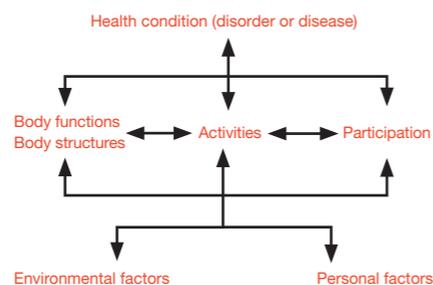


Swiss Paraplegic Research, located in Nottwil, Switzerland, is dedicated to people with Spinal Cord Injury (SCI). The project ‘Case studies describing persons with Spinal Cord Injury and their health care based on the ICF and the Rehab-Cycle’ was initiated to enhance the implementation of the International Classification of Functioning, Disability and Health (ICF) in rehabilitation practice. Within these brochures, we aim to familiarize the reader with the problems and needs of persons with spinal cord injury and the application of the ICF in their rehabilitation programs.

Functioning is a central parameter of people with health conditions. Within the approval of the **International Classification of Functioning, Disability and Health (ICF)** the World Health Organization provides for the first time a universal and internationally accepted framework and classification for functioning, disability and health.

The ICF is based on the integrative **bio-psycho-social model of functioning, disability and health**. Based on this model, functioning, with its components Body functions and Body structures and Activities and Participation, is considered as the result of the interaction between a Health condition and Per-



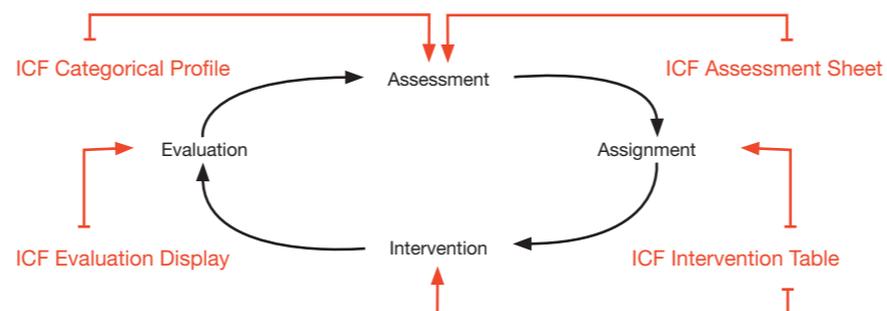
sonal- and Environmental factors. This bio-psycho-social model is the basis for the **classification of functioning, disability and health**. The ICF contains more than 1400 categories, making it a very comprehensive classification. The classification is hierarchically organized, with each hierarchic level the specificity of an ICF category increases. ICF categories are denoted by alphanumeric codes that denote their component and hierarchic level. An ICF code comprises so-called ICF qualifiers, which quantify the severity of a problem in the ICF categories:

- 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
- 9 – not applicable

To enhance the applicability of the classification, **ICF Core Sets** (including spinal cord injury) have been developed. An ICF Core Set provides a list of ICF categories selected from the whole classification for specific diseases or for different health-care contexts. ICF Core Sets can serve in clinical studies and health statistics (Brief ICF Core Sets) or guide multidisciplinary teams (Comprehensive ICF Core

Sets) to assess the level of functioning in persons with health conditions.

ICF-based documentation tools have been developed to facilitate the implementation of ICF Core Sets and to be used in a structured rehabilitation management, such as the Rehab-Cycle.



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You can find more information about the ICF and the description of the use of ICF tools and more case studies on our website: www.icf-casestudies.org



Tetraplegia is a serious condition resulting from SCI which leads to complete or incomplete paralysis of all four limbs. Those suffering from it face a range of difficult challenges, both physical and psychological. Personality, motivation and life perspective play no small role in the desired rehabilitative outcomes.

Even an incomplete loss of arm and hand functions has an immense impact on an individual’s ability to carry out everyday activities. Table 1 below illustrates in detail the American Spinal Injury Association **Impairment Scale (AIS)**³ of a typical impairment of this type.

The patient must overcome significant obstacles in order to interact with his or her environment and is often dependent upon others to accomplish everyday activities. Learning to cope with this situation is a complex process that affects a patient’s life quality.⁴ How a person deals with a condition such as tetraplegia may play a significant role in the true benefits of even proven surgical and medical interventions.



Table 1: ASIA Impairment Scale (AIS), touch functions are graded from 0 = absent, 1 = impaired to 2 = normal. Motor functions are graded from 0 = total paralysis to 5 = active movement with full range of motion and against gravity and provides normal resistance.

