AO TRAUMA

AO Competency-Based Curriculum

AO Trauma Course—
Basic Principles of Fracture Management

December 1–6, 2019
Davos, Switzerland

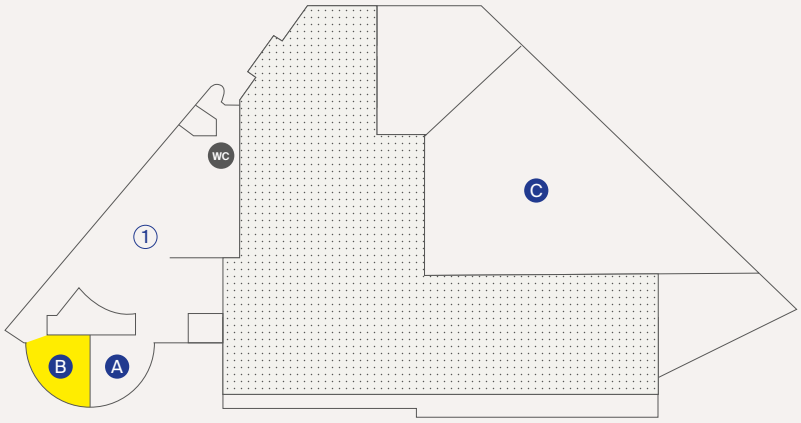
Lecture room:
Aspen 2

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

EVENT PROGRAM

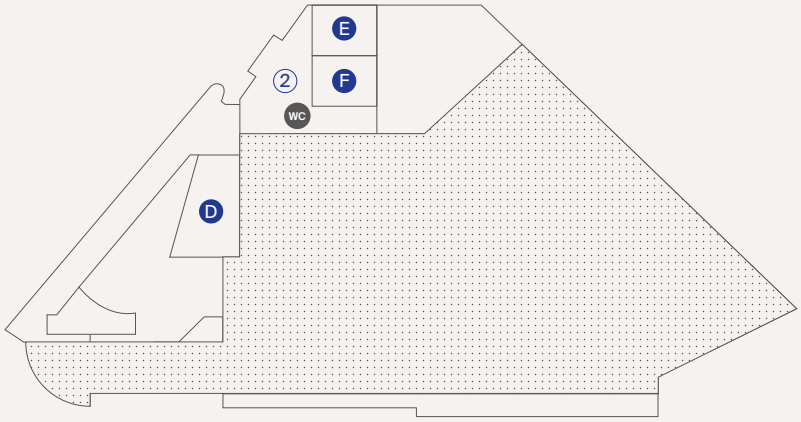
Level **Promenade**

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



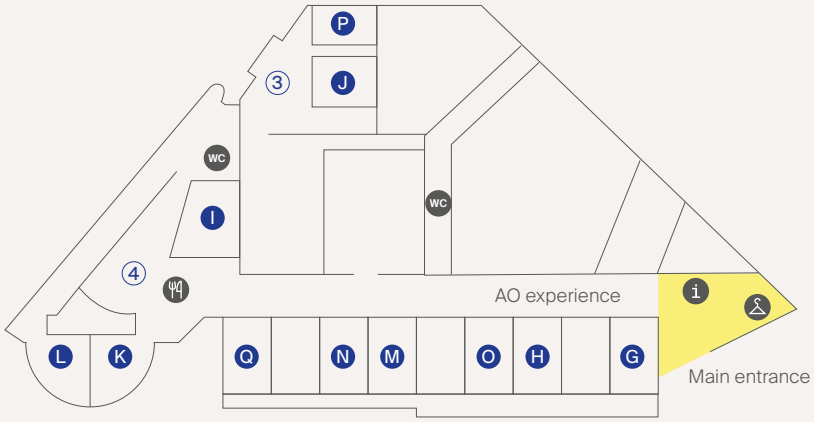
Level **Mezzanine**

- D Chamonix (Faculty lounge)
- ② Foyer B3
- E Parsenn
- F Pischa



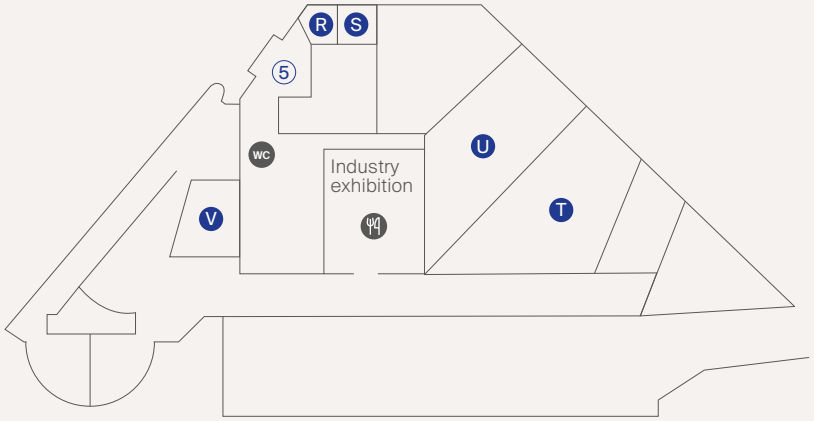
Level **Kurpark**

- G Dischma
- H Flüela
- I Forum
- ③ Foyer B2
- ④ Foyer C1
- J Jakobshorn
- K Sanada 1
- L Sanada 2
- M Schwarzhorn
- N Seehorn
- O Sertig
- P Strela Rinerhorn
- Q 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.

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—Basic Principles of Fracture Management is part of AO Trauma's educational program for residents and 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 online modules on bone healing and classification. The course will consist of several evidence-based lectures, which will cover the key information required. In practical exercises, participants will be trained in the application of various techniques.

The AO Skills Lab consists of ten stations where participants will learn about the principles of fractures and test fracture management options. Discussing cases in small groups will help participants to understand decision-making processes and further develop management skills.

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—Basic Principles of Fracture Management is part of a newly developed educational program teaching fundamental principles and current concepts in the treatment of injuries, incorporating the latest techniques in operative fracture management. The AO Trauma Basic Principles course is the initial step along the path of lifelong learning in the area of operative fracture management, and the main focus of this course is on teaching the basic principles of fracture management.

Target participants

The AO Trauma Course—Basic Principles of Fracture Management is targeted at surgical trainees and is also open to certified orthopedic and trauma surgeons who are interested in furthering their knowledge and skills in operative fracture management.

Learning objectives

