

# Scientific Background

European Nursing care Pathways – Version 3.0



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# Scientific Background

## Introduction

The nursing classification ENP (European Nursing care Pathways) has been developed to illustrate the nursing care process within the context of the nursing documentation in standardized language. The major targets of adopting the standardized nursing language ENP as an instrument refer to improving the communication among healthcare professionals, supporting process flows such as the transfer from one institution to another, the performance transparency of nursing. The structure of ENP supports nurses in their decision-making within the framework of the nursing care process by presenting up-to-date nursing knowledge. Furthermore, data will be generated through the use of standardized formulations for nursing documentation which can be used for hypothesis formation/examination within the context of nursing research and control procedures of nursing management as well as risk management. ENP is available as print version as well as database or implemented in software products. Due to the availability of the taxonomy in different languages (English, German, French, and Italian) within a software environment ENP can also be used in a multilingual team.

ENP can be divided into three parts:

- A) ENP... as a nursing classification system for a total of seven concept groups (see chapter 1.1)
- B) ENP... as pre-combination of the elements of this nursing classification system (see chapter 1.2)
- C) ENP ... as the practice guidelines developed from the pre-combination and the nursing classification (see chapter 1.3) which offer nurses professional support to illustrate the nursing care process by using standardized formulations, such as nursing diagnoses, characteristics, etiologies, resources, nursing outcomes, and interventions.

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## 1. Structure of ENP

The three different parts of ENP are described and its structures illustrated in figures. **Part A** in the figure shows the **nursing classification system** ENP. **Part B** illustrates how **pre-combinations** of elements of the nursing classification system lead, for example, to nursing diagnoses and intervention concepts. **Part C** in the figure illustrates how a nursing diagnosis develops to a nursing practice guideline through linkages with characteristics, etiologies, resources, nursing outcomes, and nursing intervention concepts. Currently, there are **566 (version 3.0)** nursing practice guidelines defined. In the following, the categorization of ENP as a nursing classification and practice guideline will be explained. In the overall figure (Figure 1), the connection between the three parts is shown.

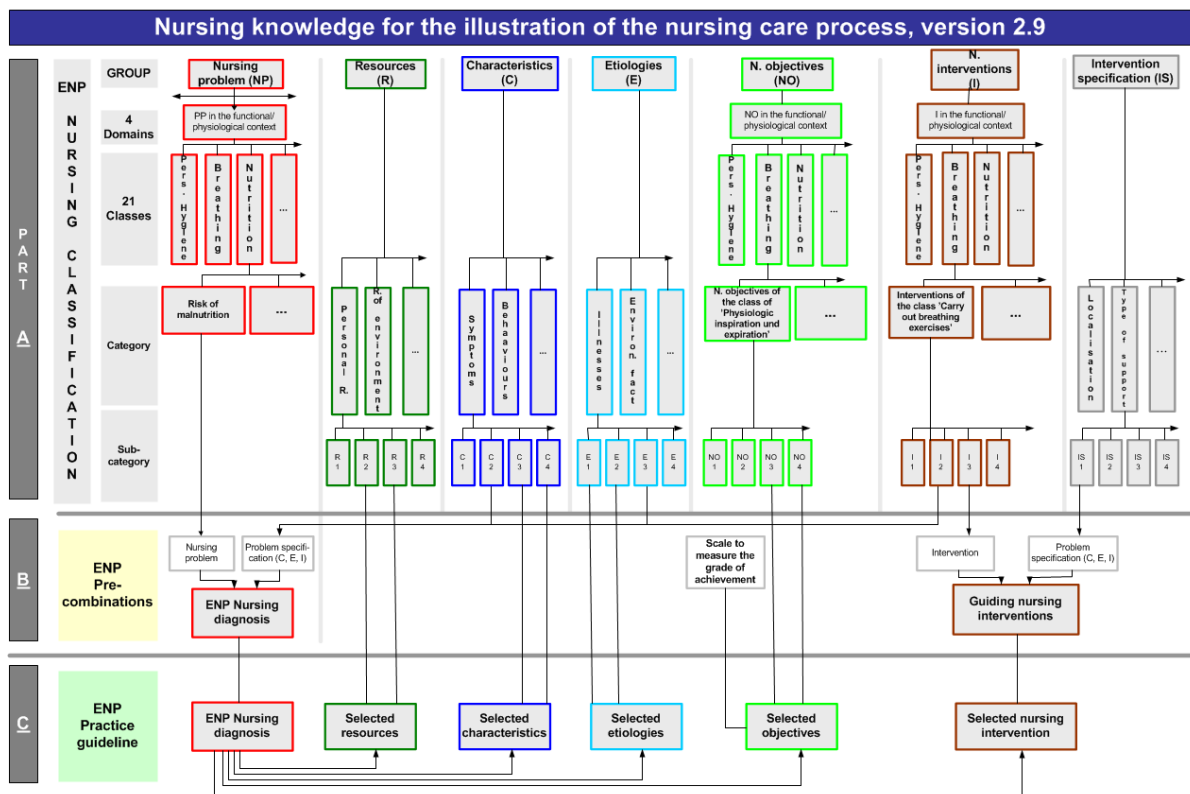


Figure 1: Hierarchical structure of the ENP classification system with parts A, B, and C

### 1.1 The nursing classification ENP – part A

For better understanding, the principles of organization theory are briefly explained. Generally, a classification is an organization system which is based on the principle of class formation. A classification is a list of terms which normally shows a hierarchical structure. The term superordinate to all other terms in the classification is usually called top term and represents the all-comprehensive term. In ENP, the top term is called **"Nursing knowledge/terms for the illustration of the nursing care process"**. The hierarchical term relations illustrate the relations between the super- and subordinate terms. Within the individual classes the classification system is hierarchically organized, as well. It spans the elements: group → domain → class → category → subcategory.

