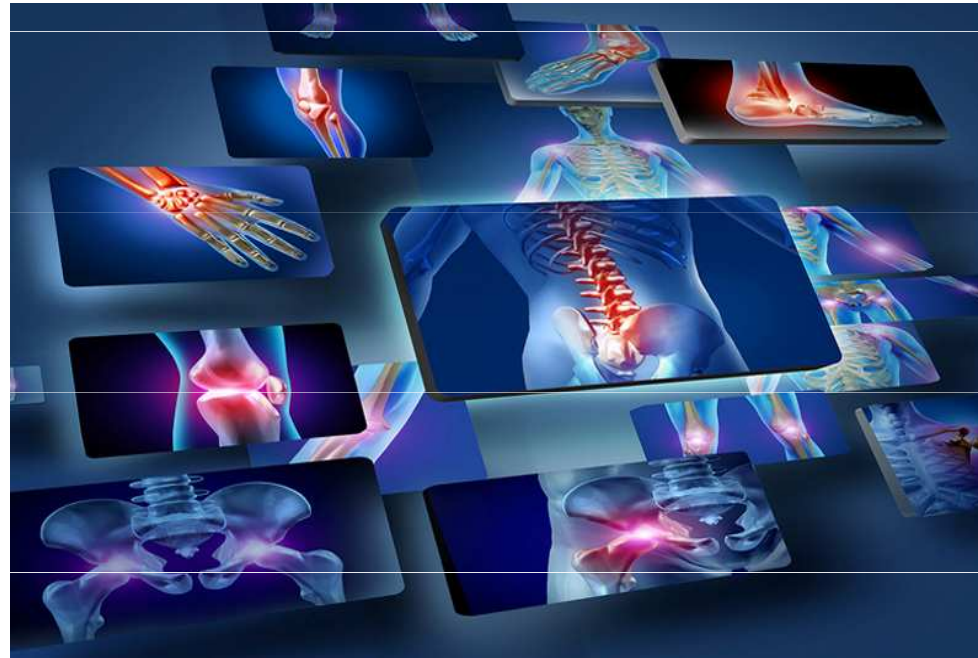


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Basics of Orthopaedics



MUDr. Robert Vyskočil

Orthopaedic Dpt., University Hospital Brno

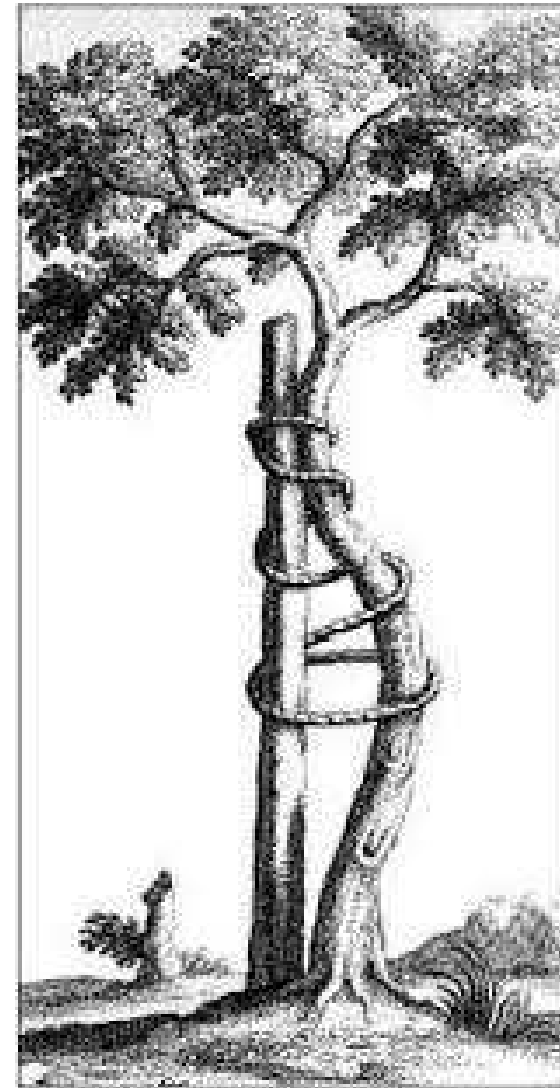
Head of Dpt: Prof. MUDr. Martin Repko PhD.

Orthopaedic surgery:

