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ICF Case Studies

Translating Interventions into Real-life Gains – a Rehab-Cycle Approach

Health Behaviour

Case Study 04



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Swiss Paraplegic Research
Guido A. Zäch Strasse 4
6207 Nottwil (Switzerland)
spf@paraplegie.ch
www.paraplegiker-forschung.ch

ICF Research Branch
in cooperation with the World Health Organization Collaborating Centre for
the Family of International Classifications (WHO-FIC) in Germany (at DIMDI)
www.icf-research-branch.org

Swiss Paraplegic Centre
Guido A. Zäch-Strasse 1
6207 Nottwil
www.paraplegiker-zentrum.ch

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Preface

Functioning is a central dimension in persons experiencing or likely to experience disability. Accordingly, concepts, classifications and measurements of functioning and health are key to clinical practice, research and teaching. Within this context, the approval of the **International Classification of Functioning, Disability and Health (ICF)** by the World Health Assembly in May 2001 is considered a landmark event.

To illustrate the use of the ICF in rehabilitation practice **Swiss Paraplegic Research (SPF)** together with **Swiss Paraplegic Centre (SPZ)**, one of Europe's leading (acute and rehabilitation) centres for paraplegia and spinal cord injury (SCI), performed a series of case studies. Conducting ICF-based case studies was one approach to address SPF's aim to contribute to optimal functioning, social integration, health and quality of life for persons with SCI through clinical and community-oriented research. The ICF-based case studies project began in October 2006.

In this project, persons of different age groups and gender and who are living with SCI of varying etiology and levels of severity, were accompanied during their rehabilitation at SPZ. The rehabilitation process is then described using the Rehab-Cycle® and the corresponding ICF-based documentation tools. Since persons with SCI are faced with a number of physical, psychological and social challenges, the case studies aimed to cover a broad spectrum of these challenges. With this in mind, each case study highlighted a specific theme of SCI rehabilitation.

A booklet is published for each case study conducted. To better understand the case studies described in these booklets, find below some basic information about SCI, the ICF, ICF Core Sets, the Rehab-Cycle® and the ICF-based documentation tools.

Spinal Cord Injury (SCI)

Spinal cord injury (SCI) is an injury of the spinal cord that results in a temporary or permanent change in motor, sensory, or autonomic functions of the injured person's body. The spinal cord is divided into four sections which can be further subdivided into individual segments:

- 8 cervical segments (C1 to C8)
- 12 thoracic segments (T1 to T12)
- 5 lumbar segments (L1 to L5)
- 5 sacral segments (S1 to S5)

The damage of the spinal cord is called lesion. Important functions such as mobility (motor functions) or sensation (sensory functions) fail below the lesion. To help determine future rehabilitation and recovery needs, the extent of a SCI in terms of sensory and motor functions is described using the American Spinal Injury Association (ASIA) impairment scale.

International Classification of Functioning, Disability and Health (ICF)

The ICF is a classification of the **World Health Organization (WHO)** based on the integrative bio-psycho-social model of functioning, disability and health. Functioning and disability reflect the human experience related to the body functions, body structures, and activities and participation. It is viewed in terms of its dynamic interaction with a health condition, personal and environmental factors.

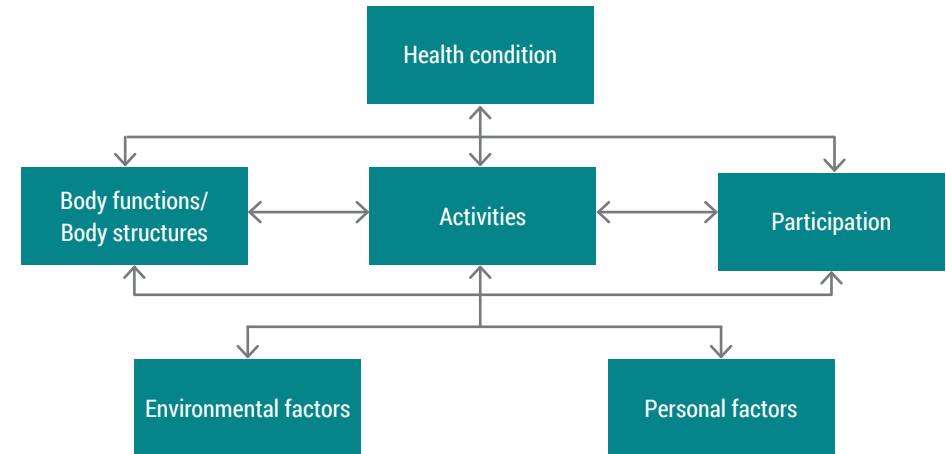


Figure 1: Bio-psycho-social model of functioning, disability and health

The ICF classification corresponds to the components of the model. Within each component, there is an exhaustive list of categories that serve as the units of the classification. ICF categories are denoted by unique alphanumeric codes and are hierarchically organized in chapter, second, third and fourth levels. When going from the chapter level to the fourth level, the category's definition becomes more detailed.

The classification also comprises so-called ICF qualifiers, which quantify the extent of a problem experienced by a person in a specific ICF category. Since environmental factors can also be facilitators, the ICF qualifier for facilitators are indicated with a plus sign.