The **group of nursing problems**, for example, subdivides into **four domains** (nursing problems in the functional/physiological context, nursing problems in the emotional/psychosocial context, nursing problems with multi-dimensional risks, and environment-related nursing problems). The domain nursing problems in the functional/physiological context, for example, is divided into **11 classes**, which are attributed to **68 categories**. In the following table, the domains, classes, and categories of ENP nursing problems are listed. The subdivision of domains and classes is identical in the three groups of nursing diagnoses, outcomes, and interventions.

Domain	Class	Category
<p><b>Functional/physiological context</b></p> <p><i>The domain includes all ENP practice guidelines which lead to restrictions and/or loss of self-care skills to meet the basic physical needs and/or health risks related to changes of body functions and structures.</i></p>	<p><b>Personal hygiene/clothing</b> Ability to plan and carry out conscious actions for cleansing, care of the body and to provide for clothing adapted to the environment.</p>	Self-care deficit washing <sup>1</sup>
		Self-care deficit oral hygiene
		Self-care deficit care of the nails, ears, eyes and the nose
		Self-care deficit hair care
		Self-care deficit dressing
	<p><b>Respiration</b> Includes the respiratory functions of ventilation (inspiration and expiration, function of respiratory muscles), gas exchange between air and blood as well as the self-cleansing functions of the respiratory tract.</p>	Impaired airway clearance
		Insufficient respiration
		Risk of respiratory insufficiency
		Risk of suffocation
		Risk of aspiration
		Risk of atelectasis/pneumonia
		Risk of impaired respiration postoperatively
	<p><b>Nutrition</b> Includes the activities, abilities, requirements and functions of human beings to take food with the purpose of growth, preservation, regeneration of tissue, and energy production.</p>	Reduced food intake
		Impaired swallowing
		Malnutrition
		Risk of malnutrition
		Impaired eating habits
		Dehydration/electrolyte imbalance
		Risk of impaired fluid and electrolyte balance
		Risk of impaired breast feeding
		Impaired breast feeding
	Risk of nutritional related complications	
	<p><b>Elimination</b> An elimination of urine, stomach or intestinal contents caused by muscle contraction</p>	Self-care deficit micturition/defecation
		Impaired urinary elimination
		Self-care deficit urinary incontinence
		Impaired stool elimination
		Self-care deficit stoma care
		Risk of stoma complications
		Impaired stoma care
		Risk of paralytic ileus
		Risk of anuria / renal failure
		Risk for incontinence
Risk of infection of the urinary system		
<p><b>Circulation</b> Includes activities, functions which ensure the blood supply of the</p>	Impaired cardiovascular function	
	Risk of impaired cardiovascular function	
	Risk of thrombosis	

<sup>1</sup> **Self-care deficit washing, for example, is defined as:** Limited or lacking abilities or skills to realize the necessary measures to clean the whole body with water and suitable care products. This creates an imbalance between self-care needs and self-care abilities of the person concerned. Each category is defined and is part of the assigned ENP nursing diagnosis.

	<p>body with adequate and necessary volume and pressure. This includes the pumping functions of the heart, the blood vessel functions for the transport of blood through the body as well as functions for the preservation of arterial blood pressure.</p>	Risk of lung embolism
		Risk of bleeding
		Risk of allergic reaction/anaphylactic shock
	<p><b>Exercise/mobility</b> Includes all activities and abilities of movement to change body positions or transfer from one place to another, locomotion in various forms such as walking, running, etc. also belongs to this class.</p>	Impaired movement
		Impaired walking
		Impaired sequence of movement/movement pattern
		Risk of falling
		Risk of contracture
		Risk of spasticity
		Risk of paralysis
		Risk of impaired mobility
	<p><b>Relaxing/Sleeping/Resting</b> Includes all activities and mental functions which are expressed in a periodical, reversible and selective physical and mental detachment from the immediate environment, in which a body enters a state of rest and bodily functions are reduced.</p>	Risk of sleep deficit
		Impaired sleep
		Impaired relaxation
	<p><b>Tissue Integrity</b> Includes all activities, behaviors and functions, which influence or may influence the integrity of the body and/or the organs.</p>	Risk of pressure points
		Risk of skin damage
		Risk of mucous membrane/skin damage
		Altered oral mucosa
		Risk of corneal damage
		Risk of impaired wound healing
Impaired wound healing		
Risk of dislocation/luxation		
Risk for trauma		
Risk of swelling/edema formation		
Risk of tissue damage		
Risk of infection/germ spreading		
<p><b>Metabolism</b> Includes all functions of regulation of the required food components such as carbohydrates, proteins and fats as well as their conversion into energy and all other chemical conversion processes of the organism. This includes e.g. the glucose metabolism as well as the functions of hormone balance of the pituitary gland, thyroid, adrenal gland, etc.</p>	Risk of hypo/hyperglycemia	
	Risk of ketoacidosis	
	Metabolic disorder	

