UEMS PRM Section & Board

Clinical Affairs Committee

New accreditation procedure

Programme n°2

PRM programme after hip and knee arthroplasty

Prog002_hip and knee arthroplasty20110711.doc

Issue

Candidate No: 2
Version: 3.2
Date of the first version: 03/02/2010
Date of the previous version: 11/10/2010
Date of the present version: 11/07/2011

Reviewing comments

Reviewer 1 : 02/03/2010
Reviewer 2 : 16/03/2010
Reviewer 3 :26/5/2010
Reviewer 4:12/09/2010

SECOND REVIEW
Reviewer 1:16/01/2011

Content :

I. Identifying data

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II. Summary

This program is designed for patients after hip and knee arthroplasty, mostly due to primary osteoarthrosis. If the arthroplasty is performed for other clinical or traumatic reason, those patients are not excluded. For about 90% of all our patients is performed cemented hip or knee arthroplasty. And hip is replaced using antero-lateral or posterior approach technique.

Due to our country Minister of Health Order, geography and traditions - PRM out-patient and in-patient services are not available in most rural area, rehabilitation is organized as a 20 days in average in-patient PRM Programme. The period can be extended or shorter after assessing the patient's achievement and functional independence.

Payer of the program in National Health Insurance and rehabilitation is free for all insured persons.

Program is carried out in the in-patient Rehabilitation Unit which is the part of Rehabilitation, Physical and Sports Medicine Centre in the University Hospital.

A multiprofesional rehabilitation program is provided by PRM physicians, which coordinates multidisciplinary team work: physiotherapists, occupational therapist, social worker and psychologist, nurses, nurses assistants; in regards to orthotics issues the patients are advised by mainly orthopedists-technicians. Besides it the angiosurgeons consults in case of deep vein thrombosis (DVT) and the orthopaedist- traumatologist as well as doctors of other specialisation is invited in case of indication.

The rehabilitation process is reviewed regularly by PRM specialists, whereas the clinical rounds with the Head of the Centre take place once a week and rehabilitation team conferences with rehabilitation team staff are organized once a week, during which the short term and long term rehabilitation goals are determined. The patients and their relatives with consent of the patient are invited to participate in team meeting conferences.

Treatments: physiotherapy (including massage and physiotherapy in pool); physical modalities (electrical stimulation of the muscles of operated leg; for the other joints if needed and for other comorbid conditions- microwaves therapy, laser, magnetic field therapy, ultrasound therapy, heat and cold therapy); occupational therapy with elements of vocational activities; consultations of psychologist (individual and group psychotherapy, relaxation, art therapy; counselling of family members), social worker; rehabilitation nursing, teaching of patients and relatives; nutritional therapy; orthotics, technical supports and aids; consultation of other specialists if need be (orthopaedist, vascular surgeon, internist, cardiologist or others); speech therapy (if need be due to comorbid condition), medications (like analgetics, anticoagulants and others if need be).

Each PRM specialist writes a medical report at patient's admission and a standardised discharge summary for the patient, his general practitioner and the orthopaedist-traumatologist.

III. General bases of the Programme

A. PATHOLOGICAL AND IMPAIRMENT CONSIDERATIONS

1. Aetiology

According to our unit statistics, 60,78% of hip and knee cases arthroplasty was performed due to primary unilateral osteoarthrosis. Other frequent reasons for hip arthroplasty were femoral neck fracture and bilateral osteoarthrosis and for knee- rheumatoid polyarthritis and bilateral osteoarthrosis too (see the table below).

ARTICULATION	REASON FOR ARTHROPLASTY	%
HIP	Unilateral osteoarthrosis	60,78
	Femoral neck fracture	17,65
	Bilateral osteoarthrosis	13,73
	Displastic arthrosis	2,94
	Pathologic fracture	1,96
	Post-traumatic aseptic necrosis	1,96
	Rheumatoid polyarthritis	0,98
KNEE	Unilateral osteoarthrosis	60,78
	Bilateral osteoarthrosis	28,43
	Rheumatoid polyarthritis	9,81
	Post-traumatic aseptic necrosis	0,98

Hip and knee arthroplasty is performed more often for women (62,75% of all our hip arthroplasty cases and 87,25% of knee arthroplasty cases) than men (37,25% of all our hip arthroplasty cases and 12,75% of knee arthroplasty cases) [1].

2. Natural history and relationship to impairment

Primary osteoarthrosis (OA) is a common disorder of the elderly, and patients are often asymptomatic. Approximately 80-90% of individuals older than 65 years have evidence of primary osteoarthritis. Patients with symptoms usually do not notice them until after they are aged 50 years. The prevalence of the disease increases dramatically after the age of 50 years, likely because of age-related alterations in collagen and proteoglycans that decrease the tensile strength of the joint cartilage and because of diminished nutrient supply to the cartilage.