	Light Touch		Pink Prick		Motor Functions				
	R	L	R	L	R	L			
C2	2	2	2	2					
C3	2	2	2	2					
C4	2	2	2	2					
C5	2	2	2	2	5	4	Elbow flexors		
C6	2	2	2	2	5	4	Wrist extensors		
C7	1	1	1	1	0	0	Elbow extensors		
C8	1	1	1	1	0	0	Finger flexors		
T1	1	1	1	1	0	0	Finger abductors		
T2	1	1	1	1					
T3	1	1	0	0					
T4	1	1	0	0					
T5	1	1	0	0					
T6	1	1	0	0					
T7	1	1	0	0					
T8	1	1	0	0					
T9	1	1	0	0					
T10	1	1	0	0					
T11	1	1	0	0					
T12	1	1	0	0					
L1	0	0	0	0					
L2	0	0	0	0	0	0	Hip flexors		
L3	0	0	0	0	0	0	Knee extensors		
L4	0	0	0	0	0	0	Ankle dorsiflexors		
L5	0	0	0	0	0	0	Long toe extensors		
S1	0	0	0	0	0	0	Ankle plantar flexors		
S2	0	0	0	0					
S3	0	0	0	0					
S4-5	1	1	0	0					
Sum	26	+	26	14	+	14	9	+	9
			= 52			= 28			= 18

ASIA Impairment Scale:

X

- A** Complete: No motor or sensory functions is preserved in the sacral S4-S5
- B** Incomplete: Sensory but no motor function is preserved below the neurological level and includes the sacral segments S4-S5
- C** Incomplete: Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3
- D** Incomplete: Motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade of 3 or more.
- E** Normal: Motor and sensory functions are normal

For instance, one accepted procedure – **upper extremity surgery** – has been shown to greatly improve the functioning of the hand and arm in persons suffering from tetraplegia^{6, 6} resulting in positive life impacts, improvements in activities of daily living, increased independence and better quality of life.⁷

Box 1: Upper Extremity Surgery Used for the Improvement of Functioning in Tetraplegia

Upper extremity surgery is a proven surgical technique that has shown improvement in the hand and arm functioning of individuals suffering from tetraplegia. The procedure consists of two approaches (Moberg, 1975):

1. The restoration of elbow extension is achieved through the deltoid-to-triceps transfer. The totally paralyzed or weak triceps is restored utilizing the posterior deltoid, which is separately innervated.
2. The restoration of hand grip is achieved in four steps:
 - a) The construction, if needed, of a wrist extensor using the brachioradialis;
 - b) The increase of the mechanical advantage of the weak flexor system through the release of the flexor pollicis longus tendon;
 - c) Stabilization of the distal thumb joint with a Kirschner wire;
 - d) Tenodesis of the flexor pollicis longus tendon.

The goal of the surgery, as described by Moberg, is to allow a “tripod pinch” as well as a degree of voluntary motion of the fingers. Mohammed et al. (1992), in a study of 57 patients and 97 reconstructions, reported that 70% had good or excellent subjective results.



However, surgery and its associated post-operative management alone may not guarantee positive results, and the rehabilitative process that follows must include the patient’s individual perspective in order to maximize his or her actual benefits.^{8, 9, 10} In fact, a focus on “person-centered service” is increasingly emphasized in the field of rehabilitation management.¹¹

This case study aims to illustrate a key challenge and opportunity in translating the potential of such a beneficial procedure into positive, meaningful outcomes for an individual patient.

“The rehabilitative process includes the patient’s individual perspective.”



"The thing that bothers me most about my situation is depending on others so much. I cannot stand to have to wait until the nurse arrives in the morning to get me out of bed. The days that I wake up early are terrible. My inanimate body forces me to lie there! These are the moments in which you realize most how much you are at the mercy of others. I do not like to be dressed and washed. You feel almost like a baby. During the

day it is OK. I can handle almost everything I want to do. Something else that bothers me is to have to organize ahead of time when I go to bed or to have to ask one of my friends for help. ... But that's nothing compared to not being able to decide when I want to get up. I hope that something can still be fixed to change it."

– Peter five years following accident.

Peter was a 20 year-old plasterer at the time of his car accident five years ago. He presents with tetraplegia (sub C6, as a consequence of vertebral fracture of C5) AIS (ASIA Impairment Scale) B. Three years following the accident, Peter and his medical team decided that upper extremity surgery for his left arm and hand (he is left-handed) would improve his arm-hand function, lower his dependence and lead to improvements in his quality of life. This procedure was performed successfully and, following a period of rehabilitation without complications, Peter's ability to do many day-to-day activities improved and his independence increased.¹²

"These are the moments in which you realize most how much you are at the mercy of others."

