

AO Trauma Course— **Advanced Principles of Fracture Management**

December 1–6, 2019
Davos, Switzerland

Lecture room:
Davos 1

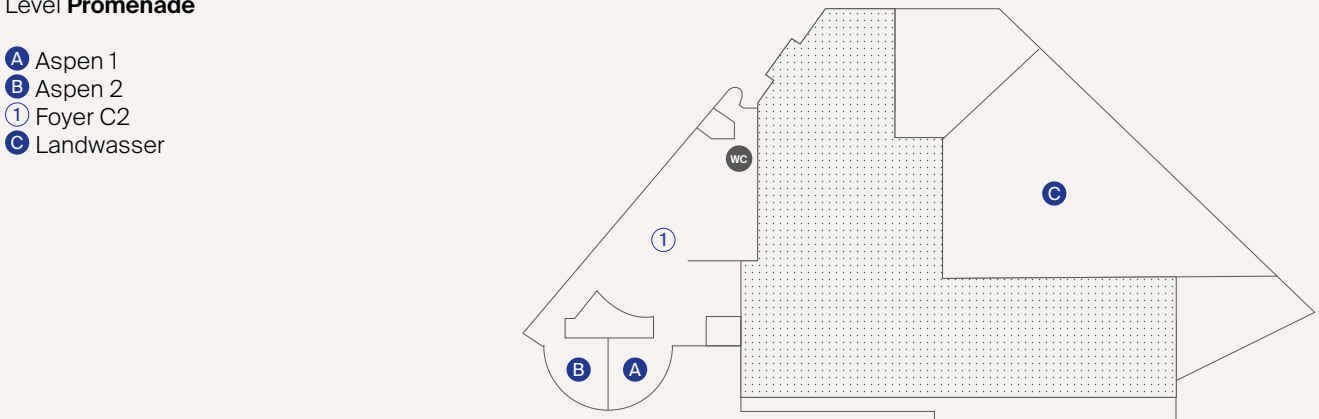
Precourse online activities:
November 1–30, 2019
Postcourse online activities:
December 7–20, 2019