Generic Scale of ICF Qualifiers	
0	NO problem (none, absent, negligible,...) 0-4%
1	MILD problem (slight, low,...) 5-24%
2	MODERATE problem (medium, fair,...) 25-49%
3	SEVERE problem (high, extreme,...) 50-95%
4	COMPLETE problem (total,...) 96-100%
8	not specified (used when there is insufficient information to quantify the extent of the problem)
9	not applicable (used to indicate when a category does not apply to a particular person)

ICF Core Sets

To facilitate the use of the ICF in clinical practice, it is essential to have ICF-based tools that could be integrated into the existing processes. The first step toward providing ICF-based tools for clinical practice was the development of ICF Core Sets. ICF Core Sets are shortlists of ICF categories that are considered to be most relevant for describing persons with a specific health condition or in a particular setting. In a rehabilitation setting an ICF Core Set can help guide the rehabilitation management process. ICF Core Sets have been developed for several health conditions e.g. for spinal cord injury, health condition groups e.g. for neurological conditions and for various settings. ICF Core Sets can serve as a basis when using the **ICF-based documentation tools** that follow the **Rehab-Cycle®**.

Rehab-Cycle® and corresponding ICF-based documentation tools

The Rehab-Cycle® is one approach that reflects the structured processes inherent in multidisciplinary rehabilitation management. The Rehab-Cycle® consists of an assessment phase, assignment phase, intervention phase and evaluation phase. An ICF-based documentation tool has been developed to guide each of the Rehab-Cycle® phases: the ICF Assessment Sheet, the ICF Categorical Profile, ICF Intervention Table and ICF Evaluation Display. These tools can help a multidisciplinary rehabilitation team to better understand the role of functioning within the rehabilitation process and to more comprehensively describe a person's functioning - hence support ICF-based rehabilitation management.

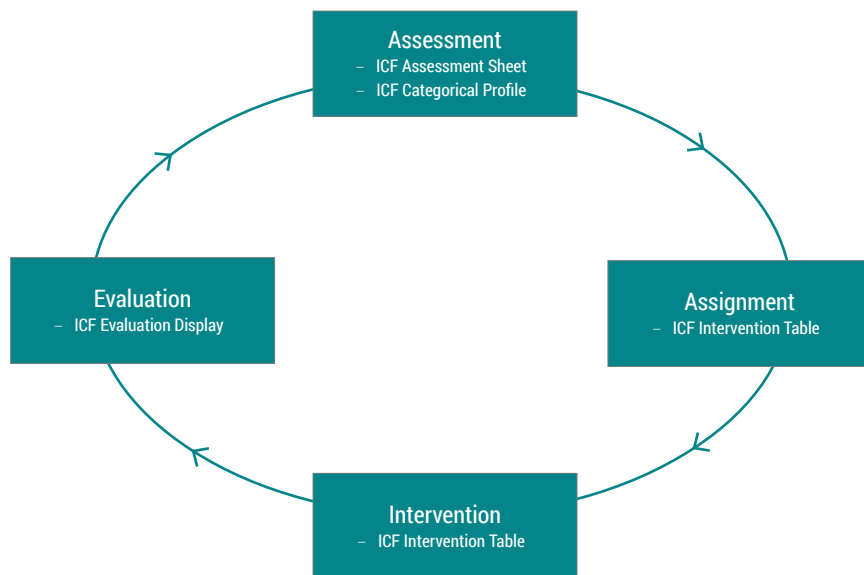


Figure 2: Rehab-Cycle®

You can find more detailed information about SCI, the ICF, ICF Core Sets, the Rehab-Cycle® and the ICF-based documentation tools on the website www.icf-casestudies.org.

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General Introduction



Health maintenance is considered a key outcome in the long-term care of persons with spinal cord injury (SCI). A person's health behaviour plays a major role in maintaining his or her health. Such behaviour encompasses a range of strategies that can be undertaken by the person and supported by the rehabilitation team. A key strategy toward health maintenance is the prevention of adverse events and comorbidities.^{1,2}

Individual health behaviour such as leading a healthy lifestyle may prevent and influence the development of complications. By offering education, counseling and training, rehabilitation programs hope to support a person with SCI toward preventing many avoidable complications and secondary conditions.

Health Maintenance

Health maintenance is an important outcome in persons with SCI that can be achieved through preventative strategies such as health behaviour promotion. **Health behaviour promotion** cover a spectrum of activities and interventions from the educational to the clinical. Such health behaviours on the part of the person with SCI can include activities like eating properly, getting

enough rest and exercise, maintaining a healthy weight, drinking in moderation and not smoking.^{2,3} Note however that solely focusing on preventative behaviours may be ineffective in reducing the long-term risk of secondary complications such as pressure ulcers (PUs). Promoting an overall healthy lifestyle and considering various

approaches toward health maintenance may be equally if not more valuable.⁴

Clinical interventions that foster health maintenance may include routine health monitoring and the treatment of complications such as pain and sexual dysfunctions.¹

Pressure ulcers (PUs) are the most common medical complications experienced by persons with SCI followed by pneumonia and genitourinary issues.^{1,5}

Box 1 | Health Maintenance and Secondary Complications in SCI

The prevention of secondary complications is a main objective of health maintenance. In SCI common complications include pressure sores, spasticity, urinary infections, pulmonary complications and pain. Gender-specific issues can also affect SCI patients including sexuality and fertility complications.^{1,5,6}

Notably, the World Health Organization (WHO) has addressed this issue by including health maintenance aspects in the International Classification of Functioning, Disability and Health (ICF). Here, they fall under the term, "looking after one's health," meaning "ensuring physical

comfort, health and physical and mental well-being." Maintaining one's health is further defined as "caring for oneself by being aware of the need and doing what is required to look after one's health, both to respond to the risks to health and to prevent ill-health."⁷ Note that these definitions clearly place the responsibility for health maintenance on the person with the health condition.

