



EUROPEAN PROJECT FOR EDUCATION IN OSTEOSYNTHESIS FOR SURGICAL MANAGEMENT OF FRACTURES FOR ORTHOPEDIC SURGEONS AND BIOMEDICAL ENGINEERS



Orthopaedic Surgery
& Musculoskeletal Trauma
Faculty of Medicine, University of Thessalia

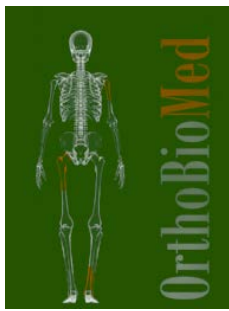


SLAVKA TZANOVA, TECHNICAL UNIVERSITY OF SOFIA (BULGARIA)

ZOE DALIANA, DEPARTMENT OF ORTHOPAEDIC SURGERY AND TRAUMATOLOGY OF UNIVERSITY OF THESSALIA (GREECE)

KETI TOKMAKOVA, MEDICAL UNIVERSITY PLOVDIV (BULGARIA)

CARLOS ATIENZA, INSTITUTE OF BIOMECHANICS OF BARCELONA (SPAIN)



Project 2013-1-BG1-LEO05-08711

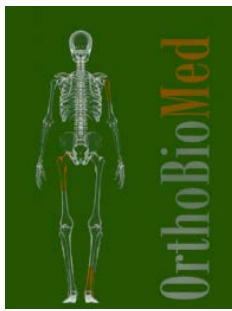
Project financed by :

- European Community action programme in the field of education.
- Leonardo da Vinci programme promotes European cooperation in the field of vocational education and training.

Budget: 257 049 euro

October 2013 – September 2015

This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use, which may be made of the information contained therein.



Partners

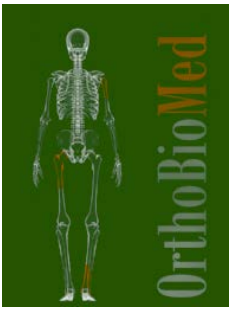
The consortium consists of:

- orthopaedic surgeons,
- experts in biomechanics,
- experts in educational technology and e-learning materials development,
- institutions providing continuing education for professionals in mechanical engineering and in orthopaedics.



Orthopaedic Surgery
& Musculoskeletal Trauma
Faculty of Medicine, University of Thessalia

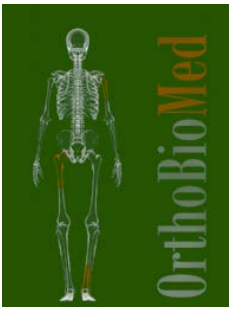




Priorities and Needs

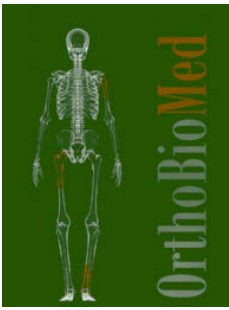
- European eHealth strategy
- Needs of target groups:
 - increased pressure by patients and patient organizations to improve quality and prevent errors;
 - continuous introduction of new surgical techniques and implant models, many of them being not well known to surgeons;
 - need of better trained professionals able to address the growing demand in the field.

There is a need of e-learning courses with demonstrations, simulation of the cases for predictive, evidence based planning and intervention and they will be more useful for the doctors in remote regions.



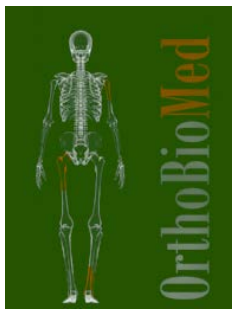
Objectives

- Identifying and **analysing the needs** of biomedical labour market, of biomedical engineers, orthopaedic surgeons, managers, residents in the sector.
- Selecting and adapting the **e-learning innovative content** to meet these needs and upgrade the content with the new developments in the sector.
- Adapting, upgrading and **implementing the Osteoform** e-learning materials to the legal framework, training system, and language in Bulgaria and Greece and to the needs of the target groups in all partner countries.



