

Patient-Radar – Application Scenario

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1. Introduction

In this document I am going to introduce a use case scenario that describe the patients' transferal management process. Such a process takes into account administrative aspects only and starts with the hospitalization of patients in an acute hospital and ends with the transfer of the patient to the most suitable rehabilitation clinic. The scenario is based on a real case provided by the transferal manager Karin Zimmermann from the Patient-Radar project partner - hospital of Grabs. The real case was carefully chosen in the workshop held on the **14th of March 2016** in the hospital of Grabs. In order to develop a consistent use case scenario with respect to the research project Patient-Radar, the information model (created on the 23rd of July 2015) together with other documents produced in the project were taken into account. Therefore, terms and concepts are consistently used. As additional sources to better refine the use case scenario (e.g. precise definition of roles, activities and data objects), I consulted literature review as well as Swiss and international official health-related websites together with related documents. These are all referenced along this work. The main contribution in terms of literature review is provided by the book (Walker & Betz 2013) authored by Walker and Betz that in 2013 won the Business Engineering Award at the University of St. Gallen. The combination of several sources raised new terms and concepts that were added in the existing information model accordingly.

The original version of the information model document is in German, some terms were first translated in English and then double-checked in English-health-related research papers for authenticity reasons.

2. Scenario

Transferal processes can differ based on two types of patient admission, i.e. **emergency entry** or **elective entry**. Elective entries' processes generally follow a quite standard procedure, for which the administrative process flow is mostly known in advance. Cases with **musculoskeletal diseases** are mainly

Commented [EL1]: Rehabilitation Clinic is-a Organizational Unit (OU)

of elective admission type. Conversely, administrative processes for emergency cases might be rather unpredictable, and the related transferal action plan can vary from case to case. In order to describe a complex case we focused on a particular emergency case, i.e. a patient affected by **geriatric and neurological diseases**. Patients as such are said to be **comorbidity cases**, which means they suffer from multiple disease at the same time. In their study, Uijen & van de Lisdonk (2008), shown that the number of patient affected by multiple diseases tripled in twenty years (1985-2005). Comorbidity cases are therefore becoming increasingly frequent and require support. The goal of this application scenario is to comprehensively describe a comorbidity case with an emergency entry.

This will provide the basis for deriving requirements for a domain specific modelling language (DSML) elements.

For privacy reasons, any kind of real patient's information such as name, patient ID, case number etc. have been modified in the scenario.

2.1 Emergency entry for a geriatric patient with a stroke

The patient Peter Müller arrives at the **emergency room** of the hospital of Grabs in Switzerland. As soon as he arrives the **check-in** is accomplished at the **registration window** by the **administrative staff**. More in detail, the latter accomplishes the following:

- Initiate registration of the patient Peter Müller;
- Open the patient case in the Patient Administration System (PAS) (most of these info are described in Table 3).

Next, the patient is sent to the **waiting room**. After a while the so called **rapid assessment nurse** (also known as **triage nurse**) shows up and does the following:

- **Greets the patient;**
- **Identifies the level of severity of the case** – She assigns a level of emergency severity called ESI - Emergency Severity Index (Gilboy et al. 2011). This is also known as “*triage activity*” and it prioritizes patients based on the urgency of treatment for the patients conditions. The triage nurse determines the priority or level by evaluating both patient acuity and resource needs. Levels range between 1 - high-risk patients and 5 – low-risk patients. The activity can also be performed by an **Emergency Medical Technician (EMT)**. In our case the ESI level assigned to the patient is 3. Figure 1 depicts the triage algorithm, and a level of 3 means that the patient needs more than one resource such as labs, nebulized medication and specialty consultation, but vital signs are not in danger (see the ESI triage legend in the Appendix);
- Speak with a family member/person who waits in the waiting room.

Commented [EL2]: Comorbidity Case. Polymorbidity and multimorbidity are all synonyms.

Commented [EL3]: Is-a OU part of the OU “Acute Hospital”

Commented [EL4]: Activity “Patient Registration” – Role: Administrative Staff

Commented [EL5]: Role “Administrative Staff”

Commented [EL6]: Role “Rapid Assessment Nurse”

Commented [EL7]: Role “Triage Nurse” synonym of “Rapid Assessment Nurse”

Commented [EL8]: Activity “Greets the Patient” – Role: Triage Nurse

Commented [EL9]: Activity “Assign ESI Level” – Role: Triage Nurse or Emergency Medical Technician (EMT) (it includes decision rules)

Commented [EL10]: Role: EMT

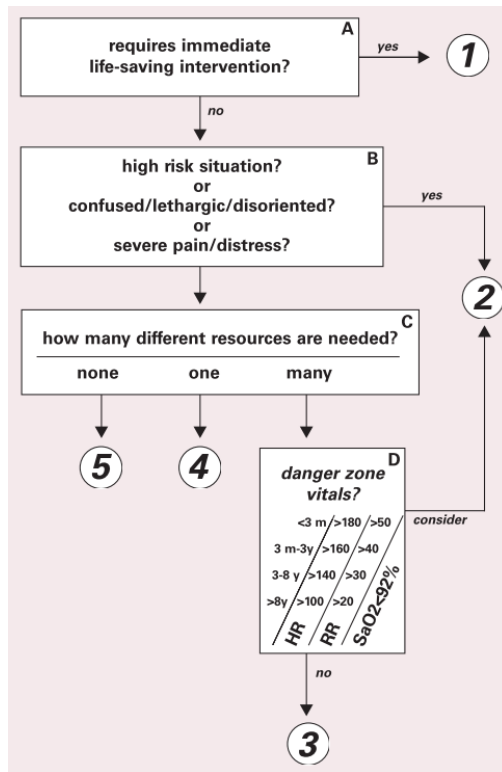


Figure 1. ESI Triage Algorithm (Gilboy et al. 2011)

The waiting room does not have any worse cases, therefore after a few minutes, the patient is led to a bunk. Next, an expert nurse (also known as MTE¹ nurse) does the initial assessment of the patient by collecting the vital signs and reporting results to a resident/intern physician. The resident/intern doctor (also known as MTE-physician) checks also the case and sees that a doctor who specializes in neurology is required. Hence, a neurologist performs the first examination, and provides both prescription and diagnosis to the case.

The patient is a **complex case** as he suffers from more than one disease, i.e. geriatric patient with a stroke (presence of *comorbidity* (Valderas et al. 2009)) - Haemorrhagic stroke with comorbidity: heart malfunctions, diabetes and osteoporosis. The neurologist consults a geriatric physician and then **prescribes medication** according to the patient needs. Medications aim at controlling bleeding, reducing brain swelling and stabilizing the vital signs such as blood pressure, blood sugar level, decreasing fever and seizures.