EVENT PROGRAM

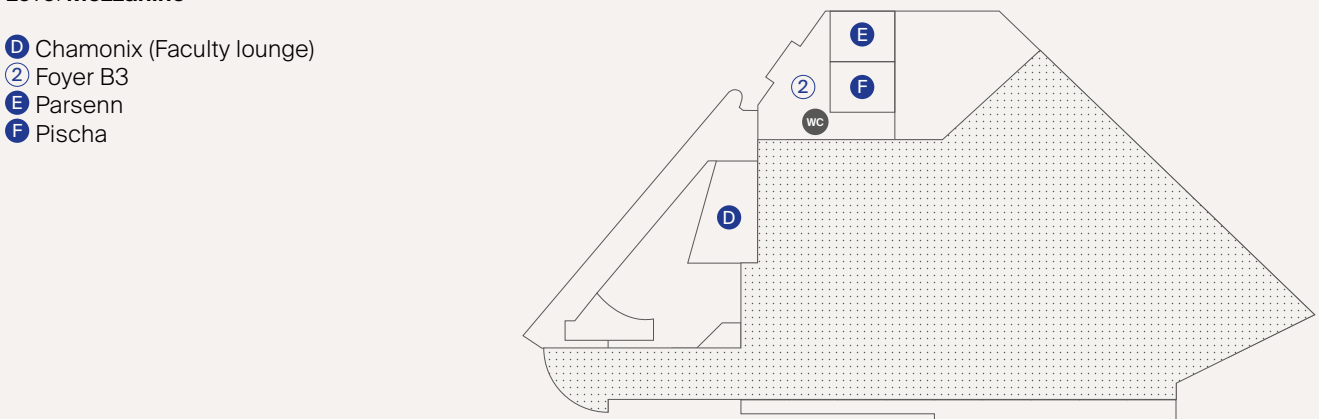


Level Promenade

- A Aspen 1
 B Aspen 2
 ① Foyer C2
 C Landwasser

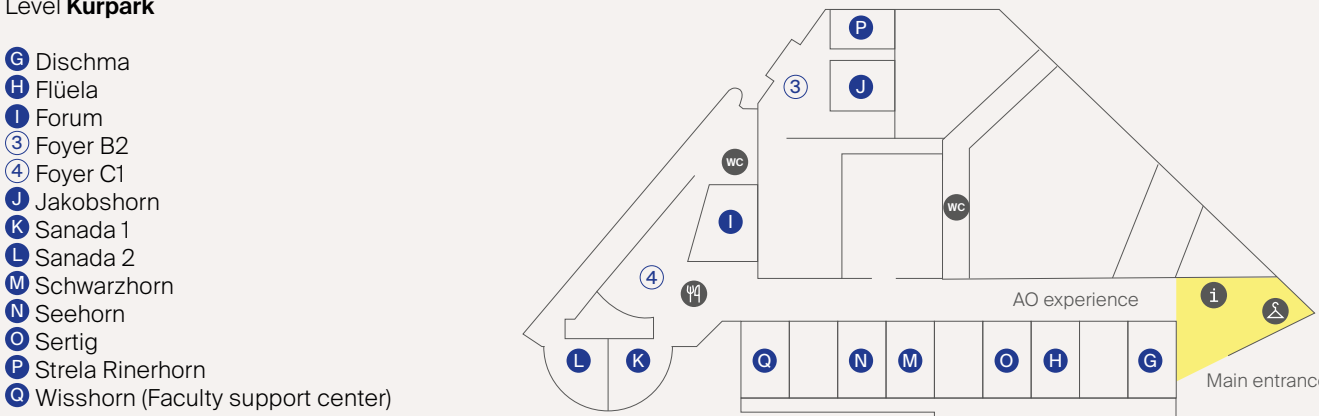
Level **Mezzanine**

- D Chamonix (Faculty lounge)
 ② Foyer B3
 E Parsenn
 F Püscha
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- The diagram shows a partial floor plan of the second floor. It includes a staircase labeled '2' and a room labeled 'WC'. There are also rooms labeled 'D', 'E', and 'F'. The plan is partially cut off on the right side.

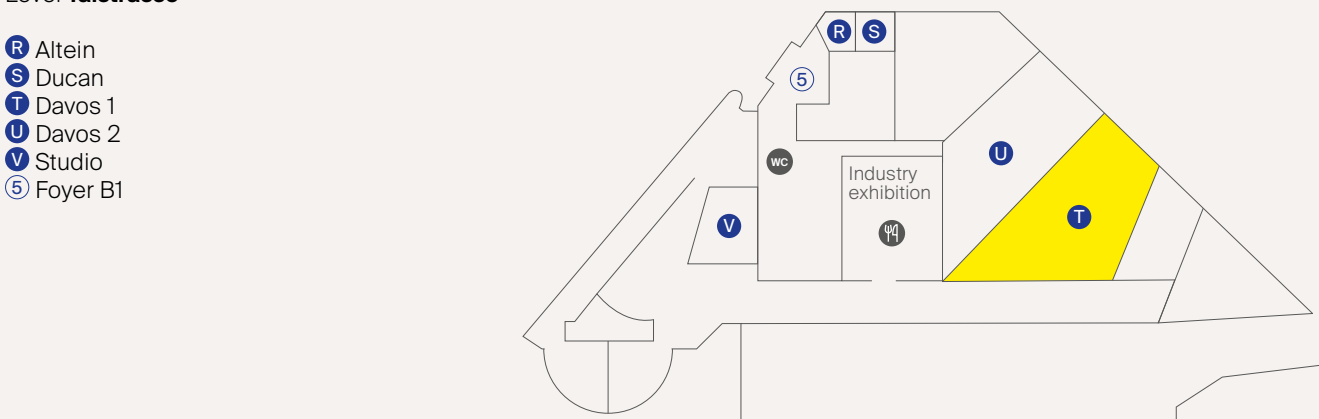


Level Kurpark

- G Dischma
 H Flüela
 I Forum
 J Foyer B2
 K Foyer C1
 L Jakobshorn
 M Sanada 1
 N Sanada 2
 O Schwarzhorn
 P Seehorn
 Q Sertig
 R Strela Rinerhorn
 S Wisshorn (Faculty support center)

Level **Talstrasse**

- R Altein
 S Ducan
 T Davos 1
 U Davos 2
 V Studio
 5 Foyer B1



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.

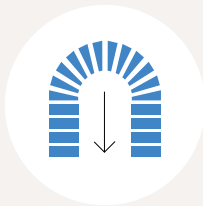
The AO principles of fracture management

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 is one of the several competency-based curriculum events in 2019 which are built around 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 understand decision-making processes and further develop 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 may also bring their own cases for discussion with the faculty.

After the course an online postcourse self-assessment will provide participants with important feedback on how much they have learned.

Goal of the course

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

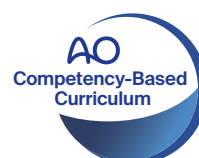
Target participants

The AO Trauma Course—Advanced Principles of Fracture Management is targeted at certified orthopedic and trauma surgeons who are at the threshold of becoming independent surgeons and taking over decision-making responsibility for the treatment of complex injuries. Participants must have completed the AO Trauma Course—Basic Principles of Fracture Management and must be actively involved in trauma management.