	<p><b>Reproduction</b> Includes all functions and activities which relate to fertility, pregnancy, birth, and lactation.</p>	<p>Risk of complications for the mother and/or unborn child</p> <p>Risk of unwanted conception</p> <p>Impaired sex life</p>
	<p><b>Body temperature</b> Includes all functions and activities related to the regulation of body temperature.</p>	<p>Risk of complications related to heat regulation</p> <p>Risk of hyper/hypothermia</p>
<p><b>Emotional/psychosocial context</b> <i>The domain includes all ENP practice guidelines related to limitations (e.g. physical, environmental), behaviors or other circumstances, which impair the personal development, participation and/or emotional and social health.</i></p>	<p><b>Sensation</b> Includes all neurophysiological and neuropsychological processes, which are caused as a precursor of perception through stimulus response. Feelings may relate to pain or emotions such as boredom, fatigue, etc.</p>	Pain
		Fear
		Impaired feeling
		Impaired well-being
		Feeling of boredom
		Personal suffering
		Exhaustion
		Risk of exhaustion
		Shame
	<p><b>Perceptions</b> Includes all processes and functions related to the specific mental functions of recognition and interpretation of sensory stimuli (auditive, visual, gustatory, olfactory, tactile).</p>	Restricted spatial orientation
		Impaired body image
		Impaired self-concept/image
		Risk of disorder of consciousness
		Impaired consciousness
		Impaired perception
		Risk of complications due to perceptual disorders
	<p><b>Interaction</b> Includes any interrelated, mutual action of two or more persons, for which usually any kind of communication is used.</p>	Risk of adequate/ineffective communication
		Impaired communication
		Risk of impaired interaction
		Impaired interaction
		Impaired relationship
		Risk of unfulfilled needs
	<p><b>Action/behavior</b> Includes all activities and physical reactions of a human being which can be observed and/or measured. All immediately observed actions are behaviors, which are externally observable expressions of a human being to his/her environment.</p>	Impaired adjustment
		Noticeable behavior
		Impaired coping strategy
		Harmful behavior/addiction
		Risk of self-injury/endangering others
Behavior endangers self/others		
Self-injurious behavior		
Risk of ineffective therapy		
Risk of unachieved health-related goals		
Risk for suicide		

		Risk of escape	
	<b>Activity/daily routine</b> Includes all actions/activities of a person's involvement in a life situation which focuses on carrying out tasks of a structured daily routine, such as organize leisure time, carry out household activities, etc. and/or relate to the social integration/participation and the associated perspectives.	Risk of self-care deficit	
		Impaired self-care	
		Impaired organization of daily life/life	
		Impaired performance of activities	
		Impaired recreational activities	
		Self-care deficit housekeeping	
		Dependent care	
		Risk of dependent care	
	<b>Personal development</b> Includes all activities, requirements and functions to get a realistic picture of the world and oneself to act and make decisions in one's own interest.	Impaired cognitive capacity	
		Impaired ability to make decisions	
		Impaired development	
		Risk of impaired development	
		Impaired future perspectives	
		Disturbed habits	
		Impaired quality of life	
		Impaired dying phase	
	<b>Knowledge/information</b> Includes all abilities and activities to gain and use information and knowledge and to apply these for the promotion of health as well as maintenance and restoration.	Impaired self-esteem	
		Lack of information/abilities	
		Impaired ability to process information	
	<b>Group</b> Includes activities, actions and ideas which relate to social norms such as religion, roles, beliefs, value systems and influence the own choices and decisions.	Knowledge about health-promoting behavior	
		Risk of social exclusion	
		Risk of social isolation	
		Risk of financial/social ruin	
		Risk of occupational detachment	
		Role conflict	
		Impaired religious practice/beliefs	
	Self-care deficit		
<b>Multidimensional risks</b> <i>The domain includes all ENP practice guidelines related to therapy/procedures, limitations (e.g. physical, environmental) and/or other circumstances which lead to risks and which affect the functional/physiological as well as the emotional/psychosocial area and cannot be clearly assigned to a class.</i>	<b>Health risks non-specific</b> Includes all activities, treatments, therapies and (physical) changes which relate to a potential risk for own health.	Risk for sudden infant death syndrome	
			Risk of complications: treatment/therapy
			Risk of complications: primary disease/injury
			Risk of complications: surgeries
			Risk of complications: pathologic changes
			Health risks



<b>Environment-related nursing problems</b> <i>The domain includes all ENP practice guidelines which do not relate to the care receiver, but to risks for his/her social environment.</i>	<b>Health risks for the environment</b> Includes all physical changes which are a potential threat of the person affected for his/her environment.	Risk of infection
N = 4	N = 21	N = 137

Table 1: Group of nursing problems divided into domains, classes, and categories in ENP version 3.0

In 2006 (version 2.3), the pre-combined terms/concepts of the ENP nursing diagnoses were separated into the elements nursing problem and specification and a **monohierarchic structure** was created through clustering. This reorganization enables data evaluation on different aggregation levels. The clustering of the nursing problems were realized in several steps by analysis of the inherent nursing concepts. The entire hierarchization processes were conceptually driven and follow previously set rules based on the fundamental definition work of the domains, classes, etc.