"It made some things much easier, definitely, like eating and drinking. But also other things I enjoy, like driving to meet friends. I could more easily transfer myself to the car and play video games. These things were really much easier after this surgery, much less difficult.

Although it's not like I need less help. The nurses still have to come and do all the things I can't do by myself. It's just certain things have become a little less hard for me to do, and because of this, I started enjoying life more. And when you're stuck in a wheelchair, these small improvements make a big difference.

"...certain things have become a little less hard for me to do, and because of this, I started enjoying life more."

I would even be able to work in a call center if I wanted to. But you know, I'm not so excited about that. I'd rather just meet friends and play games ... so we'll see..."

– Peter, 2006

With his left arm-hand function much improved, Peter made the decision to have another operation on his right arm and hand. He wanted to become more independent (particularly in self-care when getting up in the morning and going to bed in the evening) by improv-

ing his ability to use his hand and arm while transferring. Five years following the accident, he went for upper extremity surgery for his right arm. This procedure was again completed successfully and was followed with standardized, post-operative medical management (see Table 2 on page 12 for more detail) by his health care team. This program meant that he was fitted with a wrist brace and arm cast and began physical and occupational therapy.

“He was fitted with a wrist brace and arm cast and began physical and occupational therapy.”

Additionally, due to restrictions imposed by his surgeon, Peter was not allowed to use his hand and arm, which forced him to use an electric wheelchair. Over the subsequent three weeks, no obvious problems arose, and Peter was able to easily accomplish the physical exercises prescribed for him.

After three weeks, however, a change in Peter’s behavior was noticed: Peter

became increasingly contrarian and difficult. He began to miss therapy sessions without offering any excuse, dismissing without concern his responsibilities as a patient. He drank and smoked more often with other patients late into the night, became fatigued in the daytime and disregarded rehabilitation center rules. Yet at the same time, Peter made inquiries into the possibility of weekend leaves to travel home and visit with friends. These mixed signals caught the attention of the health care team.

A member of the team recalls: *“Four weeks following the surgery, we met to discuss Peter’s evolution. We immediately focused on his behavior and the challenges it presented to his rehabilitation. We all agreed that Peter’s wish for weekend leaves was unrealistic. He could not drive and, most importantly, a weekend leave would possibly compromise the advances already made in the rehabilitative process.”*

“A change in Peter’s behavior was noticed: Peter became increasingly contrarian and difficult.”



Additionally, given his behavior, all of us were concerned that he would not continue with his treatment plan at home without supervision. All of us agreed that a shift in Peter’s behavior would be necessary for the best rehabilitative outcomes.

We also realized that we should also learn more about Peter’s own perspective. His change in behavior had to have an explanation. The psychologist eventually pointed out that we had underestimated how important common goal setting is, even in a case in which rou-

tine surgery is performed. Agreement on targets between Peter and us might result in increased intrinsic motivation and his own sense of responsibility to the rehabilitation program.”

“...a weekend leave would possibly compromise the advances already made in the rehabilitative process.”

Table 2: Treatment Scheme After Upper Extremity Surgery.

	Pre-surgery	Post-surgery	2 weeks post-sx	3 weeks post-sx	4 weeks post-sx	6 weeks post-sx	8 weeks post-sx
Wheel chair use / Positioning	Adaptation of electrical wheelchair with positioning of arm in 60° abduction and 60° horizontal adduction.	Positioning of arm: Dorsal position: 60° abduction, 60° abduction; Side position: arm above trunk.				Moving of manual wheelchair allowed.	
Braces		Adaptation of Scotch-Cast-Brace for wrist joint in 0° and positioning of thumb in 20° adduction.			Adaptation of thumb protection brace.	Removal of brace.	
Exercises	Muscle status of upper extremity.	Wrist: Isometric exercises of wrist extensors.	Making of movement cast for elbow flexion up to 30°.	Removal of cast.	Daily exercises with out brace for key grip, intensity of exercise only until thumb forefinger contact, no resistance. Exercises only with light objects such as sheets, paper, etc.	Increasing exercises for key-grip with increasing resistance and weights	Increasing exercises with heavier and larger objects for key-grip.
		Shoulder joint: Passive movement of arm in 90° abduction, 60° flexion and free extension, horizontal adduction. Elbow joint: No movement		Shoulder joint: No active elevation, assistive exercises allowed. Elbow joint: Flexion up to 30° with weekly increase of 30°, active extension in the beginning without resistance, later with increasing resistance.			Shoulder joint: No limitation in range of motion. Elbow joint: Increasing resistance for extension.
Activities						Beginning with exercising activities of daily living.	Increase training of active self-help-training. Transferring allowed.