In younger patients OA can occur either through genetic mechanisms or, more commonly, because of previous joint trauma. Potential risk factors include age, obesity, trauma, genetics, sex hormones, muscle weakness, and environment, because these factors actually cause traumatic arthritis on a macrotraumatic or microtraumatic basis. This is especially true of individuals whose lifestyles require squatting, climbing stairs, or excessive kneeling.

The osteoarthrotic joint is characterized by decreased concentration of hyaluronic acid because of reduced production by synoviocytes and increased water content because of inflammation, particularly during later stages of the disease. Traumatic insults to the articular cartilage, ligaments, or menisci lead to abnormal biomechanics in the joints and enhance their premature degeneration.

The onset of pain is usually insidious, is generally described as aching or throbbing, and may be the result of changes that have occurred over the previous 15-20 years of the patient's life [2, 7, 11].

3. Medical diagnosis and prognosis

Osteoarthrosis (OA) can be defined epidemiologically (ie, using radiographic criteria) or clinically (eg., radiography findings plus clinical symptoms, WOMAC or other indexes).

a) Clinical symptoms

Pain is the main reason persons with OA seek medical attention. Initially, symptomatic patients incur pain during activity, which can be relieved by rest and may respond to simple analgesics. Morning joint stiffness usually lasts for less than 30 minutes. **Stiffness** during rest may develop. Excessive pain causes a loss of full joint extension and limited range of motion (ROM) during ambulation, leading to inevitable joint deformity and a loss of function.

Joints may become unstable as the OA progresses; therefore, the pain may become more prominent (even during rest) and may not respond to medications.

Physical examination findings are mostly limited to the affected joints. Misalignment with a bony enlargement (depending on the disease severity) may occur. Limitation of joint motion or muscle atrophy around a more severely affected joint may occur. Muscle activity around the affected joint is attenuated because of pain and increased symptomatology, causing ambulatory episodes of giving way or buckling to occur.

For hip joint*:* the Thomas test is performed to assess for flexion contracture of the hip. Internal rotation is painful and limited. And the Ober test is done to evaluate for a contracture of the tensor fascia lata.

When an OA knee is examined, bony enlargement due to proliferative change is often noted. Genu varum or valgum deformity may be present.

b) Radiology

One important radiological characteristic of primary OA is that different abnormalities are found in the pressure (ie, contact) and non pressure areas of the affected joint. In the highly stressed (ie, pressure) areas of the joint, radiographs can depict joint space loss, as well as subchondral bony sclerosis and cyst formation. In the areas without high contact pressures, osteophytes can be detected. Bilateral symmetry is often seen in cases of primary OA.

In the osteoarthritic knee commonly observes the greatest loss of joint space in the medial femorotibial compartment, although the lateral femorotibial compartment and patellofemoral compartment may also be affected. Collapse of the medial or lateral compartments may result in varus or valgus deformities, respectively. Hence, weight-bearing radiographs are preferred for evaluation of the osteoarthritic knee to depict such deformities, as well as to provide an accurate assessment of joint-space narrowing.

In the osteoarthritic hip, the superior aspect of the joint is typically the most narrowed; axial and medial migration of the femoral head is less commonly seen.

Rentgenological stages of knee or hip OA:

- Grade I: minimal osteophytes, slightly narrowed joint-space.
- Grade II: prominent osteophytes, slightly narrowed joint-space.
- Grade III: average narrowed joint-space, slight subchondral osteosclerosis, medium size osteophytes.
- Grade IV: prominent narrowed joint-space, subchondral osteosclerosis and subchondral cysts, large size osteophytes.

Other assessments: computed tomography (CT) scanning has no advantage in the primary diagnosis of OA. The main indication for this imaging modality is the detection of the small intraarticular bodies seen in advanced cases of OA. An MRI could confirm the diagnosis of such conditions as avascular necrosis and/or soft-tissue meniscal changes or tearing [4, 7, 11].

4. Treatments

The goals of OA treatment include pain alleviation and improvement of functional status.

a) Conservative treatment

Non pharmacologic interventions are the cornerstones of OA therapy and include patient education, exercise, physical therapy (including massage and physiotherapy in pool), occupational therapy, physical modalities (electrical stimulation of the muscles, electrotherapy for pain modulation like TENS, microwaves therapy, laser, magnetic field therapy, ultrasound therapy, heat and cold therapy), hydrotherapy, weight loss, and joint unloading in knee, hip [9, 20, 21].

