



# UEMS PRM Section & Board

## Clinical Affairs Committee

*New accreditation procedure*

### Programme n°5

## PRM programme for spinal cord injury and trauma

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#### **Issue**

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## I. Identifying data

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Country	SLOVENIA

## II. Summary

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2 The programme of rehabilitation of persons with spinal cord injury in Slovenia conducted  
3 at the department for rehabilitation of patients with spinal cord injury at the University  
4 Rehabilitation Institute in Ljubljana is the only such programme in Slovenia. The  
5 department treats patients after injury as well as patients with various spinal cord diseases  
6 and their consequences such as tetraplegia/tetraparesis or paraplegia/paraparesis.  
7 Patients after trauma receive their primary care at the closest regional hospital and are  
8 transferred within 24 hours to one of the three trauma centres in Slovenia, where they are  
9 treated surgically as well as receive their early rehabilitation. Patients with spinal cord  
10 diseases are treated at the departments for neurology, neurosurgery, orthopaedics,  
11 infectious diseases, vascular diseases, oncology and other departments in Slovenian  
12 hospitals. Patients are admitted to the University Rehabilitation Institute Soča two to four  
13 weeks after trauma depending on their condition and the level of injury. The average  
14 rehabilitation programme length is 2 to 4 months for persons with paraplegia and 3 to 7  
15 months for persons with tetraplegia. Patients are treated by a team and life-long out-patient  
16 follow-up is carried out after the programme conclusion. There is direct communication  
17 between the acute care departments and the rehabilitation department of URI Soča, the  
18 physicians agree on the patient's transfer and each patient is entitled to the programme of  
19 rehabilitation which has no time limit imposed by the insurance system.

20 The patients are selected for rehabilitation on the basis of admission criteria. The selection  
21 of patients for rehabilitation programmes at the University Rehabilitation Institute is done by  
22 PRM specialists on the basis of a written proposal by PRM specialists or other specialists  
23 in Slovenian hospitals or after an examination at the Outpatient Clinic for SCI patients at  
24 the University Rehabilitation Institute. The unit for rehabilitation of patients with spinal cord  
25 injury has 31 beds for inpatient care. It is a part of University Rehabilitation Institute in  
26 Ljubljana and is the only such department in Slovenia. About 80 new SCI patients after  
27 trauma or disease of spinal cord are admitted yearly. There is a large outpatient clinic  
28 responsible for the admission and follow-up of SCI patients. The unit and the Institute are  
29 under the authority of the Ministry of Health, Republic of Slovenia and the rehabilitation  
30 programme for the patients is paid completely by National Health Insurance. The SCI  
31 department got a certificate ISO 9001:2000 in 2009. There are 2 full-time PRM specialists,  
32 5 physiotherapists, 3 occupational therapists, 2 university college graduated nurses, 20  
33 nursing staff and one part-time working psychologist and social worker. The  
34 multidisciplinary team meets regularly once weekly. There are ASIA, SCIM, FIM, FIC,  
35 10MWT, 6MWT, BBS, COPM and MMT regularly recorded and a clinical pathway is used  
36 for planning and evaluation of the rehabilitation programme.

### III. General bases of the Programme

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#### A. PATHOLOGICAL AND IMPAIRMENT CONSIDERATIONS

##### 1. *Aetiology and pathogeny*

Tetraplegic and paraplegic patients with injuries or diseases of the spine from C4 to L2 with complete or incomplete neurological lesions of spinal cord and patients with incomplete neurological lesions from C1 to C4. The most frequent causes of admission of SCI patients include traffic accidents, high falls, jumps into water, sports-related injuries, falls of hang gliders, attempted suicide and others. In patients with spinal cord diseases the most frequent causes include primary tumours, inflammatory and vascular spinal cord diseases, inflammatory diseases of the spinal cord with resulting spinal cord impairment, secondary tumours and others.