Learning objectives

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

- Apply reduction techniques in fracture management with attention to soft tissue
- Assess and treat complex diaphyseal and (peri)articular fractures
- Demonstrate strategies for assessing and treating open fractures and soft-tissue injuries
- Initiate appropriate management for patients with pelvic injuries and polytrauma
- Recognize complications and manage these accordingly



Chair-person



Martin Richardson
University of Melbourne,
Epworth Hospital,
Melbourne, Australia

Co-chair-person



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

International faculty

Matheus Azi	Manoel Victorino Hospital	Salvador	Brazil
Sushrut Babhulkar	Sushrut Institute of Medical Sciences	Nagpur	India
Henry Broekhuysse	University of British Columbia	Vancouver	Canada
Ying-Chao Chou	Chang Gung Memorial Hospital Linkou Branch	Taoyuan	Taiwan
David Chua	Changi General Hospital	Singapore	Singapore
Juan Concha Sandoval	Universidad del Cauca	Popayan	Colombia
Gregory Della Rocca	University of Missouri	Columbia	USA
Adel Ebrahimpour	Taleghani Hospital	Tehran	Iran
Timothy Harris	Wake Orthopaedics	Raleigh	USA
Marcos Leonhardt	Instituto de Ortopedia e Traumatologia do HCFMUSP	Sao Paulo	Brazil
Ting Li	Beijing Jishuitan Hospital	Beijing	China
Eric Moghadamian	University of Kentucky	Lexington	USA
Achdiat Mustapa	Tropicana Medical Centre	Petaling Jaya	Malaysia
Fadi Nassereddine	Dar Al Hikme Hospital	Baalbeck	Lebanon
Andrew Oppy	Royal Melbourne Hospital and Epworth Hospital	Melbourne	Australia
Marinis Pirpiris	Epworth Hospital	Richmond	Australia
Jorge Ponce de Leon Dominguez	Instituto Nacional de Rehabilitacion	Mexico City	Mexico
Kongkhet Riansuwan	Faculty of Medicine Siriraj Hospital, Mahidol University	Bangkok	Thailand
John Scolaro	University of California, Irvine	Orange	USA
Michael Sirkin	New Jersey Medical School	Newark	USA

Regional faculty

Igor Belenkiy	Alexandrovskiy City Hospital	St.Petersburg	Russian Federation
Taco Bijlsma	Medical Centre Alkmaar	Alkmaar	The Netherlands
Matej Cimerman	University Clinical Centre Ljubljana	Ljubljana	Slovenia
Frank Damborg	Sygehus Lillebaelt Kolding	Kolding	Denmark
Anna Ekman	Södersjukhuset	Stockholm	Sweden
Mark Hatton	Nottingham University Hospitals	Nottingham	United Kingdom
Shaun O'Brien	Sunderland Royal Hospital	Sunderland	United Kingdom
Dan Putineanu	Cliniques Universitaires St. Luc	Brussels	Belgium
Marcis Radzins	Hospital of Traumatology and Orthopaedics, Clinic Ortomed		
An Sermon	University Hospitals Gasthuisberg	Riga	Latvia
Alexandre Sitnik	Belarus Scientific and Practical Center for Traumatology and Orthopedics	Leuven	Belgium
Jayne Ward	University Hospital Coventry and Warwickshire	Minsk	Belarus
		Coventry	United Kingdom

National faculty

Paul-Martin Sutter	Spitalzentrum Biel AG	Biel	Switzerland
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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)

https://emodules.aoeducation.org/aoelearn/aot_launch/aot_fr/lib/launch.html?fracture_reduction



Sunday

December 1, 2019

15:00	Opening of the congress center
15:00–17:00	Registration of participants
17:00–19:00	Opening Ceremony and Founders’ Reception

Monday

December 2, 2019

Location: Davos 1 (lectures) **Davos 2** (practicals)

08:00–08:15	Welcome and introduction to the course— how to get the most out of your course	M Richardson, V Giordano
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Module 1

Moderator: M Pirpiris

Review of the principles and new techniques

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

- Review concepts of relative and absolute stability
- Demonstrate appropriate techniques of direct and indirect reduction with attention to the soft tissue
- Identify clinical indications for locked plating
- Describe the role of soft tissue in fracture healing
- Describe the role of preoperative planning

08:15–08:30	Review of the principles of fracture management	M Pirpiris
08:30–08:45	Clinical applications for locked plating	M Hatton
08:45–09:00	Minimally invasive osteosynthesis (MIO)—minimizing surgical footprints	K Riansuwan
09:00–09:10	Preoperative planning—key to success	A Oppy
09:10–09:30	Module 1—discussion and summary	M Pirpiris
09:30–10:00	Coffee break	
10:00–12:35	Practical exercise 1 (including discussion group 1) Reduction techniques	A Oppy, A Sermon
12:35–13:35	Lunch break	