Pharmacologic therapy- acetaminophen, NSAIDs, COX-2 inhibitors; in patients with highly resistant pain- narcotic analgesics; muscle relaxants may benefit patients with evidence of muscle spasm. In addition: intra-articular injections of glucocorticoids and hyaluronic acid.

b) Surgery

Conservative surgery is indicated in those patients who have significant symptoms that have not responded to medical and rehab therapy, whether it is treatment by oral or injected medications or the supportive role of physical therapy: joint lavage - closed-needle joint lavage may benefit a small subgroup of patients with osteoarthritis; arthroscopy- for patients with osteoarthritis of the knee that in whom imaging reveals specific structural damage; osteotomy- recommended in younger patients with osteoarthritis, and for patients with a misaligned hip or knee joint, it can lead to more challenging surgery later if the patient requires arthroplasty [9, 11, 14, 16, 22].

Arthroplasty (total joint replacement) is an excellent treatment in individuals with moderate to severe OA. This procedure is the most reliable, can significantly improve the patient's quality of life, and has results that last the longest. The rate of revision for arthroplasty has decreased with advances in the technique and prosthesis design [9, 11, 14, 16].

Cemented joint arthroplasty - a procedure in which bone cement or polymethylmethacrylate is used to fix the prosthesis in place in the joint.

Ingrowth, or cementless, joint arthroplasty - a procedure that does not involve bone cement to fix the prosthesis in place; an anatomic or press fit with bone ingrowth into the surface of the prosthesis leads to a stable fixation.

- **Total knee arthroplasty**- replacement of the articular surfaces of the femoral condyles, tibial plateau, and patella. The posterior cruciate ligament may be saved in cruciate-retaining systems.
- **Total hip arthroplasty** of the femoral head and the acetabular articular surface.

  The anterior approach of hip arthroplasty involves splitting the musculus tensor fasciae latae, musculus sartorius and musculus rectus femoris.

  The antero-lateral approach involves splitting the musculus gluteus medius and musculus tensor fasciae latae.

  The posterior approach involves splitting the fascia lata and musculus gluteus maximus and releasing the short external rotators (musculus piriformis, obturatorius internus and externus, quadrates), which are repaired [1, 8, 9, 11, 14-21].

  For all our patients total hip arthroplasty is done by antero-lateral or posterior approach, mini-invasive approach isn’t very frequent.

B. ACTIVITY LIMITATIONS AND PARTICIPATION RESTRICTIONS

Prior to arthroplasty, participation restriction and activity limitations are mostly influenced by the impaired body structures functions, like pain, limitation of joint motion, and muscle weakness.

After arthroplasty, limitations depend on time after operation:

- In acute phase (1-5 day after operation): first day- safe and correct transferring from the bed to the chair; other days- begin ambulation under supervision by physiotherapist with a walker or crutches, weight-bearing as tolerated or in accordance by surgeons recommendations.
- > 6 day after operation: weight-bearing as tolerated or in accordance by surgeons recommendations, eliminating the use of assistive devices according pain or surgeons recommendations, progressive stair climbing.

Each patient after hip arthroplasty should maintain hip dislocation precautions after first day after procedure for ~12 weeks. In hip replacements, anterior approach increases the risk of anterior dislocation due to extended postures. Posterior approach leads to a risk of posterior dislocation in hyperflexion or internal rotation.

After hip or knee replacement after 3 months, most patients can return to playing low-impact sports, such as golf, double tennis, bowling, walking, using exercise machines such as a stationary cycle, cross-country ski simulators. High-impact exercises such as running, single tennis, basketball, volleyball, football should be avoided as these may lead to undo wear and tear on the prosthesis [9, 10, 11, 14, 16].

C. SOCIAL AND ECONOMIC CONSEQUENCES

1. Epidemiological data

Osteoarthrosis accounts for 69-70% of all musculo-skelettal disorders in European countries**.** About 80% of population of age over 50 have radiological changes specific to osteoartrosis at least in one articulation, whereas more than 80% of population over 75 have clinicaly expressed osteoarthrosis [4, 5].

According to the epidemiological information of our country about 0.55% of population is suffering from rheumatoid arthritis (12000 – 13000 of people). There are about 1200 new cases registered every year, where female cases are 2 - 3 times more frequent than men. Moreover, this disease is starting more often when patients are 50-60 years old. Arthroplasty were performed on the average after 16 years from the beginning of the disease [2, 3].

Aseptic necrosis is diagnosed for about 60-70% of all the patients after femoral neck fracture. It is also more frequent among the young males [4, 5].

According to the data published in 2008 by The State Patients' Fund at the Ministry of Health of our country, there were 3365 surgeries for primary hip arthroplasties, 2701 for knee joint, and about 10 000 patients are waiting for hip and knee arthroplasty [13].

The estimated average age of the patients of our centre after arthroplasty was 68,89 ± 8,78 years old, when the average female age was 69,80 ± 8,83 and male age - 67,37 ± 8,62 [1].

2. Social data

Age- and sex-adjusted employment was 24.2% lower and work disability 51.7% higher in rheumatoid arthritis patients compared with the general population in our country. After 10 years of disease, 48% of the patients had withdrawn from the labor force. In those with a paid job, the average sick leave in the past year was 31.9 days compared with the national average of 10.8 days [6]. Rheumatologic disorders take 1-, or 2-place due to the long-term disability. ~3 percent of GNP (gross national product) is lost on the rheumatic diseases (direct and indirect costs) [7].