The importance of the person's involvement in his or her own health maintenance can be seen when dealing with pressure ulcers, also known as bedsores or decubitis.⁸

"Pressure ulcers (PUs) are the most common medical complications experienced by persons with SCI followed by pneumonia and genitourinary issues."

Box 2 | Pressure Ulcers

The National Pressure Ulcer Advisory Panel (NPUAP) and the European Pressure Ulcer Advisory Panel (EPUAP) define PUs as a "localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear".⁹ In addition, PUs cause inadequate blood supply and death of cells and tissue.¹⁰ The area where ulcers are found depends on whether an individual is bed-bound or a wheelchair user and on which body part is affected. About 95% of PUs occur in the lower part of the body.¹¹

PUs are generally classified by different stages of severity from stage 1 through 4. An additional stage called unstageable or unclassified stage is also available for the United States. These stages reflect progressing depth and the extent of lesions, and are defined as follows:⁹

Stage 1: Non-blanchable redness of intact skin and may be accompanied by changes in skin temperature, tissue consistency and/or sensation. Although dark skin may not show visible blanching, the color of the skin may differ from the surrounding area. Nevertheless, detecting stage 1 PUs remain difficult in persons with dark skin tones.

Stage 2: Partial thickness skin loss involving epidermis, dermis or both. The ulcer is usually superficial and presents clinically as an abrasion, blister or shallow crater.

Stage 3: Full thickness skin loss involving damage to or necrosis of subcutaneous tissue. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Clinically,

the ulcer presents as a deep crater with or without undermining of adjacent tissue. The depth of the PU is dependent on which body part it is located.

Stage 4: Full thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone or supporting structures e.g. tendon joint capsule. The ulcer can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule) making the occurrence of infection (osteomyelitis) and inflammation (osteomyelitis) of the bone or bone marrow more likely. Exposed bone/muscle is visible or directly palpable. Often includes undermining and tunneling. The depth of the PU is dependent on which body part it is located.

Common complications of PUs include increased mortality, osteomyelitis and sepsis (i.e. a systemic inflammatory response).¹¹

The prevalence of PU amongst persons with SCI range from 15% to approximately 45%.^{5, 12, 13, 14} and increases with time post-injury.¹⁵ In order to prevent PUs, risk factors must be identified. The Braden Scale for Predicting Pressure Ulcer Risk is one instrument that can be used to determine the risk of developing ulcers.^{16, 17} The risk of developing ulcers is influenced by multiple factors that include:^{18, 19}

- **Physical/medical factors** including the level and completeness of injury, activity and mobility, bladder, bowel and moisture, comorbidities such as incontinence, and an inability to feel pain (especially in complete SCI)

- **Psychological and social factors** including psychological distress, cognitive impairment, smoking, substance abuse, and treatment adherence
- **Extrinsic factors** such as type of wheelchair, cushion and surface of bed
- **Demographic factors** such as age (increasing risk over 40), duration of injury and education (lower education is linked to health outcomes in general)

These risk factors help to point out which patients require more closer observation and support in preventing PUs.^{18, 19}

The presence of PUs also influences the length of stay at hospital, resulting in greater treat-

ment costs than other SCI-associated medical complications.^{4, 14} Left untreated, PUs can lead to systemic infections and can be life-threatening. However, they are preventable and most often, treatment is successful.

Treatment guidelines for health professionals recommend the following interventions:^{18, 20}

1. prevention considerations
2. correction of underlying factors, including nutritional support
3. debridement options, infection control and wound care
4. stage-dependent interventions that range from conservative treatment to surgical closure methods

Given the frequency and seriousness of PUs among persons with SCI, treatment and health maintenance efforts are essential. This encom-

passes the person's health behaviour and understanding of his or her responsibilities and involvement in the interventions.

"...treatment and health maintenance efforts are essential. This encompasses the person's health behaviour and understanding of his or her responsibilities and involvement in the interventions."

In illustrating one person's experience with PUs, this case study aims to show that promoting health behaviours is the first step toward health

maintenance. To achieve success the responsibility for the interventions must be shared by rehabilitation team and the person with SCI alike.

Monica's Story



"During my first rehabilitation following the onset of spinal cord injury (SCI), I shared a room with a person who was suffering from pressure ulcers (PUs). Seeing her suffer, I promised myself that I would not allow that to happen to me. But just three months after I returned home, I acquired my first ulcer. And now two years later I'm back here again with my second ulcer."

Monica, January 2007

It had been over two years since Monica had required hospitalization. At the age of 67, she suffered a spinal cord injury (SCI) resulting from emergency surgery she underwent to treat an aortic aneurysm.²¹ The SCI was one of the unfortunate costs of a procedure that probably saved her life. Three months post-surgery Monica developed her first PU. Monica had always feared PUs and had hoped to avoid them. However, after the treatment for the initial ulcer and despite her initial pledge to avoid getting PUs, she made only limited efforts to prevent them from forming. Apparently,

the **lifestyle habits** that put her at risk were deeply ingrained.

To her detriment, Monica actively attempted to put the risks of PUs out of her mind. In doing so, she continued to act irresponsibly with regard to prevention, smoking and insufficiently caring for her skin. Consequently, this behaviour became counterproductive to maintaining her health and preventing complications. To her dismay, two years after her rehabilitation a new PU developed; this time the PU turned out to be a very serious complication.