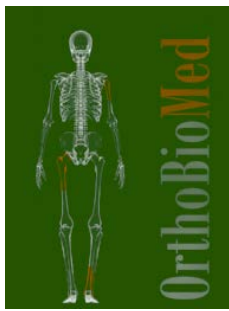
Target groups

- **Residents in orthopaedics and orthopaedic surgeons** needs to update their knowledge on issues related to the surgical techniques of osteosynthesis;
- **Engineers in mechanics** needing knowledge and skills in biomechanical engineering for working in the development and manufacture of osteosynthesis implants.

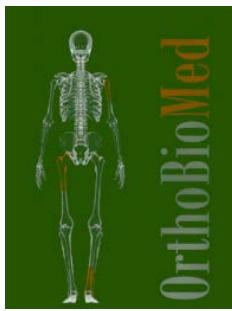


OSTEOform system

- e-learning platform with training courses specialized in the field of bone fractures and osteosynthesis
- This initiative is focused on long bones fracture, and their diagnosis and treatment, including implants used in their restoration.
- OSTEOform also supports a database of anonymous cases that is continuously updated with presurgical and postsurgical patient information.



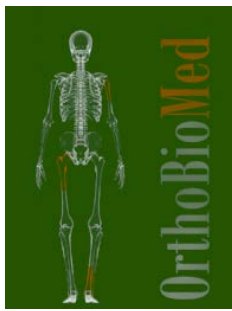
OSTEOform system



OSTEOform system

The system offers:

- Specialized training courses:
- A database of anonymized clinical cases.
- A virtual community of skilled professionals (discussion boards, chats, FAQs, blogs, etc).
- Usage of the simulation services with generic implants.
- A tool to practice bone fracture analysis

