Learning outcomes

- Discover that success in AO developments depends on:
  - Clinical expertise
  - Documentation
  - Research
  - Education
- Realize that the AO is a network of surgeons, ORP, and researchers with mutual interests and motivations
- Discuss the scope of education provided by the AO Foundation
50 years ago…

- Dissatisfaction with fracture treatment

← Conservative

Operative →
Poor outcomes after fracture fixation

- Lack of asepsis
- Lack of good tools
- Lack of training

Failures

Frustrates use of fracture fixation techniques
In 1950, Maurice Müller visited Robert Danis in Belgium. What Maurice saw made a huge impression. Many surgeons had come to visit Danis but returned empty handed, blind to all that they had seen. Maurice immediately grasped the full significance of these radically new concepts. The visit to Danis laid the foundation for his future principles of osteosynthesis.

Danis describes in his book “Théorie et Pratique de l’Osteosynthèse” (1949) the concepts of

- Compression plating
- Primary bone healing
Müller’s next appointment came in 1951, when he was placed in charge of trauma care at the University Hospital of Fribourg. For Maurice this was a golden opportunity. He showed almost reckless courage in testing his evolving new ideas and techniques.

He treated 75 patients with absolutely stable internal fixation and immediate functional mobilization. The complication rate was almost nil. At the time, this kind of success was unheard of.”
1958—the founders of the AO
(Arbeitsgemeinschaft für Osteosynthesefragen)

Maurice E. Muller  Martin Allgower  Walter Blandi  Robert Schneider  Hans Willenegger

Ernst Baumann  Fritz Brussatis  August Guggenbühl  Willy Hunziker

Walter Ott  René Patry  Walter Schär  Walter Stähli
1. Development of instruments and implants

2. Research of fracture healing and tissue cultures

3. Documentation of all patients

4. Teaching of fracture fixation techniques

The four principles of documentation, teaching, research, and instrumentation would become the four pillars of the AO Foundation in 1984.

References:

1. Müller ME, Allgöwer M, Willenegger H. Technique of Internal fixation of

Maurice Müller starts to work together with the industry and develops instruments and implants starting with the hexagonal head screw.
Martin Allgöwer was the first director of the AO Laboratory for Experimental Surgery in Davos. The building had previously been a tuberculosis clinic and was rented to the founders of AO who each paid CHF 10,000 towards the costs.
Documented (1959)

- Maurice Müller, Davos, Switzerland

Extract from Surgery, Science and Industry by Thomas Schlich:

“Like Böhler, the AO used standardized forms in its project. At the beginning of 1959 Müller introduced colored code sheets for documenting the operation and the check-ups after four and twelve months. He also designed punch cards to which miniature copies of the X-rays could be attached. After discharging an osteosynthesis patient, surgeons were supposed to send the yellow code sheet to the Davos documentation center first.

The information from this sheet was then used to make two new punch cards, one of which remained in Davos while the other was sent back to the respective surgeon. The surgeons also needed to send along a set of pre- and post-operative X-ray pictures. These were copied, miniaturized and pasted onto the punch cards.

Four months later the surgeon saw the patient again, took two X-rays in different planes, filled in a blue code sheet and sent these, together with his copy of the punch card, to Davos. Again, miniaturized copies were added to the punch card and one copy went back to the surgeon. The same happened one year after the operation. Following this third examination the surgeons filled in a red sheet.

In the first year after the center was opened, 1000 cases were registered and 10,000 X-ray copies were made available for analysis.”
Teaching (1960)

- 1960 first AO Course in Davos
- 69 participants

M. Müller teaches femoral nailing
Teaching

- 1965 AO Courses crossing the Swiss border
  - First AO Course in Freiburg, Germany
AO Foundation—Today

• Medically guided, global network of surgeons:
  • More than 10,000 surgeons
  • In more than 100 countries
  • Interdisciplinary teamwork
• World’s leading educational and research organization:
  • For trauma and musculoskeletal treatment
AO Vision

Our vision is excellence in the surgical management of trauma and disorders of the musculoskeletal system.

AO Mission

Our mission is to foster and expand our network of healthcare professionals in education, research, development and clinical investigation to achieve more effective patient care worldwide.
Since 1958 the 4 AO principles of fracture fixation have been introduced and ever since taught.

At AO courses the course content is built around those 4 principles of fracture fixation. In ORP courses of course also perioperative nursing is addressed. Over the years, the focus has changed but not the principles.

For example: In 1958 the awareness of the care of the soft tissues was not as outstanding as with the knowledge we have now that has been accumulated since.