Risk Prevention, Health Behaviour and Health Maintenance in Persons with SCI

Following SCI, persons face the challenge of having to develop a range of new health behaviours that allow them to both manage and overcome their physical limitations as well as prevent further SCI-related complications such as

PUs. Some of these behaviours are essential for survival as well as to help to maintain quality of life. Considering this, health maintenance education and behaviour adaptation can be viewed as a major part of the rehabilitation process.²²

In order to successfully treat and prevent complications like Monica's PUs, a rehabilitative strategy was needed that required the active involvement not only of the rehabilitation team but also of Monica herself. The rehabilitation team made efforts to facilitate Monica's involvement by strengthening her **self-management capacity and performance** as an integral aspect of health behaviour. This included:

- following her rehabilitation team's evidence-based treatment scheme (e.g. taking prescribed medication)
- integrating the theoretical knowledge she gained in the rehabilitation process into her daily routine (e.g. undertaking skin control activities) and in healthy activities (e.g. exercise and nutrition)

- avoiding those activities that potentially increase the risks of PUs (e.g. smoking, increased pressure on the skin areas at risk)

Both treatment and health behaviour strategies should ideally be based on a bio-psycho-social understanding as well as recognition of environmental factors.¹⁸

Although much is known about preventative health behaviours with regard to PUs, the condition remains prevalent among persons with SCI. Furthermore, it is not entirely clear why some persons do not adopt and maintain the health behaviours necessary for PU prevention.^{12, 23} Examining the **dynamic interaction between health (or protective) and risk behaviours** may provide some insight in possible influences on adherence to prevention strategies.

Box 3 | Protective and Risk behaviour

Both health (protective) and risk behaviours can occur in the same individual. The interaction of these behaviours results in four general risk groups. Figure 1 shows a bi-dimensional model of risk and protective behaviours.⁴

Risk behaviour is self-destructive and puts the person engaged in rehabilitation “at risk” for PUs. Protective behaviours, on the other hand, help to “buffer or reduce the likelihood of secondary conditions.” While risk behaviours such as smoking and alcohol abuse seem to influence the (re-) occurrence of secondary complications such as PUs, there is little empirical evidence for the direct relationship between specific protective behaviours and reduction of secondary complications.⁴ Despite this, knowing in which risk group a person is can help to guide the rehabilitative process.

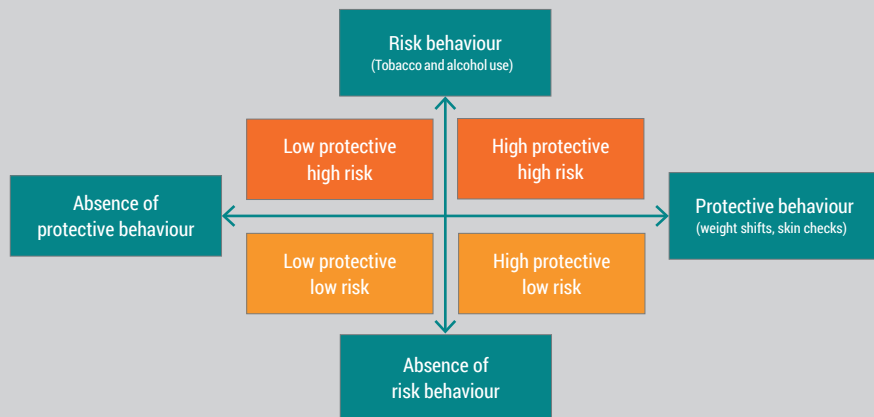


Figure 1: Bi-dimensional model of risk and protective behaviours⁴

When Monica was diagnosed with aortic aneurysm, her physician strongly recommended emergency surgery as Monica's condition was deemed to be life-threatening. However the surgery was known to be risky.²¹ After getting over the shock of hearing the unexpected diagnosis and some initial indecisiveness about having the recommended surgery, Monica made the decision to proceed with the life-saving aortic surgery.

The aortic aneurysm repair was performed successfully. However, it also resulted in a SCI (ASIA

B, at level of T8; see information about the ASIA impairment scale on page 4) – one of the most serious complications associated with aortic surgery. This resulting SCI required further treatment and rehabilitation during which Monica learned to adapt to living with incomplete paraplegia. However, the SCI caused complications; in the same year as the surgery, Monica acquired a serious stage 4 PU at the right greater trochanter i.e. the bony prominence at the top of the thigh bone (femur). This also resulted in osteomyelitis or bone infection.

After the successful treatment of the first PU two years passed. Unfortunately, Monica did not adopt any preventative health behaviours during this time. In fact one risk behaviour of PU was very much present in Monica's life i.e. her addiction to cigarettes. Monica smoked roughly 40

cigarettes per day, and had neither the desire nor the intention of quitting. To put this into context, the following statements offer some insight into Monica's own perceptions of health behaviour and feelings towards her situation:

“Paralysis to me means that I'm really no longer free, that I can't do the things I want to. In order to cope with this disability, I have to put my emotions aside. Emotions were certainly relevant in the beginning when I fell into a deep hole of depression. Now I have to constantly say to myself that this is simply the reality, and I've got to make the best of it. That's what I'm doing now... Sometimes though I start to cry all of a sudden and for no apparent reason. I get so angry for crying and not even knowing why...but then I go outside and have a cigarette. Then everything's OK again.”

“I just don't want to know the consequences of this disease ... I really don't want to know.”

Monica in 2007

In 2007 two PUs developed again on Monica's left and right hip that were diagnosed during a routine examination at the rehabilitation centre. While one PU was classified as a stage 2 ulcer, the other one was more seriously classified as a stage 4 ulcer. Subsequently, Monica was admitted to the

rehabilitation centre for treatment. Again, there was infection of the bone and a surgical intervention was necessary. After a successful operation, a standard post-operative management intervention was conducted without any further complications.