A New Rehab-Cycle

The team decided to close the initial cycle (which focused on hand recovery using a standardized treatment scheme) and open a new cycle to address both the current physical situation and Peter's behavior.

Peter's physician and his health care team worked closely with a psychologist to carry out the assessment (see Figures 1 and 2 for detail). The inclusion of a psychologist in the team helped ensure that Peter's behavior was taken into account when evaluating his functioning status.

"I had to use this electric wheelchair, which I couldn't really get the hang of."

With Peter's view (i.e. the Patient's Perspective, detailed in Figure 1) a number of illuminating facts arose. His specific needs and complaints about body functions reflected those of many tetraplegic patients (pain, muscle weakness, lack of sleep, etc.). These were not exceptionally difficult to address and many of the perspectives on bodily function were well-met. This was illus-

trated by the fact that Peter was easily performing his physical therapy activities. His perspectives on activities and participation, however, were not so simple.

Again, here is Peter's point of view: *"You know, after this surgery, everything just seemed more difficult. I had to use this electric wheelchair, which I couldn't really get the hang of. And I even needed more help because I couldn't use my hand."*

"It was all really frustrating. I felt a bit resentful and I think I kind of took it out on the nurses and doctors."

And I felt like I was in prison. I wanted just to go home on the weekends to get away — play around a little, meet my friends, feed my cat. I really wanted more freedom.

In the hospital, I found it hanging out with my new friends in the ward, but that wasn't exactly the same as going home."

– Peter, 2006

In short, Peter found it difficult being a patient. His interest in the rehabilitation program was continually decreasing and he was oftentimes idle and bored, not to mention the fact that he felt frustrated and less-than-challenged. The procedure performed on Peter's arm and hand did not present any complications.

"And I felt like I was in prison. I wanted just to go home on the weekends to get away..."

From the health professional's perspective, Peter had the typical impairments and limitations of a patient with tetraplegia C6, ASIA B.

However, the psychologist made note of a number of personal factors that had a significant impact on his functioning. These included a passive lifestyle, poor compliance, and the absence of

a sense of responsibility and purpose. Therefore, one activity selected – "carrying out a daily routine" – incorporating these factors was included under the health professional perspective. These and other health professional perspectives can be seen in more detail in Figure 1 on page 16.

Additionally, the team documented Peter's problems based on the standardized language of the International Classification of Functioning, Disability and Health (ICF) and created a profile of Peter's functioning status that was later used for the Evaluation Display (see Figure 2 on page 20).

With all of these perspectives in mind, goals were discussed amongst the team. It was believed that clear and meaningful common goals would help to increase Peter's intrinsic motivation and foster his feeling of responsibility toward the program.

So, with Peter's input, a 6-month global goal was established to reduce ambulant care to once daily. The first service-program goal would allow Peter to fulfill his wish and go home on weekends.



Figure 1:
ICF Assessment Sheet

	Health professional's perspective			
Patient's Perspective	Sometimes I can't sleep because of my snoring neighbor I have pain in my lower belly I have pain in my right upper arm My sensitivity is not like it used to be before the injury Currently I gain bodyweight My body temperature increases due to heat I have muscles that are weak My muscles exhaust faster I have a risk for pressure sores (especially on my back)	I need support in transferring from bed to wheelchair Currently, I can't transfer into the car by myself I hope to improve putting objects down with my hands I can't pick up things At the moment, I can do less with my right arm Driving long distances with the wheelchair is exhausting I need support in dressing I need support in washing myself I can't drive the car by myself	No sporting activity I want to spend time with my friends I would like to go home for the weekend Playing computer games I would like to drive a motorbike Maybe I will work in the summer I want more independence	
	Body-Structures / Functions	Activities	Participation	
Health Professional's Perspective	Sleeping is impaired Touch functions impaired related to diagnosis No proprioceptive functions related to diagnosis Fecal continence completely impaired Urinary continence completely impaired Mobility of joints of right upper extremity reduced by surgery Muscle power functions of upper extremity reduced Muscle spasticity existing but without influence on functioning Endurance of muscles of upper extremity Reflex functions impaired regarding to diagnosis Prop-up functions of arms reduced, e.g. not allowed Scars are healed Structure of the skin — at risk	Completely limited in changing body positions Completely limited in transferring from seat to seat Grab functions reduced Use of hand and arm reduced Moving the manual wheelchair not allowed Completely limited in washing body parts Partially limited in caring for body parts Completely limited in toileting Completely limited in dressing Partially limited in eating Partially limited in drinking Carrying out daily routine limited		
	Environmental Factors	Personal Factors		
	Assistive devices for daily living Manual / electrical wheelchair Adapted car Wheelchair-adapted flat Disability payment, Social welfare Ambulant care 2x daily My family is important to me My friends are important to me My cat is important to me Fellow human beings are mainly friendly Care in Rehabilitation is good	25-year-old male Single, living on his own Plasterer, unemployed Poor purposefulness	I have adapted to loss of functions Being patient is difficult Passive lifestyle Poor compliance Poor sense of responsibility	