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

- Discuss the concepts of stability, their influence on bone healing, and how to apply implants to achieve appropriate stability
- Plan a treatment based on assessment, imaging, classification, and decision-making
- Apply reduction techniques in fracture management with attention to the importance of the soft-tissue
- Use appropriate fixation techniques to treat diaphyseal and simple (peri)articular fractures
- Identify and discuss the special problems related to:
  - Fractures in the immature skeleton
  - Pelvic injuries
  - Osteoporotic fractures
  - Postoperative infection
  - Delayed union and/or nonunion
- Plan the initial treatment of the polytrauma patient

AO Competency-Based Curriculum

Chair-person

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

Co-chair-person

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

International faculty

Mazen Abdalla	An-Najah University Hospital	Nablus	Palestinian Territory
Francisco Cavalcante	Instituto Ortopédico de Goiânia	Goiânia, GO	Brazil
Maria Virginia Giménez	Hospital Italiano de Buenos Aires	Buenos Aires	Argentina
Yazan Hattar	Private Sector	Amman	Jordan
Thomas Large	Mission Hospital	Asheville	USA
John Munz	University of Texas Health Science Center at Houston	Houston	USA
Tomoyuki Noda	Okayama University Hospital	Okayama	Japan
Mauro Núñez	Hospital del Trauma	San José	Costa Rica
David Rothberg	University of Utah	Salt Lake City	USA
Gillian Soles	University of Rochester	Rochester	USA
Danilo Taype Zamboni	Hospital Italiano de Buenos Aires	Buenos Aires	Argentina
Frank Wurmitzer	South Canterbury DHB	Timaru	New Zealand

Regional faculty

Mikhail Panin	Peoples' Friendship University of Russia, Hospital №17	Moscow	Russian Federation
Oleksandr Rikhter	Hospital "Boris"	Kyiv	Ukraine
Johan Scheer	University Hospital Linköping	Linköping	Sweden
Bas Twigt	Chirurgenmaatschap Amsterdam (BovenIJ/OLVG)	Amsterdam	The Netherlands
Yoram Weil	Hadassah Hebrew University Medical Center	Jerusalem	Israel

Guest lecturer

Piet De Boer	Medical Education Consultants GmbH	Dietlikon	Switzerland
Markus Windolf	AO Foundation	Davos	Switzerland

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 two eLearning modules "Biology of bone healing" after the precourse self-assessment and before attending the course, because faculty will build on your newly acquired knowledge.