“A rehabilitative strategy to treat PUs should seek to implement a person-oriented, comprehensive approach...”

A rehabilitative strategy to treat PUs should seek to implement a **person-oriented, comprehensive approach**, not only focused on **re-gaining functioning** that existed prior to the PUs but also on **minimizing the risk** of recurrent ulcers and complications. Therefore risk factors have to be taken into account. See box 3.

In Monica's case, a number of risk factors clearly played a role in the recurrence of PUs. Four weeks after Monica's surgery, a comprehensive rehabilitation program that incorporated the Rehab-Cycle[®] was implemented.

“...not only focused on re-gaining functioning that existed prior to the PUs, but also on minimizing the risk of recurrent ulcers and complications.”

Assessment



In the assessment phase of the Rehab-Cycle®, Monica's perspective was considered important and complimentary to the perspective of her rehabilitation team.

Complimentary Perspectives on Functioning Status

Monica's view of her health situation reflected some issues with body functions and structures e.g. she did not feel pain and experienced sensations of touch as "dull", but focused more heavily on her ability to execute daily activities. For example, Monica experienced limitations imposed by her dependence on others for toileting, caring for her skin, changing body position and dressing. In particular, she feared disturbing her surgical incision in executing these activities. Monica also felt that she was no longer able to drive. Before admission to the rehabilitation centre, she experienced partial limitations in her ability to do housework; she was, however, able to cook for her son everyday.

When considering her ability to participate in the community or "just plain everyday life", Monica felt a general lack of freedom. Outside of the rehabilitation centre, it was important for her to socialize with friends and pursue her old hobby of fixing antiques and selling them at flea markets. She also enjoyed gardening and watching television. Additionally, from Monica's perspective there were environmental factors such as accessible accommodation, a supportive son, daily ambulatory care and health insurance, as well as personal factors that impacted her functioning status. Simple things like streets that are paved with cobblestones affected her mobility using a wheelchair. One of her important sources of strength was living in a house with a garden together with her son.

"Outside of the rehabilitation centre, it was important for her to socialize with friends and pursue her old hobby..."

While **Monica's views and experiences focused on activities and participation**, the **rehabilitation team detailed more body function issues**.

The rehabilitation team indicated that due to her diagnosis Monica was confronted with difficulties in controlling both her urination and defecation; consequently she required routine catheterization and manual elimination. Monica also had a reduced sense of touch and loss of muscle power below the level of the lesion. The reduced physical activity in the previous weeks weakened Monica's arms resulting in the inability to support any significant weight.

In addition, there were issues surrounding the structure of Monica's skin that were directly related to pressure sores. Although her surgical incision was healing quite nicely, the rehabilitation team thought there were serious shortcomings in many areas of activity. Monica was truly limited in looking after her health, caring for her skin, transferring herself and changing body positions, as

well as washing herself and using the toilet – all areas that had potential for improvement.

Not surprisingly, the rehabilitation team realized that Monica also had issues with her body image and how she perceived herself. In addition, many of Monica's personal factors presented barriers to her rehabilitation. Her addiction to smoking, emotional instability, low acceptance of her disease, limited self-responsibility and low levels of health behaviour all posed a challenge to the rehabilitation team.

Luckily, there were also several environmental factors that served as facilitators of Monica's rehabilitation. For example, Monica had access to appropriate medication and assistive devices and she had an adjustable air mattress. While these environmental factors are generally considered part of the standard care for persons with SCI, it is still important to note that these supported Monica's rehabilitation.

Goal-setting/Determination of Intervention Targets

In consideration of the assessment phase results, the goals for Monica's current Rehab-Cycle® were determined by the rehabilitation team, and documented on the ICF Categorical Profile.

See "Table 1: ICF Categorical Profile" on page 26 at the end of this booklet. To address the most important issues confronting Monica, the rehabilitation team defined 'health maintenance' and 'prevention of pressure ulcers (PUs)' as her **global goals**. Since the surgical incision was healing well and the standardized treatment scheme allowed Monica more activity, the rehabilitation team established a new **service-program goal** for this Rehab-Cycle® – independence in daily living.

To help achieve 'independence in daily living', three **cycle goals** were defined. Although Monica's skin was healing well, the rehabilitation team decided

that cycle goal 1 should be to continue focusing on improving the structure of the skin and in skin healing. Cycle goal 2 focused on 'mobility' i.e. reduction of Monica's physical limitations. Without any support, Monica remained bedridden at the start of this Rehab-Cycle®. Lastly, cycle goal 3 was defined as 'looking after one's health'; this included the prevention of future PUs and other secondary complications of spinal cord injury.

"...the surgical incision was healing well..."

Setting Intervention Targets

Intervention targets were established by the rehabilitation team for each of the three cycle goals. **Intervention targets** are ICF categories that correspond to specific goals outlined in the ICF Categorical Profile and that are to be addressed with interventions in a rehabilitation program. In Monica's case, the intervention targets related to the healing of the skin involved the 'repair functions of the skin' and the 'structure of areas of the skin'. The intervention targets identified to help improve mobility were 'supportive functions of the arms', 'transferring oneself' and 'changing basic body positions' – all of which needed to be addressed in consideration of Monica's heightened risk of developing PUs.