3. Economic data

According to the regulation of The State Patients' Fund at the Ministry of Health of our Republic, the patients, which were operated after 15th of September 2008, are entitled to 1850,10 Lt (~535,83 €) compensation for hip endoprosthesis, and 3506,16 Lt (~1015,45 €) for knee endoprosthesis. The cost of one rehabilitation day in hospital should not exceed 134 Lt (~38,81 €) [12, 13].

There are still not enough physiotherapists, occupational therapists our country to work in outpatient departments in smaller towns or countryside. There are not many private offices of physiotherapists and it is not reimbursed by The State Patients' Fund.

For all insured persons after arthroplasty rehabilitation is free and is reimbursed by The State Patients' Fund [12, 13]. According to the law and the determinate order by the Ministry of Health and the State Patients' Fund at the Ministry of Health, if due to earlier mentioned pathology the patient was assigned the elective or urgent surgery, the rehabilitation program should be started during the early stage after the surgery and after the treatment in traumatological departament the patients arive to our rehabilitation unit to continue the rehabilitation program [12].

D. MAIN PRINCIPLES OF YOUR PROGRAMME

Hip and knee arthroplasty is among the most widely performed procedures in orthopaedic practice in end-stage joint disease or in other traumatological situation, leading to pain relief, functional recovery and substantial improvement in quality of life [9, 10, 16].

Rehabilitation program goals are improvement of patients function, activity and participation [10].

So to help operated patients achieve full functional independence it is needful :

- to increase range of motion and surrounding muscle strength of replaced knee or hip- the postoperative range of motion depends on preoperative joint contracture, deformation and weakened, shortened surrounding muscles.
- To increase endurance and physical capability.
- To learn independent and secure mobility- weight-bearing is allowed as tolerated or as per orthopaedist- traumatologist.
- To decrease pain and swelling.
- To detect and prevent complications- hip replacement by anterior approach increases the risk of dislocation due to extended postures; posterior approach leads to a risk of dislocation in hyperflexion or internal rotation.

The patient should become self- confident before returning home to the normal social life and activity [9, 10, 15, 16].

IV. Aims and goals of the Programme

A. TARGET POPULATION

1. Inclusion/exclusion criteria

This PRM program is for the all patients of over the country after total hip or knee arthroplasty, who come to our unit to proceed a rehabilitation program after an acute rehabilitation program in the traumatological departament.

If the patient, according his clinical situation or complications (eg. fever, acute deep vein thrombosis, acute osteomyelitis, abscesses or other) stay in traumatological unit or is transferred to another unit, the acute rehabilitation program is performed. After the problem is solved, PRM doctor consults the patient for the needs of a rehabilitation program after arthroplasty, so the patient comes to our unit for the PRM program [12].

2. Referral of patients

Direct access to the PRM programme	No
Referral from general practitioners	No
Referral from other specialists	Yes
Referral from specialists in PRM	Yes

PRM specialist, who is responsible for the acute rehabilitation program, together with the operating physician (commonly orthopaedist- traumatologist) makes the decision about patients' referral to the specialised rehabilitation unit.

3. Stage of recovery

Within two weeks of onset	Yes
2 weeks to 3 months after onset	No
3 months or longer after onset	No

The acute rehabilitation program is supervised by a PRM doctor together with his mobile team and starts in the early period after the surgery in the traumatological department. The patient is taught by a physiotherapist about mobility precautions- if hip arthroplasty was made, corrects transfer, starts to walk under supervision.

Patients continue the rehabilitation program in our rehabilitation unit straight after the treatment in orthopaedic–traumatological department, if there aren't any exclusion criteria.

Patients arrive to our rehabilitation centre 8,17±2,92 days (in 2005 it was 9,43 ± 1,53 days) after the operation.

B. GOALS OF THE PROGRAMME

ICF categories are cited according the numeration:

1. In terms of body structure and function

ICF code	ICF label
b134	Sleep functions

b152	Emotional functions
b280	Sensation of pain
b455	Exercise tolerance functions
b530	Weight maintenance functions
b710	Mobility of joint functions
b715	Stability of joint functions
b720	Mobility of bone functions
b730	Muscle power functions
b735	Muscle tone functions
b740	Muscle endurance functions
b770	Gait pattern functions
b780	Sensations related to muscles and movement functions
s740	Structure of pelvic region
s750	Structure of lower extremity
s770	Additional musculoskeletal structures related to movement
s8104	Skin of lower extremity