Task 2: eLearning module Biology of bone healing (20 minutes)

https://emodules.aoeducation.org/aoelearn/aot_launch/aot_bh/lib/launch.html?bone_healing

Additional information on the 2018 revision of the AO/OTA Fracture and Dislocation Classification Compendium can be found here: https://classification.aoeducation.org

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: Aspen 2 (lectures) **Foyer C2** (practicals)

08:00–08:15	Welcome and introduction	S Fischer, N Cohen

Module 1
Moderator: S Fischer
Injury pattern (soft-tissue and bone) and biology of bone healing

Upon completion of this module, participants will be able to:
- Describe how patient-related factors affect the management of fractures
- Describe the importance of soft-tissue in fracture healing
- Use the AO/OTA Fracture and Dislocation Classification to describe a fracture

08:15–08:30	The AO world—from history to lifelong learning	P de Boer
08:30–08:40	Influence of the patient factors and the injury mechanism on fracture management	Y Weil
08:40–08:55	The (soft-tissue) injury—a high priority consideration	Y Hattar
08:55–09:05	Principles of external fixation	F Cavalcante
09:05–09:20	Updated AO/OTA Fracture and Dislocation Classification Compendium	M Núñez
09:20–09:40	Coffee break	

Module 2
Moderator: J Munz
Stability and biomechanics of bone healing

Upon completion of this module, participants will be able to:
- Explain the biology of fracture healing and how it is affected by fracture treatment
- Define absolute and relative stability and describe their effects on fracture healing
- Describe the biomechanics of locking compression plates (LCP) and how to achieve different types of stability
- Explain the principles and steps of the lag screw technique

09:40–10:00	Absolute stability—biomechanics, techniques, and fracture healing	N Cohen
10:00–10:20	Relative stability—biomechanics, techniques, and fracture healing	M Panin
10:20–10:35	The use of plates in fracture fixation	B Twigt
10:35–10:40	Location change to practical exercise room	
10:40–12:30	**Practical exercise 1** **Internal fixation with screws and plates—absolute stability**	M Abdalla, T Large
12:30–13:30	Lunch break	
13:30–14:40	**Practical exercise 2** **Principles of the internal fixator with LCP**	F Cavalcante, J Munz
14:40–14:45	Location change to skills lab (Foyer C2)	
14:45–16:45	**AO Skills Lab** * Note: participants spend 10 minutes at each station, then rotate Station A – Torque measurement of bone screws Station B – Soft-tissue penetration during drilling Station C – Heat generation during drilling Station D – Mechanics of bone fractures Station E – Techniques of reduction, part 1 Station F – Techniques of reduction, part 2 Station G – Mechanics of intramedullary fixation Station H – Mechanics of plate fixation Station J – Fracture healing and plate fixation Station K – Difficult implant removal	N Cohen F Cavalcante Y Hattar, M Abdalla T Noda, F Wurmitzer J Munz, O Rikhter T Large, MV Giménez M Núñez, S Fischer D Rothberg, M Panin G Soles, B Twigt J Scheer Y Weil, D Taype Zamboni
16:45–17:05	Coffee break	
17:05–18:00	**Discussion group 1** **General principles, classification, concepts of stability, their influence on bone healing, and how to apply implants to achieve appropriate stability** 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	 F Cavalcante, T Large Y Hattar, D Rothberg J Munz, T Noda M Núñez, M Abdalla G Soles, D Taype Zamboni F Wurmitzer, M Panin J Scheer, N Cohen

Tuesday

December 3, 2019

Location: Aspen 2 (lectures) Foyer C2 (practicals)

08:00–08:15	Questions and conclusions—injury pattern, biology of bone healing and stability	J Munz