Addressing cycle goal 3 'looking after one's health' was more complex. The intervention targets that were identified for addressing cycle goal 3 were behavioural in nature. This included improvement of the body function 'body image' and some of the personal factors identified during the assessment phase i.e. emotional instability, low acceptance of disease, limited self-responsibility and low levels of health behaviour. The extent to which Monica was able to look after her health naturally had consequences on reaching and maintaining success in the other two cycle goals.

Assignment and Intervention

Assignment

Monica's rehabilitation team consisted of her physician, nurse, a physical and an occupational therapist and a psychologist. Each team member was assigned to attend to specific intervention targets.

The ICF Intervention Table (see "Table 2: ICF Intervention Table" on page 28 at the end of this booklet) depicts the assignment of each rehabilitation team member to the intervention targets

identified during the assessment phase and documented on the ICF Categorical Profile.

In Monica's case, the intervention targets corresponding to **personal factors and related to her health behaviour** were of special importance. While the **psychologist on the team was assigned to address these intervention targets**, all of the rehabilitation team members considered these important intervention targets in their 5-week treatment program.

"...intervention targets corresponding to personal factors and related to her health behaviour were of special importance...the psychologist on the team was assigned to address these intervention targets..."

Intervention

To improve Monica's ability to look after her health and help transform Monica's personal factors from being a barrier to becoming a facilitator of her health situation, the psychologist implemented specific therapeutic approaches. For example, **body awareness exercises** intended to help increase Monica's acceptance of her body image. **Behavioural therapy, counseling and instruction** were provided to help Monica accept her disease more, increase her self-responsibility, improve emotional stability as well as stop or

reduce smoking to 3 cigarettes/day. Counseling and instruction focused on strengthening Monica's self management abilities.

In addition to the **psychological interventions**, treatment that supported the repair functions of the skin was provided. This involved **medications, daily wound dressings, skin control and positioning the body** on a proper mattress. To improve Monica's mobility, the physical therapist provided **muscle power training and transfer training**.

Evaluation



Against medical advice and at Monica's insistence she was discharged pre-maturely. Consequently, the (re-)evaluation of her health status took place only five weeks after starting intervention.

"I'll leave the rehabilitation centre the day after tomorrow. The doctors wanted me to stay for one more week to make sure everything is OK. I have to say, I'm just tired of the hospital."

Monica, one day before pre-mature discharge

The evaluation of Monica's health status revealed that there was **some improvement**, even if minimal, in the intervention targets identified during the assessment phase and success in achieving some of her goals. For example, cycle goal 1 'structure and healing of the skin' was fully achieved; the post-operative incision and surgery were deemed to be successful. Likewise, the goals set for the intervention targets of **'repair functions of the skin' and 'structure of areas of the skin' were also achieved.**

However, cycle goals 2 'mobility' and 3 'looking after one's health' showed little improvement, not

reaching any of the expected targets. Mobility only slightly improved with regard to Monica's ability to transfer herself and with respect to muscle power. One cause of poor gains in cycle goals 2 and 3 was her lack of concern for the skin, although it was at risk for ulceration. Particularly problematic and worrisome for Monica's rehabilitation team was Monica's lack of progress in looking after her health. After initially rejecting the interventions provided by the psychologist assigned to her team, stating that she did not need counseling nor psychological support, Monica later reluctantly interacted with one resident psychologist. Thus, it is of little surprise that the goals set for the intervention targets associated with health behaviour and health maintenance for the prevention of pressure ulcers were not met.

Monica's impaired body image, considered a moderate problem, acceptance of her disease and health behaviour, both considered a moderate barrier, all remained unchanged. Monica's emotional instability also remained unchanged; it continued to be a mild barrier.

"Monica's lack of acceptance of her condition was considered a strategy to avoid addressing the risk factors..."

Monica's lack of acceptance of her condition was considered a strategy to **avoid addressing the risk factors**. For instance, there were episodes when Monica forgot to avoid pressure stress on her skin. She also showed little interest in self-checking her skin. The body awareness exercises implemented by the psychologist proved to be particularly challenging for her.

moderate problem. She was also able to reduce her smoking from 40 to 10 cigarettes per day.

"I've cut my smoking back to 8 or 10 cigarettes per day, and I'm happy keeping it there. I've been smoking for the last 40 years...I'm not going to stop now."

Monica

Despite these issues, Monica did show some improvement in 'looking after one's health' i.e. from being a complete problem to becoming a

The results of the evaluation of Monica's functioning status is visualized on the ICF Evaluation Display. See *"Table 3: ICF Evaluation Display"* on page 30 at the end of this booklet.

Discussion

Health maintenance is a critical factor that contributes to the quality of life of persons with spinal cord injury (SCI). While rehabilitation professionals can do much to influence a person's health maintenance efforts through interventions such as routine clinical monitoring, the person's own health behaviour is equally important, if not more.

Health behaviour has two essential components – risk behaviour and protective behaviour, each of which may be present to varying degrees in the same person. Under ideal circumstances in a rehabilitation setting, a person's risk behaviour is kept at a minimum while protective behaviour is maximized. However, promoting health behaviour in the context of health maintenance is challenging for everyone. Ultimately, the final **responsibility for health behaviours lies with the person** him- or herself.

Health behaviour is especially important in the prevention of pressure ulcers (PUs), a serious and potentially life-threatening complication of

“Risk behaviours such as smoking can increase the chances of developing PUs.”

