AO Recon Course—
Complex Total Hip and Knee Arthroplasty

December 1–3, 2019
Davos, Switzerland

Lecture room: Sertig

Best-in-class education in joint preservation and replacement
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 Recon is a global network of orthopedic surgeons committed to best-in-class education in joint preservation and replacement.

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 Recon course participant,

It is with great pleasure that we welcome you to our advanced-level course that offers experienced surgeons training on complex and revision total hip and knee arthroplasty.

Over the two-day program, global leaders in the field of arthroplasty will lead interactive discussion groups and inspiring lectures and deliver technical know-how in practical exercises.

The AO Davos Courses 2019 offer more than just a course experience. Your primary focus is active engagement in your course. In addition, we encourage you to:
- Interact with the international faculty and speak with staff and surgeons from across the AO’s clinical divisions, institutes and initiatives.
- Expand your professional network and establish new relationships with colleagues, including faculty and participants from all over the world.
- Visit the exhibits in the AO experience, gain insight into the AO center, and learn about the AO’s ongoing activities and the resources available to support you in your clinical work.

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

We hope that you will immediately transfer the knowledge you gain here into your daily practice in order to reach our shared goal of improving patient care through surgical excellence.

Yours sincerely,

Norbert P. Haas  
AO Recon Steering Board

Carsten Perka  
AO Recon Education Forum
Course description

This course is modular in structure and highly interactive. Short, evidence-based lectures cover the key information required. Moderated case discussions in small groups will expand on each topic and help participants to develop decision-making and surgical management skills. Participants will have the opportunity to share their experience with peers and international faculty. All factors related to achieving the best possible outcomes in complex and revision arthroplasty will be covered.

Goal of the course

The AO Recon Course—Complex Total Hip and Knee Arthroplasty teaches current concepts in the treatment of patients with a need for revision or complex primary arthroplasty in the hip and knee.

Target participants

This course is targeted at certified, experienced orthopedic surgeons who wish to enhance their knowledge and skills in complex arthroplasty.

Learning objectives

At the end of the event, the participants will be able to:

- Describe a systematic clinical, laboratory, and radiographic evaluation in revision and complex primary arthroplasty
- Optimize preoperative planning
- Adopt a patient-centered approach
- Optimize patients preoperatively to reduce complications
- Describe and discuss safe and effective procedures for revision and complex primary arthroplasty
- Discuss the management of early and late problems or complications
- Communicate and facilitate a multidisciplinary team-based approach
- Apply best practice to optimize and document patient outcomes
Chairpersons

Carsten Perka
Germany, Berlin

Bassam Masri
Canada, Vancouver

International faculty

Matthew Abdel
Rochester, USA

Anthony Albers
Montreal, Canada

Guillermo Bonilla
Bogotá, Colombia

Peter Chiu
Hong Kong, Hong Kong

Youn-Soo Park
Seoul, South Korea

Aree Tanavalee
Bangkok, Thailand

Regional faculty

Mohamad Allami
Baghdad, Iraq

Robert Hube
Munich, Germany

George Matziolis
Jena, Germany

Krisztian Sisak
Szeged, Hungary

National faculty

Karl Stoffel
Basel, Switzerland

Yves Acklin
Basel, Switzerland
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:00</td>
<td>Opening of the Congress Center</td>
</tr>
<tr>
<td>15:00–17:00</td>
<td>Registration of participants</td>
</tr>
<tr>
<td>17:00–18:00</td>
<td>Opening ceremony</td>
</tr>
<tr>
<td>18:00–19:00</td>
<td>FOUNDERS’ RECEPTION</td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
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<td>---------------------------------------------------------------------------</td>
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<tr>
<td>07:30-08:00</td>
<td>Registration of participants</td>
</tr>
<tr>
<td>08:00-08:10</td>
<td>Welcome and introduction to the course</td>
</tr>
<tr>
<td>08:10-08:20</td>
<td>Overview of failure mechanisms and indications for revision hip arthroplasty</td>
</tr>
<tr>
<td>08:20-08:30</td>
<td>Mechanically assisted tribo-corrosion</td>
</tr>
<tr>
<td>08:30-08:40</td>
<td>Preoperative investigation and planning for revision hip arthroplasty</td>
</tr>
<tr>
<td>08:40-08:50</td>
<td>Discussion and closing of module</td>
</tr>
<tr>
<td>08:50-09:00</td>
<td>Extended surgical approaches</td>
</tr>
<tr>
<td>09:00-09:10</td>
<td>Well-fixed implant removal</td>
</tr>
<tr>
<td>09:10-09:20</td>
<td>Assessment of bone loss in revision hip arthroplasty</td>
</tr>
<tr>
<td>09:20-09:30</td>
<td>Questions and answers</td>
</tr>
<tr>
<td>09:30-09:50</td>
<td>Coffee Break</td>
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</tbody>
</table>