¹ Medical Team Evaluation

- Commented [EL11]:** Role "Expert Nurse"
- Commented [EL12]:** Role "MTE nurse" synonym of "Expert Nurse"
- Commented [EL13]:** Activity "Initial Patient Assessment" – Role: MTE nurse
- Commented [EL14]:** Role "Resident/Intern Doctor"
- Commented [EL15]:** Role MTE-physician, synonym of Resident/Intern Doctor
- Commented [EL16]:** Activity "Check Patient Case" – Role: MTE-physician
- Commented [EL17]:** Role "Neurologist" is a specialization of Physician
- Commented [EL18]:** data objects "Prescription" and "Diagnosis" as outcome of the activity "Check Patient Case"
- Commented [EL19]:** Activity "Consult Specialized Physician" - Roles: Neurologist and Geriatric Physician
- Commented [EL20]:** Role: Geriatric Physician

The prescribed medication is entered in a free-text box “**medication list**”. Additionally, some or all (it is out of the scope of the scenario to provide a precise description of the prescribed medication) of the following aspect are specified, including *frequency* and *dose*:

- *Enteral drug administration,*
- *Parenteral drug administration,*
- *Alternative medication,*
- *Single medication.*

The **medical diagnosis**, **medication list**, together with the **Indication**² (in German this is called “Indikation”, which are the *reasons for the treatment*) are part of the **short report** (see Table 1), which is stored in the **Hospital Information System (HIS)**³. The short report includes medical data that *may change over time* as generally patient’s conditions are luckily to evolve along the treatment.

Table 1. Short Report

Short report elements	Attributes	Storage
Medical Diagnosis	Description	Hospital Information System (HIS)
Medication List	Enteral drug administration – Name, Dose and Frequency	
	Parenteral drug administration – Name, Dose and Frequency	
	Alternative medication – Name, Dose and Frequency	
	Single medication – Name, Dose and Frequency	
Indication	Description	

Next, the neurologist enters further **medical data** onto the HIS. These are shown in Table 2 and are meant not to vary except for the type of *functional deficit* - some may evolve along the treatment, e.g. the speech ability after a stroke generally improves while blindness remains. The assigned code for the main disease (i.e. ICD-10 version 2016 (main)) is also not luckily to change unless patient’s conditions get worse. The **ICD-10 code** is an important notion in the transferal management domain as it provides the **length of stay** (LOS) in the acute hospital.

Medical data will then contribute to the “**Documentation Care**”. The documentation care can contain other information that are listed in the information model.

Further data that are not luckily to change are the **patient’s administrative information** (see Table 3). Additional administrative data can be found in the *information model document*. The neurologist opens the case of the patient that was created by the administrative staff (see above) and enters the **reasons for hospitalization** onto the Patient Administration System (PAS).

Commented [EL21]: Data object “Medication”

Commented [EL22]: Attributes of the data object “medication list”

Commented [EL23]: Data object “Indication”

Commented [EL24]: Data object “Short Report” that includes other data objects (see Table1)

Commented [EL25]: Information System “HIS”

Commented [EL26]: Data object “Medical Data” that contains other data objects (see table 2)

Commented [EL27]: Data object “ICD-10” From this can be derived the Long of Stay (LoS) for both in hospitals and rehabilitation clinics.

Commented [EL28]: Data object “LoS” derived from the ICD-10

Commented [EL29]: “Acute Hospital” is-a OU

Commented [EL30]: Data object “Documentation Care” that contains other data objects (e.g. medical data)

Commented [EL31]: Data object “Administrative Data” (see table 3)

Commented [EL32]: Data object “Reasons for Hospitalization”

² <http://www.merriam-webster.com/dictionary/indication#medicalDictionary>

³ Sometimes it is named as „Clinical Information System“.

The Swiss **DRG code**⁴ is the only administrative data to be calculated at discharging time.

Commented [EL33]: Data object SwissDRG code" part of the data object "Administrative Data"

A SwissDRG code is assigned to each patient's case and sent to the health insurance for cost reimbursement to acute hospital (not for rhea clinics). The calculation of the SwissDRG code includes administrative aspects such as age, sex, degree of severity as well as medical ones such as main and secondary diagnosis in terms of ICD-10 code, and the surgery category classified by the Swiss procedure code **CHOP**⁵. Functional deficits can be described via the International Classification of Functioning, Disability and Health ICF⁶ (World Health Organization 2001). The ICF standard includes the taxonomy (web-version⁷) of the following four macro-categories, also called components:

Commented [EL34]: Data object "CHOPE code"

- *body functions (labelled as **b**)*,
- *body structures (labelled as **s**)*,
- *activities and participation (labelled as **d**)*,
- *environmental factors (labelled as **e**)*.

Each component is extended by more than one category (also called chapters – see Table 2). In turn each chapter has more than one category and the latter can go more in details by specifying one or more sub-categories. The same applies to sub-categories. The unique ICF codes are built as a journey from the component to the category or sub-category. For instance, the sub-category "Sustaining attention" has code **b1400**, where **b** is the label for the body functions component (see list above), **b1** refers to its chapter *Mental Functions*, **b140** is the sub-category *Attention functions*, which belongs to the upper category *Specific Mental Functions* that spans from the b140 to b189.

Categories are qualified by a scale that record the extent of functioning or disability, or the extent to which an environmental factor is a facilitator or barrier.

Table 2. ICF categories (World Health Organization 2001)

Body	
Function: <ul style="list-style-type: none"> - Mental Functions - Sensory Functions and Pain - Voice and Speech Functions - Functions of the Cardiovascular, Haematological, - Immunological and Respiratory Systems - Functions of the Digestive, Metabolic, Endocrine Systems - Genitourinary and Reproductive Functions - Neuromusculoskeletal and Movement-Related Functions 	Structure: <ul style="list-style-type: none"> - Structure of the Nervous System - The Eye, Ear and Related Structures - Structures Involved in Voice and Speech - Structure of the Cardiovascular, Immunological and - Respiratory Systems - Structures Related to the Digestive, Metabolic and - Endocrine Systems - Structure Related to Genitourinary and Reproductive Systems - Structure Related to Movement - Skin and Related Structures

⁴ www.swissdr.org

⁵ <https://www.ispor.org/HTARoadMaps/SwitzerlandMDD.asp>

⁶ http://www.who.int/classifications/icf/icf_more/en/

⁷ <http://apps.who.int/classifications/icfbrowser/>

- Functions of the Skin and Related Structures	
Activities and Participation	
<ul style="list-style-type: none"> - Learning and Applying Knowledge - General Tasks and Demands <ul style="list-style-type: none"> - Communication - Mobility - Self Care - Domestic Life - Interpersonal Interactions and Relationships <ul style="list-style-type: none"> - Major Life Areas - Community, Social and Civic Life 	
Environmental Factors	
<ul style="list-style-type: none"> - Products and Technology - Natural Environment and Human-Made Changes to Environment - Support and Relationships <ul style="list-style-type: none"> - Attitudes - Services, Systems and Policies 	

Qualifiers of all ICF components use a negative scale, except for the environmental factors component, which uses a positive scale too (see Fig. 2).