Although Monica's surgery and the treatment of existing PUs were successful, the rehabilitation team felt that Monica was not “taking ownership” of her health condition and rehabilitation. This was apparent during the assessment phase of the Rehab-Cycle® when she indicated that her main issues lie primarily in restrictions in her body functions, and activities and participation. She did not acknowledge what her rehabilitation team had perceived as an important factor that contributed

SCI. PUs offer a good example of a secondary health condition that is significantly dependent upon a person's health behaviour. Risk behaviours such as smoking can increase the chances of developing PUs. Accordingly, protective factors include leading a healthy lifestyle and proper nutrition.

Monica's case is instructive in that it illustrates the challenges faced by rehabilitation professionals when focusing on health maintenance, including the implementation of preventative strategies and strengthening a person's own health behaviour, as an approach toward dealing with PUs.

to the problems she was facing in health maintenance – her own health behaviour.

“Health maintenance... contributes to the quality of life.”

In general, progress in improving Monica's health behaviour was disappointing. Given her addiction to cigarettes, unwillingness to give up smoking

and an overall limited effort in looking after her health, Monica seemed to reflect the high risk, low protective behaviour group outlined in Krause's bi-dimensional model of health behaviour.⁴ Her rehabilitation team felt that low levels of disease acceptance, self-responsibility and health behaviour in general were significant personal factors that put Monica at risk for developing PUs. The team had a feeling they would be seeing Monica again.

“Recurring PUs could certainly be one symptom that suggests a lack of acceptance of the patient's paralysis. Although Monica had formulated her goal as ‘going home with a completely healed ulcer’, to reach this there are certain requirements that have to be fulfilled... And I know that for someone like Monica, having to undergo psychological counseling is a difficult requirement. When I

“...low levels of disease acceptance, self-responsibility and health behaviour in general were significant personal factors that put Monica at risk for developing PUs.”

Lastly, more time and energy would have been reserved to support and strengthen Monica's responsibility and management of her own health, that in turn, was expected to contribute greatly to

consider her biography and her overall case, I think she'll likely return at some point with another ulcer. I really see psycho-therapeutic counseling as one important opportunity that will help her develop behaviours that promote ‘looking after herself.’”

Monica's physician

In re-evaluating Monica's case, the rehabilitation team agreed that the Rehab-Cycle® might have achieved a better outcome if it proceeded slightly differently. They would have placed more attention on aspects of ‘looking after one's health’, and they would have engaged Monica more in the goal-setting process. In addition, they would have considered setting ‘looking after her health’ as an overarching service-program goal rather than as a specific cycle goal. This may have led to better preventative health behaviour.

preventing future PUs. In the event of an unfortunate return visit, Monica's rehabilitation team will ensure that the Rehab-Cycle® takes a slightly different path than in the past.

Annex

- *Table 1: ICF Categorical Profile*
- *Table 2: ICF Intervention Table*
- *Table 3: ICF Evaluation Display*
- *Literature*
- *Questions*

Table 1: ICF Categorical Profile

ICF Categorical Profile												
Assessment												
Global Goal: Health maintenance; prevention of pressure ulcers (PUs)												
Service-Program-Goal: Independence in daily living												
Cycle goal 1: Structure and healing of the skin												
Cycle goal 2: Mobility												
Cycle goal 3: Looking after one's health												
ICF categories		ICF Qualifier				Goal Relation		Goal value				
		problem										
		0	1	2	3	4						
b1801	Body image										3	2
b260	Proprioceptive functions										-	-
b265	Touch function										-	-
b270	Sensory functions related to temperature... stimuli										-	-
b440	Respiratory functions										G	0
b525	Defecation functions										-	-
b620	Urination functions										-	-
b640	Sexual functions										-	-
b710	Mobility of joints										G	0
b7303	Power of muscles in the lower half of the body										-	-
b7603	Supportive functions of the arms										2	0
b820	Repair functions of the skin										1	0
s810	Structure of areas of the skin										1,G	0
d410	Changing basic body positions										2	0
d420	Transferring oneself										2	0
d465	Moving around using equipment										2	0
d510	Washing oneself										3	1
d520	Caring for body parts										SP	1
d530	Toileting										SP	3
d540	Dressing										SP	0
d570	Looking after one's health										3	1
d9204	Hobbies										-	-
d9205	Socializing										-	-
		Facilitator				Barrier						
		4+	3+	2+	1+	0	1	2	3	4		
e1101	Drugs										G	2+
e1151	Assistive products... for personal use in daily living										1, 2	4+
e1201	Assistive products... for personal mobility										2	4+
e155	Design, construction... of buildings for private use										-	-
e310	Immediate family										-	-
e325	Acquaintances, peers... and community members										-	-
e355	Health professionals										-	-
pf	Addicted to smoking										3	2
pf	Health behaviour										3	1
pf	Self-responsibility										3	0
pf	Acceptance of disease										3	1
pf	Emotional stability										3	0

Table 1: ICF Categorical Profile; ICF Qualifier: rate the extent of problems (0 = no problem to 4 = complete problem) in the components of body functions (b), body structures (s), activities and participation (d) and the extent of positive (+) or negative impact of environmental (e) and personal factors (pf). Goal Relation: 1, 2, 3 refers to Cycle goal 1, 2, 3. SP refers to Service-Program Goal. G refers to the Global Goal. Goal value refers to the ICF qualifier to achieve after an intervention.