This service-program goal was of some concern as it might have compromised the potential outcomes of the surgery.

So the service-program goal was in turn dependent upon three cycle goals which, importantly for Peter's case, were all informed by both the patient and health professional perspectives. This gave both parties agency in the goals themselves and in the processes leading up to them.

"...the cycle goals selected involved Peter and inferred "ownership" and a shared responsibility toward the rehabilitative program."

The cycle goals included:

- Transferring oneself: Independent transfer to his wheel chair and car within 2 weeks
- Hand and arm use: Drinking with right arm
- Carrying out a daily routine: Participating in all treatment sessions.

Once the cycle goals were established, the team identified which intervention targets were related to the cycle goal and, once improved, should also lead to an improvement in the cycle goal. The team took into account those intervention targets that were most relevant to the cycle goal and that were modifiable.

The intervention targets selected for Peter's ability to transfer himself to his wheelchair and car, for increasing fine hand and arm use, and for carrying out a daily routine are represented in Table 3.

Once the targets were decided upon, the appropriate interventions were discussed, selected and assigned to the corresponding health professionals (as seen in detail in the Intervention Table).

"...the psychologist, whose intervention included a realistic behavioral plan with attainable goals that incorporated progressive levels of difficulty from Peter's point of view."

At the end of each week, both Peter and the psychologist evaluated the extent to which the goals had been reached.

As each of the three interventions (compliance, responsibility and purposefulness) were of particular importance – as well as cornerstones of all the goals – it was hoped that addressing these specifically would further support the other cycle goals as well as the program goal.

For all other targets, such as arm and hand use, the specific indicators and instruments used to monitor the interventions (for example, the time needed to play "a functional game") were selected by the respective health professionals.

Based on Peter's development following surgery and his change of behavior, it was difficult to predict the value that should have been attained by the subsequent assessment. Some health professionals decided to make a prediction and adapt it during the intervention period if necessary.

Figure 2: ICF Intervention Table;
The values are rated within the ICF qualifier.*

Intervention target		Phy	Nurse	PT	OT	Psych	First value*	Goal value*	Final value*
Body function / -structure	s810 Structure of the skin	-	x	-	-	-	0	0	0
	b134 Sleep functions	-	x	-	-	-	2	0	1
	b28012 Pain in lower belly	x	-	-	-	-	2	1	1
	b28014 Pain in the right upper limb	x	-	-	-	-	3	0	0
	b7101 Mobility of several joints	-	-	x	x	-	2	0	0
	b7300 Power of isolated muscles (M. triceps brachii)	-	-	-	x	-			
	b7401 Endurance of muscle groups	-	-	x	-	-	3	2	2
	b7603 Supportive functions of the arms	-	-	x	-	-	3	1	1
	b820 Healing of the scars	-	-	x	-	-	3	1	2
	b820 Healing of the scars	x	-	-	-	-	0	0	0
Activity / Participation	d230 Carrying out daily routine	-	-	-	-	x	3	1	1
	d410 Changing basic body position	-	x	x	-	-	4	0	2
	d4200 Transferring oneself while sitting	-	x	-	-	-	4	0	2
	d440 Fine hand use	-	-	x	-	-			
	d445 Hand and arm use	-	-	-	x	-	4	2	2
	d510 Washing oneself	-	-	-	x	-	3	2	2
	d520 Caring for body parts	-	x	-	-	-	4	3	3
	d530 Toileting	-	x	-	-	-	3	3	3
	d540 Dressing	-	x	-	-	-	4	4	4
	d550 Eating	-	x	-	-	-	4	3	4
d560 Drinking	-	x	-	-	-	3	2	2	
Persona I factors	pf Compliance	-	x	-	-	-	3	1	1
	pf Sense of responsibility	-	-	-	-	-			
	pf Purposefulness	-	-	-	-	-	3-	1-	1-
Intervention		Phy	Nurse	PT	OT	Psych	First value*	Goal value*	Final value*
Daily monitoring		-	x	-	-	-	0	0	0
Daily monitoring		-	x	-	-	-	2	0	1
Medication		x	-	-	-	-	2	1	1
Medication		x	-	-	-	-	3	0	0
Active / passive exercises based on treatment scheme		-	-	x	x	-	2	0	0
Adapting brace for limiting ROM		-	-	-	x	-			
Active / passive exercises based on treatment scheme, Manual and machine muscle power training 6 weeks postsurgery		-	-	x	-	-	3	2	2
Repetitive exercises. Endurance training with arm ergometer 6 weeks post-surgery		-	-	x	-	-	3	1	1
Repetitive prop-up training 6 weeks post-surgery. Muscle power training with machine 6 weeks post-surgery		-	-	x	-	-	3	1	2
Daily wound control		x	-	-	-	-	0	0	0
Behavioral approach		-	-	-	-	x	3	1	1
Support, assistance		-	x	x	-	-	4	0	2
Support, assistance		-	x	-	-	-	4	0	2
Functional training, Prop up training 6 weeks post-surgery		-	-	x	-	-			
Functional games		-	-	-	x	-	4	2	2
Functional games		-	-	-	x	-	3	2	2
Support, assistance		-	x	-	-	-	4	3	3
Support, assistance		-	x	-	-	-	3	3	3
Support		-	x	-	-	-	4	4	4
Support, assistance		-	x	-	-	-	4	3	4
Assistance		-	x	-	-	-	3	2	2
Assistance		-	x	-	-	-	3	1	1
Behavioral approach		-	-	-	-	-			
Behavioral approach		-	-	-	-	x	3-	1-	1-
Behavioral approach		-	-	-	-	-			