Between 2007-2008 the segmentation and cluster formation of ENP nursing outcomes and interventions was carried out. This, as well, refers to monohierarchic structures. The nursing outcomes and interventions are hierarchically structured on the level of domains and classes as well as thematically structured according to the same structure as the nursing problems. On the level of categories there are abstractly formulated nursing outcomes and nursing intervention concepts. The structure of domains and classes in the three groups of nursing diagnoses, objectives, and interventions has been harmonized. Example: category of nursing problems: "*self-care deficit personal hygiene*", attributed category of nursing outcomes is "*existing self-care ability personal hygiene*", on the level of nursing interventions the category is "*nursing interventions of personal hygiene*". Characteristics and etiologies have their own hierarchical structure. The terms/concepts are structured **monohierarchically** in ENP. The hierarchization of ENP started in 2006 (version 2.3) with nursing problems. Since then ENP has been termed as nursing classification. An example from the current ENP version 3.0:

**Nursing diagnoses (n=566)**

Domain: **Functional/physiological context**

Class: personal hygiene/clothing

Category: Self-care deficit washing

**Diagnosis**

Category: Self-care deficit oral hygiene

Nursing diagnosis ...

**Nursing outcomes (n=1920)**

Domain: **Functional/physiological context**

Class: personal hygiene/clothing

Category: Existing self-care ability personal hygiene

Nursing outcomes

Category: Existing self-care ability oral hygiene

Nursing outcomes

**Nursing interventions (n=2641)**

Domain: **Functional/physiological context**

Class: personal hygiene/clothing

Category: Nursing interventions for personal hygiene

Nursing interventions

Category: Nursing interventions for oral hygiene

Nursing interventions

**Characteristics (n=4433)**Domain: **Functional/physiological context**

Class: personal hygiene/clothing

Category: Characteristics related to dental care

Characteristics

**Etiologies (n=3974)**Domain: **Functional/physiological context**

Class: personal hygiene/clothing

Category: hygiene behavior

Etiologies

**Resources (n=694)**Domain: **Functional/physiological context**

Category: physical abilities

Resource

The hierarchies developed are relevant for further development of ENP and data evaluation and are invisible to the end user as well as in ENP book publications, because the benefit of ENP for nursing practice can be seen in the horizontal structure (figure 1 part C).

The following table 2 shows the current number of items from each group of ENP. Each item exists only once in the system, but can be linked several times with the exception of the nursing diagnoses. Within the domains, classes and categories each element of a group has only one linkage to the next level. Each item has a definite ID number which doesn't change with a new version. In ENP, items are not deleted, but deactivated. This ensures that older nursing care plans with now invalid terms can still be displayed and read.

Terms/concepts of the group	Number 2.6	Number 2.7	Number 2.9	Number 2.10	Current 3.0
Nursing diagnoses	542	548	552	557	566
Characteristics	2,719	2,905	3,984	4,243	4,439
Etiologies	2,282	2,426	3,526	3,802	3,983
Resources	457	473	648	653	694
Nursing outcomes	1,683	1,724	1,852	1,865	1,930
Nursing interventions	2,511	2,558	2,615	2,632	2,653
Intervention specifications	4,285	4,461	4,797	5,011	5,732

Table 2: Number of items of the ENP groups in the version history

Domain	Class				Category				Pre-combined ENP nursing diagnoses			
	2.7	2.9	2.10	3.0	2.7	2.9	2.10	3.0	2.7	2.9	2.10	3.0
Nursing problems in the functional/physiological context	11	11	11	11	67	67	67	70	279	278	280	294
Nursing problems in the emotional/psychosocial context	8	8	8	8	59	59	59	60	212	221	224	228
Nursing problems with multi-dimensional risks	1	1	1	1	9	9	9	6	54	50	50	41
Environment-related nursing problems	1	1	1	1	1	1	1	1	3	3	3	3
<b>Total: 4</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>134</b>	<b>136</b>	<b>136</b>	<b>137</b>	<b>542</b>	<b>547</b>	<b>552</b>	<b>566</b>

Table 3: Number of elements from the group of ENP nursing problems, version 2.7 (May 2012) to version 2.9 (May 2014), version 2.10 (May 2017) and version 3.0 (May 2019)

## 1.2 Pre-combinations of terms from the ENP nursing classification – part B

In ENP, elements of the nursing classification are pre-combined, i.e. the combination of individual terms and elements is considered in their whole form as a descriptor. For example, the great majority (approx. 4/5) of all nursing diagnoses consist of a nursing problem (term from category level of the group nursing problems) and a specification (terms from the group of characteristics, etiologies, or nursing interventions). Besides the nursing diagnoses, the nursing interventions are pre-combined in ENP, as well. The following chapters illustrate the procedure and structure of the pre-combination by means of examples.

### 1.2.1 Pre-combined ENP nursing diagnoses

An ENP nursing diagnosis is created by the combination of a nursing problem from the monohierarchic structure of part A and a specification of the nursing problem by means of an etiology or characteristic.