Table 2: ICF Intervention Table

ICF Intervention Table													
	Intervention target		Intervention		Doc	Nurse	PT	OT	Psych	First value	Goal value	Final value	
Body function/structure	b1801	Body image	Body awareness exercises						x	2	2	2	
	b440	Respiratory functions	Inhalation			x					0	0	
	b710	Mobility of joints	Breathing exercises				x				0	0	
	b7603	Supportive functions of the arms	Passive movement				x			0	0	0	
	b820	Repair functions of the skin	Muscle power training (manual and with equipment)				x			2	0	1	
			Medication			x					0	0	0
	s810	Structure of areas of the skin	Daily wound dressing								0	0	0
	d410	Changing basic body positions	Daily skin control				x			3	0	0	
	d420	Transferring oneself	Changing body position in consideration of skin situation					x		4	0	1	
	d465	Moving around using equipment	Transferring while considering skin situation					x		4	0	1	
Activities/Participation	d510	Washing oneself	Control considering skin situation				x			4	0	0	
	d520	Caring for body parts	Assistance/Support				x			3	1	1	
	d530	Toileting	Assistance/Support				x			4	1	1	
	d540	Dressing	Support				x			4	3	4	
	d570	Looking after one's health	Assistance/Support				x			3	0	1	
	e1101	Drugs	Counseling/Instruction				x	x	x	3	1	2	
	e1151	Assistive devices... for personal use in daily living	Standardized treatment			x				2 (+)	2 (+)	2 (+)	
	e1201	Assistive devices... for personal mobility	Specific mattresses during course of rehabilitation							4 (+)	4 (+)	4 (+)	
	pf	Self-responsibility	Choice and ordering of new wheelchair					x		2 (+)	4 (+)	2 (+)	
	Personal factors	pf	Addicted to smoking	Behavioural therapeutic approach						x	2	0	2
pf		Health behaviour	Behavioural therapeutic approach						x	4	2	3	
pf		Acceptance of disease	Behavioural therapeutic approach						x	2	1	2	
pf		Emotional stability	Behavioural therapeutic approach						x	2	1	2	
pf			Behavioural therapeutic approach						x	1	0	1	

Table 2: ICF Intervention Table: Doc = Physician; PT = Physical Therapist; OT = Occupational Therapist; Psych = Psychologist. The first value refers to the rating at the initial assessment, the goal value refers to the rating that should be achieved after the intervention, and the final value refers to the actual rating at the second assessment or evaluation. ICF qualifiers were used to determine these ratings (0 = no problem to 4 = complete problem) in the intervention targets. For the interventions targets representing environmental (e) and personal factors (pf), the plus sign next to the value indicates a facilitator.

Table 3: ICF Evaluation Display

ICF Evaluation Display													
Assessment													
Global Goal: Health maintenance; prevention of pressure ulcers (PUs)												Not evaluated yet	
Service-Program-Goal: Independence in daily living													
Cycle goal 1: Structure and healing of the skin													
Cycle goal 2: Mobility													
Cycle goal 3: Looking after one's health													
ICF categories		ICF Qualifier				Goal Relation	Goal Value	ICF Qualifier				Goal Achievement	
		problem						problem					
		0	1	2	3	4		0	1	2	3	4	
b1801	Body image						3	2					+
b440	Respiratory functions						G	0					+
b710	Mobility of joints						G	0					+
b7603	Supportive functions of the arms						2	0					-
b820	Repair functions of the skin						1	0					+
s810	Structure of areas of the skin						1, G	0					+
d410	Changing basic body positions						2	0					-
d420	Transferring oneself						2	0					-
d465	Moving around using equipment						2	0					+
d510	Washing oneself						3	1					+
d520	Caring for body parts						SP	1					+
d530	Toileting						SP	3					-
d540	Dressing						SP	0					-
d570	Looking after one's health						3	1					-

		Facilitator				Barrier				Facilitator				Barrier					
		4+	3+	2+	1+	0	1	2	3	4	4+	3+	2+	1+	0	1	2	3	4
e1101	Drugs																		
e1151	Assistive products...for personal use in daily living																		
e1201	Assistive products...for personal mobility										G	2+							
pf	Addicted to smoking										1, 2	4+							
pf	Health behaviour										2	4+							
pf	Self-responsibility										3	2							
pf	Acceptance of disease										3	1							
pf	Emotional stability										3	0							

Table 3: ICF Evaluation Display; ICF Qualifier: rate the extent of problems (0 = no problem to 4 = complete problem) in the components of body functions (b), body structures (s), activities and participation (d) and the extent of positive (+) or negative impact of environmental (e) and personal factors (pf); Goal Relation: 1, 2, 3 refers to Cycle goal 1, 2, 3; SP refers to Service-Program goal; G refers to the Global Goal; Goal value refers to the ICF qualifier to achieve after an intervention; Goal achievement: + means achieved, - means not achieved

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Questions

- Q1. **Identify the most common complications associated with a spinal cord injury (SCI).** *(Refer to page 9 for the answer.)*
- Q2. **Describe the stages of pressure ulcers (PUs).** *(Refer to page 10 for the answer.)*
- Q3. **Name predictive factors for developing PUs in persons with SCI.** *(Refer to page 10 for the answer.)*
- Q4. **How does protective and risk behaviour influence the development of complications associated with SCI?** *(Refer to page 14 for the answer.)*
- Q5. **In the context of preventing further PUs, which intervention targets were identified to improve Monica's ability to look after her health?** *(Refer to page 18 for the answer.)*

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www.icf-casestudies.org



Swiss Paraplegic Research
Guido A. Zäch Strasse 4
6207 Nottwil (Switzerland)
www.paraplegiker-forschung.ch



Swiss Paraplegic Centre
Guido A. Zäch-Strasse 1
6207 Nottwil
www.paraplegiker-zentrum.ch

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