Module 2

Moderator: PM Sutter

Advanced principles in complex diaphyseal fractures

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

- Describe the decision-making process for the management of complex diaphyseal fractures
- Explain the technical aspects of diaphyseal fracture fixation
- Discuss the nuances of region-specific issues in diaphyseal fracture management

13:35–13:50	Complex humeral shaft fractures	A Ebrahimpour
13:50–14:05	Complex forearm injuries	PM Sutter
14:05–15:05	Case-based panel discussion	G Della Rocca, S O'Brien, M Sirkin, J Ponce de Leon Dominguez, A Ekman
15:05–15:35	Coffee break	
15:35–15:50	Current treatment options of subtrochanteric fractures	T Bijlsma
15:50–16:05	Proximal, distal, and segmental tibial shaft fractures	E Moghadamian
16:05–17:05	Case-based panel discussion	A Oppy, D Putineanu, J Ward
17:05–17:20	Module 2—discussion and summary	PM Sutter

Location: Davos 1 (lectures) **Davos 2** (practicals)

Module 3

Moderator: M Radzins

Articular shoulder fractures

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

- Identify the indications for surgical treatment of proximal humeral fractures including prosthetic replacement
- Identify the expected outcomes and appropriate treatment options for clavicular fractures
- Evaluate the indications for and techniques of fixation of scapular fractures

08:00–08:15	Proximal humeral fractures—to fix, to replace, or to treat nonoperatively?	YC Chou
08:15–08:30	Fractures of the scapula—indications for surgery and methods of fixation	M Radzins
08:30–08:45	Module 3—discussion and summary	M Radzins
08:45–08:50	Location change to discussion groups	
08:50–10:05	Discussion group 2 Upper extremity fractures—decision-making and methods of stabilization Group 1 – Landwasser 1 Group 2 – Landwasser 3 Group 3 – Landwasser 5 Group 4 – Landwasser 7 Group 5 – Landwasser 9 Group 6 – Landwasser 11 Group 7 – Landwasser 13 Group 8 – Landwasser 15 Group 9 – Landwasser 17 Group 10 – Landwasser 19 Group 11 – Landwasser 21 Group 12 – Landwasser 23	A Mustapa, M Sirkin F Nassereddine, A Sitnik F Damborg, PM Sutter S O'Brien, J Ward A Oppy, M Azi M Pirpiris, S Babhulkar J Ponce de Leon Dominguez, I Belenkiy D Putineanu, T Bijlsma M Radzins, M Cimerman K Riansuwan, YC Chou J Scolaro, D Chua A Sermon, J Concha Sandoval
10:05–10:25	Coffee break	
10:25–11:45	Practical exercise 2 Fixation of a four-part proximal humeral fracture	D Putineanu, T Li
11:45–12:45	Lunch break	

Module 4

Moderator: G Della Rocca

Articular elbow and wrist fractures

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

- Plan fixation and describe the different surgical approaches to the distal humerus
- Recognize the key concepts for managing elbow fracture dislocations
- Explain the key issues in the treatment of distal radial fractures

12:45–13:00	Distal humerus—intraarticular fractures and complications	F Damborg
13:00–13:15	Fracture dislocations of the elbow	G Della Rocca
13:15–13:30	Distal radial fractures	J Concha Sandoval
13:30–13:40	Module 4—discussion and summary	G Della Rocca
13:40–13:45	Location change to practical exercise room	
13:45–15:15	Practical exercise 3 Fixation of a type 13C1 fracture in the distal humerus using a locking plate	A Mustapa
15:15–15:40	Coffee break	

Module 5

Moderator: I Belenkiy

Articular knee fractures

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

- Recognize open reduction and internal fixation (ORIF) principles and techniques for distal femoral fractures
- Evaluate surgical principles and techniques for ORIF of the tibial plateau

15:40–15:55	Distal femoral fractures—treatment options and outcomes	I Belenkiy
15:55–16:10	Complex tibial plateau fractures	T Li
16:10–16:20	Module 5—discussion and summary	I Belenkiy
16:20–16:25	Location change to practical exercise room	
16:25–17:35	Practical exercise 4 Distal femur—fixation of an intraarticular type 33C2.1 fracture using a distal femoral locking plate	A Ekman, V Giordano

17:45–20:30	AO Davos Courses night
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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 Civico 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
Nir Cohen
Marcis Radzins
Martin Richardson
Johan Scheer
Frédéric Vauclair

