results of week’s quiz, awards and week’s summary, Course feedback, closing remarks, and awarding of prizes</td>
<td>N Helmy, C Candrian</td>
</tr>
<tr>
<td>12:00–12:30</td>
<td>Sandwich break</td>
<td></td>
</tr>
</tbody>
</table>

Postcourse online activities
December 7–20, 2019

Online postcourse self-assessment (10 minutes)

Upon completion of this course, you will receive an e-mail link to the postcourse self-assessment. Please take the opportunity to complete the self-assessment. This will help you to reflect on what you have learned during the event and also help us to improve future events.
Event organization

AO Trauma Education
Claudia Guentensperger
Clavadelerstrasse 8
7270 Davos Platz
Switzerland
Phone +41 81 414 27 20
Fax +41 81 414 22 84
E-mail cguentensperger@aotrauma.org

AO funding sources
Unrestricted educational grants from different sources are collected and pooled together centrally by the AO. All events are planned and scheduled by local and regional AO surgeon groups based on local needs assessments. We rely on industrial commercial partners for in-kind support to run simulations and/or skills training if educationally necessary.

Event venue and opening times

Congress Centre Davos
Talstrasse 49A
7270 Davos, Switzerland
Phone +41 81 414 62 00
Fax +41 81 414 62 29

General information
Sunday 12:00–19:00
Monday through Thursday 07:30–19:00
Friday 07:30–16:00

The AO experience
Sunday 14:00–17:00
Monday through Thursday 09:00–18:30 (Tuesday –20:30)
Friday 09:00–16:00

Industry exhibition
Sunday 14:00–17:00
Monday through Thursday 09:00–18:30
Friday 09:00–18:00
Exhibitions

The AO experience
The AO experience offers you the chance to view the latest publications in the AO library, see what benefits you are eligible for in the community and membership area and take a selfie with your new colleagues. Explore AO teaching and learning resources and find out about our new digital gateway myAO at the digital zone’s interactive stations. Visit the innovation in research and development zone, to take part in hands on demos featuring some of our newest innovations, and join the AO Technical Commission’s popular Meet the Experts sessions. Don’t forget to purchase any mementos at our store in the main entrance. Experience the AO spirit, walk the timeline of AO history, and mingle with other participants. AO staff will be on-hand to help you get the most out of this experience.

Exhibition partners
Visit the exhibitions of our trusted partner DePuy Synthes, Siemens, and other exhibitors: SPI, Invibio, Precision OS, Synoste, Rimasys, AO Alliance.

Media exhibitors
Lehmanns Media is in the welcome area.

Sponsors

We thank our trusted partner DePuy Synthes, and Siemens, for contributing in-kind support (materials and logistics) without which this event would not be possible. A special thanks to DePuy Synthes and Siemens for providing an unrestricted educational grant for this event.

We also extend our thanks to the following co-sponsors (educational grants, in-kind support):

DePuy Synthes
Siemens
Credit Suisse
Synbone
Business center

The business center facilities in the Congress Centre Davos are accessible to everyone.

Services
- Internet and e-mail access
- Printer access
- www.aodavoscourses.org
- AO Davos Courses website offering course-related information

Opening hours
The business center is open 30 minutes before the first course of the day starts until 30 minutes after the end of the last course of the day.

Disclaimer
The use of your own computer in the business center network is inherently not secure. We strongly recommend that you take appropriate actions to protect your computer against unauthorized use or theft (e.g., firewall, virtual private network [VPN] connection, virus scanner). AO cannot be held responsible for any data loss or theft.

For further information or support, please contact:
Phone +41 81 414 28 70
E-mail it.helpdesk@aofoundation.org

Wireless network

How to connect to the AO wireless local area network (LAN)

1. Open the Wireless Network Connection window
2. Choose the AO Business network as shown in the image below and click on the Connect button
3. Our AO Business wireless network requires a wireless protected access (WPA) network key: Network key: aowireless
4. Then click on the OK button
Event information

**Event fee**
AO Trauma Course—Advanced Principles of Fracture Management for Swiss Surgeons: CHF 2,300
The event fee covers the conference bag, documentation, coffee breaks, lunches, participation in AO Davos Courses night, and the course certificate.

**European CME Accreditation**
For this course the UEMS-EACCME in Brussels have granted 31 European CME credits (ECMEC).

**Swiss CME Accreditation**
Additionally, an application has been made to the following Swiss societies:
- Schweizerische Gesellschaft für Chirurgie (SGC/SSC)
- Schweizerische Gesellschaft für Orthopädie und Traumatologie (SGO/SSO).