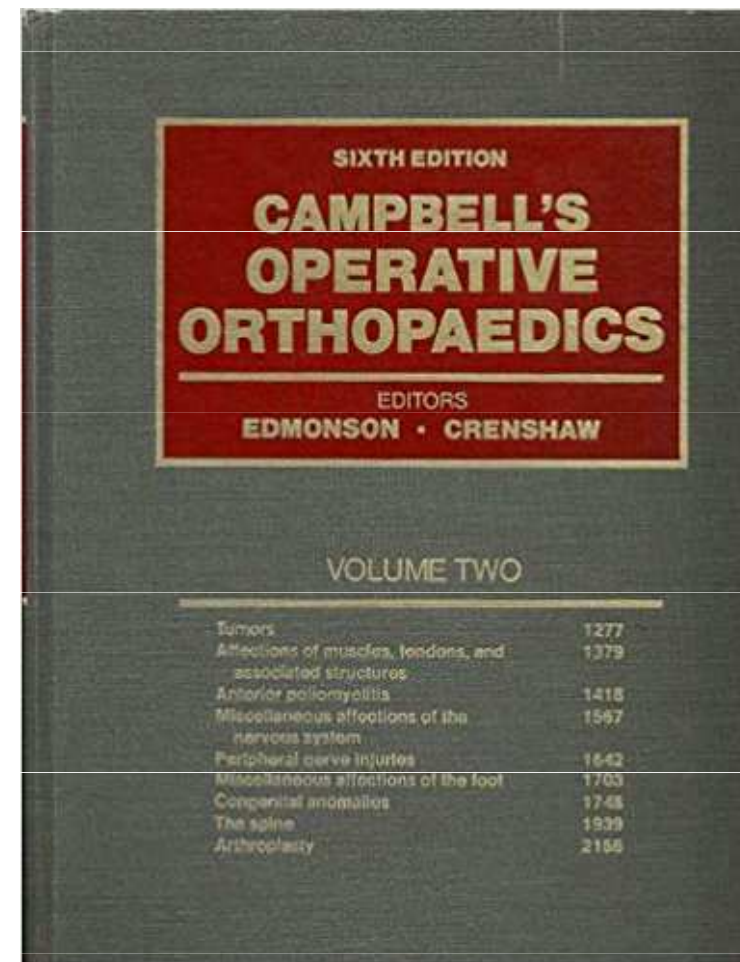
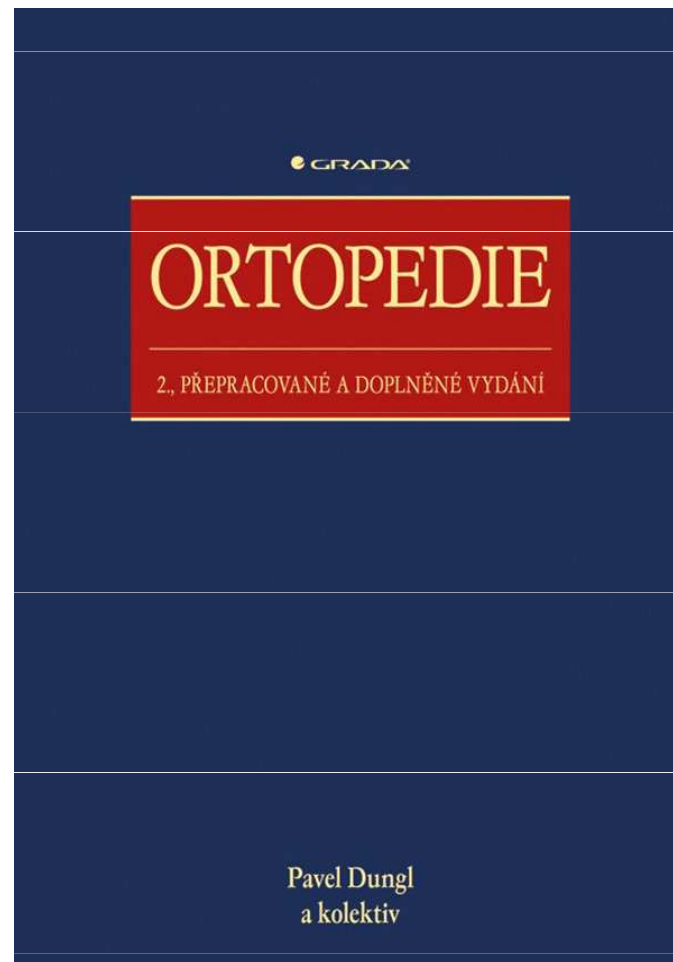
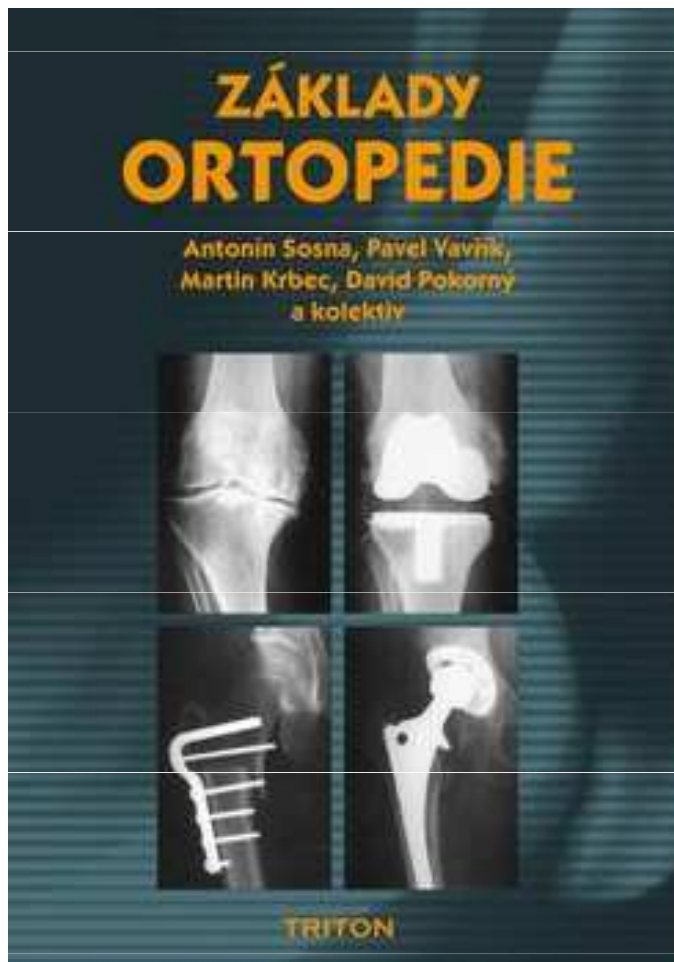
- Degenerative diseases
- Congenital disorders
- trauma / post-traumatic changes
- Inflammation and Tumours

of

Musculoskeletal system



literature



Orthopaedic Dpt. University Hospital Brno

Spondylosurgery:

- Deformities - Scoliosis
- Degeneration
- Tumours
- Trauma of the Spine



General Orthopaedics:

- TJRs and revisions
- Arthroscopy - knee, hip, shoulder, ankle, wrist, elbow
- Hand and Foot surgery
- Chondral lesions and defects, osteoporosis

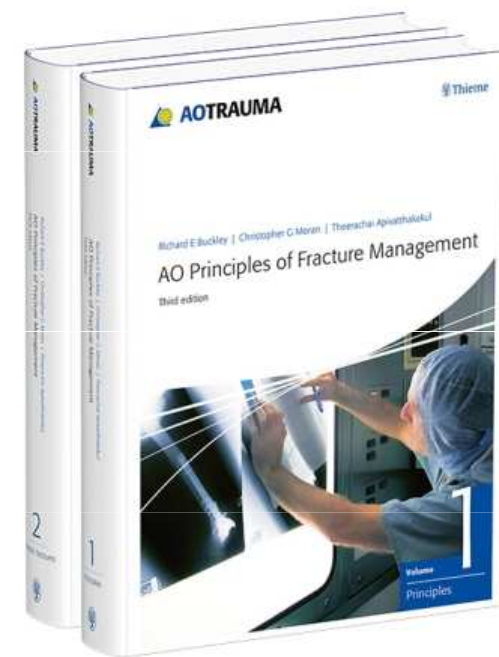
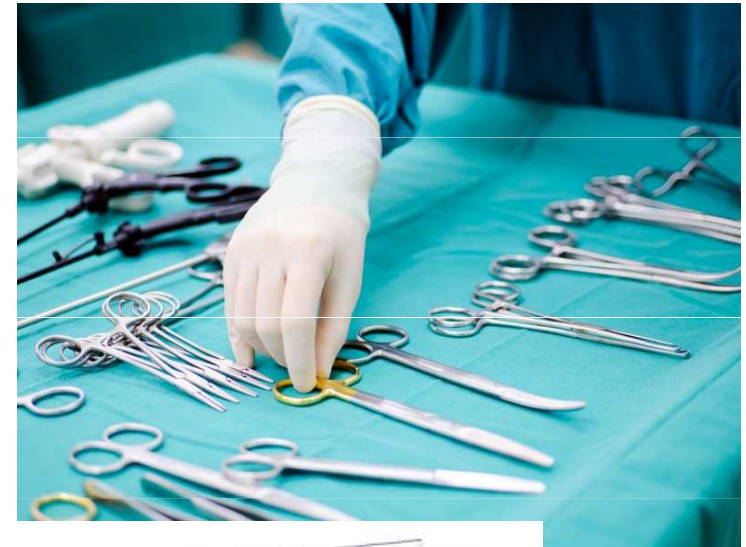