1 ***2. In terms of activity***

2

ICF code	**ICF label**
d230	Carrying out daily routine
d410	Changing basic body position
d415	Maintaining a body position
d420	Transferring oneself
d430	Lifting and carrying objects
d435	Moving objects with lower extremities,
d450	Walking
d455	Moving around
d470	Using transportation
d475	Driving
d510	**Washing oneself**
d530	**Toileting**
d540	**Dressing**
d620	Acquisition of goods and services
d 630	**Preparing meals**
d640	Doing housework
d770	Intimate relationships

3 ***3. In terms of participation***

4

ICF code	**ICF label**
d660	Assisting others
d850	Remunerative employment
d910	Community life
d920	Recreation and leisure

V. Environment of the programme

A. CLINICAL SETTING

Individual practice or part of a doctor's group practice	No
Individual practice in a private hospital	No
Part of a local (public) hospital	No
Part of a regional hospital (or rehabilitation centre)	No
Part of a university or national hospital	Yes

The Rehabilitation Unit is the part of Rehabilitation, Physical and Sports Medicine Centre in the University Hospital.

It has 1000 beds, which are under the supervision of Ministry of Health and University.

Our centre of Rehabilitation, Physical and Sports Medicine is PRM Section and Board of UEMS certified training centre.

B. CLINICAL PROGRAMME

Inpatients in beds under PRM responsibility	Yes
Inpatient beds belonging to other departments	No
Day programme (most of the day in outpatient setting, not home)	No
Outpatient clinic (assessment and/or treatment, for up to 3 hours/day)	Yes
Community based (in the patient's home or workplace or other relevant community location, eg sports centre)	No

There are 35 beds in our Unit, 18 of them for patients with locomotor disability.

Our Unit belongs to the Rehabilitation, Physical and Sports Medicine Centre of University hospital and has 95 beds and Outpatient department.

C. CLINICAL APPROACH

Uniprofessional	No
Multiprofessional	Yes

D. FACILITIES

Does your programme have a designated space for :	
For assessments and consultations?	Yes
For an ambulatory or day care programme?	Yes
For inpatient beds?	Yes
For therapeutic exercises?	Yes
For therapeutic exercises ?(occupational therapy)	Yes
For training in independence and daily living?	Yes
For vocational and/or recreational activities?	Yes

- 18 beds (in rooms with 1-2 patients) are allocated for patients with locomotor system disturbances;
- 1 room in the Rehabilitation Unit is allocated for patients' assessment and consultation if needed (if the patient is assessed or consulted by the doctor in our hospital but from different unit, then the patient has to visit it's working premises);
- 1 physiotherapy hall and 1 physiotherapy cabinet are allocated for individual training; a swimming pool is for physiotherapy in the water;
- 1 occupational therapy room is with elements of vocational and recreational activities and 1 cabinet is for daily living learning;
- 1 room for psychologist consultations;
- 1 room for social worker consultations;
- Speech and language therapist has a room too.

All rooms eligible requirements of health sector authorities.

VI. Safety and patient rights

A. SAFETY

The safety concerns of persons in the unit where the programme takes place, relate to :	
Emergencies (fire, assault, escape)	Yes
Medical emergencies	Yes
Equipment	Yes
Handling of materials	Yes
Transports	Yes
The safety of persons in the programmes of your unit is provided by :	
Written standards from National Safety Bodies	Yes
Written standards from National Medical Bodies	Yes
Unit-specific written rules	Yes
Periodic inspection	
Internal	Yes
External	Yes

The safety of the patients at the Unit is secured by the ruling order of hospital management as well as with reference to written standards from National Medical Bodies and National Safety Bodies.

The Hospital has certified the Quality Management System under LST EN ISO 9000:2001 and 9001:2001 requirements.

Internal audit as well as outside control check takes place regularly every year or more often in case of any discrepancies.

The instructions regarding the action in case of emergency (evacuation of patients and personnel) are set by the hospital director following the legislation. For this purpose the regular training takes place every year to instruct the action plan in case of emergency as well as the emergency exits.

The training about the cases of medical emergency: 1 time a year the resuscitation courses are organised to instruct about action algorithm, how to use resuscitation equipment, defibrillator and other. There are first aid medicaments, equipment kits, ECG apparatus, and defibrillators ready for use in the Unit. In case of medical emergency if needed, the patient is assessed and advised by a reanimatologist and for further treatment is transferred to intensive care unit of our hospital.

B. PATIENT RIGHTS

Has your programme adopted a formal policy or statement of patients' rights?	Yes
Does this statement specify the influence that the patient should have in the formulation and implementation of the programme?	Yes
Is the statement known to all personnel involved in delivering the programme?	Yes
Is this checked periodically?	Yes
Is the statement made known to and is available to all persons visiting your unit?	Yes

Access to Rehabilitation is a basic human right, which is based on the statements of patients' rights and law the Ministry of Health of our Republic [8, 12].

Each patient has to sign informed consent at the hospitalisation place according to our Center and Unit procedure for the work organisation.