Chang Gung Memorial Hospital Linkou Branch
Rabin Medical Center - Beilinson Campus
Hospital of Traumatology and Orthopaedics, Clinic Ortomed
University of Melbourne, Epworth Hospital
University Hospital Linköping
Centre hospitalier universitaire vaudois

Taoyuan
Petah Tikva
Riga
Melbourne
Linköping
Lausanne
Taiwan
Israel
Latvia
Australia
Sweden
Switzerland

Intramedullary nailing—principles made easy

Sushrut Babhulkar
Paulo Barbosa
Gregory Della Rocca
Sergei Fischer
Vincenzo Giordano
Näder Helmy
Mark Lee
Jong-Keon Oh
An Sermon
Philipp Stillhard

Sushrut Institute of Medical Sciences
Hospital Quinta D'Or
University of Missouri
Universidade Federal do Paraná - Hospital do Trabalhador
Serviço de Ortopedia e Traumatologia Prof. Nova Monteiro
Bürgerspital Solothurn
University of California, Davis
Korea University Guro Hospital
University Hospitals Gasthuisberg
Kantonsspital Graubünden

Nagpur
Rio de Janeiro
Columbia
Curitiba
Rio de Janeiro
Solothurn
Sacramento
Seoul
Leuven
Chur
India
Brazil
USA
Brazil
Brazil
Switzerland
USA
South Korea
Belgium
Switzerland

Associated shaft and articular fractures

Christian Candrian
Juan Concha Sandoval
Marcos Leonhardt
Eric Moghadamian
Jochen Müller
Chang-Wug Oh
Dan Putineanu
Paul-Martin Sutter
Moritz Tannast

Ospedale Civico Lugano
Universidad del Cauca
Instituto de Ortopedia e Traumatologia do HCFMUSP
University of Kentucky
Ospedale Regionale Lugano
Kyungpook National University Hospital,
Cliniques Universitaires St. Luc
Spitalzentrum Biel
Hôpital cantonal de Fribourg

Lugano
Popayan
Sao Paulo
Lexington
Lugano
Daegu
Brussels
Biel
Fribourg
Switzerland
Colombia
Brazil
USA
Switzerland
South Korea
Belgium
Switzerland
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	Serviço 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 Traumatology	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	Alexandrovskiy City Hospital	St. Petersburg	Russian Federation
Lorin Benneker	Inselspital, 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

Wednesday morning

December 4, 2019

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
- Recognize the limitations of the different surgical exposures of the upper extremity
- Explain how to obtain intraoperative imaging

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

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

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

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

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

Wednesday afternoon

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

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

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

13:30–13:35	Introduction	V Giordano
13:35–13:55	What complications does damage control orthopedics avoid?	T Rocha
13:55–14:15	Do you need to stage all periarticular fractures?	M Sirkin
14:15–14:35	What to do when periarticular wounds break down and fractures become infected?	J Concha Sandoval
14:35–14:55	The management of open bony deficits—the place of shortening—Masquelet and transport	K Kojima
14:55–15:15	The place of external fixation in definitive management of delayed presentation of open limb injuries	A Volna
15:15–15:35	Osteotomies in the correction of diaphyseal injuries	S Reid
15:35–15:55	Questions and answers	V Giordano
15:55–16:15	Coffee break	
16:15–16:35	Amputations or salvage—how to decide?	J McMaster
16:35–16:55	Osteotomies in the correction of articular fractures	L Solomin
16:55–17:15	Repair or replace?—options for cartilage resurfacing	M Pirpiris
17:15–17:45	Questions and closing remarks	V Giordano

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 Núñez
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 Belenkiy
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	Cased based discussion	M Hatton
17:15–17:30	Questions and closing remarks	N Cohen

Location: Davos 1 (lectures) Davos 2 (practicals)

08:00–09:25	Discussion group 3 Lower extremity–femoral fractures Group 1 – Landwasser 1 Group 2 – Landwasser 3 Group 3 – Landwasser 5 Group 4 – Landwasser 7 Group 5 – Landwasser 9 Group 6 – Landwasser 11 Group 7 – Landwasser 13 Group 8 – Landwasser 15 Group 9 – Landwasser 17 Group 10 – Landwasser 19 Group 11 – Landwasser 21 Group 12 – Landwasser 23	F Nassereddine, PM Sutter A Ebrahimpour, J Ward S O'Brien, M Azi M Pirpiris, S Babhulkar J Ponce de Leon Dominguez, I Belenkiy D Putineanu, T Bijlsma M Radzins, M Cimerman K Riansuwan, YC Chou J Scolaro, D Chua A Sermon, J Concha Sandoval M Sirkin, F Damborg A Sitnik, G Della Rocca
09:25–09:30	Location change to practical exercise room	
09:30–10:45	Practical exercise 5 Management of a type 41C3 bicondylar tibial plateau fracture using a locking plate	M Leonhardt, S O'Brien
10:45–11:10	Coffee break	