Just two weeks before completing the first Rehab-Cycle, Peter asked to be discharged and was released against the recommendations of his health care team. Unfortunately, he was unable to be dissuaded and a final evaluation was performed just before he left the clinic — significantly earlier than originally intended.

Other critical interventions, such as those grouped under personal factors, did however show some improvement. Similarly, some cycle goals were not achieved. It is believed that this was a result of his early departure from the program and that had he remained in the program, more targets and goals would have been met.

“Peter asked to be discharged and was released against the recommendations of his health care team.”

This evaluation compared the first assessment of the intervention targets with the final outcomes. His Evaluation Display showed that his outcome evaluation met most of the intervention targets (see Figure 2). Although there was some improvement in all of the targets, the desired values were not reached in a number of intervention targets, including changing body position and the ability to transfer himself.

“Although there was some improvement in all of the targets, the desired values were not reached in a number of intervention targets.”

Figure 3: ICF Evaluation Display; 1, 2, 3: Relation Cycle goals; SP: Relation to Service-Program goal; ICF Qualifier* rate the extent of problems (0=no problem to 4=complete problem) in the components of body functions (b), body structures (s), activity and participation (d) and the extent of positive (+) or negative impact of environmental (e)- and personal factors (pf).

		Assessment						Evaluation											
		ICF Qualifier					Goal relation	Goal Value	ICF Qualifier					Goal achievement					
Problem		0	1	2	3	4			Problem	0	1	2	3	4					
Global Goal: Ambulant care only once daily		[Bar chart: 0-1]						2		not evaluated yet					-				
Service-Program Goal: Weekend holiday		[Bar chart: 0-2]						2		not evaluated yet					-				
Cycle goal 1: Independent transferring while sitting		[Bar chart: 0-3]						1		[Bar chart: 0-1]					-				
Cycle goal 2: Hand and arm use: Drinking		[Bar chart: 0-2]						1		[Bar chart: 0-1]					+				
Cycle goal 3: Carrying out daily routine (Treatments)		[Bar chart: 0-2]						1		[Bar chart: 0-2]					-				
ICF categories																			
b134	Sleep functions	[Bar chart: 0-1]					SP	1		[Bar chart: 0-1]					-				
b28012	Pain in stomach and abdomen	[Bar chart: 0-2]					SP	1		[Bar chart: 0-1]					+				
b28014	Pain in upper limb	[Bar chart: 0-3]					1,2	0		[Bar chart: 0-1]					+				
b7101	Mobility of several joints	[Bar chart: 0-3]					2	0		[Bar chart: 0-1]					+				
b7301	Power of muscles of one limb	[Bar chart: 0-4]					2	2		[Bar chart: 0-2]					+				
b7401	Endurance of muscle groups	[Bar chart: 0-3]					1,2	1		[Bar chart: 0-1]					+				
b7603	Supportive functions of the arms	[Bar chart: 0-4]					1	2		[Bar chart: 0-2]					+				
b820	Repair functions of the skin	[Bar chart: 0-1]					SP	0		[Bar chart: 0-1]					+				
s810	Structure of areas of the skin	[Bar chart: 0-1]					SP	0		[Bar chart: 0-1]					+				
d410	Changing basic body positions	[Bar chart: 0-4]					1	1		[Bar chart: 0-2]					-				
d4200	Transferring oneself while sitting	[Bar chart: 0-4]					1	1		[Bar chart: 0-2]					-				
d440	Fine hand use	[Bar chart: 0-4]					2	1		[Bar chart: 0-1]					+				
d445	Hand and arm use	[Bar chart: 0-3]					2	2		[Bar chart: 0-2]					+				
d510	Washing oneself	[Bar chart: 0-4]					SP	3		[Bar chart: 0-3]					+				
d520	Caring for body parts	[Bar chart: 0-4]					SP	3		[Bar chart: 0-3]					+				
d530	Toileting	[Bar chart: 0-4]					SP	3		[Bar chart: 0-3]					+				
d540	Dressing	[Bar chart: 0-4]					SP	3		[Bar chart: 0-4]					-				