##### 2. *Natural history and relationship to impairment*

The department admits patients with injuries at the levels from C4 to L2 where the level of impairment is considered as the first injured spinal cord segment according to the French model of assessment (1-5). Around 110 patients are admitted yearly, 80 out of which come for their first admission. Half of the patients are SCI patients with and the other half are patients with neurological impairments of the spinal cord resulting from various diseases. Patients after complete spinal cord injury above the level C3 are seldom admitted to rehabilitation. We have had some experience in rehabilitation of patients after spinal cord disease with neurological impairment above the C3 level who required assisted ventilation (6). Patients in good physical condition, neurological impairment at the levels T5 - T12 and present spasticity with adequate response to stimulation are included into gait training with functional electrical stimulation (FES) when all the necessary criteria are met (7-29). Patients with neurological impairment at the segments L1 – L2 and flaccid plegia can be included into gait training with mechanical orthoses and can be expected by the end of rehabilitation to walk short distances with the orthoses and with the support of a walker or crutches. In patients with incomplete spinal cord impairment (ASIA C, D) gait training is performed on a treadmill without weight bearing and from autumn 2010 robotized gait training will be carried out on a Locomat. During the programme, FES is used as an orthotic therapeutic device and patients can get a prescription for an electrical stimulator for home use covered by health insurance. Patients and if necessary their relatives are instructed on the use of FES during the programme. Depending on the level and range of neurological impairment patients are included into the training of activities of daily living, neurogenic bladder and intestine (30), counselling on sexual dysfunction, sports activities and other. At the end of rehabilitation, patients have an interview at the Centre for vocational rehabilitation, where they are tested for the remaining abilities for employment or education. The interview is carried out during hospitalization or later. The patient's relatives can be trained on home nursing and the patient with the relatives can stay at an architecturally and technologically adapted apartment. If necessary, home visits are carried out and counselling on the necessary adaptation of the home environment is offered.

##### 3. *Medical diagnosis and prognosis*

Functional diagnoses in treated patients include: tetraplegia, tetraparesis, paraplegia, paraparesis (ICD10 codes G.82.0 - G.82.5; G83.0 - G83.9)

Aetiology: injuries (most frequently in traffic accidents and high falls), consequences of degenerative and inflammatory spinal cord impairments (discus hernia in the area of cervical, thoracic and lumbar vertebra, spondilodiscitis), inflammatory and vascular spinal cord diseases, primary tumours of the spinal cord, solitary metastases and other diseases (ICD10 CODES C41.2; C72.0; C79.5; D32.0 - D32.9; G95.0 - G95.9; S12.0 - S12.9; S13.0)

1 - S13.6; S14.0 - S14.6; S22.0 - s22.9; S23.0 - S23.9; S24.0 - S24.6; S32.0 - S32.8; s33.0 -  
2 S33.7; T91.0 - T91.9).

3 Prognosis depends on aetiology and completeness or incompleteness of the SCI injury  
4 (30-36). Patients with impairment at the level C4 are expected to breathe independently  
5 (35) and use an electrical wheelchair with chin commands. Such wheelchair with chin  
6 commands can be prescribed and the patients can be trained on its use as well as supplied  
7 with the wheelchair before discharge. Patients are also trained on using a personal  
8 computer with wheelchair commands via special interface. Patients with C5 level of  
9 impairment are expected to use an electrical wheelchair with regular joy stick commands.  
10 Patients with C6 impairments are expected to use a manual light-weight wheelchair usually  
11 with thickened rims due to finger grip disability. At the levels C7-8, patients can usually  
12 operate a manual light-weight wheelchair with regular wheel rims. In patient with complete  
13 impairment at the levels T1 – T9 standing between bars will be achieved, exceptionally  
14 also walking with functional electrical stimulation (FES), they are expected to be  
15 independent in activities of daily living (ADL) and have bladder management. Patients with  
16 impairments at the levels T10 – L1 are expected to walk short distances with FES or  
17 mechanical orthoses and use a wheelchair to cover medium long and long distances. The  
18 electrical stimulators and lower limb orthoses are prescribed and covered by health  
19 insurance. The lower limb orthoses (AFOs and KAFOs) are manufactured by engineers of  
20 prosthetics and orthotics at the University Rehabilitation Institute. Patients with impaired  
21 L2 – S5 are completely independent in ADL, have control of the neurogenic bladder with  
22 intermittent catheterization, walk with or without orthoses and usually do not need a  
23 wheelchair.