Traumatology and General surgery

- trauma of bones and pathology of visceral organs follow AO principles. !!

<https://www2.aofoundation.org/wps/portal/surgery>

- acute /elective surgery
- operations of soft tissues



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Neurosurgery

- CNS – brain and spinal cord

intra–dural pathology

- **IVD** herniations

- **Tumours of CNS**

- **Entrapment syndromes /CTS/,
chronic and acute neuropathies**



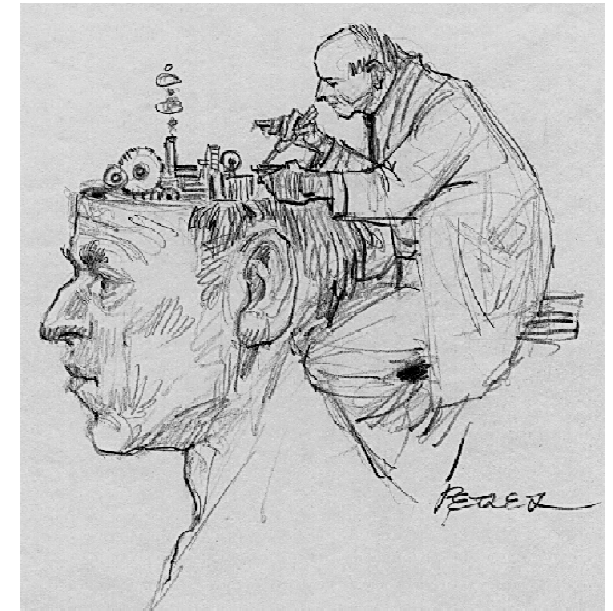
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Neurology

- **Neurological description** of symptoms and nerve pathology specification
irritation or **damage** of nerve roots
- **Degenerative spine disorders – LIS, CB, CC syndromes**
- Clinical examination, **EMG, SSEP, MEP**



Rheumatology

- **Diagnosis and conservative treatment**
of **systematic disorders** of muscles and bones
- RA, Ankylosing Spondylitis /Bechterw's disease/,
arthritis and autoimmune diseases of MS system



Fysio and Rehabilitation

- **Conservative treatment** – soft techniques, mobilisation of joints, improvement of ROM stretching, fysikal therapy, kinesiotaping
- **Degenerative and trauma pathologies** of muscles, periarticular soft tissues
- **Entesopathies** - muscle insertion pain, myalgies
- poostoperative RHB



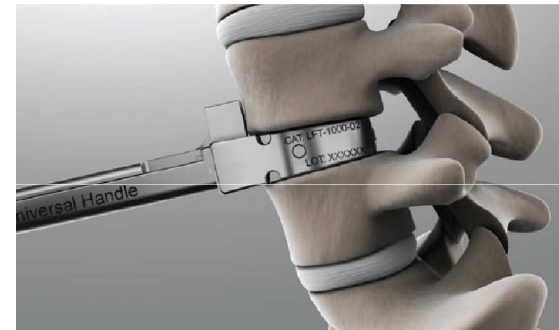
Orthopaedics...

- **Operative** / conservative treatment
- **Elective surgery**
- **Strict Asepsis**
- Development of „**medical industry**“
- **Super-specialisation** –

teams: TJRs, Arthroscopy, Spine,...

lower extremity – hip, knee, ankle and foot surgery

upper extremity – shoulder, elbow, wrist and hand



Orthopaedics – examination methods

Anamnesis

Clinical examination

Imaging methods– **Xray**, US, CT, **MRI**

Scintigraphy, PET, PET – MRI

Lab tests – FBC, FW, CRP, prokalcitonin

Microbiology - PCR

Histology



Anamnesis

Family and **personal anamnesis**

– Present disease – complains, difficulties, pain –

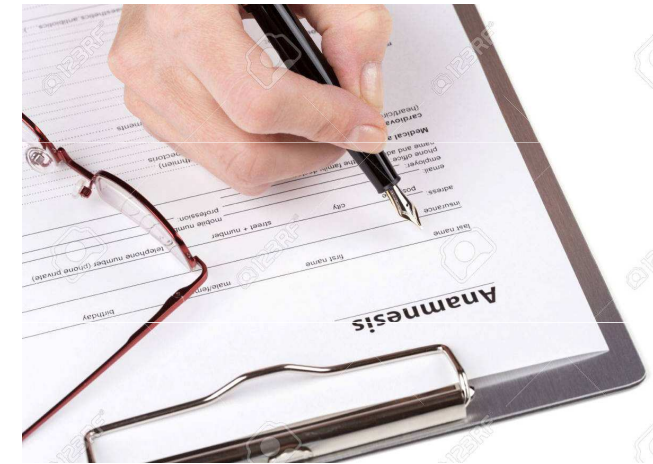
resting / stress pain

manuevers causing pain / pain free position

localized / spreading, irradiation to periphery

time of develompent, **progression** / **regression** in time

calm effect/ effect of conservative treatment



Clinical examination

- Skin cover - swelling, temperature, redness, joint effusion, haematoma
- Function examination - Range of Movement
S, F, T, rotation
- Provocation tests - **Shoulder** - Neer, Hawkins – Kennedy, Appley, Jobe,..
Knee - McMurray, Appley / meniscus tear /
Lachman, Pivot shift /instability-rpt LCA/
Spine - Thomayer, Lassegue, Schober, Stibor