Module 6

Moderator: G Della Rocca

Injuries of the distal tibia, ankle, and foot

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

- Assess complex malleolar fractures and plan appropriate treatment
- Prepare a preoperative plan including rationale for imaging, choice of approach, and surgical tactics for tibial pilon fractures
- Explain the risk of complications following injuries to the talus
- Identify patterns of calcaneal injuries
- Discuss the indications for surgical management of midfoot injuries and surgical principles

11:10–11:25	Complex malleolar fractures	H Broekhuysse
11:25–11:40	Early and definitive treatment of pilon fractures	M Sirkin
11:40–11:55	Talar neck fractures and complications	A Sitnik
11:55–12:10	Navicular and Lisfranc injuries and complications	G Della Rocca
12:10–12:25	Module 6—discussion and summary	G Della Rocca
12:25–13:35	Lunch break	

13:35–15:05	Practical exercise 6 Management of a type 43C2.3 tibial pilon fracture using a distal tibial locking plate	F Nassereddine, J Scolaro
15:05–15:30	Coffee break	
15:30–16:15	Discussion group 4 Lower extremity—fractures of the tibia, ankle, and foot Group 1 – Landwasser 1 Group 2 – Landwasser 3 Group 3 – Landwasser 5 Group 4 – Landwasser 7 Group 5 – Landwasser 9 Group 6 – Landwasser 11 Group 7 – Landwasser 13 Group 8 – Landwasser 15 Group 9 – Landwasser 17 Group 10 – Landwasser 19 Group 11 – Landwasser 21 Group 12 – Landwasser 23	K Riansuwan, YC Chou J Solaro, D Chua E Moghadamian, J Concha Sandoval M Sirkin, F Damborg A Sitnik, G Della Rocca PM Sutter, A Ebrahimpour J Ward, A Ekman M Azi, T Harris S Babhulkar, M Hatton I Belenkiy, T Li T Bijlsma, H Broekhuysen M Cimerman, M Leonhardt
16:15–16:25	Location change to lecture room	

Module 7

Moderator: T Harris

Articular hip and pelvic fractures

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

- Evaluate and plan appropriate fixation techniques for femoral neck fractures
- Compare treatment options and define principles of fixation for intertrochanteric fractures
- Assess pelvic ring damage in patients with pelvic injuries
- Classify acetabular fractures and describe principles of management

16:25–16:40	Femoral neck fractures—different patients, different problems	J Ponce de Leon Dominguez
16:40–16:55	Intertrochanteric fractures—treatment options and outcomes	S Babhulkar
16:55–17:10	Evaluation and emergency management of pelvic ring injuries	T Harris
17:10–17:25	Principles of acetabular fracture management	D Chua

Location: Davos 1 (lectures) Davos 2 (practicals)

08:00–09:00	Practical exercise 7 Fixation of an intraarticular distal radial fracture using the 2.4 mm VA-LCP two-column distal radial plate	M Radzins, YC Chou
09:00–09:05	Location change to lecture room	

Module 8

Moderator: J Scolaro

Potential life-threatening problems

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

- Set priorities for the management of the polytrauma patient
- Describe the systemic impact of injury
- Evaluate the decision for early total care versus damage control
- List the key principles for mangled extremity decision-making

09:05–09:20	Management of multiple-injured patients	A Mustapa
09:20–09:35	Mangled extremity management	J Scolaro
09:35–09:50	Module 8—discussion and summary	J Scolaro
09:50–10:40	Discussion groups 5 Decision-making in difficult fracture cases and polytrauma patients Group 1 – Landwasser 1 Group 2 – Landwasser 3 Group 3 – Landwasser 5 Group 4 – Landwasser 7 Group 5 – Landwasser 9 Group 6 – Landwasser 11 Group 7 – Landwasser 13 Group 8 – Landwasser 15 Group 9 – Landwasser 17 Group 10 – Landwasser 19 Group 11 – Landwasser 21 Group 12 – Landwasser 23	S O'Brien, S Babhulkar M Pirpiris, I Belenkiy J Ponce de Leon Dominguez, T Bijlsma D Putineanu, M Cimerman M Radzins, YC Chou K Riansuwan, D Chua J Scolaro, J Concha Sandoval A Sermon, F Damborg A Sitnik, G Della Rocca PM Sutter, A Ebrahimpour
10:40–11:00	Coffee break	
11:00–12:40	Practical exercise 8 Multifragmentary fractures of the calcaneus	A Ebrahimpour, H Broekhuysen
12:40–13:10	Sandwich break	