Principles:
1. Fracture reduction and fixation to restore anatomical relationships
2. Stability by fixation or splintage, depending on the personality of the fracture and the injury
3. Preservation of the blood supply to soft tissues and bone by careful handling and gentle reduction techniques
4. Early and active mobilization
AO Center Davos – Headquarter

- Clinical divisions
- Service units
  - AO Research and Development
  - AO Clinical Investigation
  - AO Technical System
  - AO Education Institute
  - Management & Logistics
The AOFoundation is the umbrella which finances the four specialties and monitors and controls several core service units such as TK, Education....
Operating Room Personnel (ORP)

- AOTrauma Courses, AOTrauma Seminars and AOT ORP Clinical Training Modules
- Faculty development globally
- ORP educational material

ORP (Operating Room Personnel) is part of AOTrauma and
- Organizes AOTrauma courses, seminars and clinical trainings
- Teaches faculty globally
- Creates educational material
This slide shows the process from a clinical problem to the development of an implant or technique in one particular service of the AO Research Institute.
AO Clinical Investigation & Documentation

• A leading independent and certified study organization:
  • For orthopedic/trauma multicenter studies
  • Worldwide

• Can develop, monitor, and analyze orthopedic/trauma studies:
  • Based on surgical questions
Task of TK System:

- Constant reviewing and developing of surgical techniques, implants, and instruments in close collaboration with the industrial partners of the AO Foundation under the medical guidance of independent surgeons.

AOTK is empowered to approve a device (product) or method (technology) as a SYNTHES® product. There is

1. Trauma TK
2. Spine TK
3. CMF TK
The AO Education Institute supports the clinical divisions in different branches such as:

- Journals
- Production of audio/visual media
- e-Learning
- Books
- Courses and fellowships
• More than 50 years experience in delivering high-quality medical education.
• AO has educated more surgeons and ORP than any other institution in the fields of orthopedics.
• In 2010: 618 courses worldwide with 35,000 participants.
• Since 1960 over 350,000 surgeons from 124 countries and 150,000 ORP from 74 countries have been educated.
The AOTrauma ORP Clinical Training Modules can be used for local at point of care educational sessions and take about 2.5 to 3h.
Each AOT faculty can organize these modules in their hospital.
For more information, see flyer (Flyer is available in the faculty support package and can be distributed in the course bags).
In the AO Courses three different methods are used:

- Lectures to increase the knowledge
- Discussion groups to change the attitude
- Practical exercises to improve the skills
Today AO offers blended learning in which e-Learning and face-to-face learning are well mixed.
Through the AO Foundation portal, direct access to the Surgery Reference is provided. This is a platform where through form of a skeleton the diagnosis, approach, preparation, treatment, etc are explained.
AO Surgery Reference

• Repository of surgical knowledge
• Available through the internet
• Free access
• Describes complete surgical process:
  • From diagnosis to aftercare
  • For all fractures of a given anatomical region

Provides access to:

• Step-by-step descriptions of hundreds of surgical procedures
• Surgical decision-making support
• Hundreds of instructional videos
• Hundreds of pages of book chapters, journal articles, studies, etc recently published in other contexts
Many teaching videos are accessible online.
AOTrauma offers webinars, such as «Patient Safety in the Orthopedic Operating Room» (see slide).
Different applications “Müller AO Classification” and “AO Surgery Reference” can be downloaded for iPhones and androids.
AO books published in 2012–2013

• AO Education Institute:
  • Text production with international authors
  • e-books
    • For the AO clinical divisions

Books are created by AO Education in close cooperation with AO Faculty who are the authors and editors. E-books are available for the clinical divisions.
AOT ORP launched their latest version of “Techniques and Principles for the Operating Room” in 2010.
AO Journals

- **TK Innovations**
  - Information on newly approved implants from AO TK System

- **AO Dialogue**
  - Information about the AO Group and issues of interest in orthopedics and trauma care

- **JPP**
  - Information on perioperative practice for Operating Room Personnel
The faculty disseminate the theoretical and practical basics of operative fracture management according to AO Principles.

The courses are characterized by an open exchange between participants and faculty during the many practical exercises and group discussions. In this way important knowledge transfer occurs.
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  - Clinical expertise
  - Documentation
  - Research
  - Education
- Realize that the AO is a network of surgeons, ORP, and researchers with mutual interests and motivations
- Discuss the scope of education provided by the AO Foundation
Benefit for the patient is the ultimate goal!