Clinical examination

– ROM S 0-0-120, F 40-0-20

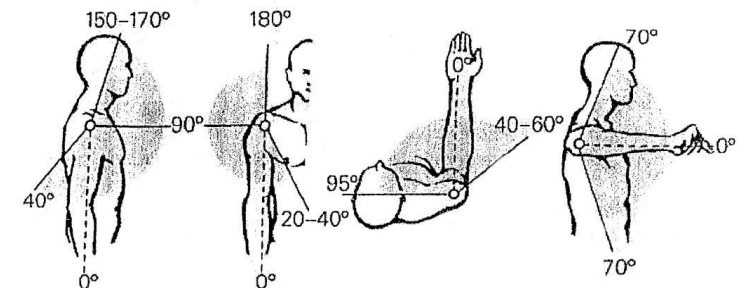
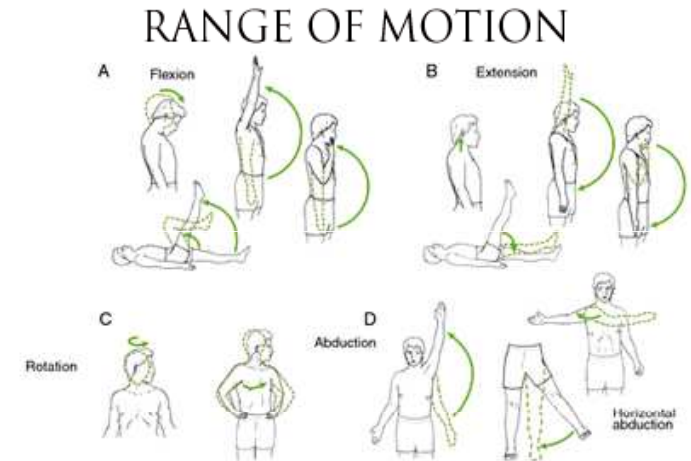
3 planes + rotation

– Sagittal, Frontal, Transverzal + rotation

1. movement out of the body / **extension**, abduction, ER /

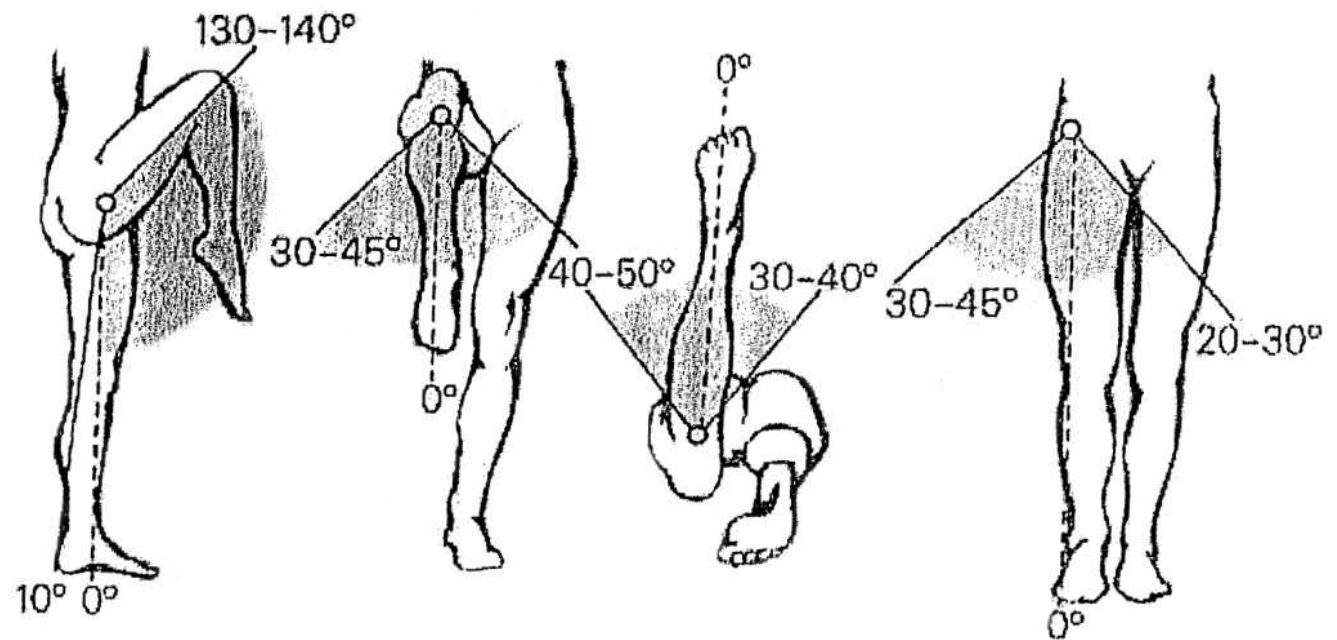
2. zero position / **neutral** joint position

3. movement to the body / **flexion**, adduction, IR /



ROM of the hip

- S 15 - 0 - 140
- F 45 - 0 - 30
- T 80 - 0 - 30
- R90 50 - 0 - 40



Clinical examination

Examples of clinical test– videos / Youtube /

- 1. **knee instability**– Anterior drawer test, lachman test, pivot- shift
- 2. **McMurray, Appley** – menisci rpt
- 3. **Patella Balottment** – Joint effusion
- 4. **Aprehension test** – anterior shoulder luxation
- 5. **Drop Arm test** – Rotator cuff tear

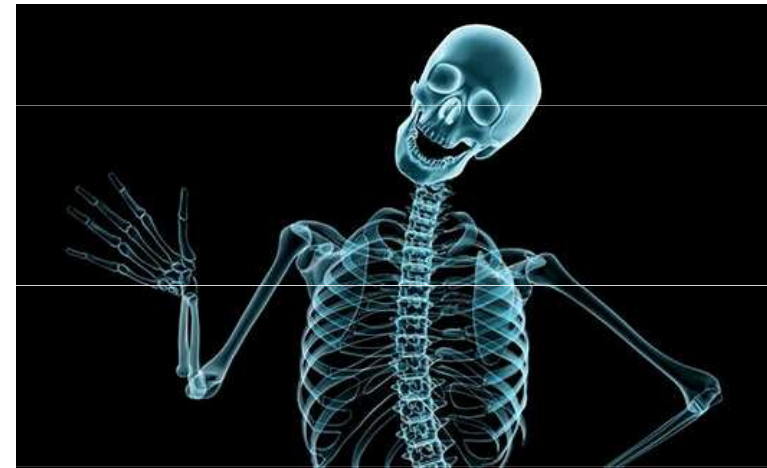
Imaging methods

X ray

Basic examination of bones

– 2 perpendicular projections, AP + lateral view

- Oblique /axial/, special projections +
navicular quartet /os scaphoideum/
hyperflexion and hyperextension of the spine
sun – rise view /PF/
outlet view transthorakal /shoulder/...