Generic qualifier:

- 0 No problem
- 1 Mild problem
- 2 Moderate problem
- 3 Severe problem
- 4 Complete problem
- 8 Not specified
- 9 Not applicable

Qualifier for Environmental factors:

- | | |
|---------------------------|-------------------------------|
| .0 No barrier | +0 No facilitator |
| .1 Mild barrier | +1 Mild facilitator |
| .2 Moderate barrier | +2 Moderate facilitator |
| .3 Severe barrier | +3 Substantial facilitator |
| .4 Complete barrier | +4 Complete facilitator |
| .8 Barrier, not specified | +8 Facilitator, not specified |
| .9 Not applicable | +9 Not applicable |

Figure 2. ICF Qualifiers Scales

Additionally, the **body structures** component includes a second qualifier to indicate the nature of the change in the respective body structure, i.e.:

- 0 no change in structure

- 1 total absence
- 2 partial absence
- 3 additional part
- 4 aberrant dimensions
- 5 discontinuity
- 6 deviating position
- 7 qualitative changes in structure, including accumulation of fluid
- 8 not specified
- 9 not applicable.

Moreover, the *activities and participation* component include **Performance** and **Problem in the person's current environment** as first qualifiers, while **Capacity** and **Limitation without assistance** as second qualifiers. For simplicity reasons in this work only the generic qualifiers are considered.

In the point of time I've conducted the interview, the ICF was not adopted. However, I include it in this work as it is becoming a worldwide common practice for hospitals to describe health functioning and disabilities by means of the ICF standard. In order to describe the relevant ICF components I refer to the ICF core sets for stroke described in (Geyh et al. 2004) – see column "ICF code and category title" of table 3 .

According to the ICF official documentation, the generic qualifier term "problem" is replaced based on the ICF component, i.e. "impairment" for both body functions and body structures, while "difficulty" for activities and participations (see the column "Generic qualifiers" in Table 3).

ICF categories applied to patients may change during their hospital stay. In a workshop conducted on the on the 4th of October, Prof. Rainer Endl stated that categories that belong to components such as **body function, body structure, activity and participation** are likely to change after surgeries. In this work we won't show how and which of the ICF categories change as when conducting interviews the hospital of Grabs did not make use yet of the ICF standard.

The patient's administrative information (see Table 4) belongs to the **patient admission form** (in German "*Eintrittlist*") and are stored in the **Patient Administration System (PAS)**.

Commented [EL35]: Data object "Patient Admission Form" that contains "administrative information"

Commented [EL36]: Information System "PAS"

Table 3. Medical Data of patient Peter Müller

Medical Data (contained in the Documentation care)	Tessiner code (see Appendix 3.3)	L1		
	ICD-10 version 2016 (main)	G46.3 (Brain stem stroke syndrome)		
	ICD-10 version 2016 (secondary)	<ul style="list-style-type: none"> - I09.9 (Rheumatic heart disease, unspecified) - E12 (Malnutrition-related diabetes mellitus) - M81.1 Postophorectomy osteoporosis 		
	CHOP	-		
	Functional deficits – ICF Standard	ICF component	ICF code and category title	Generic qualifiers
		Body functions	B140 Attention functions	xxx.2 MODERATE impairment

			B114 Orientation functions	xxx.2 MODERATE impairment
			B730 Muscle power functions	xxx.2 MODERATE impairment
			B110 Consciousness functions	xxx.3 SEVERE impairment
			B167 Mental functions of language	xxx.3 SEVERE impairment
			B144 Memory functions	xxx.3 SEVERE impairment
		Body structures	S110 Structure of Brain	xxx.2 MODERATE impairment
			S730 Structure of upper extremity	xxx.2 MODERATE impairment
		Activities and participation	D450 Walking	xxx.3 SEVERE difficulty
			D330 Speaking	xxx.3 SEVERE difficulty
			D530 Toileting	xxx.8 other specified
			D550 Eating	xxx.2 MODERATE difficulty
			D510 Washing oneself	xxx.2 MODERATE difficulty
			D540 dressing	xxx.2 MODERATE difficulty
			D310 Communicating with – receiving – spoken messages	xxx.3 SEVERE difficulty
		Environmental factors	E310 Immediate family	xxx+3SUBSTANTIAL facilitator
			E355 Health professionals	xxx+4COMPLETE facilitator
			E580 Health services,	xxx+4COMPLETE facilitator

			systems and polices	
	(x)Disease ()Accident			

Table 4. Administrative Data of patient Peter Müller

Administrative Data / Master Data	Master Patient ID (unique in the nation)	2063924645
	Patient ID (unique in the single hospital)	2063924759
	Case Number	2048573592
	SwissDRG code	3947856899
	Name	Peter Müller
	Street	St. Leonahrdstrasse, 92
	City	St. Gallen
	Nation	Switzerland
	Nationality	Swiss
	Mobile number	0843827734
	Mother tongue	German
	Job	Pensioner
	AHV-Number	4578647956
	Date of birth	4/10/1940 (76 years old)
	Entry Type	Emergency
	Health insurance	Swica – 8.476.534
	Health insurance status	Canton General
	Date of hospitalization	24/02/2016

Commented [EL37]: Email from Rainer: "Basically, the appropriate DRG Code will be determined at the time the patient is discharged. This is quite different compared with the practice in Germany, where the DRG code will be fixed at the time the patient enters the hospital"

The last category of information that the physician enters in the HIS are the **care status** (in German "Pflegebedarfsblatt"), which generally includes assistance information, see Table 5.

Commented [EL38]: Data object "Care Status"

Table 5. Care Status of patient Peter Müller

Care Status	Assistance in Mobility
	Assistance in Nutrition
	Assistance in Excretion
	Assistance in Personal Hygiene
	Assistance in Cognition
	Necessity of Medical devices

In our case the neurologist is consistent with nurse's choice with respect to the **ESI level**, hence he notes it down together with the patient's care status, i.e. lack of mobility, nutrition and cognition, and therefore assistance is required for that (in the ESI is also specified the required number of resources - see Figure 1, block C).

According to the neurologist assessment the patient will most luckily require rehabilitation after the acute hospital⁸.

After a couple of hours, the neurologist transfers the patient to the intensive care unit (ICU) **Stroke Unit** (labelled as **STROKE-GR**), where a more appropriate treatment is provided.

After a couple of days the patient's health conditions stabilize⁹. The neurologist decides to keep the patient in the **Stroke Unit** for **at most 3 days**, after which the patient will be transferred to the non-intensive care unit **Medicine station** (labelled as **M3-GR**). At this point, the neurologist dispenses lighter medication, and updates the following documents:

- **Medications,**
- **Indication,**
- **Care status,**
- **Diagnosis.**

At the same time the **neurologist** suggests the **rehabilitation type** and **rehabilitation clinic** that fit the patient's needs at best:

- **Inpatient neurological rehabilitation at the Valens¹⁰ clinic.**

The rationale¹¹ of the physician for this choice is as follows:

- The main disease of the patient is a neurological disease,
- Valens clinic is highly qualified to meet patient's need as they are specialized in both neurological and geriatric rehabilitation (*main and secondary disease* of the patient, respectively),
- Clinic Valens already *work tightly* with the hospital of Grabs,
- Patient's family member/ contact person *live near* by the clinic.