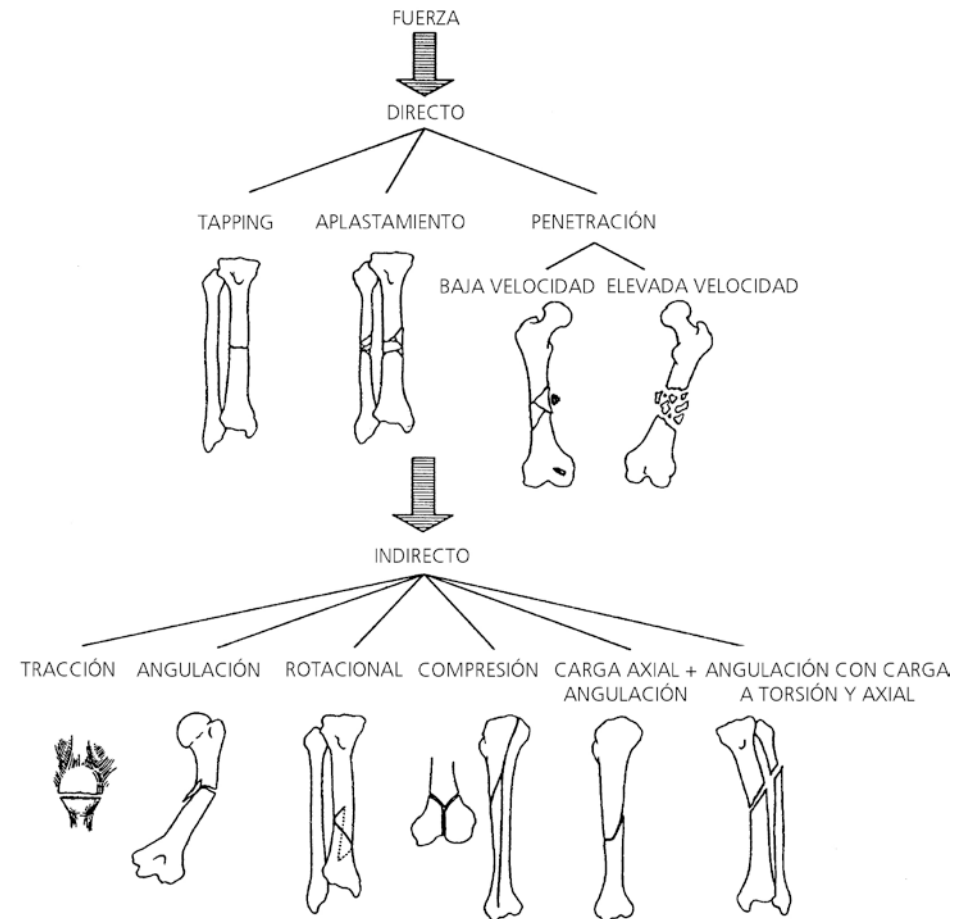


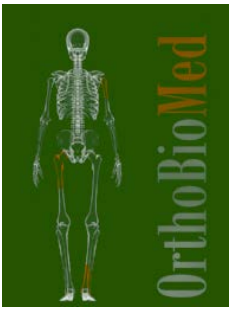
Example “Fracture mechanisms”

Working out the possible mechanism of injury from the clinical and X-ray characteristics of a fracture is not just an academic exercise.

Knowing how a fracture occurred has a series of therapeutic implications.

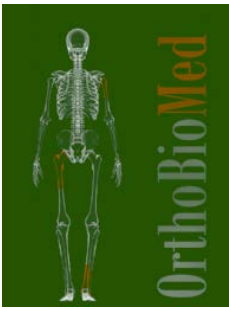
Fractures can be classified according to the type of forces that caused them.





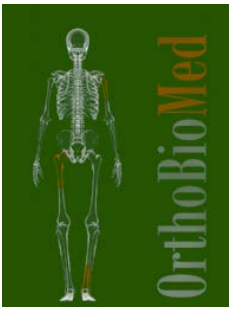
Work in progress

- Generation of teaching materials for courses taught in doctoral and MSc programmes in osteosynthesis of biomechanics;
- A database of clinical fractures.
 - It can be used as a training tool of diagnosis, the trainee may use the Internet through the analysis of practical cases based on real clinical cases, and this will result in better training of surgeons with reduced learning time and less need for face clinical sessions;



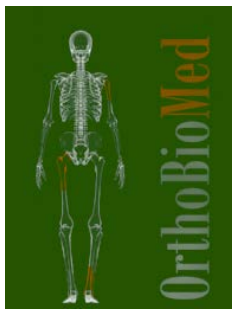
Work in progress

- Created finite element models of long bones and major osteosynthesis implants.
- These models can provide the mechanical behaviour of the implant, once implanted in a patient,
 - **improving the understanding of the mechanisms** that underlie the osteosynthesis techniques,
 - helping surgeons **in selecting the most suitable implant for each clinical case** and engineers in the design process and improving existing products.



Pilot test results with surgeons

- Surgeons were satisfied by the usability of the computer system, the interface and the information provided.
- Pilot test participants felt comfortable using internet for educational purposes and working in in Internet-based environment.
- After finishing the course surgeons emphasized on the learning support they got in osteosynthesis and felt the content resourced associated with the tasks as presented in a comprehensible way.



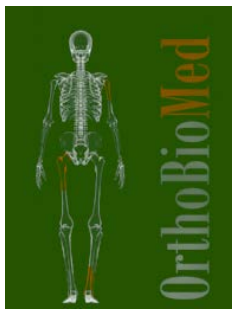
Summary and conclusions

Expected impact on the target users. The courses will allow :

- medical professionals to update and expand their knowledge of the biomechanics of fractures and fixation techniques, and
- engineers in the field of surgical implants to acquire knowledge that will result in improved design implants.

In long term:

- As a result of the continuous training, surgeons will know the latest surgical techniques and the best alternatives for the patient; they will have skills for the identification of lesions, and as a result, there will be a reduction in health care costs and improved quality of life of patients undergoing surgery.



Summary and conclusions

- Work in progress within the OrthoBioMed project:

<http://telearn.tu-sofia.bg/OrthoBioMed/>

- Learning environment on:

<http://campus.ibv.org/>