Module 3
Moderator: T Large
Surgical treatment of diaphyseal fractures

Upon completion of this module, participants will be able to:
- Describe the treatment goals for diaphyseal fractures
- Describe the treatment principle for diaphyseal fractures in the upper and lower extremities
- Determine the type of reduction and stability needed for diaphyseal fractures
- Explain the rationale behind preoperative planning and the importance of careful decision making with regard to reduction technique, implant requirements, and fixation techniques

08:15–08:35	Principles of diaphyseal fracture management—what is important in treating these fractures?	F Wurmitzer
08:35–08:50	Reduction techniques of diaphyseal fractures—principles and methods	D Rothberg
08:50–09:05	Fractures of the femoral diaphysis (including subtrochanteric)—management principles	D Taype Zamboni
09:05–09:25	Fractures of the humeral diaphysis—management principles	J Scheer
09:25–09:30	Location change to practical exercise room	
09:30–10:30	**Practical exercise 3** **Reamed intramedullary (IM) nailing** **Tibial shaft fractures—IM nailing with the expert tibia nail (ETN) (with reaming) with extractor**	Y Hattar, T Noda
10:30–10:50	Coffee break	
10:50–12:05	**Discussion group 2** **Management principles for the treatment of diaphyseal 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	 S Fischer, O Rikhter B Twigt, Y Weil J Munz, T Noda M Núñez, D Rothberg G Soles, D Taype Zamboni F Wurmitzer, M Panin J Scheer, N Cohen
12:05–12:10	Location change to lecture room	
12:10–12:25	Questions and conclusions—diaphyseal fractures	T Large
12:25–13:25	Lunch break	

Module 4
Moderator: S Fischer
Treatment of articular fractures

Upon completion of this module, participants will be able to:
- Describe the treatment goals for articular fractures
- Define the key surgical principles of the management of articular fractures
- Determine the type of reduction and stability needed for articular fractures
- Outline the function and clinical indications for the tension band technique

13:25–13:40	Management principles for articular fractures—how do they differ from diaphyseal fractures?	J Munz
13:40–13:55	Reduction techniques for articular fractures—principles and methods	T Noda
13:55–14:10	Distal radial fractures—which to fix, how to fix?	J Scheer
14:10–14:25	Tension band principle and cerclage wiring	F Wurmitzer
14:25–14:40	Ankle fractures—a systematic approach for their fixation	Y Hattar
14:40–14:45	Location change to practical exercise room	
14:45–15:15	**Practical exercise 4** **Tension band wiring of the olecranon**	F Wurmitzer, M Núñez
15:15–16:15	**Practical exercise 5** **Management of a malleolar fracture type 44C**	D Rothberg, M Panin
16:15–16:35	Coffee break	
16:35–16:50	Preoperative planning—rationale and how to do it	N Cohen
16:50–17:05	Forearm fractures need—understanding of principles for diaphyseal and articular fractures	M Núñez
17:05–18:05	**Practical exercise 6 (part 1)** **Preoperative planning—plan your forearm operation**	N Cohen, S Fischer

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 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	Chang Gung Memorial Hospital Linkou Branch	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 Vauclair	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 Civico 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	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	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	Pennslylvania 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	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	

Wednesday morning

December 4, 2019

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

Wednesday afternoon

December 4, 2019

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

Thursday

December 5, 2019

Location: Aspen 2 (lectures) Foyer C2 (practicals)

08:00–09:10	**Practical exercise 6 (part 2)** **Operate your plan—fixation of a 2R2A, 2U2C forearm fractures using the LCP 3.5 (8 and 11 holes)**	MV Giménez, J Scheer
09:10–09:15	Location change to lecture room	
09:15–09:30	Femoral neck fractures	M Abdalla
09:30–09:45	Trochanteric fractures	O Rikhter
09:45–10:00	Distal femoral fractures—management principles	J Munz
10:00–10:15	Tibial plateau fractures	S Fischer
10:15–10:30	Distal tibial fractures	F Cavalcante
10:30–10:50	**Interactive case discussion**	D Rothberg
10:50–11:20	Coffee break	
11:20–12:30	**Discussion group 3** **Management principles for the treatment of articular 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	 S Fischer, O Rikhter B Twigt, Y Weil M Abdalla, F Cavalcante Y Hattar, T Large G Soles, D Taype Zamboni F Wurmitzer, M Panin J Scheer, N Cohen
12:30–13:40	Lunch break	
13:40–13:55	Questions and conclusions—treatment of articular fractures	T Noda
13:55–14:00	Location change to practical exercise room	
14:00–15:10	**Practical exercise 7** **IM nailing of a proximal femur using a trochanteric femoral nail antirotation (TFNA)**	G Soles, O Rikhter
15:10–15:15	Location change to lecture room	