- **CAVE!! stress fractures/fatigue**
delayed X ray findings
repeat X ray after 4-6 weeks
MRI, scintigraphy



Don't rely always on X rays

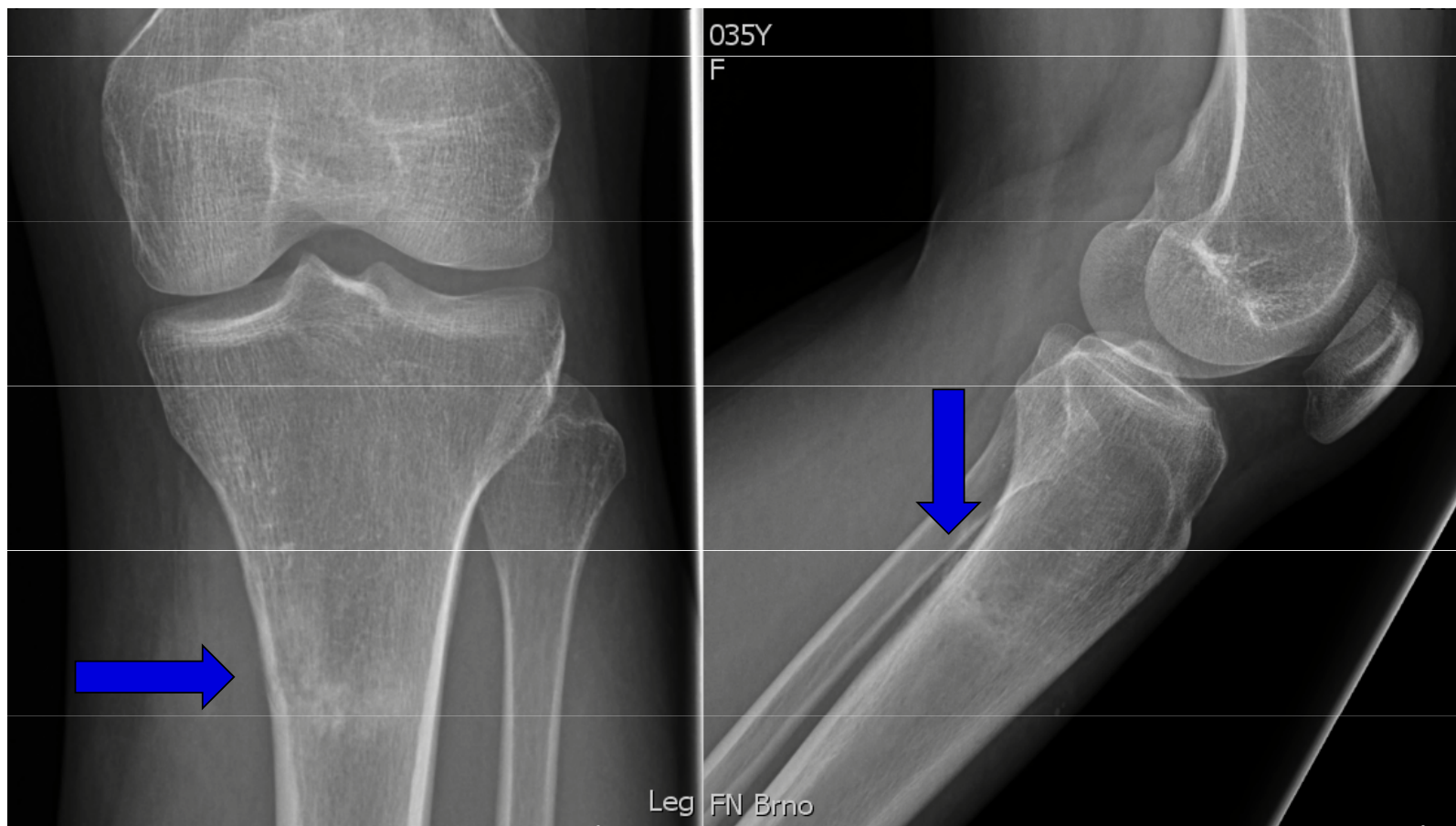


Case report

- Young man, Painful left shin after running
- X ray negative



– 1 month later...



MRI, dg. **Stress fracture of the Tibia**, treated with POP, healed up conservatively



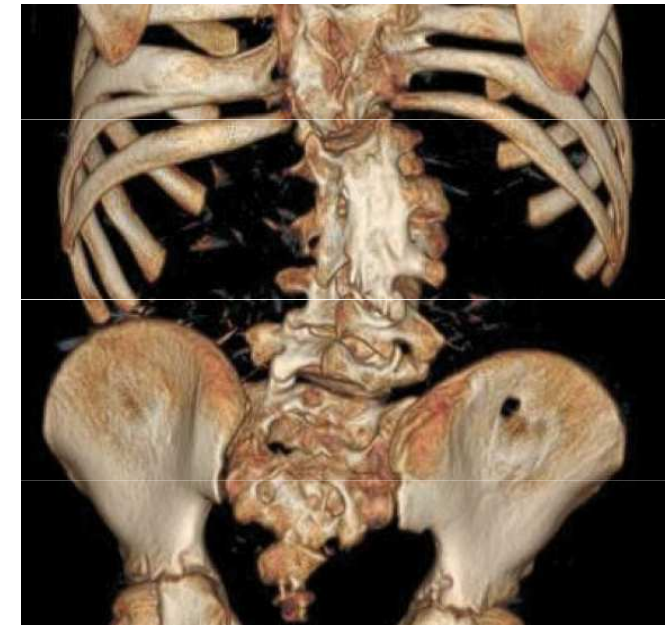
Ultrasound

- **fast, non-invasive, radiation free**
- Basic evaluation of newborns hip –
DDH (development dysplasia of the hip)
- **FAST US Focussed Assessment Sonograph Trauma**
- Soft tissues – muscles
 - tendons, insertions** – rotator cuff
 - joint effusion** / gonitis, children **coxitis!!** /