d550	Eating	[Bar chart: 0-3]					SP	2		[Bar chart: 0-2]					+				
d560	Drinking	[Bar chart: 0-3]					SP	1		[Bar chart: 0-1]					+				
		Facilitator		Barrier					Facilitator		Barrier								
		4+	3+	2+	1+	0	1	2	3	4	4+	3+	2+	1+	0	1	2	3	4
pf	Compliance	[Bar chart: 0-3]					3	0	-	[Bar chart: 0-1]									
pf	Sense of responsibility	[Bar chart: 0-3]					3	0	-	[Bar chart: 0-1]									
pf	Purposefulness	[Bar chart: 0-3]					3	0	-	[Bar chart: 0-1]									

As illustrated in Peter’s case, the translation of the results of a surgical intervention such as upper extremity surgery into positive, meaningful outcomes for a patient can present a significant rehabilitative challenge.

Real-life results are dependent not only upon the success of medical intervention, but also on the patient himself and the subsequent rehabilitative interventions. These are effected by an individual patient’s engagement and acceptance of responsibility for the process, as well as the healthcare professional-patient interaction.

Peter’s case offers an illustrative example. While it is well-documented that upper extremity surgery is effective for increasing functionality,^{13, 14, 15} surgery and the treatment scheme alone may not guarantee positive results, as was evident three weeks into Peter’s medical management.

“...an absence of common, agreed-upon goals beyond those set by the surgery treatment scheme impacted his overall motivation...”

The initiation of a new ICF Rehab-Cycle after having realized that Peter’s situation was not improving was certainly beneficial. As is well documented from studies, the introduction of common and meaningful goals leads to increased motivation in patients.^{16, 17}

Notably, the ICF has been promoted as a conceptual framework for documenting the patient’s problems related to hand function after upper extremity surgery in tetraplegic patients.¹⁸

In Peter’s case, an absence of common, agreed-upon goals beyond those set by the surgery treatment scheme impacted his overall motivation towards the program. Thus, proper goal-setting based upon an individual patient and undertaken through shared decision-making is critical. This process offers healthcare teams a valuable tool for determining a patient-oriented rehabilitation plan.^{19, 20}

Goals have been shown to achieve positive results in self-care tasks among patients and also function well as a concrete measure with respect to rehabilitation.^{21, 22} Peter's behavior exemplified a strong need for common goal setting and offered an opportunity for the health care team to better define goals that were expected to lead to real and positive rehabilitative outcomes.

This case highlights the need for both healthcare professional and patient perspectives:^{23, 24} a single perspective gives an incomplete picture. And although the patient and health care perspectives seem at times to be contradictory (such as "can't pick things up" and "wearing a brace and cast"), the patient perspective facilitates a process based on goal-oriented solutions that can increase his or her motivation.

When both perspectives are understood, common goals can be defined. In Peter's case, it was the involvement of both the patient, his physician and a psychologist who together defined which were the most appropriate and achievable goals: one was Peter's own – transferring / changing position; one

arose from the healthcare perspective – carrying out a daily routine; and one was a discussion point – increasing grab functions. All of the cycle goals worked to achieve the program goal that was central to Peter's very own wishes: going home on the weekends.

“When both perspectives are understood, common goals can be defined.”