The patients and their relatives with consent of the patient are invited to participate in team meeting conferences.

C. ADVOCACY

Give at least one example of how your organisation advocates for people your programme deals with:	
CME conferences	Yes
Articles	Yes

CME conferences once per 6 month for all University hospital doctors, trainees, students.

Rehabilitation association CME conferences twice per year.

We take part in CME conferences of other specialists (mostly GP, traumatologists, other rehabilitation team specialists).

Articles in the medical journals of our country.

VII. PRM Specialists and team management

A. PRM Specialists in the Programme

Does your PRM physician have overall responsibility and direction of the multiprofessionnal team?	Yes
Does your PRM physician have overall responsibility and direction of the rehabilitation programme, not only medical responsibility?	Yes
Does he/she have a European Board Certification in PRM?	Yes
Does he/she meet National or European CME/CPD Requirements?	Yes
Number of CME or EACCME points earned in the last 3 years :	95
The *two primary functions* for the PRM specialist in your Programme are to :	
Treat comorbidity	No
Assess the rehabilitation potential of the patient	Yes
Analyse & treat impairments	No
Coordinate interprofessional teams	Yes

PRM physicians are the leaders of multidisciplinary team and are responsible for the patients' care in specialised PRM facilities.

Our teams of rehabilitation specialists work closely together to deliver rehabilitation in an organised goal-oriented and patient centred manner.

According to the national regulation of State Health Care Accreditation Agency under the Ministry of Health of our Republic each specialist must collect 120 credits during 5 year period by national CME or continuing professional development.

The rehabilitation process is reviewed regularly by PRM specialists, whereas the clinical rounds with the Head of the Centre take place once a week and rehabilitation team conferences with rehabilitation team staff are organized once a week, during which the short term and long term rehabilitation goals are determined. Often some of rehabilitation team meetings include patients and their relatives.

B. Team management

Which rehabilitation professionals work on a regular basis (minimum of once every week) in your programme ? (give the number)	
Physiotherapists	3
Occupational therapists	2
Psychologists	1
Speech & Language therapists	1
Social workers	1

Vocational specialists	-
Nurses	2
Orthotists/prosthetists assistive technicians/engineers	+
Other (please specify)	specialists for physical modalities and massage

How often does your staff receive formal continuing education (mark as is) ?	
In team rehabilitation :	Every year Every second year Other period Not regularly
In their own profession :	Every year Every second year Other period Not regularly

Do team activities in your rehabilitation programme include the following ?	
Is the patient at the centre of a multiprofessional approach?	Yes
Do you always give informed choices of treatment?	Yes
Do you regularly promote family involvement?	Yes
Does your organisation of multi professional team working include :	
Holding regular team meetings with patient's records only (more than 2 members)	Yes
Holding regular team meetings (more than 2 members) with the presence of the patients	Yes
Joint assessment of the patient or joint intervention	Yes
Regular exchanges of information between team members	Yes

- 1,5 full time equivalents (40 working hours per week) of staff are PRM physicians (1 person for 1 place and 1 person for 0,5 place),
- 2 full time equivalents of staff are physiotherapist (1 person for 1 place and 2 persons for 0,5 places),
- 1 full time equivalents of staff is occupational therapist,
- 0.5 full time equivalents of staff works social worker,
- 0.5 full time equivalents of staff psychologist,
- 2 full time equivalents of staffs of nurses,
- 2 full time aequivalents of staffs of nurses assistants.

In case of indications to orthotics (team and PRM doctor decides it), PRM doctor prescribes it, and patient may obtain by them self or orthopaedists-technicians may come on call. Besides it the angiosurgeon consults in case of deep vein thrombosis (DVT) and the orthopaedist- traumatologist as well as doctors of other specialisation is available on call in case of indication.

Our specialists actively participate in different courses and conferences organized by our Rehabilitation Centre or other Centres and Universities on national level as well as international ones. Moreover, our specialists give the presentations during these events and cooperate with the universities to help prepare future specialists in rehabilitation field.

Our centre organize training for the medical students, and students of nurses, social workers, physiotherapists, occupational therapists, so and post graduating courses for those specialists. PRM specialists take part in this process.

VIII. Description of the programme

A. TIME FRAME OF THE PROGRAMME

1. Phases of the programme and follow up procedure

The mean is 18, 52 days of inpatient rehabilitation.

The programme is reviewed by rehabilitation specialists using diagnostic tools, functional assessment, activity and participation assessments each rehabilitation day.

The results of 1-2 weeks and the short term goals for the upcoming 1-2 weeks are evaluated once a week during the clinical rounds and conferences with rehabilitation team staff.