Next, the neurologist fills the rehabilitation form¹² for costs reimbursement (in German this is called "*Einweisung Reha*"). In the transferal management process this refers to the activity "*Create a request for cost reimbursement*", in German "*Antrag Kostengutsprache erstellen*". From now on we will call the cost reimbursement form with the German acronym **KoGu** (see Appendix 3.2 for a four screen-shots of one original KoGu document. The document is in German language and all its information appear along this use case scenario. Therefore, a translation of that document in English language is not required).

Commented [EL39]: (Organizational Unit) ICU is-a Care Unit

Commented [EL40]: (Organizational Unit) Stroke Unit instance of "ICU"

Commented [EL41]: (Organizational Unit) Medicine Station instance of a Non-Intensive Care Unit

Commented [EL42]: Decision on the Rehab Type

Commented [EL43]: Decision on the Rehab Clinic

Commented [EL44]: (Organizational Unit) Inpatient Neurological Rehabilitation is sub-instance of Neurological Rehabilitation type

Commented [EL45]: (Organizational Unit) Valens Clinic is instance of "Rehabilitation Clinic"

Commented [EL46]: Point of support – Choice of the right rehabilitation type in the right rehabilitation clinic

Commented [EL47]: Value of the attribute "main disease". The Disease Ontology (DO) can be integrated

Commented [EL48]: (Organizational Units) are instances of Rehabilitation Type

Commented [EL49]: Hospital of Grabs is instance of "Acute Hospital"

Commented [EL50]: Role: Patient Contact Person

Commented [EL51]: Required knowledge to infer decisions

Commented [EL52]: Requires conceptualization of "Location" (from TOP ontology)

Commented [EL53]: Data object "KoGu"

⁸ The Care Status document is fundamental for the KoGu.

⁹ Physicians cannot prepare the KoGu before the patient conditions stabilizes (extract from the content of the interview made to Prof. Rainer Endl held on the 13.06.2016)

¹⁰ <http://www.kliniken-valens.ch/en/>

¹¹ Knowledge that can be inferred by the system.

¹² In the research project Patient-Radar there is the intention to let the transferal manager fill the form for the KoGu or even let directly the rehab clinic deal with it.

Next, the **transferal manager receives the permission to work on the case** (in German the “Eintrittsmeldung”). First thing he/she does is to **send the appropriate information concerning the patient to the rehab clinic Valens, i.e.:**

- short report (see Table 1),
- medical data (see Table 2),
- administrative data (see Table 3),
- care status (see Table 4).

Next, the transferal manager’s task at present is to **refine the KoGu document** (as already mentioned in the footnotes, in the future he/she may **create the KoGu on her/his own**). For this purpose, he/she will check whether there are any **error** and whether its content is **consistent with patient’s information** such as the *indication, medical data, administrative data and care status*. Additionally, the KoGu document should **comply with the content of the DefReha**¹³ standard issued by the organization H+ Swiss Hospitals.

The aim of H+ with the DefReha standard is to define the notion of rehabilitation in the national legal framework. For this, the H+ Swiss Hospitals organization introduces a cost reimbursement system for somatic and psychosomatic rehabilitation, which is valid on a national scale. This leads to a unified tariff plan for rehabilitation that enables transparent comparisons among rehabilitation services. The unified tariff plan relies on the definition of several types of rehabilitation as well as of criteria of inclusion and exclusion for each rehabilitation type. Those criteria are applied on the transferal management process, i.e. transferring the patient from an acute hospital to a rehabilitation clinic or to an intensive unit care and then to a rehabilitation clinic.

In our case, since the **main disease** of the patient is a **stroke**, the transferal manager takes into consideration *criteria of inclusion and exclusion* for the **admission in the neurologic rehabilitation type**. The DefReha document defines criteria for three interfaces of transfer:

- [1] from **acute hospital to a rehabilitation with compulsory medical monitoring;**
- [2] from **acute hospital to inpatient neurological rehabilitations;**
- [3] from **rehabilitation with compulsory medical monitoring to inpatient neurological rehabilitations.**

The third type of transfer is generally the follow-up of the first one. As mentioned above, due to the critical care status of the patient, the **neurologist recommends an inpatient neurological rehabilitation** (the second one in the above list – see it highlighted in yellow). However, the transferal manager has to **double-check** whether this decision complies with the content of the DefReha standard.

The transferal manager makes sure that the **Valens clinic** meets these requirements and then checks the criteria that are applied on this interface. Following, we introduce these criteria:

- All of the following criteria should hold true to allow the transferral of the patient to the **neurological rehabilitation clinic (admission criteria to rehab are met):**

- 1) The patient mainly has a clear awareness;

Commented [EL54]: Role “Transferal Manager”

Commented [EL55]: Permission message

Commented [EL56]: Send message to Rehab Clinic with patient info

Commented [EL57]: Activity “Refine KoGu” – Role: Transferal Manager

Commented [EL58]: Point of support – recommending info concerning the KoGu ?

Commented [EL59]: Data object “DefReha” containing many discharging decision criteria

Commented [EL60]: ICD-10 Main Disease influences the choice of the rehabilitation type

Commented [EL61]: Point of support, i.e. since in the near future this activity will be held by the transferal manager, what about supporting her/him to identify the rightest criteria to apply?! Open question

Commented [EL62]: It reflects those criteria appropriate for one of the nine rehab types. Represented in decision tables.

Commented [EL63]: Inpatient Neurological Rehabilitation is instance of Neurological Rehabilitation.

Care Status influences the choice of the targeted rehabilitation type, i.e. inpatient neurological rehabilitations

Commented [EL64]: Point of support
The compliance checking can be supported with automation.
The approach: appropriate values can be generated (inferred) out of rules. Rules can contain health values (in the medications, indication, care status and diagnosis). The outcome of these rules will suggest whether the patient health conditions are potentially suitable for a rehab or not yet.

Commented [EL65]: Decision table containing admission criteria of a specific rehab type, i.e. from **acute hospital to inpatient neurological rehabilitations**

¹³ http://www.hplus.ch/de/publikationen/fachpublikationen/einzelsicht_produkte/nocache/1/?productuid=273

- 2) Patient is able to actively participate in activities in more rehabilitative therapy sessions of about 30 minutes;
- 3) Patient is able to interact and communicate, also by means of support devices;
- 4) Patient is able to move, about 3-4 hours per day in wheelchair;
- 5) Patient mainly needs support for daily life activities;
- 6) Patient does not need rehabilitation with compulsory medical monitoring; risk of complication is low;
- The following criteria should hold true to deny the patient transferral to the rehab clinic **(admission criteria to rehab are not met)**:
 - 1) Acute worsening of the patient's health conditions, i.e. confused patient and uncooperative;

Commented [EL66]: Decision table containing exclusion criteria of a specific rehab type, i.e. from **acute hospital** to **inpatient neurological rehabilitations**

Although out of the scope, for the sake of completeness following we also introduce discharging criteria that applies on rehab clinics. These are adopted to take decisions on discharging the patients from rehab clinics to the next site of care.