Once these common goals were set, Peter showed continual improvement in both compliance and functioning. Although he discharged himself from the rehabilitation center two weeks before the end of the program and did not meet all targets in the final evaluation, once concrete and realistic goals had been established, continual and significant progress was made.

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Q1. How does ASIA classify spinal cord injuries? Explain the classification with an SCI ASIA score of B C5/C6.

Refer to page 4 and 5 for the answer.

Q2. What is performed in the Moberg Surgery?

Refer to page 6 for the answer.

Q3. What are the three distinct levels of goals determined during the goal-setting? Describe them using Peter's case as an example.

Refer to page 18 for the answer.

Q4. Which intervention targets would you identify to influence the cycle goals? Refer to Table 4 for insights into this question.

Refer to page 20 for the answer.

Q5. Why is common goal-setting, using the ICF as framework, important for rehabilitation planning?

Refer to page 25 for the answer.



Swiss Paraplegic Research
P.O. Box
CH-6207 Nottwil, Switzerland

Phone: +41 41 939 6565
Fax: +41 41 939 6566
www.paranet.ch/sw13412.asp
E-Mail: spf@paranet.ch



Swiss Paraplegic Centre
P.O. Box
CH-6207 Nottwil, Switzerland

Phone: +41 41 939 5454
www.paranet.ch/sw13871.asp
E-Mail: spz@paranet.ch

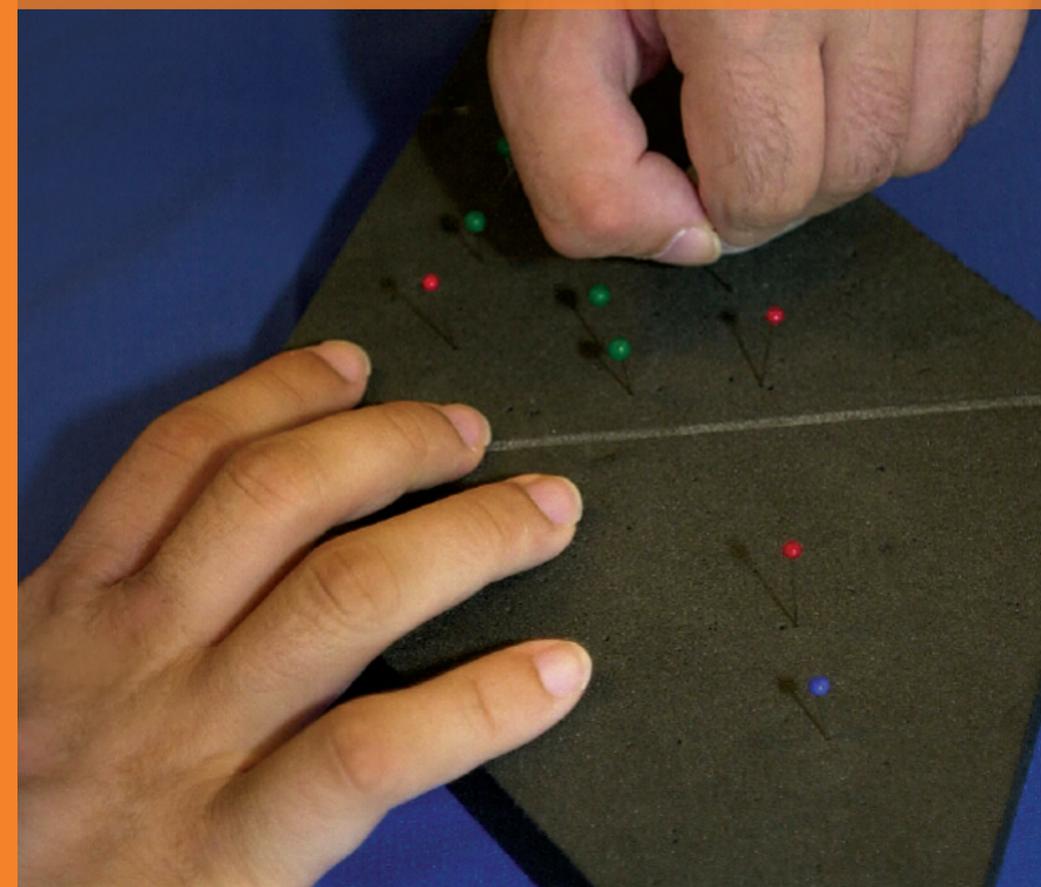
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Case Studies

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



Case Study 1: Translating Interventions into Real-Life Gains – A Rehab-Cycle Approach

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