#### Example 1 – group nursing problem:

Domain: Nursing problems in the functional/physiological context  
Class: Personal hygiene/clothing

Category: Self-care deficit dressing

Nursing problem: **impaired dressing/undressing**

For example, the precombined ENP nursing diagnosis "The patient is restricted in dressing and undressing due to a disturbed planning of action/movement and performance" is composed of the nursing problem "impaired dressing/undressing" and the etiology "disturbed planning of action/movement". The exemplary nursing diagnosis is assigned to self-care deficit dressing.

Another example is "The patient is at risk of atelectasis/pneumonia due to dystelectasis (reduced lung ventilation), as displayed in the following figure:

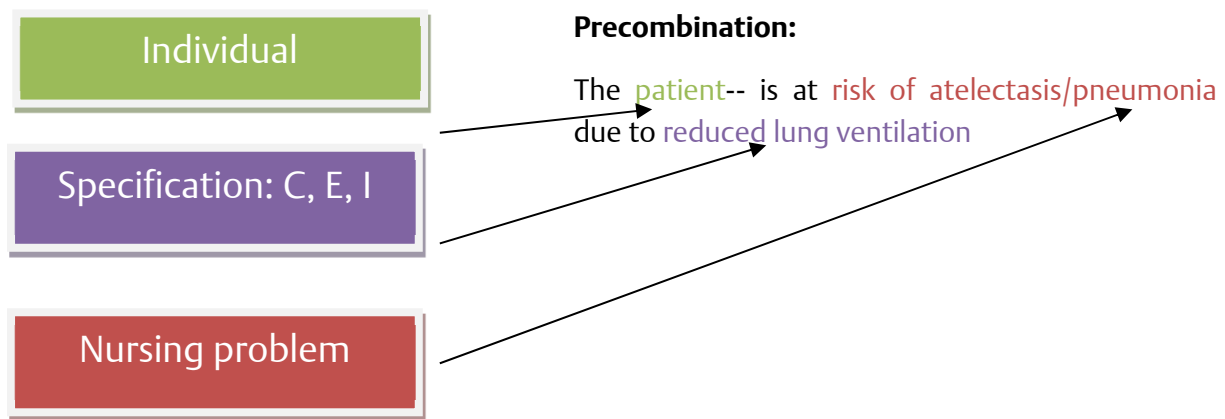


Figure 2: Precombination of an ENP nursing diagnosis

These examples show how the ENP nursing diagnosis is composed out of the terms of the classification by precombination.

Each ENP nursing diagnosis of version 3.0 received a definition for a clear application (see also chapter 2.7). This has been developed both for educational purposes as well as for nurses who do not know the nursing diagnostic concepts and to support and promote a common understanding. In general, the definitions are not required in daily use by trained nurses due to the granularity of the ENP nursing diagnoses, i.e. the level of detail, accuracy, and expressiveness, and the clear formulations which offer little room for interpretation. The example below shows the structure of a definition for a ENP nursing diagnosis.

00022 The patient-- is unable to organize **personal hygiene independently** due to being **disorientated**

**Definition:**

Restricted or lacking ability to wash whole body or body parts with water and/or care utensils due to impaired mental function of (self-)perception which is required to orient to time, place, situation and/or person.

It becomes clear that in the definition the two concepts "disorientation" and "unable to organize personal hygiene independently" are addressed. It is attempted to describe and/or to explain the key elements of an ENP nursing diagnosis by the precise definition of terms used.

If there is already a specification in the nursing diagnosis in the form of an etiology or a characteristic, the offered etiologies as well as the characteristics refer to the two components of the nursing diagnosis.

Example:



## ENP nursing diagnosis

Der **Patient** unable to carry out **personal hygiene** independently due to a **hemiplegia/hemiparesis**

- Individual
- Specification: E
- Nursing problem

### Characteristics

- Is unable to wash him/herself
- Is unable to dry him/herself
- Flaccid paralysis of the affected side
- Spastic paralysis of the affected side
- ...

### Etiologies

- (Etiology in the title **hemiplegia/-paresis**)
- Cerebral vascular accident
  - Neurological disease
  - Brain tumour
  - ...

Figure 3: Reference points of the characteristics and etiologies of ENP

Nursing diagnoses for which it is helpful to state the impairment grade on the level of characteristics will be added with a Likert scale for impairment and dependency grades. Example:

The patient is impaired in transfer skills

Characteristics:

- Impaired transfer ability from bed to the (wheel-/arm-) chair
- Impaired transfer ability from (wheel-/arm-) chair to the bed
- Impaired transfer ability from wheelchair to the toilet
- ...

#### Impairment level of the transfer

- Level 1: Independent transfer using aids
- Level 2: Low impairment of transfer
- Level 3: Significant impairment of transfer
- Level 4: Severe impairment of transfer
- Level 5: Loss of transfer ability

A concrete operationalization of impairment levels according to the clinical context of the associated ENP nursing diagnosis is desirable and set on the developmental agenda for the medium to long-term future. This is to ensure a clear understanding of the individual graduations among all ENP users and thus a selection that is as uniform as possible.

### 1.2.2 Pre-combined ENP nursing interventions

For the group of nursing interventions pre-combinations are created, as well. In contrast to the ENP nursing diagnoses the pre-combination consists here of different elements from the group of nursing interventions and the group of intervention specifications. The nursing interventions are attributed to intervention specifications. These can contain further information, for example, regarding frequency, grade of care of the person concerned during performance of the nursing intervention, number of required nurses, required aids or products, localization/location referring to the intervention, and time data, etc.