**Conflicts of Interest (COI)**
All disclosure information can be viewed at the event webpage: http://AOTRAUMA10009580.aotrauma.org

**Course certificate**
Course certificates will be available at the end of the event at the general information desk.

**Evaluation guidelines**
All AO Trauma events apply the same evaluation process, which includes pre- and post-event online evaluation and on-site written questionnaires. These evaluation tools help ensure that AO Trauma continues to meet your training needs.

**Use of social media**
During the AO Davos Courses 2019, you can post about your experience using the #AODavosCourses2019 hashtag. While we encourage you to share your AO Davos Courses 2019 experience with your online network, it is expressly forbidden to share any images or recordings from inside the course.

**Intellectual property**
Event materials, presentations, and case studies are the intellectual property of the event faculty. All rights are reserved. For more information, please see: www.aofoundation.org/legal.

**Recording, photographing, or copying lectures, practical exercises, case discussions, or any event materials is strictly forbidden. Participants violating intellectual property will be dismissed.**

The AO Foundation reserves the right to film, photograph, and audio record during its events. Participants must understand that in this context they may appear in these recorded materials. The AO Foundation assumes participants agree that these recorded materials may be used for the AO’s marketing and other purposes, and that they may be made available to the public.

**Security**
Security checks will be conducted at the building entrance. Wearing a name tag is compulsory at all times in the congress center and hospital.

**Insurance**
The event organization does not take out insurance to cover any individual against accident, theft, or other risks.

**Use of mobile phones**
Use of mobile phones is not permitted in the lecture halls or in other rooms during educational activities. Please be considerate of others by turning off your mobile phone.

**Picture gallery**
Check out aodavoscourses.org for a daily selection of pictures from the AO Davos Courses 2019, the best from last year’s courses, and a selection of photographs from the first-ever AO Davos Courses.

**Dress code**
Warm clothes and suitable shoes are recommended.
Principles of AO educational events

1. Academic independence
Development of all curricula, design of scientific event programs, and selection of faculty are the sole responsibilities of volunteer AO network surgeons. All education is planned based on needs assessment data, designed and evaluated using concepts and evidence from the most current medical education research, and reflects the expertise of the AO Education Institute (www.aofoundation.org). Industry participation is not allowed during the entire curriculum development and planning process to ensure academic independence and to keep content free from bias.

2. Compliance to accreditation and industry codes
All planning, organization, and execution of educational activities follow existing codes for accreditation of high-quality education:
- Accreditation Criteria of the Accreditation Council for Continuing Medical Education, US (www.acrme.org)
- ACCME Standards for Commercial Support: Standards to Ensure Independence in CME Activities (www.accme.org)
- Criteria for Accreditation of Live Educational Events of the European Accreditation Council for Continuing Medical Education (www.uems.eu)

Events that receive direct or indirect unrestricted educational grants or in-kind support from industry also follow the ethical codes of the medical industry, such as:
- Eucomed Guidelines on Interactions with Healthcare Professionals (www.medtecheurope.org)
- AdvaMed Code of Ethics on Interactions with Health Care Professionals (advamed.org)
- Mecomed Guidelines on Interactions with Healthcare Professionals (www.mecomed.org)

3. Branding and advertising
No industry logos or advertising (apart from the AO Foundation and its clinical divisions) are permitted in the area where educational activities take place. Sponsors providing financial or in-kind support are allowed to have a promotional booth or run activities outside the educational area with approval from the event chairperson.

4. Use of technologies and products in simulations
In case simulations are chosen as an educational method to educate skills, we only use technology approved by the AO Technical Commission—a large independent group of volunteer surgeons developing and peer reviewing new technology. More information about the AO Technical Commission and its development and approval processes can be found on the AO's website: www.aofoundation.org.

5. Personnel
Industry staff members are not permitted to interfere with the educational content or engage in educational activities during the event.
AO Research Institute Davos (ARI)

Mission
The AO mission is promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders.

AO Research Institute Davos (ARI)
In its work to further the AO mission, ARI's purpose is to advance patient care through innovative orthopedic research and development.

Orthopedics concerns musculoskeletal, spine and craniomaxillofacial trauma, degenerative musculoskeletal diseases, infections, and congenital disorders.

Goals
• Contribute high-quality, applied preclinical research and development focused toward clinical applications/solutions.
• Investigate and improve the performance of surgical procedures, devices and substances.
• Foster a close relationship with the AO medical community, academic societies, and universities.
• Provide research environment/support/training for AO clinicians.