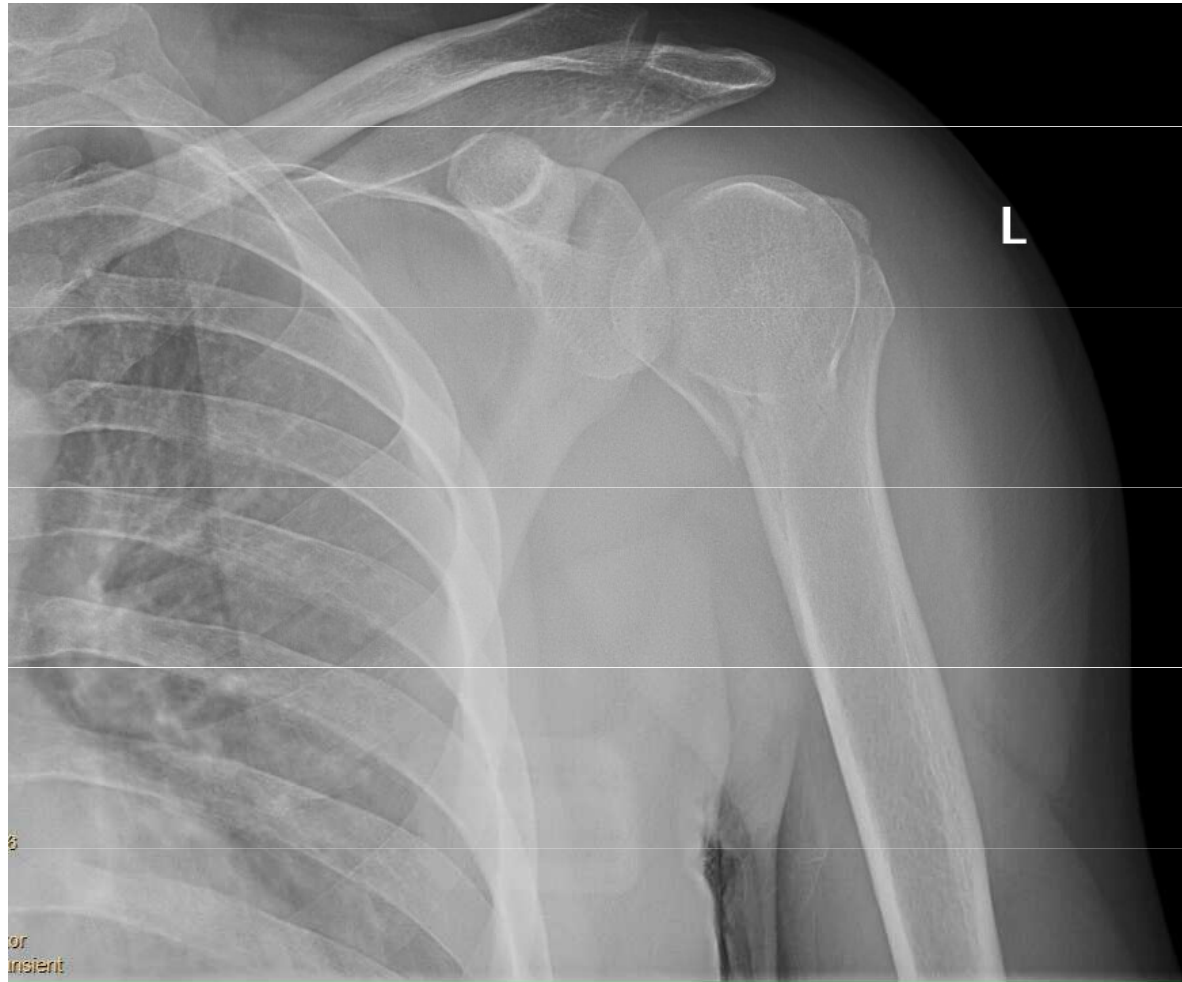
CT Computer tomography

- Radiation
- Examination of **bone structures**
- used in polytrauma –
CT – spiral
3D reconstruction



Imaging methods

My own experience 😊



CT 3D reconstruction

Comminuted dislocated fracture of the proximal humerus

ORIF Phillos Plate, healed up nicely with full ROM



MRI

– Soft tissues / periarticular, bone marrow



– Clinical examination + X ray + **MRI** + neurology –
SPONDYLOSURGERY

– **KI** – cardiostimulator, defibrillator, magnetic implants,
6 weeks post op, claustrophobia, gravidity,..

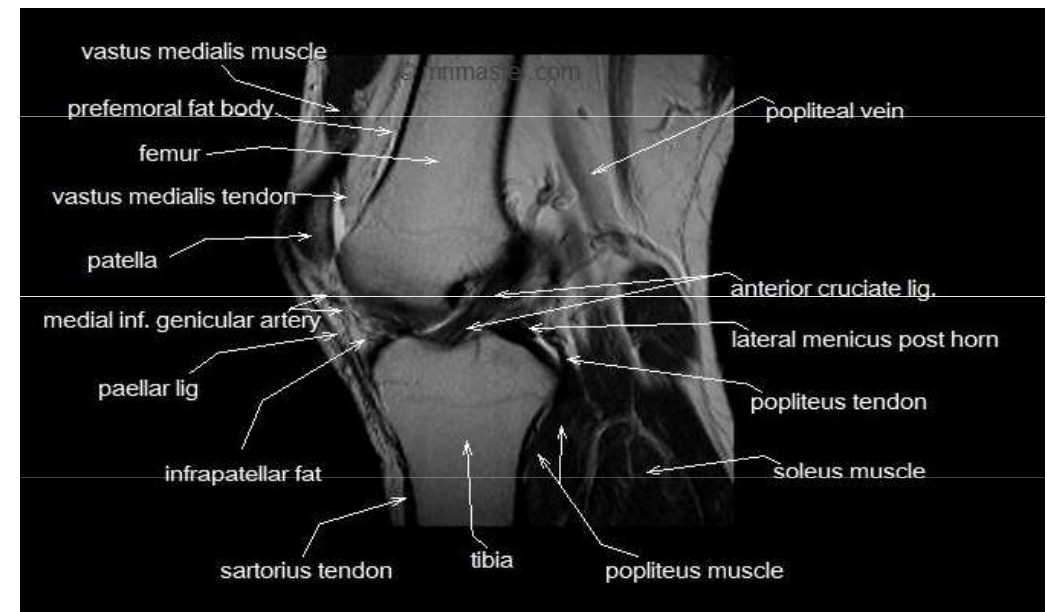
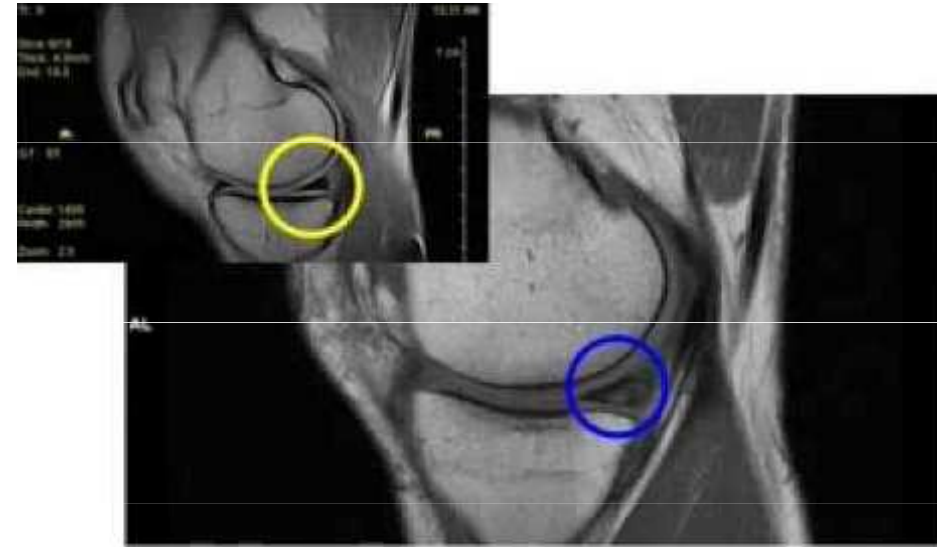