#### 25 **4. Treatments**

26 After acute injury, patients can be admitted directly to one of the trauma centres in  
27 Slovenia, which are well equipped and offer programmes of early rehabilitation. When  
28 persons after spinal cord injury are admitted into one of the regional hospital, they are  
29 transferred within 24 hours into one of the three trauma centres. Immediately after the  
30 surgery, patients are administered high doses of corticosteroids to decrease the oedema  
31 and thus prevent further damage to the undamaged areas. Surgical stabilization of the  
32 injured spine is done within 24 hours in most cases (31). Preventive protective treatment  
33 with low molecular heparins against vein thrombosis is conducted immediately after the  
34 surgery in all cases. Patients receive early rehabilitation at the acute departments of  
35 trauma centres within the range of possibilities (maintaining mobility, prevention of  
36 pressure sores, deep vein thrombosis and infections, assistance of respiratory functions,  
37 early phase of movement promotion). As soon as the patient's health state permits the  
38 continuation of rehabilitation, he or she is transferred to a specialized rehabilitation centre.  
39 The contents and the length of the rehabilitation programme are individually adjusted to the  
40 patient's health state, consequences of the injury or disease and his or her functional  
41 abilities. The decision of the team on the end of rehabilitation and the date of discharge is  
42 based on the possible reasons and criteria for discharge.

43 Discharge criteria for SCI patients:

- 44
- 45
- 46 - all or the majority of the goals set at the admission have been achieved
- 47 - no visible progress in the patient's functional state between two team rounds
- 48 - the assessment of the patient's functional state on the FIM scale shows no progress
- 49 between two steam rounds
- 50 - the patient does not participate in the programmes of rehabilitation or actively declines
- 51 participation which is lower than his or her abilities
- 52 - worsening of the patient's health condition prevents his or her participation in the
- 53 programmes of rehabilitation

54

## B. ACTIVITY LIMITATIONS

ICF code	ICF label
d4	All codes from CHAPTER 4 MOBILITY
d5	All codes from CHAPTER 5 SELF-CARE
d620	Acquisition of goods and services
d630	Preparing meals
d640	Doing housework
d650	Caring for household objects

The activities are aimed at promoting the patient's independence, self-care, eating abilities, doing housework and caring for household.

## C. PARTICIPATION RESTRICTIONS

ICF code	ICF label
d770	Intimate relationships
d825	Vocational training
d830	Higher education
d845	Acquiring, keeping and terminating a job
d920	Recreation and leisure

The activities are aimed at improving relationships, vocational counselling and training, acquiring additional education, acquiring or keeping a job, preparing for retirement, possibilities of recreation and leisure activities.

## D. SOCIAL AND ECONOMIC CONSEQUENCES

### 1. *Epidemiological data*

URI-Soča offers rehabilitation to all patients with spinal cord injury or disease and neurological impairments, with motor impairments and resulting paresis or plegia or with impaired cauda equina and resulting impairments of the sacral functions with disorders of urination, defecation and sexual functions. Around 80 patients are admitted yearly. In half of the cases, the cause of the neurological impairment is injury which means that there are around 20 spinal cord injuries per 1 million inhabitants yearly in Slovenia.

### 2. *Social data*

There are no data on the number of tetraplegics or paraplegics returning to work. The program of comprehensive rehabilitation includes evaluation of the patient's working ability and vocational rehabilitation as well as additional schooling and qualifications for those up to 45 years of age. Due to the existing conditions and legislation a large part of the patients retires despite the mentioned programmes. Most of them are discharged to return home where they live with their relatives. Home assistance is offered by social institutions, layman organizations and visiting nurse services. Those patients who cannot take care of themselves after concluded rehabilitation need to be accommodated in appropriate social institutions. Patients and relatives are offered counselling on sexual disorders. They can get practical training on the use of devices for maintaining erection. Problems with