Module 9

Moderator: J Ward

Complications and special problems

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

- Recognize the reasons why fractures do not heal
- List the treatment principles for nonunions
- Identify the treatment principles for infected fractures after ORIF
- Integrate the management principles for geriatric fractures
- List the key treatment principles for periprosthetic fractures
- Recognize the key ways to stay out of trouble

13:10–13:25	Treatment of metaphyseal and diaphyseal nonunion	M Azi
13:25–13:40	Infection after osteosynthesis	J Ward
13:40–13:55	Principles of orthogeriatric fracture care	V Giordano
13:55–14:10	Periprosthetic fractures	M Hatton
14:10–14:30	Latest innovative research from AO Research Institute to advance patient care	G Richards
14:30–14:45	Violation of AO principles—staying out of trouble	S O'Brien
14:45–15:00	Module 9—discussion and summary	J Ward
15:00–15:10	Closing remarks and end of course	M Richardson, V Giordano

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

Maria Anisimova Berni
Clavadelerstrasse 8
7270 Davos Platz
Switzerland
Phone +41 81 414 27 12
Fax +41 81 414 22 84
E-mail mberni@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

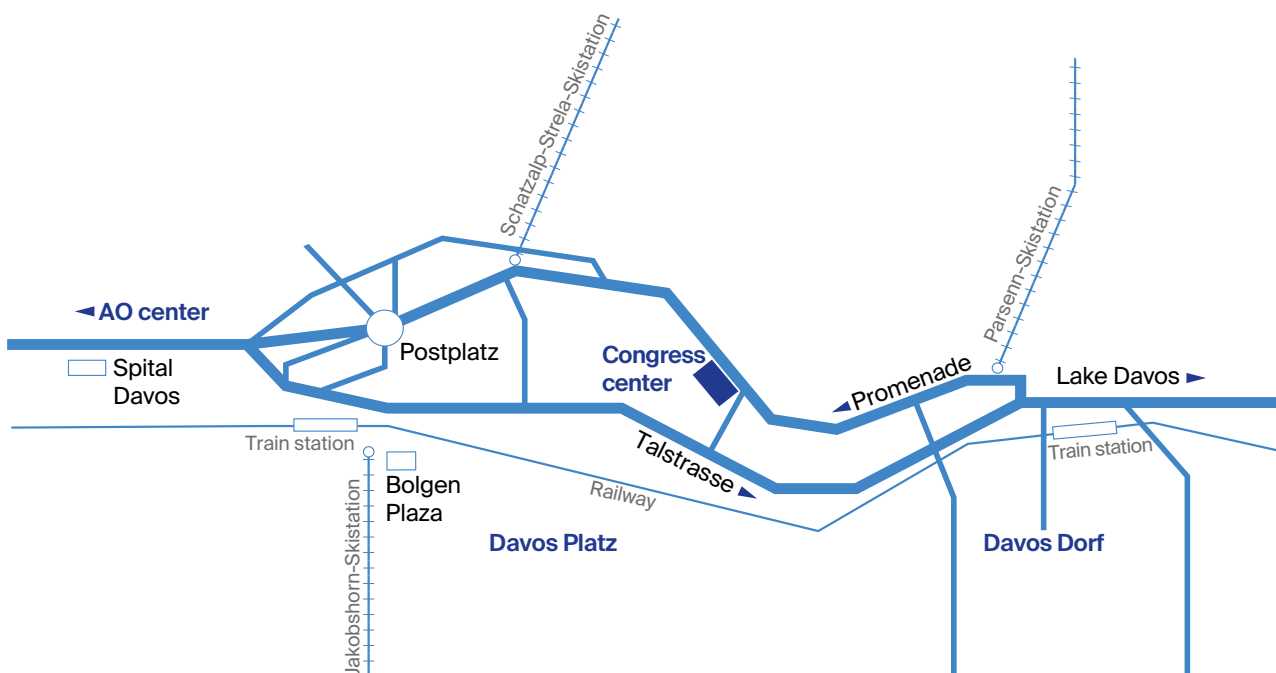
Sunday	12:00–19:00
Monday through Thursday	07:30–19:00
Friday	07:30–16:00

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	09:00–16:00



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):



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

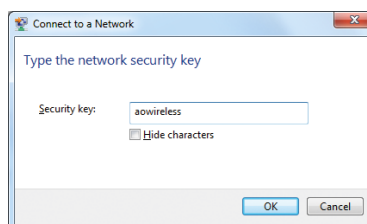
The use of your own computer in the business center network is inherently not secure. We strongly recommend that you take appropriate actions to protect your computer against unauthorized use or theft (eg, firewall, virtual private network [VPN] connection, virus scanner). AO cannot be held responsible 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: CHF 2,800

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 34 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://AOTRAUMA10009579.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.