- *One or more of the following criteria should hold true to transfer the patient either back to the acute hospital in case of worsening or to a less intensive site of care or even home, respectively **(discharging criteria from rehab are met)**:*
 - *Transfer back to the acute hospital:*
 - 1) *Worsening of consciousness with delirium;*
 - 2) *Aspiration with failure respiratory;*
 - 3) *The need for intensive monitoring;*
 - 4) *Severe infection;*
 - 5) *Psychic decompensation with suicide danger;*
 - 6) *Aggression against third parties;*
 - 7) *Escape risk of patient;*
 - *Transfer to a less intensive site of care or home:*
 - 1) *The rehabilitation objectives are achieved;*
 - 2) *The rehabilitation potential is completed;*
 - 3) *Family integration of the patient with continuation of outpatient rehabilitation;*
 - 4) *Patient's employer is involved.*

The structured preparation for the patient's reintegration is possible.

- *One or more of the following criteria should hold true to deny the transfer **(discharging criteria from rehab are not met)***

- 1) *Instability;*
- 2) *Presence of rehabilitative potential, but only in the hospital context;*
- 3) *Domestic context not ready yet for patient's re-integration;*
- 4) *Assigned brain exercise(s) cannot be executed in outpatient facilities.*

In this case, it is assumed that all the admission to rehab criteria will be met (see list above). Hence, the **content of the KoGu complies with the DefReha document**.

Next, the **KoGu is sent to both the health insurance** and the **rehabilitation clinic**. Additionally, the transferal manager sends the following information (above mentioned) to the rehabilitation clinic:

- indication (will evolve along the hospitalization),
- care status (luckily to change along the hospitalization),
- patient's medical data (luckily to evolve along the hospitalization),
- patient's administrative data (luckily to stay the same).

Next, the **KoGu gets approved**.

After spending **3 days in the Medicine station**, the patient's health conditions **get worse**, i.e.:

- difficulties in breathing,
- increase of swelling,
- Increase of confusion.

The neurologist assesses again the case and due to the worsening of vital signs and assigns more assistance and more resources for **"mobility"**, **"nutrition"** (parenteral) and **"cognition"**. At this point, the neurologist suggests a different type of rehabilitation for the patient, which is the following:

- **Neurological rehab with compulsory medical monitoring at the Valens clinic.**

The rationale of the neurologist for this choice is the same as before except for the main disease, namely:

- **The main disease of the patient is a critical neurological disease with the need of daily assistance and monitoring,**
- Valens clinic is highly qualified to meet patient's need as they are specialized in both neurological and geriatric rehabilitation (main and secondary disease of the patient, respectively),
- Clinic Valens already work tightly with the hospital of Grabs,
- Patient's family member/ contact person live near by the clinic.

Hence, the neurologist sends the patient **back** to the **Stroke Unit (STROKE-GR)** for **6 days**. The physician re-updates the **medication list, indication, care status, diagnosis and the ICF codes** with more severe values.

Subsequently, the neurologist sends the readjusted KoGu to the transferal manager, who again has to double-check that it complies with the DefReha. According to the DefReha, the interface between the acute assistance and the rehabilitation that requires medical monitoring needs a *detailed transferal planning* from the acute hospital to the specialized institute for the intensive neurological rehabilitation.

Commented [EL67]: Message transfer (KogU) – from Acute Hospital to both Rehab Clinic and Health Insurance

Commented [EL68]: Health insurance is-a OU

Commented [EL69]: Activity "Check KoGu" performed by the Health Insurance

Commented [EL70]: Warning! Progress in acute hospital is "negative"

Commented [EL71]: (Organizational Unit) Neurological Rehab with Compulsory medical monitoring is instance of the Neurological Rehab type.
(Patient will be sent from **acute hospital** to a **rehabilitation with compulsory medical monitoring**)

Commented [EL72]: Patient conditions (now need of daily assistance and monitoring - hence again the Care Status) infer the rehab type, which becomes "Neurological Rehab with Compulsory Medical Monitoring"

For instance, neurological rehabilitation experts of the institute in which the patient will be discharged are recommended to visit the patient from the beginning of the treatment. Additionally, the rehabilitative institute should have a complete infrastructure in terms of personnel and medical devices.

Like previously, the transferal manager makes sure that the **Valens clinic** meets these new requirements and then checks the criteria that are applied on this new interface. These criteria are following described.

- At least one of the following criteria should hold true to allow transferring the patient **(admission criteria to rehab are met)**:
 - 1) Vegetative instability at rest or under stress (Necessary monitoring);
 - 2) Obligated intake airway with or without tracheostomy;
 - 3) Necessity of supporting the spontaneous breathing intercurrently;
 - 4) Parental nutrition still needed;
 - 5) Heavy qualitative and quantitative disturbance of consciousness;
 - 6) Risk of acute and high complication: High risk of secondary or tertiary complications such as pressure sores, contractures, aspiration, periarticular calcification, dehydration, malnutrition or severe mental impairments;
 - 7) Delirious state with persistent or intermittent loss of auto-control, amnesic syndrome, agitation, aggressiveness, drive fault, unilateral spatial neglect, endangerment of themselves and others, escape risk;
 - 8) High necessity of monitoring, medical treatment and nursing care, including intensive medical intervention;
 - 9) Necessity of intensive and rehabilitation care for more than 4 hours per day;
 - 10) Maximal therapeutic commitment: single or double treatment, except for the group treatment;
 - 11) Severe disruption of communication skills, of instruction understanding and of the disease self-awareness;
 - 12) Any collaboration that aims at pursuing treatment objectives is useless.
- At least one of the following criteria should hold true to deny transferring the patient **(admission criteria to rehab are not met)::**:
 - 1) Forthcoming neurosurgical intervention;
 - 2) Acute treatment not completed yet;
 - 3) Active epilepsy with a high risk of a epilepticus status;
 - 4) Sepsis;
 - 5) Pneumonia with global respiratory insufficiency;

Commented [EL73]: Decision table with admission criteria of a specific rehab type

Commented [EL74]: Decision table with exclusion criteria of a specific rehab type

- 6) Impossibility of transfer due to comorbidity;
- 7) Permanent assisted breathing via artificial ventilation (it is not an exclusion criteria of specialized units).

Discharging criteria that applies on rehab clinics (also them out of the scope):

- *The following criteria should hold true to transfer the patient to a less intensive site of care such as inpatient neurological rehab (**discharging criteria from rehab are met**):*
 - 1) *Improvement of the patient's health conditions such that a discharging to an inpatient neurological rehabilitation is allowed.*
- *One or more of the following criteria should hold true to deny the transfer (**discharging criteria from rehab are not met**):*
 - 1) *Persistent neurological instability and/or rehabilitative potential is only internal;*
 - 2) *Rehabilitative potential but only in the context of rehabilitation with compulsory medical monitoring.*

Since in the first category of criteria, the **third** (necessity of supporting the spontaneous breathing intercurrently), the **fourth** (parental nutrition still needed) and the **fifth** (heavy qualitative and quantitative disturbance of consciousness) **inclusion criteria** (see them above highlighted in yellow) reflect the patient's needs, and none of the other exclusion criteria are met, the **content of the KoGu complies with the DefReha document**.