1 reproduction are treated in a specialized out-patient service at the Gynaecology clinic of  
2 the University Medical Centre in Ljubljana while the basic advice and instructions are  
3 provided by the physician of the rehabilitation team. The patient's relatives are included  
4 into rehabilitation. They learn about the severity of the impairment, approximate prognosis  
5 and the patient's progress. They learn the necessary nursing skills, personal hygiene  
6 procedures, assistance in activities of daily living, intermittent catheterization, aspiration,  
7 replacing of the tube and other necessary procedures to be carried out at home. On the  
8 first weekend the patient and one of the relatives can stay in Smart Home - IRIS  
9 (Independent Residing enabled by Intelligent Solutions) at the University Rehabilitation  
10 Institute. Smart Home IRIS offers conditions which enable the elderly and persons with  
11 disabilities to achieve the highest level of functional independence and independent  
12 residing. Adapted equipment, technical aids and numerous contemporary electronic  
13 systems enable the user to control the living space (opening doors and windows, drawing  
14 curtains, television, radio and telephone control, turning the heating on and off etc.) in  
15 various manners (remote control, voice control, wheelchair joystick, eye control etc.). At the  
16 same time, it offers surveillance of the living space which ensures safe and quality living.  
17 Already during the rehabilitation program, the patient returns home every weekend which  
18 serves as a good basis for later integration into the home environment. Technical aids are  
19 advised and prescribed as well as home adaptations suggested.

### 20 **3. Economic data**

21 There was 6.1% of GDP (18.367 EUR per capita) spent in 2008 for health care system in  
22 Slovenia. The Health Insurance Institute of Slovenia covers rehabilitation programme for  
23 SCI patients entirely. No patients need to pay for medical treatment, rehabilitation  
24 programme or sanitary and technical aids. The duration of rehabilitation program is decided  
25 by the team and is not limited by the insurance system.

## 26 **E. MAIN PRINCIPLES OF YOUR PROGRAMME**

27 Assessment to identify the residual patient's capacities after spinal cord trauma or disease  
28 and to strengthen them. Therapeutic education of the patient and his relatives/ friends /  
29 acquaintances to prevent complications and promote the adaptation of the person to his or  
30 her disability. To perform medical interventions, nursing, physiotherapy, occupational  
31 therapy, psychological support and social intervention. To evaluate the capacities for  
32 returning to job. To evaluate driving capacities. To compensate for the deficiencies with  
33 technical aids.

34 Tetraplegics are usually admitted to rehabilitation 4 to 8 weeks after trauma and  
35 paraplegics 2 to 4 weeks after trauma. After the admission, the patients are included into  
36 intensive programme of rehabilitation. Unless there are complications, the patients leave  
37 their hospital rooms and cooperate in the programmes according to the schedule.  
38 Prevention of pressure sores is performed. Different bed and seat anti-decubitus cushions  
39 are used. The patient's position in bed is changed regularly and the time of lying in one  
40 position is recorded on a special file by the nursing staff. Intensive respiratory physical  
41 therapy is offered to those patients who need such treatment.

42 The programme of mobilization includes verticalisation between bars for paraplegics or on  
43 tilting tables for tetraplegics. The patients are trained on wheelchair use. For that purpose,  
44 the department has a number of devices that can be used by the patients. They learn the  
45 activities of daily living, in tetraplegics special emphasis is placed on fine motor training and  
46 upper limb skills (12), and a training program with a haptic robot is offered. Paraplegics  
47 with adequate physical condition are included into gait training with orthoses or FES. In  
48 patients with cervical spinal cord impairment the gait training is indicated only with  
49 incomplete SCI. Permanent catheter is removed and intermittent catheterization introduced  
50 as soon as the patient's abilities permit and regular catheterization by the nursing staff is  
51 ensured for the entire 24 hours. The quantity of urine in the bladder is controlled by the US  
52 scanner (BVI 3000). To ensure proper defecation, laxatives, tea, dragees and  
53 suppositories are used.