B. ASSESSMENT

1. Diagnosis (related to ICD)

The clinical examination by PRM physician:

- Medical history: complaints; condition history, other comorbidities, allergies, addiction; drugs.
- Examination of the hip, knee and lower limb status: inspection of the healing wound;
- Evaluation of the pain by using a visual analogue scale and needs of analgesics; swelling;
- Deny possible sensory-motor deficits, range of operated joint motion- testing with goniometer; muscle testing by using the medical research council scale grade, Lafayette dynamometer.
- Evaluation of need for orthoses or other devices.
- Evaluation of functional independence.

2. Activity

Physiotherapists evaluate transferring and gait quality, velocity, stair climbing; performs six-minute-walk test, Keitel functional test; performs muscle testing and range of operated joint motion testing.

Occupational therapists evaluate patients' daily functional independence.

3. Participation - environmental and personal factors

Psychologists assess patients psychoemotional state by interview, observation, tests like Hospital Anxiety and Depression scale, Beck Depression inventory, Zung Self-Rating Depression scale, Projective methods.

Occupational therapist evaluate equipment (e.g. all kinds of mobility aids, dressing aids, elevated toilet seat, toilet safety frames, bedside commode chair, shower or bath seats) needed for the patient and inform social worker about it. Parts of the issues are discussed by the team together.

Social worker also assesses patient care needs, social situation, family and friends, community, occupation and work conditions, financial assets. Then he contacts and

prepares the documents for the Centre of Technical Aid for Disabled in case of choice of assistive devices, with social care department according to the patient's residence area in case of further need of social worker service or in case of solving the housing adjustment for disabled needs; consult the patients and intermediate with Disability and Working Capacity Assessment Office at the Ministry of Social Security and Labour (MSSL) in case of disability or working capacity evaluation or vocational training matters.

Rehabilitation nurses measure temperature, blood pressure, evaluates bowel/bladder functioning, skin and wound problems.

C. INTERVENTION

1. PRM specialist intervention

PRM physician: clinical assessment, planning and prognostication of rehabilitation program, assessment and review of interventions, pain therapy, complications management.

2. Other team members

Physiotherapist

Specific features for hip arthroplasty:

- ✓ weight bearing as tolerated or as per traumatologist, with walking device if needed ;
- ✓ Maintain strict total hip precautions : for an antero-lateral approach- extremes of external rotation, extention and abduction should be avoided. For an posterior approach- to avoid extremes of hip flexion, adduction and internal rotation.
- ✓ Begin isometric and straight-plane isotonic exercises (post-op week 1), add light resistance to the exercise program (post-op week 2) ;
- ✓ Isotonic exercise in standing posture if weight bearing is unrestricted ;
- ✓ Reconditioning exercises to unaffected extremities ;
- ✓ Prone-lying to strech out hip flexors ;
- ✓ Emphasize independance in bed mobility and transfers ;
- ✓ Community level ambulation ;
- ✓ Gain hip flexion to 90^{o}, extension at 0^{o} ;
- ✓ Physiotherapy in pool after wound heal ;
- ✓ Stair training.

Specific features for knee arthroplasty:

- ✓ weight bearing as tolerated or as per traumatologist, with walking device if needed ;
- ✓ quadriceps strengthening, gluteal sets, ankle pumps ;
- ✓ isotonic exercises ;
- ✓ lighter weights until wound heals ;
- ✓ physiotherapy in pool after wound heal ;
- ✓ achieve functional ROM- flexion to 90^{o}, extension at 0^{o} ;
- ✓ emphasize independance in bed mobility and transfers ;
- ✓ increase ambulation to community distances ;
- ✓ stair training [1, 9, 14, 15, 16, 18-21].

Physical modalities, (like electrotherapy- electrical muscle stimulation (gluteal, hamstrings, quadriceps- in especial for knee; magnetic field therapy, cold applications- for operated joint ; microwaves therapy, ultrasound, laser, heat application and massage therapy- if needed for comorbid conditions) [9, 20, 21];

Occupational therapist: assessment and teaching of safe activities according to precautions of daily living (eg. washing, dressing using dressing aids, toileting and others).

Psychologist: psychological assessment and interventions to gain self-efficacy (individual and group psychotherapy, relaxation, art therapy, counselling of family members).

Social worker: consults patients where and how get disability equipment, about social security possibilities, helps to prepare documents for public offices.

Nurses: nursing, patient education.

And also:

- Speech and language therapist- if needed due to comorbidities;
- Orthopedist-technician (prosthetics, orthotics, technical supports and aids) - if needed.
- Patient education- physician, physical and occupational therapists, rehabilitation nurses: disease-specific information; health knowledge and information about health-promoting behaviours. [1, 9, 14, 15, 16, 18-21]

3. Team organization

PRM physicians visit the patients daily, whereas the clinical rounds with the Head of the Centre take place once a week and rehabilitation team conferences with rehabilitation team staff are organized generally once a week or more often if needed.