MRI

– Joint examination

soft tissues around and inside the joint:

- **intraarticular /periarticular**
- **menisci, ACL, PCL**
- **collateral ligaments**
- **cartilage and subchondral bone**



Case report

patient DOB 1941, no injury

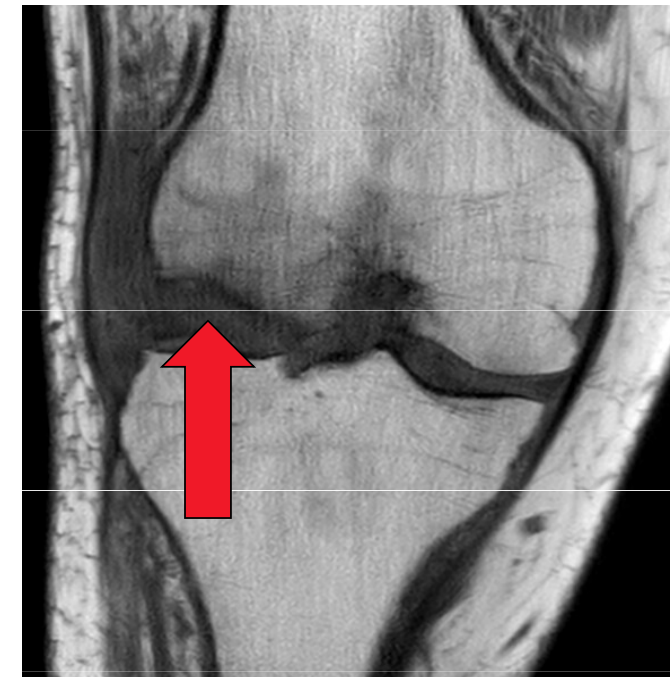
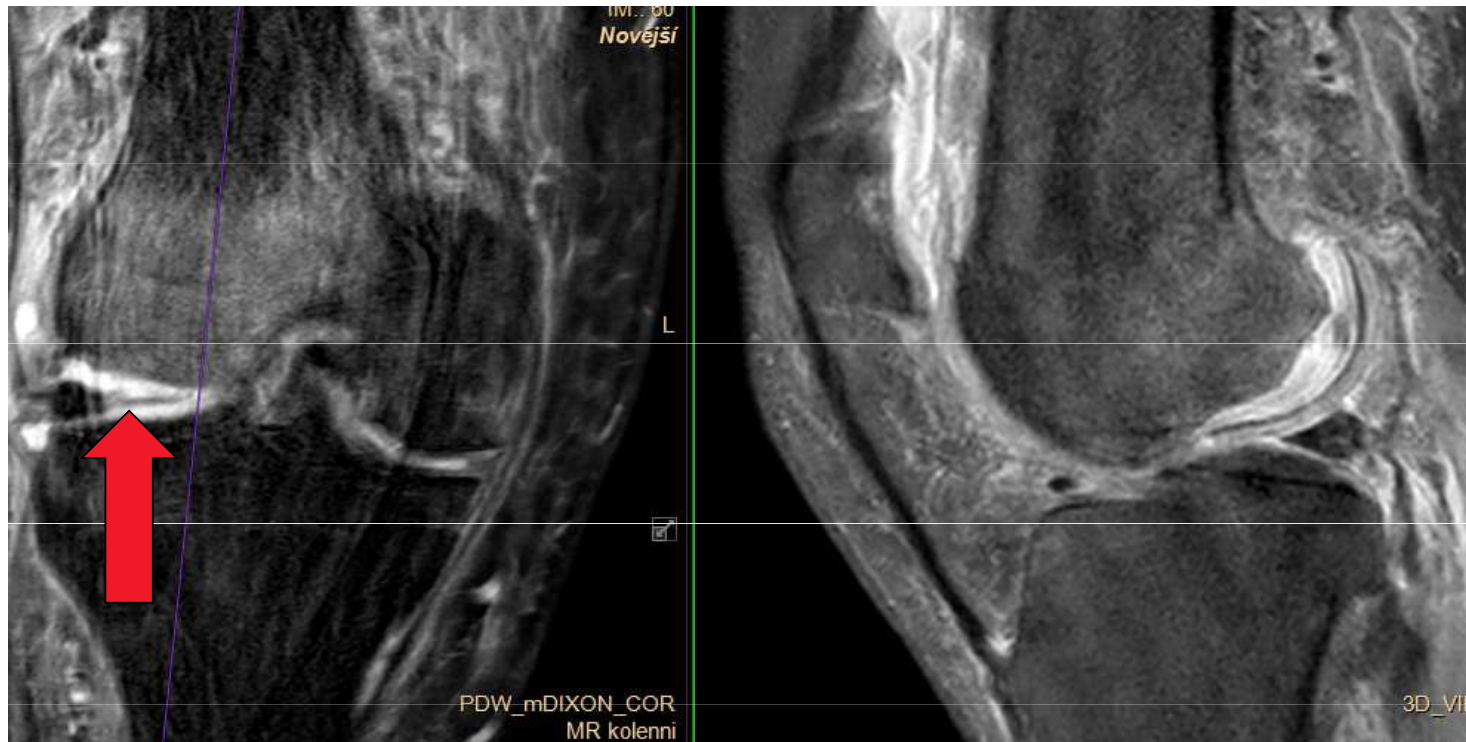
reccurent serosanguinolent exsudate