1 Patients are treated by a psychologist and a social worker, they have an interview at the  
2 unit for vocational training, they learn about the possibilities of home adaptation and  
3 removal of architectural barriers and they can stay with their relatives in a technically and  
4 architecturally adapted apartment (IRIS) at the URI Soča. Sports activities and pool  
5 swimming are organized. At the conclusion, functional testing of cardiovascular system and  
6 lung functions with weight bearing is performed (32). After discharge, life-long follow-up is  
7 conducted at our specialized out-patient units.

8

9

## IV. Aims and goals of the Programme

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### A. TARGET POPULATION

#### 1. Inclusion/exclusion criteria

Inclusion criteria:

We admit patients after spinal cord disease or injury at the level C4 to L2 with complete or incomplete neurological lesions of spinal cord and patients with incomplete neurological lesions from C1 to C4. The level of the impairment is considered as the first injured segment of the spinal cord according to the French model of assessment (1-5).

Admission criteria for medical rehabilitation programmes:

- Stable hemodynamic, respiratory, orthostatic and neurological conditions
- Ability to participate in the programmes of rehabilitation
- Adequate psycho-physical condition
- Stable spine with permitted weight bearing
- Treatment of the disease that caused SCI must be terminated
- The admission is possible only on the basis of previously submitted complete medical documentation

Exclusion criteria:

Permanent dependence on additional oxygen, spinal cord impairment due to multiple sclerosis (rehabilitation performed at another department), cervical spinal cord impairment with accompanying severe craniocerebral trauma (rehabilitation is performed at the department for head trauma). In cases of neurological impairment above the level C4 when patients are dependent on assisted ventilation, the admission is possible with stable condition, proper functioning of the ventilator and sufficient staff capacity.

#### 2. Referral of patients

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

Before the admission, the majority of SCI patients are examined by a PRM specialist and a written proposal is prepared in advance. The patients sent by general practitioners are examined before the admittance in the outpatient clinic to define their priority of admittance.

#### 3. Stage of recovery

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

Patients are admitted 7 weeks after injury on average (the median is 3 weeks). The average length of stay is 66 days (the median is 50 days). Rehabilitation programme usually lasts from 1 to 3 months for paraplegic patients and from 2 to 4 months or more for tetraplegic patients.

## B. GOALS OF THE PROGRAMME

### 1. *In terms of body structure and function*

ICF code	ICF label
b280	Sensation of pain
b420	Blood pressure functions
b440	Respiration functions
b445	Respiratory muscle functions
b525	Defecation functions
b 550	Thermoregulatory functions
b 620	Urination functions
b640	Sexual functions
b7	All codes from CHAPTER 7 NEUROMUSCULOSKELETAL AND MOVEMENT-RELATED FUNCTIONS
b810	Protective functions of the skin

The programme of rehabilitation is aimed at pain management, stabilization of blood pressure and respiratory function, management of defecation, thermoregulation, urination control, sexual dysfunction counselling, assurance of mobility and musculoskeletal system functions and protective functions of the skin.

### 2. *In terms of activity*

ICF code	ICF label
d4	All codes from CHAPTER 4 MOBILITY
d5	All codes from CHAPTER 5 SELF-CARE
d620	Acquisition of goods and services
d630	Preparing meals
d640	Doing housework
d650	Caring for household objects

The programme is aimed at acquisition of skills and abilities for the performance of the activities of daily living, housework and care for household.

### 3. *In terms of participation*

ICF code	ICF label
d770	Intimate relationships
d825	Vocational training
d830	Higher education
d845	Acquiring, keeping and terminating a job
d920	Recreation and leisure

The program is aimed at the patient's return to work when possible or at the vocational training, education or preparation for retirement.

## V. Environment of the programme

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### 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*

\* University Rehabilitation Institute is the only national rehabilitation centre in Slovenia and is not a part of any other national hospital.

### 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)	Yes
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, e.g. sports centre)	No

The programme included outpatient clinic twice weekly for assessment and regular follow up. Most patients are admitted and rehabilitated as inpatients, some from Ljubljana region may have day programme.

### C. CLINICAL APPROACH

Uniprofessional	No
Multiprofessional	Yes

All patients are treated by a multiprofessional team (MD, PRM specialist, PT, OT, psychologist, social worker, CPO, nurses).

