Rehabilitation of people with musculoskeletal disorders

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„complex rehabilitation”
Definition of WHO (1988)

„The use of all means aimed at reducing the impact of disabling and handicapping conditions and at enabling people with disabilities to achieve optimal social integration”

Prevalence of disabling conditions in European countries is around 10%
Rehabilitation evaluation

Patient history
1) Past medical history + present illness
2) Social history (family, home)
3) Vocational history
4) Psychological history

Patient examination
1) Physical evaluation (general condition, organs)
2) Evaluation of impairments: musculoskeletal system (ROM, joint stability, muscle strength testing), respiratory system, etc.
3) Functional abilities and skills
4) ADL

Individual Rehabilitation Plan
„Motor rehabilitation”

- Orthopedic diseases / deformities
- Reumatological diseases
- Injuries / polytrauma, monotrauma, burn
- Amputations
- Diabetes
Musculoskeletal disorders in children

- Limb deficiencies
- Arthritis
- Dorsopathies /spine deformities
- Chest wall deformities
- Systemic deformities
Choice of rehabilitation strategies are influenced by:

- Age
- Underlying/allied disorders
- Developmental disorder
- Progression
- Functional assessment
  - Physical fitness
  - Muscle strength
  - Motor functions
- Cooperation
- Access to services
Remediation

- Spasticity treatment
- Pain relief
- Prevention / treatment of contractures
- Prevention of inactivity (atrophy / heterotrop ossification / pressure source)
- Correction of deformities
- Muscle strengthening
SCOLIOSIS

types

Funkcional
primary
secondary

Structural
idiopathic
infantile
juvenile
adolescent

Secondary due to
Congenitalis anomalies
Neurological diseases
Other causes

Prevalence: 8-10 %
(idiopathic, school age)
International Classification of Functioning, Disability and Health (ICF) 2001

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**Structural scoliosis**

**ICF categorisation**

**Impairment** – spine and chest wall deformity
  - reduced ventilation capacity (in severe scoliosis)
  - emotional problems

**Functional limitation**
  - ADL (mild)
  - personal relations (mild to moderate)

**Participation**
  - not mandatory

**Complex rehabilitation**

**Physical therapy** – correction of posture and motor functions
  - muscle strengthening (selective)

**Orthesis**
  - corsettes / seating modules

**Ergotherapy**
  - ADL training (if necessary)

**Psychotherapy**
  - compliance in therapies /
    - acceptance if the changed body shape
  - vocational guidance

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Scoliosis
Spondylolysis, spondylolysthesis

ICF categorisation

Impairment  - pain
            - paresis

Functional limitation
            - Walking, transporting, ADL

Rehabilitation

- physiotherapy (individual, selective)

- Ergotherapy (furniture)

- Ortheses - corsettes
Hip disorders

- Hip Luxation (congenital / secondary)
- Oseochondritis capitis femoris juvenile (Perthes disease)
- Epiphyseolysis capitis femoris juvenile
- Coxa vara infantum (congenital)
- Idiopathic necrotis of femoral head
- Coxarthrosis
ICF categorisation

Impairment
- reduced ROM
- pain

Functional limitations
- walking
- dressing, ADL

Participation
- working ability
- leisure time
- intim relations

Rehabilitation
Goal: independent mobility free of pain, improvement in ADL, walking stairs

Means: PT, electrotherapy, pain treatment, massage, assistive devices, ergotherapy, surgery
Arthrosis genu

ICF categorisation

Impairment
- Instable joint, pain
- Muscle spasms, inactivity

Functional limitation
- walking

Participation
- ADL and community living barriers

Rehabilitation

Goal: pain relief, improvement in mobility and participation

Means:
PT (reducing contractures, strengthening of F / E muscles), subaqual training, biking
- electrotherapy (UH, high frequency ET, iontophoresis, cryotherapy)
- assistive devices (walking aids, KO)
- ergotherapy (furniture, protecting knee)

Surgery
Osteoporosis

Indications of rehabilitation – impairments /functional limitations

- Complicated fractures with functional limitations
  - Compressive spine fractures
  - wrist
  - hip
  - humerus

- Progressive loss of functions with conservative therapies

- In secondary osteoporosis – primary impairment like stroke, RA, DM

- Multimorbidity
Impairment

- **History**
  - previous fractures
  - X ray
- **Physical examination**
  - Height (reduced)
  - Spinal curves (progression)
  - Spine mobility
- **Osteodensitometry**
  - Reduced bone mass
- **Sonography**
  - Risk of repeated fractures
Functional limitation / participation