Breakout into Groups A and B
# Monday

**Dec 2, 2019**

**Location: Sertig**

<table>
<thead>
<tr>
<th>Group A</th>
<th>Time</th>
<th>Session</th>
<th>Moderator</th>
<th>Group Leaders</th>
</tr>
</thead>
</table>
| 09:50–10:40 | **Plenary: Treatment options for acetabular bone loss** | Case 1: Jumbo cup  
Case 2: Augments  
Case 3: From cages to triflange cups  
Case 4: Pelvic discontinuity: ORIF, cup-cage; distraction | **Moderator:** B Masri | B Masri, M Abdel, R Hube, C Perka |
| 10:40–11:20 | **Plenary: Treatment options for femoral bone loss** | Case 1: Modular proximal stem  
Case 2: Fluted titanium, tapered stem  
Case 3: Cemented fixation – with and without impaction grafting  
Discussion | **Moderator:** R Hube | B Masri, M Abdel, C Perka |
| 11:20–12:20 | **Small group discussions**  
**Revision hip replacement (failed cups and failed stems)** | B Masri, M Abdel, R Hube, C Perka |
| 12:20–13:20 | Lunch Break | | |

**Location: Studio**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Lab director</th>
<th>Group Leaders</th>
</tr>
</thead>
</table>
| 13:20–15:50 | **Practical exercises—Hip arthroplasty**  
Introduction to the practical exercises  
- Plate the posterior column  
- Removal of well-integrated hemispherical cup  
- Reconstruction of the acetabulum using trabecular metal augmentation and implantation of a hemispherical revision cup  
- Extended trochanteric osteotomy (ETO)  
- Removal of cemented stem and implantation of a modular revision stem  
- Refixation of ETO with cerclage wires | **Lab director:** K Stoffel | YS Park, P Chiu, G Bonilla, A Albers, A Tanavalee, G Matziolis, M Allami, K Sisak |
| 15:50–16:10 | Coffee Break | | |

**Location: Sertig**

<table>
<thead>
<tr>
<th>Group B</th>
<th>Time</th>
<th>Session</th>
<th>Moderator</th>
<th>Group Leaders</th>
</tr>
</thead>
</table>
| 09:50–12:20 | **Practical exercises—Hip arthroplasty**  
Introduction to the practical exercises  
- Plate the posterior column  
- Removal of well-integrated hemispherical cup  
- Reconstruction of the acetabulum using trabecular metal augmentation and implantation of a hemispherical revision cup  
- Extended trochanteric osteotomy (ETO)  
- Removal of cemented stem and implantation of a modular revision stem  
- Refixation of ETO with cerclage wires | **Lab director:** K Stoffel | YS Park, P Chiu, G Bonilla, A Albers, A Tanavalee, G Matziolis, M Allami, K Sisak |
| 12:20–13:20 | Lunch Break | | |

<table>
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Case 2: Augments  
Case 3: From cages to triflange cups  
Case 4: Pelvic discontinuity: ORIF, cup-cage; distraction | **Moderator:** B Masri | B Masri, M Abdel, R Hube, C Perka |
| 14:10–14:50 | **Plenary: Treatment options for femoral bone loss** | Case 1: Modular proximal stem  
Case 2: Fluted titanium, tapered stem  
Case 3: Cemented fixation – with and without impaction grafting  
Discussion | **Moderator:** R Hube | B Masri, M Abdel, C Perka |
| 14:50–15:50 | **Small group discussions**  
**Revision hip replacement (failed cups and failed stems)** | B Masri, M Abdel, R Hube, C Perka |
| 15:50–16:10 | Coffee Break | | |
## Location: Sertig