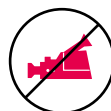
While we encourage you to share your AO Davos Courses 2019 experience with your online network, it is expressly forbidden to share any images or recordings from inside the course.

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.accme.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.

Notes

Save the date: Madrid, April 2020

Sharing a world of knowledge

AO Trauma provides an outstanding selection of AO Trauma courses designed to meet your specific professional needs. We are confident that you will find the course offerings as well as the networking opportunity professionally rewarding.

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

AO Trauma World Meeting
Madrid 2020
April 19–22, 2020



All courses include one day of anatomical specimen lab.



AO Trauma Masters Course— Shoulder Trauma

Chairpersons:

Stefaan Nijs (BE), Ashraf Moharram (EG)

[AOTRAUMA10010974.aotrauma.org](https://aotrauma.org/AOTRAUMA10010974)



AO Trauma Masters Course— Knee Injuries and Deformities

Chairpersons:

Hans Philipp Lobenhoffer (DE), Steffen Schröter (DE)

[AOTRAUMA10010972.aotrauma.org](https://aotrauma.org/AOTRAUMA10010972)



AO Trauma Masters Course— Fractures around the Elbow

Chairpersons:

Gregory Della Rocca (US), Pedro Labronici (BR)

[AOTRAUMA10010997.aotrauma.org](https://aotrauma.org/AOTRAUMA10010997)



AO Trauma Masters Course— Foot and Ankle

Chairpersons:

Mandeep Dhillon (IN), Stefan Rammelt (DE)

[AOTRAUMA10010973.aotrauma.org](https://aotrauma.org/AOTRAUMA10010973)



AO Trauma Masters Course— Hip Fractures

Chairpersons:

Michael Baumgaertner (US), Rodrigo Pesantez-Hoyos (CO)

[AOTRAUMA10010971.aotrauma.org](https://aotrauma.org/AOTRAUMA10010971)



For more information visit: www.aotrauma.org

AO
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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—Managing 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

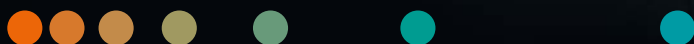
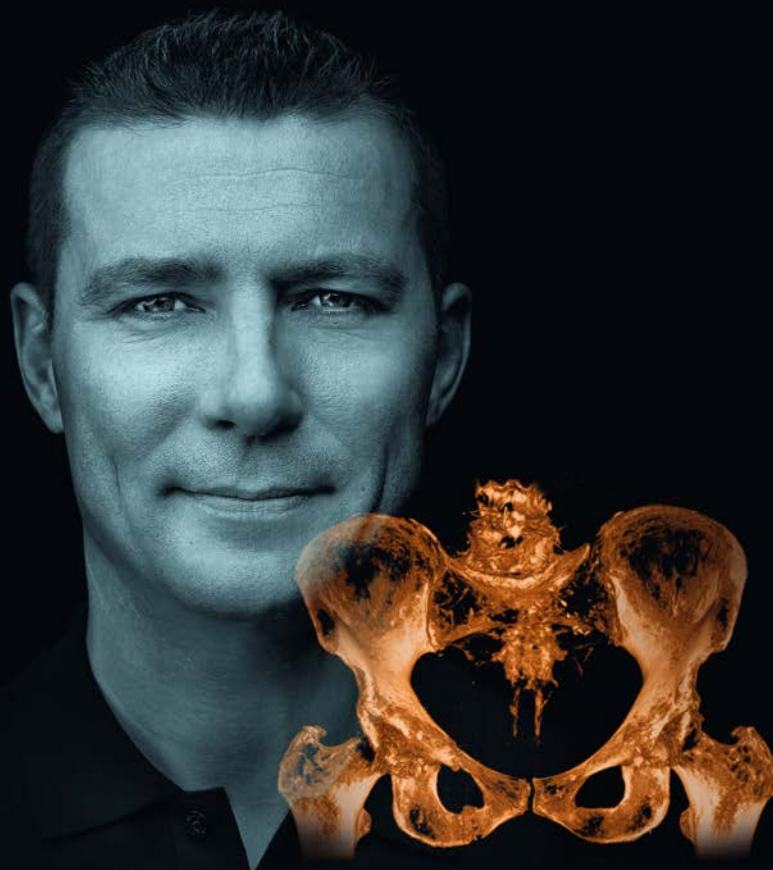
This course list is subject to further change.

The final list of AO Davos Courses and worldwide courses will be available on www.aotrauma.org in January 2020.

The clinical overlay is not that of the individual pictured.
It was modified for better visualization. · 8368 1119

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