## D. FACILITIES

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

The programme is carried out on one entire floor of the Institute. It has 11 completely accessible rooms, 10 with 3 beds and one single-bed room, all with a bathroom. There are 2 rooms for assessment and consultations with inpatients, and one for outpatients, rooms for physiotherapy, occupational therapy, a psychologist, a social worker, a room for team meetings, a dining room and an area for relaxation.

Pool swimming is organized and is led by professional staff from the Faculty of sports with direct help and assistance in the water for all patients that can be included in the programme. Urodynamics testing is performed in all patients with urinary bladder control disorders. The test of the efficient use of intrathecal baclofen application is conducted in all patients with severe spasticity. Based on the results and in cooperation with the neurosurgical unit at the University Medical Centre Ljubljana a baclofen pump is inserted surgically. The program of pump functioning control and all the necessary refills are conducted at the specialized unit for the treatment of spasticity at the rehabilitation department, at first in-patient and later out-patient. At the termination of the rehabilitation programme and if necessary also during the program, the patient's functional capacity and lung function are measured (32). The measurements are repeated after the termination during the out-patient check-ups and any possible complications on the cardiovascular and skeletomuscular systems due to decreased mobility are monitored.

## VI. Safety and patient rights

### A. SAFETY

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

Rehabilitation process is reviewed periodically by the medical director of the Clinic during clinical rounds and by the medical director of the University rehabilitation institute during team meetings. The justification of ISO 9001:2000 granted in 2009 for SCI department is regularly checked by internal and external supervision.

### 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

The Act on Patients Rights of the Republic of Slovenia was accepted on 29 January 2008 and has been used in everyday practice from 26 August 2008. The content of the act is available for all patients and employees through the brochures and posters.

## C. ADVOCACY

<b>Give at least one example of how your organisation advocates for people your programme deals with:</b>	
Selection of SCI patients as a candidate for refreshment programmes of rehabilitation organised by Paraplegic Association of Slovenia	Yes
Acquaintance of SCI patients with the possibilities of affiliation to Paraplegic Association of Slovenia	Yes
Participation of medical doctor in Professional Council of Paraplegic Association of Slovenia	Yes

Once per month representatives of Paraplegics Association of Slovenia come to the Institute and meet with the patients at the SCI department to inform them on the benefits of the Association membership.

## VII. PRM Specialists and team management

### A. PRM SPECIALISTS IN THE PROGRAMME

Does your PRM physician have overall responsibility and direction of the multiprofessional 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 :	
<b>The two primary functions for the PRM specialist in your Programme are to :</b>	
Treat comorbidity	No
Assess the rehabilitation potential of the patient	Yes
Analyse & treat impairments	No
Coordinate interprofessional teams	Yes

Beside two primary functions of PRM specialists, a lot of work must be done in the treatment of comorbidity and impairments. Almost one quarter of all the admitted patients is older than 65 years with a lot off accompanying diseases.

### B. TEAM MANAGEMENT

<b>Which rehabilitation professionals work on a regular basis (minimum of once every week) in your programme ? (give the number)</b>	
Physiotherapists	5
Occupational therapists	3
Psychologists	0.5
Speech & Language therapists	0
Social workers	0.5
Vocational specialists	0.25
Nurses	20
Orthotists/prosthetists assistive technicians/engineers	1
Other (please specify)	neurologist, urologist, plastic surgeon, etc.
<b>How often does your staff receive formal continuing education (mark as is) ?</b>	
In team rehabilitation :	Every year



In their own profession :	Every year
<b>Do team activities in your rehabilitation programme include the following ?</b>	
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
<b>Does your organisation of multi professional team working include :</b>	
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	No
Joint assessment of the patient or joint intervention	Yes
Regular exchanges of information between team members	Yes

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- There are regular meetings of the staff organised every morning before the rehabilitation programmes start with the participation of a medical doctor, the head university college graduated nurse, the head physiotherapist, the head occupational therapist, a social worker and a psychologist to adapt the schedule of the patients program. Beside the regular weekly team meetings, team members also hold short daily meetings depending on problems pending, with or without the patient.