The levels of pre-combined nursing diagnoses and nursing interventions are created from the nursing classification system. These pre-combined nursing diagnoses and nursing intervention formulations are those which are used by nurses for the documentation of the nursing care process. The separation of ENP nursing classification elements from pre-combined elements is indicated by the horizontal gray line in figure 1, and the connections are illustrated by linking lines. In the following, it will be shown how the nursing intervention concepts are assigned to guiding intervention specifications:

An example from the group of nursing interventions:

**Domain:** Nursing diagnoses in the functional/physiological context

**Class:** personal hygiene/clothing

**Category:** Carry out personal hygiene

**Subcategory:** Wash whole body individually

**Wash body parts individually**

Give support during shower

Support during bath

Carry out basal stimulating body wash according to Bobath

...

The intervention formulation "Wash body parts individually" is not concrete enough for an instruction in the context of the nursing care process planning. Details on issues such as the location, where personal hygiene is carried out and which level of support is needed, remain unanswered. Therefore, the ENP nursing interventions are specified further. Thus, a specific instruction for the individual adequate and sufficient performance of nursing care is established. The nursing intervention "Wash body parts individually", for example, is attributed to the following intervention specifications:

- Body part to wash
  - Face/hands
  - Arms
  - Chest
  - Back
  - Legs
  - Genital area
  - Buttocks
- Indicate level of support:
  - Supervise
  - Help by supporting
  - Partially take over
  - Take over completely
  - Activate/guide
- Location of partial body wash
  - In bed
  - Sitting at edge of the bed
  - At the washbasin
- Indicate nursing product used
- Frequency/time

Basically, the following intervention specifications can be assigned to the nursing intervention formulations:

- Specifying aspects of the underlying intervention concept
- Type of support
- Number of nursing personnel
- Care products used
- Localization, where the body wash is to be carried out
- Interval information
- Time data
- Localization of body region
- Aids required
- Professions involved in the treatment process

### 1.3 Practice Guidelines in ENP – part C

In part C of the ENP structure (see figure 4), it will be explained how the practice guidelines from the different items of the groups are combined. Each practice guideline consists of elements from the group of nursing problems (extended to nursing diagnoses through the intermediate step of pre-combination), etiologies, characteristics, resources, outcomes, and interventions (extended to guiding interventions through the intermediate step of pre-combination).

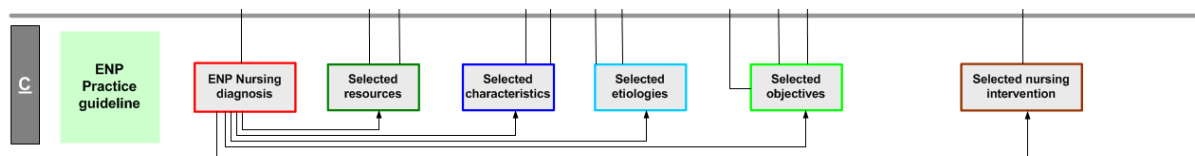


Figure 4: Horizontal structure of an ENP practice guideline

The etiologies and characteristics for a nursing diagnosis of an ENP practice guideline refer to the specification. This is a particularity of the structure of the ENP nursing diagnoses. There are also ENP nursing diagnoses which do not have any pre-combination of specification and nursing problem, but consist of the individual and the nursing problem only. By coding of etiologies and characteristics the nursing problems become nursing diagnoses and are generally rest categories for nursing phenomena which could not have been developed as nursing diagnoses by pre-combination. Pre-combinations of ENP nursing diagnoses are only developed if specific intervention concepts are suggested exactly for these. This way it is possible to provide "best practice" or "evidence-based nursing" in the sense of a practice guideline.

By linking the class-spanning items which belong together from a research-based perspective, the horizontal structure of nursing practice guidelines is created. The relations between nursing diagnoses, characteristics, resources, outcomes, interventions, and intervention specifications are illustrated in figure 1 with horizontal lines. On the emerging micro level the ENP development team speaks of an **ENP practice guideline**. It is a professionally sound and possibly evidence-based attribution of possible nursing outcomes and intervention concepts for remedy/relief of a nursing problem or a nursing diagnosis. The ENP developer also used the terms "modified practice theory" (Wieteck, 2003) or "nursing diagnosis-related pathway" (Wieteck, 2007a). Both descriptions are reflected in the term practice guideline.

An ENP practice guideline is defined in accordance with the definitions of the general term "practice guideline" (Bölicke, 2001; Field & Lohr, 1992; Ollenschläger et al., 1999; Wieteck):

*An ENP practice guideline describes the systematically developed decision support for an adequate, sufficient approach based on current nursing knowledge for concrete nursing diagnostic problems. The ENP practice guidelines show the action and decision corridor in which nursing activity is being meaningfully carried out after making an ENP nursing diagnosis.*

The result of the meaningful combination of items to a practice guideline is the part of ENP which is used in nursing practice, is visible in a software application, and is individualized as a nursing pathway for each patient in the nursing care plan. According to the ENP developers, these nursing practice guidelines represent the up-to-date nursing knowledge.

