



**Robotic- and imaging-guided procedures in the MSK system**

Prof.Dr. Bruno Beomonte Zobel, Rome/IT

Percutaneous musculo-skeletal (MSK) interventional procedures are usually performed under x-ray or ultrasound guidance. The technical progress in the modern Medicine led to the development of robotic and navigation platforms that can overcome some limitations of conventional interventional radiology. Specifically these platforms can enable accurate targeting with different angulation in image guided intervention, biopsy and tumor ablation and can be used to reduce the procedure time, the radiation exposure, if performed under x-ray guidance, and the complication rate and increase the productivity in the execution of specific complex procedures.

The different components of an image-guided interventional platform will briefly described, with a specific focus on the tracking devices, showing how they operate and their role in performing an interventional procedure in the MSK system. The use of robotic arms, image fusion methods or augmented reality will be analyzed, considering pros and cons of each technical solution. The clinical results and the impact on the health care workflow of an optical Computed Tomography (CT) navigation system, for the execution of interventional procedures on the skeletal system, like vertebroplasty, bone tumor ablation or screw fixation, or on thoracic and abdominal organs, will be presented.

The future will face a large diffusion of percutaneous musculo-skeletal (MSK) interventional procedures. Robotic and navigation platforms are able to produce optimal targeting, high efficiency and reduced learning curve in performing complex MSK interventional procedures by young radiologists. These image guided high technology platforms will become more and more popular in Medicine in very few time.