Meet with our team including our ARI Medical Research Fellows, establish contacts, freely discuss your clinical problems and ideas, and learn about the latest results from ARI.

Collaborative research programs
• Annulus fibrosus rupture
• Acute cartilage injury
• Osteochondral defect

Craniomaxillofacial
• Imaging and planning of surgery, computer aided preoperative planning
• Medication-related osteonecrosis of the jaw
• Bone regeneration and 3D printing

Spine
• Degeneration and regeneration of the intervertebral disc
• Biomarkers and patient outcomes

Trauma
• Bone infection, including the development and testing of active anti-infective interventions
• Sensing implants for objective monitoring of fracture healing
• Development of smart surgical tools
• New implant concepts for optimized bone healing
• Prediction of subject-specific risk of proximal humeral fixation failure via computational tools
• Development of generic Asian pelvic bone model
• Patient outcomes and biomarkers

Veterinary medicine
• Improving osteosynthesis for small and large animals

Multidisciplinary
• 3R principles: refinement of preclinical studies
• Bioreactor culture systems and mechanobiology
• Development, standardization, optimization, and improvement of preclinical models and methods
• Ex vivo testing using advanced biomechanical models
• Gene transfer: non-viral and viral
• Implant design using the finite element methods
• Implant positioning assistance, C-arm guided implant placement
• In-vivo and in-vitro quantification of bone turnover and scaffold degradation
• Medical additive manufacturing and biofabrication
• Medical computed tomography (CT) image processing and analysis
• Polymers to deliver cells and biological factors, create potential space for tissue development, and guide the process of tissue regeneration
• Prototype development and production
• Stem cell therapies for the treatment of bone, intervertebral disc, and cartilage defects

For the AO Research Institute Davos Activity Report 2018 and recent publications, go to www.aofoundation.org/ari/publications.
Upcoming AO Davos Courses 2020

AO Davos Courses—November 29–December 4, 2020

- AO Trauma Course—Basic Principles of Fracture Management
- AO Trauma Course—Advances Principles of Fracture Management
- AO Trauma Course—Advanced Principles of Fracture Management for Swiss residents
- AO Trauma Masters Course—Current Concepts
- AO Trauma Course—Pelvic and Acetabular Fracture Management
- AO Trauma Masters Kurs (German speaking)
- AO Trauma Course—Manging Pediatric Musculoskeletal Injuries
- AO Trauma and AO Recon Course—Comprehensive Periprosthetic Fracture Management of the Hip and Knee

AO Davos Courses—December 6–9, 2020

- AO Trauma Course—Basic Principles of Fracture Management for Swiss Surgeons
- AO Spine Courses
- AO CMF Courses
- AO VET Masters Course—Small Animal
- AO VET Masters Course—Large Animal
- AO Recon Course—Principles in Shoulder Arthroplasty
- AO Recon Course—Complex Total Hip and Knee Arthroplasty
- AO PEER Course—Level 1 Principles of Clinical Research
- AO PEER Course—Level 2 Grant writing
- AO PEER Course—Level 2 GCP and study management
- AO PEER Course—Level 2 Publication writing course

This course list is subject to further change.
The final list of AO Davos Courses and worldwide courses will be available on www.aotrauma.org in January 2020.
Expanding precision medicine in image-guided surgery

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Expanding precision medicine through a complete imaging portfolio for orthopedic trauma, spine and CMF surgery ranging from mobile C-arms and robotic angiography systems to computed tomography and magnetic resonance imaging, as well as multi-modality suites.

Engineered to be truly patient-oriented, ARTIS pheno® is a unique floor-mounted robotic C-arm system for individualized preprocedural planning, intraoperative guidance, and immediate checkup in 2D and 3D directly in the hybrid operating room – regardless of patient condition or procedure complexity.

To provide 3D capabilities that can be seamlessly integrated into clinical routine, we developed Cios Spin®: a mobile 2D and 3D C-arm for intraoperative quality assurance. Delivering new insights and perspectives, Cios Spin gives you more certainty in surgical routine – and full control over your procedures.

ARTIS pheno
As individual as your patients

Cios Spin
New perspectives. Full control.
AO Trauma membership
Driving excellence and empowering the next generation

Discover the advantages of joining the leading global trauma and orthopedic community, providing its members with education, research, and networking opportunities worldwide. Join us and share your passion.