- Physiotherapist therapy is 2 times a day 30 minutes each (or 20 times of therapy per 10 workdays) + massage therapy (4 times per 10 workdays) + physical modalities (5 times per 10 workdays);
- Occupational Therapy is once a day 30 minutes (or 10 times of therapy per 10 workdays);
- Psychologist consults 2-3 times per 10 workdays;
- social worker consults 1-2 times per 10 workdays;
- Speech and language therapy, if needed, is 4 times per 10 workdays;
- orthopaedist-technician comes on demand;
- nursing intervenes all day on demand.

Every patient is assigned to individual rehabilitation program based on the average intervention terms as mentioned earlier, however the quantities of all the mentioned therapies could be modified according to the needs.

4. Complications management

The detection of complications like: wound infection; symptoms of deep vein thrombosis- D-dimer count >250µg/l, swelling >3 cm, positive Homan's sign so for those patients legs deep vein Doppler scan is immediately performed; hip joint dislocation- hip replacement by anterior approach increases the risk of dislocation due to extended postures; posterior approach leads to a risk of dislocation in hyper flexion or internal rotation.

D. DISCHARGE PLANNING AND LONG TERM FOLLOW UP

According to the Ministry of Health regulation for controlling the rehabilitation service, the patients after the hip/knee arthroplasty are entitled in average to the 20 days rehabilitation program. The period can be extended or shorter after assessing the patient's achievement and functional independence.

Decisions on discharging patients are the responsibility of the PRM specialist on the basis of team conference, in which the patient and the family members actively participate, when the patient achieve rehabilitation goals according needs of patients daily living- no pain, good range of motion of operated hip or knee joint (≥ 90° of flexion), independent and secure mobility and daily living activities.

PRM doctor provide a comprehensive discharge report for the patient, general practitioner and orthopaedist-traumatologist on the basis of the assessment and the information provided by the each team members.

The patient is advised to be assessed again after 1, 3 and 6 month period.

IX. Information management

A. PATIENT RECORDS

Do the rehabilitation records have a designated space within the medical files ?	Yes
Do you have written criteria for :	
• Admission	Yes
• Discharge	Yes
Do your rehabilitation plans include written information about aims and goals, time frames and identification of responsible team members ?	Yes
Do you produce a formal discharge report (summary) about each patient?	Yes

B. MANAGEMENT INFORMATION

Does your programme show evidence of sustainability ?	
• Established part of public service :	Yes
• Has existed for more than 3 years :	Yes
• Has received national accreditation (where available) :	Yes
How many new patients (registered for the first time) are treated in your programme each year :	average 120
In your day care or inpatient programme :	
• What is the mean duration spent in therapy by patients on this programme	16,5 days
• How many hours a day do the patients spend in therapy.	3,5-5 hours
Give the mean duration of stay spent in the programme :	18,52 days

C. PROGRAMME MONITORING AND OUTCOMES

Does your programme have an overall monitoring system in addition to patient's records ?	Yes
Are the long term outcomes of patients who have completed your programme regularly monitored ?	

• Impairment (medical) outcomes :	Yes
• Activity/Participation (ICF) outcomes :	Yes
• Duration of follow up of the outcomes :	3-6 months
Do you use your outcome data to bring about regular improvements in the quality of your programme's performance ?	Yes
Do you make the long term overall outcomes of your programme available to your patients or to the public ?	No

On average we have about 23,5% returning patients after next hip or knee arthroplasty. They are monitored in detail for long term medical, activity and participation outcomes.

The data is stored in personal files and analysed in annual reports about the Unit work.

X. Quality improvement

A. WHICH ARE THE MOST POSITIVE POINTS OF YOUR PROGRAMME ?

The Unit is located in the University Hospital where all additional necessary diagnostic and therapeutic means are available.

Our centre of Rehabilitation, Physical and Sports Medicine is UEMS PRM Board certified training centre.

A fruitful discussion with the UEMS PRM Section - Clinical Affairs Committee members and a visit to a French Hospital (Saint-Grégoire, France) helped us to improve the programme structure in accordance with surgical considerations.

B. WHICH ARE THE WEAKEST POINTS OF YOUR PROGRAMME ?

Up to the last year the long term outcomes were not collected according to ICF core set for arthroplasty. Therefore the recent long term outcome records according ICF are statistically insufficient to make a thorough analysis.

In recent years the cooperation with orthopaedists- traumatologists is improved, but it could be better.

C. WHICH ACTION PLAN DO YOU INTEND TO IMPLEMENT IN ORDER TO IMPROVE YOUR PROGRAMME ?

It is planned to acquire for research and clinical practice gait analysis laboratory.

To prepare national guidelines for implementation of ICF for locomotors disturbances. To make the long term overall outcomes of programme available to the patients and the public.

To organize conferences together with orthopaedists- traumatologists on regular basis.

XI. References

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B. DETAILS ABOUT NATIONAL DOCUMENTS

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