Module 5
Moderator: MV Giménez
Emergency management, minimally invasive surgery, and special fractures

Upon completion of this module, participants will be able to:
- Identify indications for minimally invasive osteosynthesis (MIO) and when to use it
- Outline differences of fracture treatment in children and the elderly compared to those in adults
- Understand the danger of radiation in the operating room and how to avoid it
- Outline the algorithm for polytrauma management and discuss the roles of the team members
- Recognize the pathology of severe pelvic trauma and identify the reasoning behind emergency pelvic stabilization
- Outline the treatment plan and priorities for open fractures
- List the causes and factors that lead to postoperative infection
- Name factors leading to delayed union and/or malunion

15:15–15:30	Minimally invasive osteosynthesis (MIO)—when to use it?	D Taype Zamboni
15:30–15:45	Radiation hazards in the operating room—how to minimize?	MV Giménez
15:45–16:00	Fractures in the growing skeleton—how are they different?	O Rikhter
16:00–16:15	Fixation principles in osteoporotic bone—the geriatric patient	G Soles
16:15–16:30	Implant removal—why, when, and how?	B Twigt
16:30–16:50	Coffee break	
16:50–17:05	Treatment algorithms for the polytrauma patient	G Soles
17:05–17:20	Indications and techniques for external fixation for damage control in orthopedic and open fractures	M Panin
17:20–17:35	Emergency management of pelvic fractures—a critical skill can save lives	T Noda
17:35–17:50	Management of open fractures	MV Giménez
17:50–18:05	Question and answer session	S Fischer, N Cohen
18:05–18:15	Summery, evaluation, and take-home messages	S Fischer, N Cohen

Friday

December 6, 2019

Location: Aspen 2 (lectures) **Foyer C2** (practicals)

08:00–09:00	**Practical exercise 8** **Fixation of a tibial shaft fracture using a large external fixator (modular frame construct)**	D Taype Zamboni, J Scheer
09:00–10:10	**Practical exercise 9** **Stabilization of the pelvic ring using a large external fixator**	B Twigt, Y Weil
10:10–10:30	Coffee break	
10:30–10:45	Infection after osteosynthesis—how to diagnose and manage	M Abdalla
10:45–11:00	Delayed healing—causes and treatment principles	T Large
11:00–11:15	Research and development of smart systems to help the surgeon advance patient care	M Windolf
11:15–11:25	Location change to discussion groups	
11:25–12:35	**Discussion group 4** **Final case discussion on selected topic:** • **Polytrauma** • **Complications** • **Special fractures, eg, geriatric, osteoporotic, and periprosthetic fractures**	
	Group 1 – Landwasser 1	S Fischer, O Rikhter
	Group 2 – Landwasser 3	B Twigt, Y Weil
	Group 3 – Landwasser 5	M Abdalla, F Cavalcante
	Group 4 – Landwasser 7	Y Hattar, T Large
	Group 5 – Landwasser 9	J Munz, T Noda
	Group 6 – Landwasser 11	M Núñez, D Rothberg
	Group 7 – Landwasser 13	F Wurmitzer, MV Giménez
12:35–12:45	Location change to lecture room	
12:45–13:00	Violation of AO principles—when it goes wrong	Y Weil
13:00–13:15	Summery, evaluation, and take-home messages	S Fischer, N Cohen
13:15–13:30	Sandwich break	

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
Jana Kamber
Clavadelerstrasse 8
7270 Davos Platz
Switzerland
Phone +41 81 414 27 10
Fax +41 81 414 22 84
E-mail jkamber@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