## VIII. Description of the programme

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### A. TIME FRAME OF THE PROGRAMME

Patients are on average admitted seven weeks after the onset of impairment. The average length of stay is 89 days for paraplegics and 113 days for tetraplegics

### B. ASSESSMENT

#### 1. *Diagnosis (related to ICD)*

#### 2. *Impairment*

##### a) **Clinical assessment**

ASIA

##### b) **Diagnostic tools**

MMT, ROM, ECG, SEP, MEP, urodynamics, pendulum test (37)

#### 3. *Activity and participation*

##### a) **Capacity evaluation (what somebody can do)**

We aim at achieving the expected functional capacity in relation to the level of impairment (2).

##### b) **Performance (what somebody is actually doing)** **FIM, SCIM, 10MWT, 6 MWT, BBS, COPM**

We use FIM and SCIM for global assessment of the functional status. We use walking tests (10MWT, 6 MWT) in physiotherapy where one of the goals is walking and BBS if we try to improve balance. We use COPM in occupational therapy to identify areas and activities important to patients and their inclusion into our rehabilitation program.

#### 4. *Environmental and personal factors* *... assessment, questionnaire*

Self prepared questionnaire for assessment of environment at home, community, school/work place. Personal factors are assessed by a psychologist.

### C. INTERVENTION

#### 1. *PRM specialist intervention*

Treatment of infections, severe spasticity, hypotension and hypertension, diabetes, bedsores, pain. Management and adaptation of drug treatment. Treatment of autonomous dysreflexia (33). Prevention of deep vein thrombosis (34). Ensuring adequate lung function (11). Intrathecal application of Lioresal and testing for baclofen pump insertion, control of baclofen pump functioning, baclofen pump refill. Local application of botulinum toxin. Necrectomy of wounds and electrical stimulation of pressure sores (38-52). Neurogenic bladder training, replacement of urine catheters, the first intermittent catheterization after removal of the catheter, measurement of the delay in the bladder (6). Replacement of the

1 endotracheal tube. Digital rectal examination. Removal of sutures. Insertion and  
 2 replacement of nasogastric tube. Urodynamic measurements. EMG, SEP, MEP. US of the  
 3 skeleton. US Doppler of the veins. Sensorimetry.

## 4 **2. Team intervention**

5 Physiotherapy: MMT, ROM, walking, standing, FES, orthotic training, treadmill walking with  
 6 body weight support, balance training, (53) measuring of spasticity (37)

7 Occupational Therapy: Preservation of upper limb function (12). Upper limb training with a  
 8 haptic robot. ADL, wheelchair tests and training of its use, AT test, counselling and training,  
 9 environmental adaptations, smart home, making splints, construction of small devices for  
 10 every day activities management, leisure time etc.

11 CPO: manufacturing and fitting of lower limb and spinal orthoses

12 Psychologist, social worker: assessing personal factors, support, social support, adaptation  
 13 to new abilities (disability), building of self esteem.

14 Social worker: counselling and help, cooperation with the family, cooperation with Centres  
 15 for social work, help in claiming the patient's rights.

16 Nurses: intermittent catheterisation, wound nursing, pressure sore prevention program,  
 17 bowel management, positioning in bed, use of acquired independence in ADL at the  
 18 department, cooperation in and performance of assisted respiratory functions, teaching self  
 19 catheterization.

## 20 **D. FOLLOW UP AND OUTCOME**

### 21 **1. Review and progress through the programme**

22 Regular team meetings once a week, the team is led by a PMR specialist, regular follow-up  
 23 of the short-term and long-term goals. At the end of the rehabilitation the patients are  
 24 referred to the Centre for vocational rehabilitation for the evaluation of the work abilities or  
 25 possible training program or counselling on education.  
 26

### 27 **2. Criteria for progress measurements**

28 Numerous assessment scales are used to evaluate the patient's progress and condition,  
 29 such as FIM, SCIM, ASIA, MMT, ROM, 10MWT, 6MWT, BBS, SEP, MEP, EMG and ASIA  
 30 International Standards for the classification of Spinal Cord Injury and ISCOS International  
 31 Spinal Cord Injury Data Set (1-5).