Next, the new **KoGu is sent again to both the health insurance and the rehabilitation clinic**.

Documents such as short report (see Table 1), medical data (see Table 2) and care status (see Table 4) get updated and sent to the Rehabilitation clinic.

Since the rehab clinic is the same (i.e. Valens), the patient's administrative data are already in the system and do not need to be updated.

Also this time the **KoGu gets approved by the health insurance**.

Next the transferal manager starts to coordinate the transfer date together with the neurologist in the acute hospital and the medical staff in the rehabilitation clinic. According to the outcome of this activity, the document Rehab Clinic is created with info such as start date of rehab, and its duration.

In total the patient is kept **6 days** in the acute hospital (always in the Stroke Unit). During this period the physician updates the *indication*, *care status* and *medical data* documents on a daily basis. Since the KoGu has been approved, the **4th day** (i.e. *48 hours before the actual discharging*) the physician checks and approves the transfer of the patient to the appropriate neurological department of Valens clinic. The 6th day the patient is transferred and admitted to the new site of care where he will stay for 21 days (this is the maximum fixed period of rehabilitation for any neurological case. In case of extension the physician should justify the reasons for that).

After two weeks the transferal manager sends the so called **long report** to the rehabilitation clinic. This includes both medical related data, administrative data and investigation results.

Commented [EL75]: A new KoGu is sent to both health insurance and rehabilitation clinic

Commented [EL76]: Activity "Updates Documents" – Role: Transferal Manager.
The patient is already in the system, therefore updates short report, medical data and care status (excepts for administrative data).

Commented [EL77]: Send Message with the Updated Documents from the activity "Updates Documents" to Rehabilitation Clinic

Commented [EL78]: Activity "Check Patient in PMS" it checks whether the patient is already in the system. Role: Transferal Manager

Commented [EL79]: Send Message from the Health Insurance to both the Acute Hospital (Transferal Manager) and Rehabilitation Clinic

Commented [EL80]: Activity "Coordinate Transferal Date" – Roles involved: Transferal Manager and Physician

Commented [EL81]: Data object (outcome of the "coordinate transferal date" activity)

Commented [EL82]: Number suggested by the ICD-10 but decided by the Neurologist

Commented [EL83]: Activity "Check and Approve Transferal" 48 hours before the actual discharge – Role: Physician

Commented [EL84]: Activity "Transfer Patient" – Role: Transferal Manager, Hospital Staff

Commented [EL85]: Data object "Long Report" it includes other data objects, e.g. complete history of both medical data and administrative data. Additionally, investigation results are provided

Commented [EL86]: Data object "Investigation Results"

References

- Geyh, S. et al., 2004. ICF Core Sets for stroke. *Journal of Rehabilitation Medicine*, 36(0), pp.135–141. Available at: <http://journalsonline.tandf.co.uk/Index/10.1080/16501960410016776> [Accessed October 10, 2016].
- Gilboy, N. et al., 2011. *Emergency Severity Index (ESI): A Triage Tool for Emergency Department Care* Version 4,, AHRQ Publication No. 12-0014. Rockville, MD. Agency for Healthcare Research and Quality.
- Uijen, A.A. & van de Lisdonk, E.H., 2008. Multimorbidity in primary care: prevalence and trend over the last 20 years. *The European journal of general practice*, 14 Suppl 1, pp.28–32. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/18949641> [Accessed June 28, 2016].
- Valderas, J.M. et al., 2009. Defining comorbidity: implications for understanding health and health services. *Annals of family medicine*, 7(4), pp.357–63. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/19597174> [Accessed June 27, 2016].
- Walker, D. & Betz, P., 2013. *The Emergency Flow Concept* 1st Editio., Zurich, Switzerland: Walkerproject AG.
- World Health Organization, 2001. *International classification of functioning, disability and health : ICF*, World Health Organization.

3. Appendix

3.1 ESI Triage Legend

A. Immediate life-saving intervention required: airway, emergency medications, or other hemodynamic interventions (IV, supplemental O₂, monitor, ECG or labs DO NOT count); and/or any of the following clinical conditions: intubated, apneic, pulseless, severe respiratory distress, SPO₂<90, acute mental status changes, or unresponsive.

Unresponsiveness is defined as a patient that is either:

- (1) nonverbal and not following commands (acutely); or
- (2) requires noxious stimulus (P or U on AVPU) scale.

B. High risk situation is a patient you would put in your last open bed.

Severe pain/distress is determined by clinical observation and/or patient rating of greater than or equal to 7 on 0-10 pain scale.

C. Resources: Count the number of different types of resources, not the individual tests or x-rays (examples: CBC, electrolytes and coags equals one resource; CBC plus chest x-ray equals two resources).

<i>Resources</i>	<i>Not Resources</i>
<ul style="list-style-type: none">• Labs (blood, urine)• ECG, X-rays• CT-MRI-ultrasound-angiography	<ul style="list-style-type: none">• History & physical (including pelvic)• Point-of-care testing
<ul style="list-style-type: none">• IV fluids (hydration)	<ul style="list-style-type: none">• Saline or heparin
<ul style="list-style-type: none">• IV or IM or nebulized medications	<ul style="list-style-type: none">• PO medications• Tetanus immunization• Prescription refills
<ul style="list-style-type: none">• Specialty consultation	<ul style="list-style-type: none">• Phone call to PCP
<ul style="list-style-type: none">• Simple procedure =1 (lac repair, foley cath)• Complex procedure =2 (conscious sedation)	<ul style="list-style-type: none">• Simple wound care (dressings, recheck)• Crutches, splints, slings

D. Danger Zone Vital Signs

Consider uptriage to ESI 2 if any vital sign criterion is exceeded.

Pediatric Fever Considerations

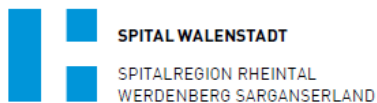
1 to 28 days of age: assign at least ESI 2 if temp >38.0 C (100.4F)

1-3 months of age: consider assigning ESI 2 if temp >38.0 C (100.4F)

3 months to 3 yrs of age: consider assigning ESI 3 if: temp >39.0 C (102.2 F), or incomplete immunizations, or no obvious source of fever

Figure 3. ESI Triage Legend (Gilboy et al. 2011)

3.2 KoGu Form



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Dr. med. Jürg Gresser, Chefärzt Chirurgie
Dr. med. Thomas Lindenfeld, Leitender Arzt
Orthopädie
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Fax +41 81 736 14 86
juerg.gresser@arnwa.ch

Walenstadt, 14. März 2016 rotFra

Einweisung Reha

Oezsu Naci, 05.07.1943, Alte Staatsstrasse 12, CH-8877 Murg, 081 7382230

Garant: Helsana Versicherungen AG, Service Center, Krankenkasse, Vers.-Nr. 697433050
Allgemein

Wir melden oben genannten Patientin/Patient zur Reha an.