pain over the lateral joint space

X ray – arthrosis gr. II

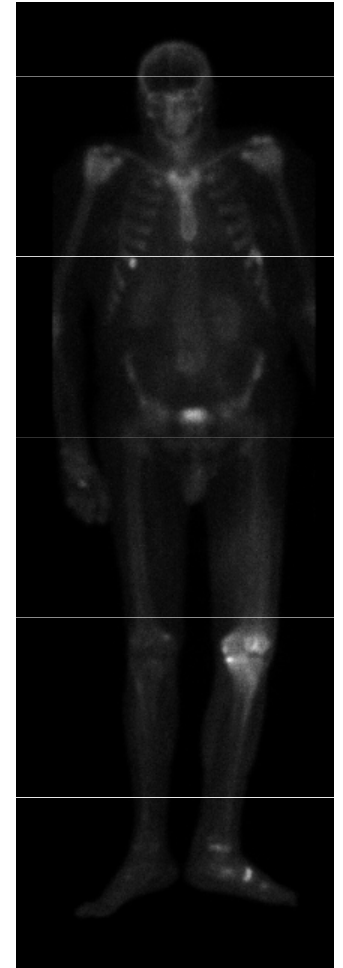
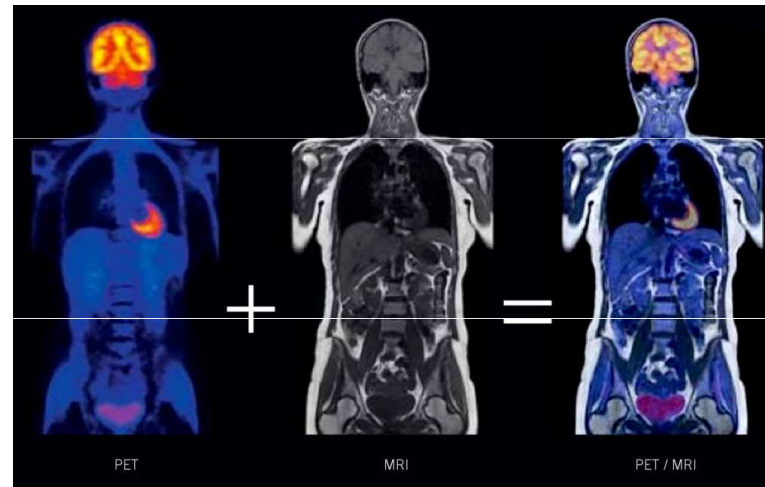
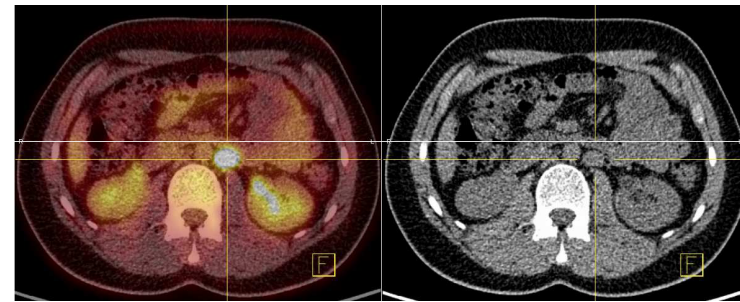


MRI – necrosis of the lateral femoral condyle – gr IV
indication of **TKR**



Scintigraphy, PET, PET-CT, PET-MRI

- Metabolism of tissues and bones
- Radionuclides i.a., i.v.
- High sensitivity!! X low specificity
- Dg. Tumours, infection, non-union, malunions, fractures



Laboratory

– Pre op examination – exclusion of infection

urine bacteriology, FBC, CRP, FW, procalcitonin

– Metabolic diseases – Uric acid - gout

– Autoimmune diseases – RF, HLAB 27, anti DNA/RNA Ab



– **Microbiology, PCR** – cultivation of pathogens

sensitivity for ATBs



– **Tumour** – ALP, LDH - OSA, Bence-Jones protein – MM

catecholamines metabolits /Vanilmandelic acid/ Ewing SA,..

– **Specific tests**- Beta2-tranferin / cerebrospinal fluid,

synovasure / periop infection,..



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Histology

– Pathological examination of the bioptic sample

– Needle biopsy 1-2mm

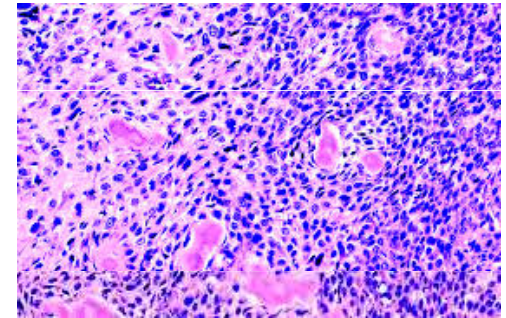
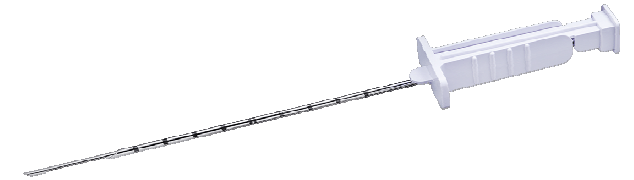
Trocar biopsy 3-5mm

Excision of the tissue sample $> 1 \times 1 \text{ cm}$, diagnostic / curative

– Histologic verification of the pathology / **tumourous tissue**


- type

- origin



Orthopaedic - Take home message

- **Surgical branch** of medicine treating pathology of musculoskeletal system
- / spondylosurgery, TJRs, Arthroscopy,../

- **Anamnesis and clinical examination are essential**
- +
– **Imaging methods** – X ray, US, CT, MRI, scintigraphy, PET
-  **diagnosis decision and treatment algorithm determination**

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Thank you for the attention

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