Functional test
  ADL like FIM
  Qualeffo

QOL
  QUALLEFFO (Quality of life questionnaire of the International Osteoporosis Foundation)
  FOOQ (The original Facts on Osteoporosis Quiz)
  OPTQOL (The Osteoporosis-targeted Quality of life)
  QUALIOST (Quality of life questionnaire in osteoporosis)
  HADS (Hospital Anxiety and Depression Scale)
Aims of rehabilitation

- Pain relief / reduction
- Muscle strengthening
- Prevention / therapy of contractures
- Improvement ROM
- Improvement of joint alignment
- Improvement of coordination
- Prevention of falls
- Improvement of aerob capacity
Pharmacotherapy

- Bisphosphonates (oral / IV)
- Parathormon
- Strontium
- SERM (selective estrogen receptor modulators)
- Estrogen
- Calcitonin
- Fluorids
- Testosteron
- Tibolon
- Ca
- Vitamin D (nativ / activ)
Other rehabilitation facilities

- Electrotherapy
  Low-, medium- high frequency
- Phototherapy
- Hydrotherapy
- Termotherapy
- Mechanotherapy
  PT
  Massage
  Passive mobilization
  Traction
  Ultrasound

Psychotherapy

Balneotherapy

Dietotherapy
Rehabilitation after trauma

• Fractures
  – Hip / femur, elderly people
  – Hand
• Polytrauma
• Neurotrauma
  – Traumatic brain injury (TBI)
  – Traumatic spinal cord injury (SCI)
  – Peripheral nerve injury
• Burn
Definition of multi- and polytrauma

1. Multitrauma: injuries in different parts of the body without severe life threatening consequences

2. Polytrauma: injuries in different parts of the body with at least one life threatening organ failure
Typical involvement in polytrauma

80% TBI

Most frequent combinations

- cranium + chest + limbs
- cranium + chest + abdomen
- cranium + chest + spine
- cranium + chest + pelvis + limbs
monotrauma

- Elderly people with traumatic femoral neck fracture
- Hand injury, any age
Garden’s classification of femoral neck fractures

- **GARDEN I.**: Incomplete fracture (impacted valgus fracture)
- **GARDEN II.**: Complete fracture without displacement
- **GARDEN III.**: Complete fracture with partial displacement
- **GARDEN IV.**: Complete fracture with full displacement
Rehabilitation is possible if:

- there is no concomitant acute or chronic illness that has to be treated parallel
- the patient’s medical condition (somatic and psychological) is stable
- the patient is willing to cooperate
Goals and means of rehabilitation

Goal: mobility / independence

Means:
- PT / hydrotherapy / assistive devices
- Psychotherapy
- Social assistance / personal assistance
- Ergotheraphy / ADL training
Hand injuries: postacute treatment or rehabilitation?

- Danger of contractures in DIP after hand surgery and hand injuries
- **Goal:** restore /reserve hand function
- **Means:**
  - Assistive devices
  - PT
  - Ergotheraphy
Ergoterapy:
– Relearning of everyday activities with a hand after injury (nerve / fractures / connective tissue).
amputation

• Upper limb (UL)
• Lower limb (LL)
Limb deficiency

Causes of limb deficiency
- congenital (dysmelia)
- Amputation

Indications of amputation
- Injury 17%
- Vascular disease (artheriosclerosis obliterans, diabetic angiopathy, thrombangitis obliterans) 80%
- Other (tumor, osteomyelitis) 3%

Prevalence: 65/100000/y, 57% LE
Limb deficiency /amputation

- Functional limitations
  - Walking
  - Hand functions
  - ADL

- Participation
  - Work
  - School
  - Community living
  - Sports

Goal of rehabilitation:
To restore functions
Find compensatory strategies
Criteria of the proper stub

• Well-shaped
• Painless
• Stabil
• Preserved joint
• „fits” to prostheses
Diabetic neuropathy

loss of sensory functions

The patient does not have proper sensation in

- pain
- Higher pressure and consequences: thickening of the skin
- Skin lesions / traumatic injuries
- Heat

Result: neurotropic ulcer
(malum perforans pedis)
Problems of the „diabetic foot”

- The cause of severe neuropathy is mainly DM
- The most frequent cause of the non-traumatic amputation is diabetic neuropathy in the developed countries

Goal of rehabilitation is

- to prevent amputation
- and maintain independent walking
Readings


• **White Book On Physical and Rehabilitation Medicine in Europe. 2006** [www.euro-prm.org](http://www.euro-prm.org)