Kliniken Valens
Rehabilitationszentrum Walenstadtberg
8881 Walenstadtberg

Hausarzt: Dr. med. Christoph Bertschinger, 8877 Murg

Einweisungsgrund: ☐ Unfall ☒ Krankheit

Rehabilitationsprinzip:

- ☒ Muskuloskelettale Reha ☐ Neurorehabilitation ☐ Geriatrische Reha ☐ Pulmonale Reha
☐ Psychosomatische Reha ☐ Internistische Reha ☐ Kardiologische Reha

Rehadauer: 2 Wochen

Eintrittsdatum 11.03.2016 Rehabeginn: 15.03.2016 OP-Datum: 11.03.2016

Spital:

Diagnose: Gonarthrose rechts

Begleiterkrankung: Art. Hypertonie, Lumbospondylogenes Syndrom L4/5

Therapie / Verlauf: Implantation Knie TP rechts

Funktionsdefizit: Muskulär, Integration Alltag, Gangunsicherheit

Behandlungsziel: Muskulärer Aufbau, Gehtraining, Integration Alltag

Arbeitsunfähigkeit: ☐ Nein ☐ Ja Wenn Ja, seit Wann: Wieviel %

Ärztliche Bestätigung der Klinikbedürftigkeit:

- ☒ Verlegung zu stationären Weiterbehandlung
☒ Stationäre medizinische Nachbetreuung, da tägliche ärztliche und therapeutische Massnahmen notwendig sind
☐ Verlegung zur stationären Frührehabilitation ab IMC / IPS
☐ Arbeitsplatzabklärung
☐ Hohe Therapiedichte
☐ Eine Ambulante Behandlung fällt ausser Betracht
☐ Besondere Lebensumstände ☐ Comorbiditäten
☐ Ambulante Therapien sind ausgeschöpft

Spital Walenstadt
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Figure 4. KoGu form page 1/4

Oezsu, Naci, geb. 05.07.1943
Einweisung Reha (erstellt 14.03.2016)

Seite 2 von 4

Grad der Behinderung

<input type="checkbox"/>	selbständig
<input checked="" type="checkbox"/>	Bedarf Hilfeleistung für
<input type="checkbox"/>	Essen
<input checked="" type="checkbox"/>	Ankleiden
<input type="checkbox"/>	Toilette
<input checked="" type="checkbox"/>	Waschen
<input checked="" type="checkbox"/>	Gehen mit Stockhilfe
<input type="checkbox"/>	Rollstuhl
<input type="checkbox"/>	Rollator
<input type="checkbox"/>	Bedarf intensiver Hilfeleistung
<input type="checkbox"/>	bettlägerig

Austeller Referenzen:

Einweisender Arzt:

Franz Roth

Konkordats-Nr. W1072.17

Tel. einweisender Arzt: 081 736 10 79

Kontakt

Spital Walenstadt: Karin Zimmermann, Christine Baruffi, Angela Weber, +41

Austrittsmanagement:

81 736 11 58 austrittsmanagement.walenstadt@srws.ch

Figure 5. KoGu form page 2/4

Pflegebedarf

Ernährung

- ☐ Sonde ☐ parenterale Ernährung
☐ Essen eingeben
☐ Aspirationsgefahr
☐ Braucht Unterstützung/teilweise allein
☐ Isst allein mit Hilfsmitteln/braucht Supervision/Herrichten
☒ Isst völlig selbständig

Bemerkung:

Persönliche Hygiene

- ☐ Ganzwäsche im Bett durch Pflegeperson/-en
☒ Teilwäsche im Bett
☐ TW am Lavabo möglich, viel Unterstützung
☒ TW am Lavabo wenig Unterstützung
☐ Braucht Hilfsmittel, Supervision
☐ Duschen mit Hilfe
☐ Körperpflege selbständig

Bemerkung:

Fortbewegung

- ☐ Bettlägerig, Fortbewegung unmöglich
☐ Bettlägerig, Fortbewegung möglich
☒ Hilfsmittel: ☐ Rollstuhl ☐ Bockli
☒ Stöcke ☐ Rollator
☒ Gehen mit ☐ viel Unterstützung
☒ wenig Unterstützung
☐ Selbständiges Gehen möglich, aber kein Treppensteigen
☐ Selbständiges Gehen und Treppensteigen möglich
☐ Teilbelastung X kg bis wann? XX
☐ Vollbelastung

Bemerkung:

Orientierung

- ☐ Stark desorientiert, braucht dauernde Überwachung (hohe Weglauftendenz)
☐ Desorientiert, braucht viel Überwachung (geringe Weglauftendenz)
☐ Desorientiert, braucht Supervision (ohne Weglauftendenz)
☐ Leichte, aber alltagsrelevante Orientierungsstörung
☒ Zeitlich, örtlich und autopsychisch orientiert

Bemerkung:

Ausscheidung / Toilette

- ☐ Stuhl inkontinent ☐ Urin inkontinent
☐ Katheter/Cystofix ☐ Blasentraining
☐ Inkontinenzmaterial notwendig
☐ Nachstuhl ☒ WC mit Hilfsperson/ Begleitung
☐ Auf Topt/Flasche angewiesen
☐ WC-Benützung alleine möglich

Bemerkung:

An- und Auskleiden

- ☐ Vollständig auf Hilfsperson/-en angewiesen
☐ Viel Unterstützung durch Hilfsperson
☒ Wenig Unterstützung durch Hilfsperson
☐ Hilfsmittel/Supervision notwendig
☐ Völlig selbständig

Bemerkung:

Transfer

- ☐ Kein Transfer möglich, braucht mehrere Hilfspersonen
☐ Transfer mit viel Unterstützung einer Hilfsperson
☐ Leichte Unterstützung durch Hilfsperson
☒ Supervision/Anleitung durch Hilfsperson
☐ Selbständiger, sicherer Transfer

Bemerkung:

Verständigung

- ☐ Keine Verständigung möglich
☒ Teilweise Verständigung möglich, sozialer Kontakt schwer beeinträchtigt-ist Fremdsprachig, Türkisch
☐ Genügende Verständigung, sozialer Kontakt leicht beeinträchtigt
☐ Sozialer Kontakt unbeeinträchtigt

Bemerkung:

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Figure 6. KoGu form page 3/4