### Module 3
**Complex primary total hip arthroplasty (THA)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:10–16:50</td>
<td>Small group discussions</td>
<td>All faculty</td>
</tr>
<tr>
<td></td>
<td>Case 1: Dysplasia (CROWE 3/4)</td>
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<tr>
<td></td>
<td>Case 2: Conversion THA for posttraumatic acetabular fracture</td>
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<tr>
<td></td>
<td>Case 3: Conversion THA for posttraumatic femoral fracture</td>
<td></td>
</tr>
</tbody>
</table>

### Module 4
**Moderator: A Tanavalee**
**Indications for revision knee arthroplasty and patient optimization**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:50–17:00</td>
<td>Overview of failure mechanisms and indications for revision knee arthroplasty</td>
<td>K Sisak</td>
</tr>
<tr>
<td>17:00–17:10</td>
<td>Preoperative planning for revision knee arthroplasty</td>
<td>G Matziolis</td>
</tr>
<tr>
<td>17:10–17:20</td>
<td>Questions and answers</td>
<td>All faculty</td>
</tr>
</tbody>
</table>

### Module 5
**Moderator: G Matziolis**
**Revision arthroplasty of the knee**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:20–17:30</td>
<td>Extended surgical approaches and implant removal</td>
<td>A Tanavalee</td>
</tr>
<tr>
<td>17:30–17:40</td>
<td>Step-by-step surgical technique for revision TKA</td>
<td>B Masri</td>
</tr>
<tr>
<td>17:40–17:50</td>
<td>Implant selection</td>
<td>A Albers</td>
</tr>
<tr>
<td>17:50–18:00</td>
<td>Extensor mechanism failure and patellofemoral complications</td>
<td>M Abdel</td>
</tr>
</tbody>
</table>
**Tuesday**
**Dec 3, 2019**

**Location: Sertig**

**Group A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Facilitators</th>
</tr>
</thead>
</table>
| 08:00–09:00   | Small group discussions  
Revision knee arthroplasty—Indications, investigation, and preparation  
Case 1: Loosening with malalignment  
Case 2: Severe bone loss requiring bone or metal substitution  
Case 3: Severe instability requiring a hinge  
Case 4: Salvage with an amputation or arthrodesis | A Tanavalee, G Matziolis, M Allami, K Sisak |
| 09:00–10:00   | Small group discussions  
Case 1: Valgus knee (that requires a hinge)  
Case 2: TKA posttraumatic with hardware  
Case 3: TKA for extraarticular deformity | A Tanavalee, G Matziolis, M Allami, K Sisak |
| 10:00–10:20   | Coffee Break               |                                     |
| 10:20–12:20   | Practical exercises—Revision knee arthroplasty  
Introduction to the practical exercises, including templating  
• Remove existing knee prosthesis  
• Perform a revision TKA  
• Fixation with screws or wires  
Wrap up and questions | Lab director: Y Acklin  
B Masri, M Abdel, C Perka, R Hube, YS Park, P Chiu, G Bonilla, A Albers |
| 12:20–13:20   | Lunch Break                |                                     |