## 1.4 (Further) development of ENP

The historical origination and further development of ENP is published in numerous book publications (e.g. Wieteck, 2003, 2004b, 2013, 2014). The specific revision documentation from one version to another can be read in the regularly published Scientific Background to ENP. Below, the key development steps and the current strategies for further development are briefly outlined.

ENP is registered as standardized nursing classification by means of object identifier (OID)<sup>2</sup> in “German healthcare” (“Deutsches Gesundheitswesen”). This allows data exchange between the different electronic patient/resident records. The information on ENP can be viewed at the homepage of the German Institute for Medical Documentation and Information (Deutsches Institut für Medizinische Dokumentation und Information, DIMDI)<sup>3</sup>.

### 1.4.1 Historical Background

The development of ENP began in 1989 at a German nursing school with the key objective to harmonize the nursing process documentation and to develop appropriate educational guidelines. A group of nursing teachers from various nursing schools were involved during the development. Coinciding with the first publication of the ENP practice guidelines in 1994, the implementation of ENP as software began in a relational database.

### Phase 1 (1989–1998) – inductive development

Starting point of the inductive approach was the objective to harmonize the educational contents and the actual organization of the nursing process planning. In the context of practice guidelines for the apprenticeship for nurse practitioners, specific nursing situations (n = 2138) with patients/residents/clients were used to create a nursing care plan. The nursing care plan was consented with the trainee and the nursing team and afterwards reflected in the teaching team. Formulations found and consented by the experts to illustrate the nursing situation in the form of nursing problems/diagnoses, outcomes, and interventions were additionally supported by literature and then cataloged (Wieteck, 2004c). The inductive development phase was characterized by four key research questions (Wieteck, 2004b).

- Which nursing diagnoses are made in nursing practice and are thus required to illustrate the individual nursing process as standardized formulations?
- Which characteristics, etiologies, and resource formulations occur in which nursing diagnosis and should be offered as a standardized formulation?

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<sup>2</sup> In the context of informatics so called “Object Identifier” are used as globally unambiguous and permanent identifier for a specific information object.

<sup>3</sup> See <http://www.dimdi.de/dynamic/de/klasi/oid/verzeichnis.html> (Accessed 10.05.2017).



- Which aims are agreed upon (with the patient/resident) in the nursing process and are documented in the nursing care plan?
- Which nursing interventions are chosen and can be illustrated with what standardized text blocks as guiding information? Which nursing interventions are discussed in the current nursing literature and can be offered as standardized text blocks?

From a methodological point of view the response to these questions was marked by three phases:

- **Qualitative, participating observation** of specific care situations were carried out in the context of practice guidelines with a trainee and a nursing teacher. During this nursing diagnostic process, the different nursing diagnoses were identified, nursing interventions determined and formulated in a nursing care plan for the patient/resident. If possible, the description of the nursing care plans are based on the already known and described nursing concepts. If this was impossible, own concept analyses were carried out according to Walker/Avant (Opel, 2004).
- Reflection of the nursing care plan with nursing practitioners and then in the teaching team in terms of a **consensus** of the diagnostic process as well as formulations for its illustration.
- Comparison of the identified nursing diagnoses, outcomes and interventions with the literature and cataloging of the new found results (Wieteck, 2004b). The ENP development team calls this a modified practice theory - in other words, it represents a nursing diagnosis-related pathway. Today, the term "ENP practice guideline" is used.

These nursing practice guidelines (situation specific or practice theories), today also called ENP practice guidelines, represent the up-to-date nursing knowledge according to the demands from the ENP developers. The development of nursing diagnosis-related pathways is based, as already mentioned, on the one hand on inductive methods, and on the other hand on literature work/analyses (Wieteck, 2004b) as well as review through validation works.

The nursing care process as well as the process of the development of a nursing diagnosis-related pathway has been understood as a hypothesis-generating process in the ENP development (Gordon & Bartholomeyczik, 2001; Schrems, 2003). The suggestions of Dickoff, James, and Wiedenbach (1968, S. 420-422) and their definition of the "situation-producing theory" or "practice theory"(Walker & Avant, 1998), which already contain key components of the nursing process, such as the objective of nursing performances and the resulting intervention instructions, have been expanded during the development of ENP by the dimensions of nursing diagnoses with characteristics, etiologies, and resources with regard to the nursing process model. While Dickoff, James, and Wiedenbach place the practice theory as the last of the four-step theory formation process, the ENP development team puts the modified "practice theory" as the second step of this process (see figure 5) (Dickoff et al., 1968). This is justified by the assumption that the nursing pathways/ENP practice guidelines, which are created by linking the nursing diagnoses with characteristics, etiologies and resources, nursing outcomes and interventions, are hypotheses but do not yet constitute a theory. Crucial to this assumption is that the developed hypotheses are considered as preliminary findings in the field of nursing. The formulated hypotheses can be approved, rejected or modified through new findings. This process is reflected in a continual updating process of ENP.