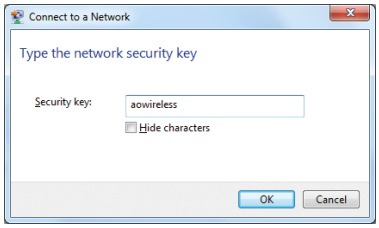
Wireless network

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—Basic Principles of Fracture Management: CHF 2,250
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 33 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://AOTRAUMA10009578.aotrauma.org

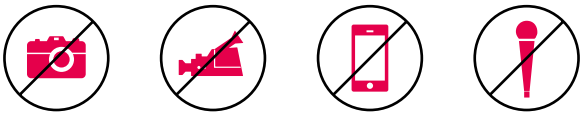
Course certificate
Course certificates will be available at the end of the event at the general information desk.

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.

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

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

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AO Trauma Masters Course—Shoulder Trauma
Chairpersons:
Stefaan Nijs (BE), Ashraf Moharram (EG)
AOTRAUMA10010974.aotrauma.org

AO Trauma Masters Course—Knee Injuries and Deformities
Chairpersons:
Hans Philipp Lobenhoffer (DE), Steffen Schröter (DE)
AOTRAUMA10010972.aotrauma.org

AO Trauma Masters Course—Fractures around the Elbow
Chairpersons:
Gregory Della Rocca (US), Pedro Labronici (BR)
AOTRAUMA10010997.aotrauma.org

AO Trauma Masters Course—Foot and Ankle
Chairpersons:
Mandeep Dhillon (IN), Stefan Rammelt (DE)
AOTRAUMA10010973.aotrauma.org

AO Trauma Masters Course—Hip Fractures
Chairpersons:
Michael Baumgaertner (US), Rodrigo Pesantez-Hoyos (CO)
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For more information visit: www.aotrauma.org

AO TRAUMA

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

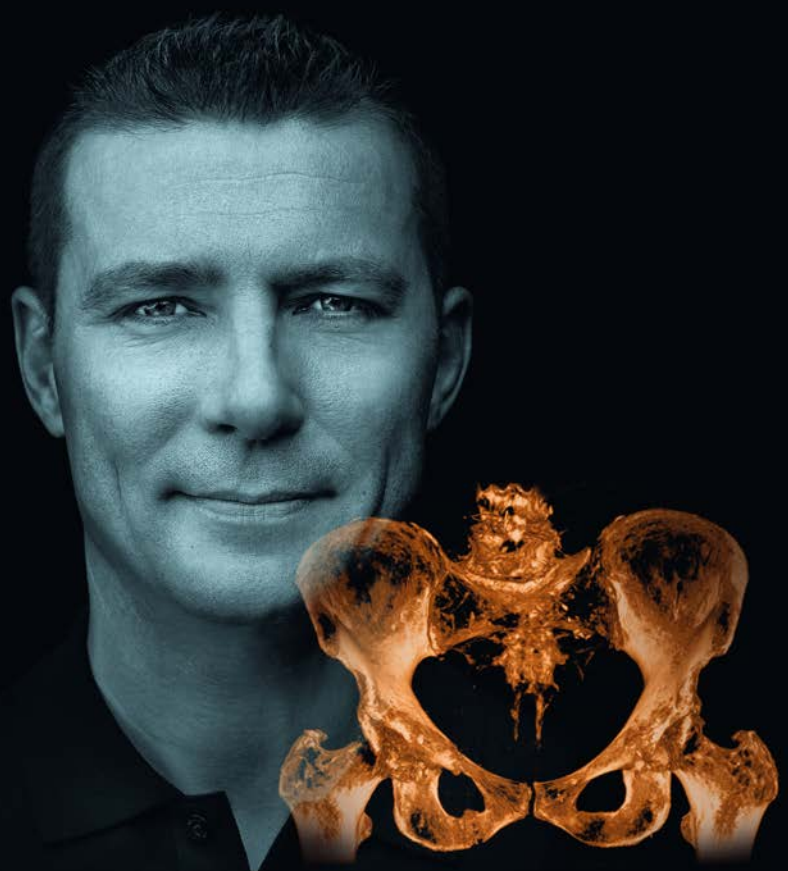
- AO Trauma Course—Basic Principles of Fracture Management for Swiss Surgeons
- AO Spine Courses
- AO CMF Courses
- AO VET Masters Course—Small Animal
- AO VET Masters Course—Large Animal
- AO Recon Course—Principles in Shoulder Athroplasty
- AO Recon Course—Complex Total Hip and Knee Arthroplasty
- 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