Soziale Interaktion	Psyche			
<input type="checkbox"/> Sehr häufig distanzlos/zurückgezogen	Aggressivität	<input type="checkbox"/> leicht	<input type="checkbox"/> mittel	<input type="checkbox"/> schwer
<input type="checkbox"/> Öfters distanzlos/zurückgezogen	Depression/Apathie	<input type="checkbox"/> leicht	<input type="checkbox"/> mittel	<input type="checkbox"/> schwer
<input type="checkbox"/> Zeitweise distanzlos zurückgezogen	Unruhe	<input type="checkbox"/> leicht	<input type="checkbox"/> mittel	<input type="checkbox"/> schwer
<input type="checkbox"/> Selten distanzlos/zurückgezogen	<input type="checkbox"/> Stimmungs labilität			
<input type="checkbox"/> Normale soziale Interaktion	<input type="checkbox"/> Adäquates Verhalten und Psyche			
Bemerkung:	Bemerkung:			
Allgemeine Bemerkungen (Wunden, Verletzungen,...):				
OP Naht				

Figure 7. KoGu form page 4/4

3.3 Tessiner code

Tessiner Code

1. Hauptcode

A. Herz- / Kreislaufsystem

- A1 Kardinale Venen / Herzklappen
- A2 Erkrankungen der Herzkranzgefäße/Myokardinfarkt
- A3 Herz - Rhythmusstörungen
- A4 Hypertonie
- A5 Arterien
- A6 Venen (inkl. Varizen)
- A7 Lymphgefäße inkl. Lymphödem
- A9 Andere Erkrankungen des Herz- / Kreislaufsystems
- B. Blut / Knochenmark/ Milz
- B1 Anämie
- B2 Gerinnungsstörungen
- B3 Erkrankungen des Knochenmarks und des Blutes
- B4 Milz / Lymphknoten / Immunsystem
- B9 Andere Erkrank. von Knochenmark / Blut / Milz
- C. Lunge / Atemwege
- C1 Asthma
- C2 Chronischer Husten
- C3 Lungenembolie
- C4 Lunge / Pleura exkl. TBC
- C9 Andere Erkrankungen des Atemtraktes
- D. Skelett / Bewegungsapparat
- D1 Muskeln / Sehnen
- D2 Gelenke / Bänder / Bursa exkl. D3
- D3 Arthritis / M. Bechterew
- D4 Arthrose
- D5 Wirbelsäule exkl. D3
- D9 Andere Erkrankungen des Bewegungsapparates
- E. Verdauungstrakt
- E1 Ösophagus / Magen / Duodenum, inkl. Ulcera
- E2 Darm (Dünndarm / Kolon)
- E3 Rektum / Anus, inkl. Hämorrhoiden
- E4 Leber / Gallenwege / Gallenblase
- E5 Pankreas, exkl. Diabetes
- E6 Zwerchfell
- E7 Hernien
- E9 Andere Erkrankungen des Verdauungstraktes
- F. Stoffwechsel
- F1 Zuckerstoffwechsel
- F2 Erkrankungen der Schilddrüse
- F9 Andere Stoffwechselerkrankungen
- G. Infektions- und Parasitäre - Krankheiten
- Gi Komplikationsloser Infekt

G 2 Tuberkulose

- G3 Virale Hepatitis
- G9 Andere infektiöse oder parasitäre Krankheiten
- H. Niere und ableitende Harnwege
- H1 Niere / Niereninsuffizienz (Dialyse / Transplantation)
- H2 Nierensteinleiden
- H3 Ableitende Harnwege
- H9 Andere Erkrankungen der Nieren + abl. Harnwege
- I. Geschlechtsorgane
- I1 Männliche Geschlechtsorgane
- I2 Vulva, Vagina, kleines Becken
- I3 Uterus
- I4 Adnexe
- I5 Störungen des Menstruations - Zyklus
- I6 Erkrankungen der Brustdrüse
- I7 Sterilisation
- I9 Andere Erkrankungen der Geschlechtsorgane
- K. Schwangerschaft / Sterilität
- K1 Schwangerschaft normales Risiko
- K2 Schwangerschaft mit Komplikation
- K3 Sterilität und künstliche Befruchtung
- L. Nervensystem
- L1 Hirn / Rückenmark
- L2 Periphere Nerven
- L3 Lähmung / Ataxie
- L4 Migräne und Äquivalente
- L5 Epilepie
- L9 Andere Erkrankungen des Nervensystems
- M. Psychische Erkrankungen
- M1 Schlafstörungen
- M2 Psychische Erkrankungen
- M3 Psychoorganische Erkrankungen
- N. Haut
- N1 Allergische Hauterkrankungen, exkl. Ekzem
- N2 Entzündliche / infektiöse Hautkrankheiten
- N3 Ekzem
- N4 Vaskuläre / degenerative Hautkrankheiten
- N5 Psoriasis / Hyperkeratosen
- N6 Narben
- N9 Andere Hauterkrankungen
- O. Hals/Nase/Ohren
- O1 Nase exkl. N6
- O2 Nasennebenhöhlen
- O3 Mundhöhle, Speicheldrüsen
- O4 Tonsillen / Adenoide
- O5 Larynx / Trachea

O6 Missbildungen der Nase und der Ohren

- O7 Mittelohr / Tuba Eustachii
- O8 Innenohr
- O9 Andere HNO - Erkrankungen
- P. Auge
- P1 Lid/Konjunktiva
- P2 Linse/Kornea / Glaskörper
- P3 Iris/Glaukom
- P4 Retina/Sehnerv/Gefäße
- P5 Augenmuskeln/Strabismus
- P9 Andere Augenerkrankungen
- Q. Zähne / Kiefer
- Q1 Zyste
- Q2 Zahnabszess
- Q3 Fibrome
- Q9 Andere Erkrankungen des Kiefers oder der Zähne
- R. Unfall / Unfallbeding
- R1 Kopf/Wirbelsäule
- R2 Thorax
- R3 Abdomen
- R4 Obere Extremität
- R5 Untere Extremität
- S. Nicht-Pflichtleistungen
- T. Präventive Massnahmen
- T1 Vorsorgeuntersuchung
- T2 Impfen
- U. Vertrauensarzt orientiert (anstelle Diagnose)

2. Zusatzcode (Falls nötig sind mehrere Angaben möglich.)

- 01 Rechts
- 02 Links
- 03 Akut
- 04 Chronisch / Rezidiv
- 05 Infektiös
- 06 Funktionell
- 07 Neoplasie
- 08 Berufsbedingt

Interpretationen: Es können mehrere Ziffern des Hauptcodes angegeben werden. Bei der Verwendung des Zusatzcodes muss der dazugehörige Hauptcode angegeben werden. Neoplasmen müssen immer mit dem Hauptcode und dem Zusatzcode angegeben werden. Unvollständige Körperschädigungen im Sinne von Artikel 9 Absatz 2 UVG / UVV werden dem Hauptcode R zugeordnet. Code U meint die Angabe der genauen Diagnose an den zuständigen Vertrauensarzt. Bei Folgeschäden von Sturz/Verletzungen ist dieser obligatorisch. Falls eine Rechnung eine Nichtpflichtleistung enthält, ist diese mit einem Stern (*) zu kennzeichnen. Bei Infektionen bezeichnet der entsprechende Hauptcode das Organ und wird mit dem Zusatzcode gekennzeichnet (Annahme Gruppe G / N2).

Figure 8. Tessiner code