## 32 **E. DISCHARGE PLANNING AND LONG TERM FOLLOW UP**

33 The patient is discharged after he or she reaches the long-term goals set at the beginning  
 34 of the rehabilitation programme, or when there is no progress in rehabilitation for at least  
 35 two to three weeks, or when he or she is not able to participate in the rehabilitation  
 36 program due to worsening of his or her health condition or at the onset of co-morbidity. All  
 37 patients are invited to the out-patient clinic from three to six months after the discharge.  
 38 Additional attendances of SCI patients are carried out upon decision of the general  
 39 practitioner, generally once per year or every second year. The outpatient clinic operates  
 40 twice a week for the entire year.

## IX. Information management

### A. PATIENT RECORDS

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

Each patient has his or her own medical file used exclusively in the rehabilitation program.

### B. MANAGEMENT INFORMATION

<b>Does your programme show evidence of sustainability ?</b>	
• Established part of public service :	Yes
• Has existed for more than 3 years :	Yes
• Has received national accreditation (where available) :	Yes
<b>How many new patients (registered for the first time) are treated in your programme each year :</b>	80
<b>In your day care or inpatient programme :</b>	
• What is the mean duration spent in therapy by patients on this programme	50 days
• How many hours a day do the patients spend in therapy.	4 hours
<b>Give the mean duration of stay spent in the programme :</b>	70 days

It is the only such programme in Slovenia with tradition of 55 years.

## C. PROGRAMME MONITORING AND OUTCOMES

<b>Does your programme have an overall monitoring system in addition to patient's records ?</b>	Yes
<b>Are the long term outcomes of patients who have completed your programme regularly monitored ?</b>	
• Impairment (medical) outcomes :	Yes
• Activity/Participation (ICF) outcomes :	Yes
• Duration of follow up of the outcomes :	longer
<b>Do you use your outcome data to bring about regular improvements in the quality of your programme's performance ?</b>	Yes
<b>Do you make the long term overall outcomes of your programme available to your patients or to the public ?</b>	No

After discharge, patients are followed-up at the out-patient clinic (54). They have a yearly control examination with urodynamic testing and urine delay measurements with the US scanner, functional testing of the cardiovascular system (55-57) and lung functions, checking of the adequacy of the prescribed medical technical aids, treatment of the secondary complications resulting from spinal cord impairment and possible counselling related to sexual dysfunction.

## X. Quality improvement

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

- 3 Multidisciplinary team-work approach in the provision of the rehabilitation programme
- 4 Offering the optimal programme in regard to the patients abilities
- 5 Treadmill walking with or without body weight support, training of walking with FES and
- 6 orthoses when appropriate
- 7 Fitting with necessary medical technical aids
- 8 Enabling the patient to return home with a possibility (of the patient and relatives) to stay in
- 9 an adapted apartment before discharge
- 10 At admission patients are given hand-outs with basic information in the department and
- 11 procedures such as removal of the urine catheter and the training of catheterization

### B. WHICH ARE THE WEAK POINTS OF YOUR PROGRAMME ?

- 13 Inaccessibility of diagnostic tools such as X-ray, laboratory, abdominal ultrasound
- 14 examination
- 15 Cooperation with consultants - specialists in plastic surgery, othorinolaryngology, urology
- 16 and psychiatry

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

- 19 1. *Extrinsic requests (equipment, manpower)*
- 20 2. *Intrinsic improvements of the programme (organisation, training, assessment)*
- 21 The University Rehabilitation Institute plans to purchase a small transportable laboratory in
- 22 2010
- 23 An agreement for cooperation with an urologist from the University Clinical Centre in
- 24 Ljubljana.
- 25 Starting of a locomotion programme on a Locomat.
- 26 Improving bladder and bowel rehabilitation programme.

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9 **B. DETAILS ABOUT NATIONAL DOCUMENTS.**  
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