**Module 6**
**Complex primary total knee arthroplasty (TKA)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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</table>
| 08:00–10:00   | Small group discussions  
Revision knee arthroplasty—Indications, investigation, and preparation  
Case 1: Loosening with malalignment  
Case 2: Severe bone loss requiring bone or metal substitution  
Case 3: Severe instability requiring a hinge  
Case 4: Salvage with an amputation or arthrodesis | A Tanavalee, G Matziolis, M Allami, K Sisak |
| 09:00–10:00   | Small group discussions  
Case 1: Valgus knee (that requires a hinge)  
Case 2: TKA posttraumatic with hardware  
Case 3: TKA for extraarticular deformity | A Tanavalee, G Matziolis, M Allami, K Sisak |
| 10:00–10:20   | Coffee Break               |                                     |
| 10:20–11:20   | Small group discussions  
Revision knee arthroplasty—Indications, investigation, and preparation  
Case 1: Loosening with malalignment  
Case 2: Severe bone loss requiring bone or metal substitution  
Case 3: Severe instability requiring a hinge  
Case 4: Salvage with an amputation or arthrodesis | A Tanavalee, G Matziolis, M Allami, K Sisak |
| 11:20–12:20   | Small group discussions  
Case 1: Valgus knee (that requires a hinge)  
Case 2: TKA posttraumatic with hardware  
Case 3: TKA for extraarticular deformity | A Tanavalee, G Matziolis, M Allami, K Sisak |
| 12:20–13:20   | Lunch Break                |                                     |
Location: AO TC Meet the Experts Stage

12:40–13:20 Introduction to AO Recon complex exercises with Karl Stoffel and Yves Acklin

Module 7
Moderator: M Allami
Complications

13:20–14:00 Plenary case-based presentations: Infection
Case 1: Infection after Hip Replacement
Case 2: Infection after Knee Replacement
Moderator: M Allami
A Albers
C Perka

14:00–14:40 Plenary case-based presentations: Periprosthetic fractures
Case 1: Classification
Case 2: Internal fixation of femoral periprosthetic fractures
Case 3: Femoral revision for femoral periprosthetic fractures
Case 4: Periprosthetic fractures about the knee
Moderator: B Masri
G Bonilla
M Allami
K Sisak
P Chiu

14:40–15:00 Coffee Break

15:00–15:40 Plenary case-based presentations: Dislocation
Case 1: Covering large head
Case 2: Dual Mobility cups
Case 3: Constrained cups
Moderator: A Albers
A Albers
P Chiu
M Abdel

15:40–15:50 Q&A - Audience encouraged to ask questions about topics not covered
All faculty

15:50–16:00 Wrap-up and take-home messages
B Masri, C Perka

17:45–20:30 AO Davos Courses night
Event organization

AO Recon Education
Sina Henrichs
Clavadelstrasse 1
7270 Davos Platz
Switzerland
Phone +41 79 815 27 76
Email sina.henrichs@aorecon.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 Center 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 offers you the chance to view the latest publications in the AO library, see what benefits you are eligible for at 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 demo’s 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: DePuy Synthes, SPI, Siemens, SYNBOONE, 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):

- Credit Suisse
- SYNBOONE
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 Course website offering course-related information

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

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

For further information or support, please contact:
AO
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
The AO Recon Course—Complex Total Hip and Knee Arthroplasty: CHF 2,300
The event fee covers the conference bag, documentation, coffee breaks, lunches, participation in AO Davos Courses night, and the course certificate.

European CME Accreditation
For this course the UEMS-EACCME® in Brussels have granted 14 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 on https://aorecon.aofoundation.org/disclosure.html

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

Evaluation guidelines
All AO Recon 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 Recon 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 during lectures, practical exercises, and group discussions.

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.
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, the technology used has been reviewed by the AO Technical Commission—a large independent group of volunteer surgeons developing and peer-reviewing new technology on behalf of the AO Foundation. Any technology used in the practical sessions of this event has been found suitable to serve the defined educational purposes. This does not imply any statement about its use in actual clinical scenarios.

More information on the AO Technical Commission 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.
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 3-D printing

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

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

Veterinary medicine
• Improving osteosynthesis for small and large animals

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

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

AO Davos Courses—November 29–December 4, 2020
- AO Trauma Course—Basic Principles of Fracture Management
- AO Trauma Course—Advances Principles of Fracture Management
- AO Trauma Course—Advanced Principles of Fracture Management for Swiss residents
- AO Trauma Masters Course—Current Concepts
- AO Trauma Course—Pelvic and Acetabular Fracture Management
- AO Trauma Masters Kurs (German speaking)
- AO Trauma Course—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.
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* Cios Spin®, with VA30 is pending 510(k) clearance, and is not yet commercially available in the United States or in other countries. Due to regulatory reasons, its future availability cannot be guaranteed.
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