siemens-healthineers.com/surgery



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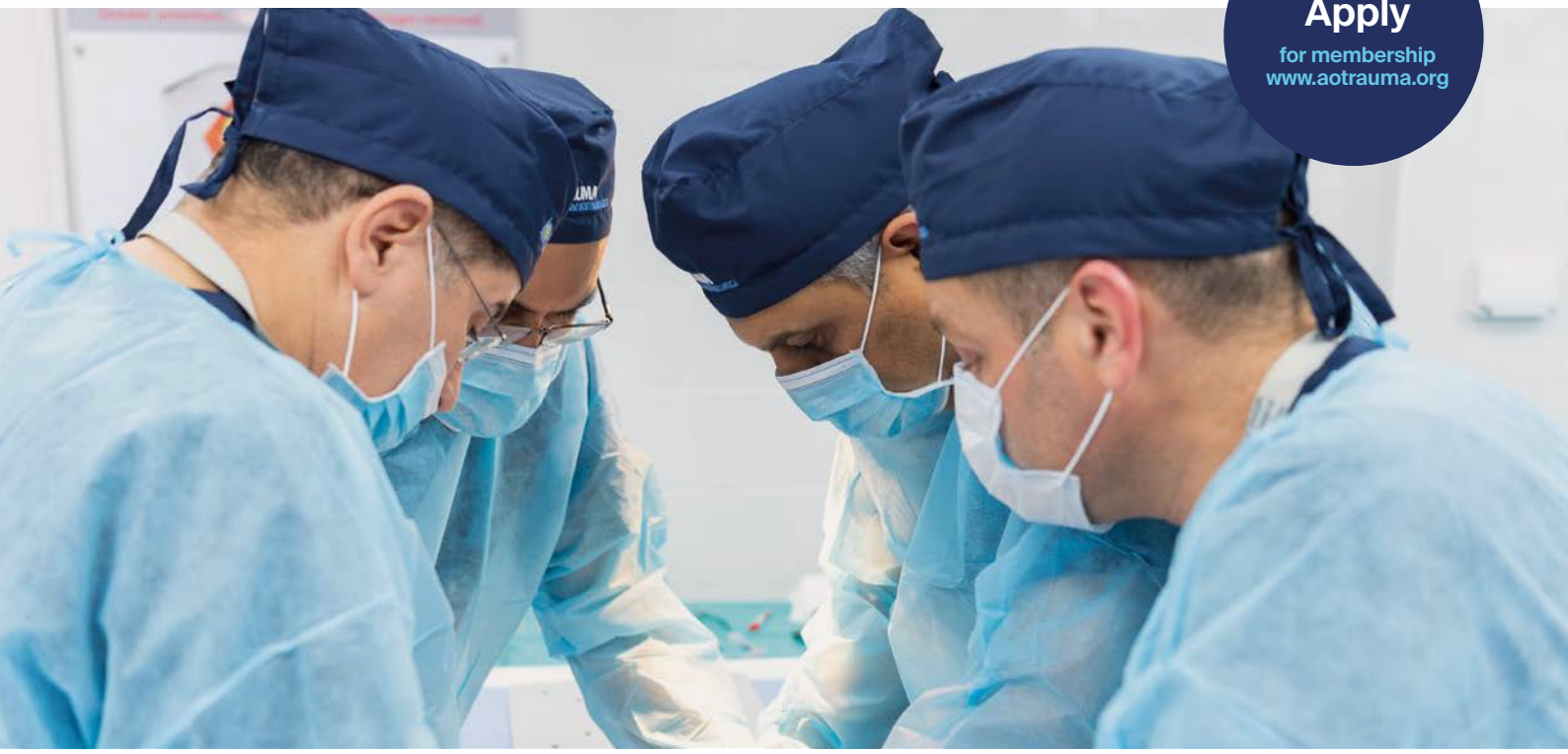

Discover the advantages of joining the leading global trauma and orthopedic community, providing its members with education, research, and networking opportunities worldwide. **Join us and share your passion.**

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