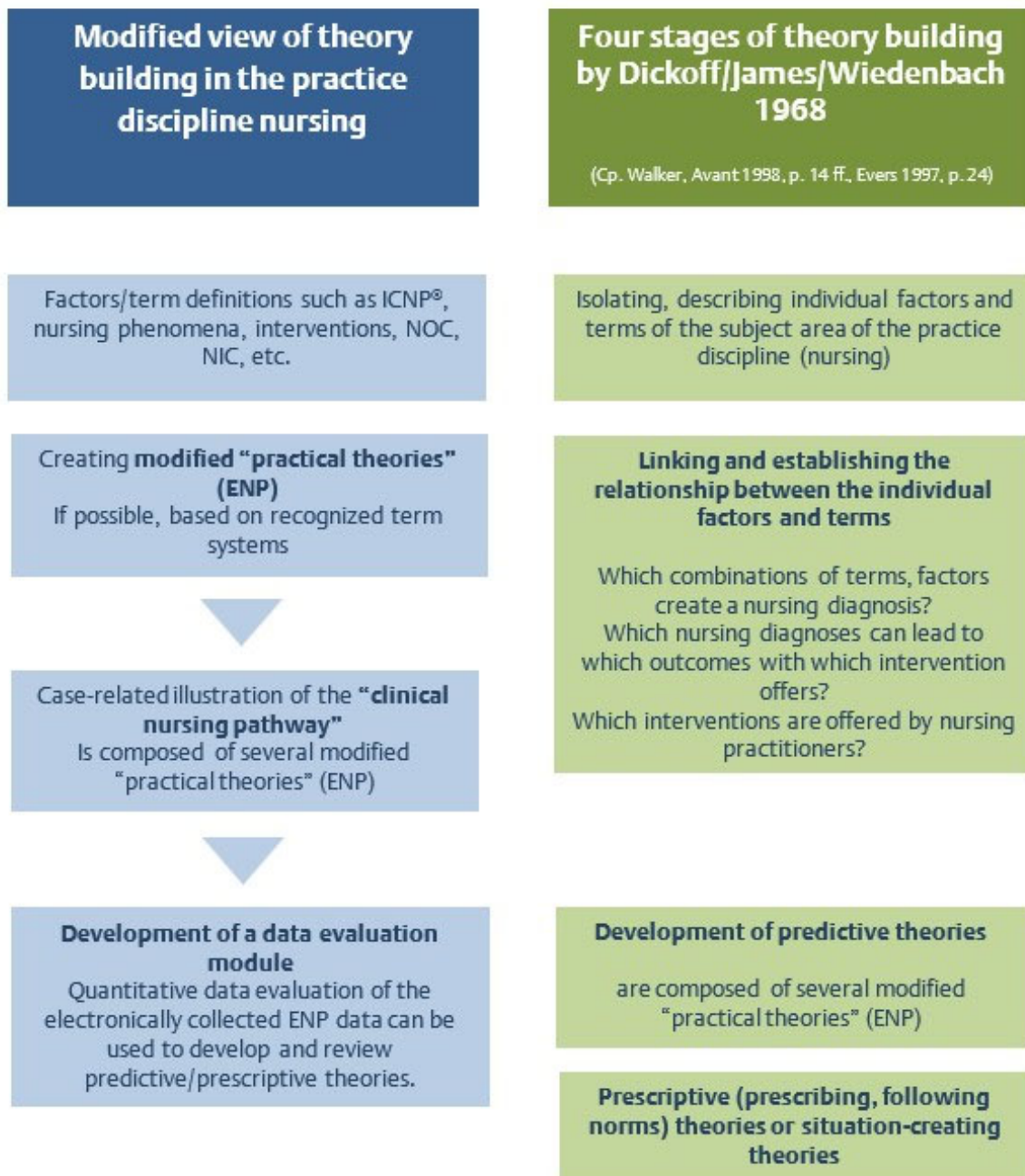


Figure 5: Integration of the modified "practice theory" in the theory formation process (Wieteck, 2007c based on Dickoff et al. 1968)

The terms/concepts used in ENP are characterized by high complexity and granularity. In order to support clarity of the developed language, linguistic structures and definitions for the individual ENP formulations have been determined by the ENP development team over the course of the development process.

### Phase 2 (1998 until today) – User feedback and validation for the further development of ENP

Since 1994 ENP is updated in a database and can be implemented by software vendors in an electronic patient/resident record for nursing process documentation. From the first application of ENP in an electronic nursing process documentation in 1996 (Deppmeyer, 1999; Wieteck, 2001) onwards, the user

feedback will be evaluated as an important aspect of the further development of ENP until today (Wieteck, 2013). The implementation of ENP in a database ensured that each term in ENP has a notation (i.e. unambiguous number or ID number) which, however, will not be printed in book publications for reasons of readability and lacking relevance for end users.

Since 2001 validation works are carried out on ENP. The studies on content and/or criteria validity are another important part of the further development of ENP. A rough overview of existing validation works is provided in chapter 1.4.3.

### **Phase 3 (2005–2009) – The classification structure**

In the book publication of 2004, ENP has no separate taxonomy structure yet. Previously, the ENP practice guidelines were assigned to the activities of daily living (ADL). The hierarchization works led step by step to the present classification structure. First, a taxonomy was developed for the ENP nursing diagnoses. The classification structure of the ENP nursing diagnoses was first mentioned in a specialist article, there ENP was also referred to as nursing classification system for the first time (Wieteck, 2006a). In 2006, ENP had seven classes, now called groups (nursing diagnoses, etiologies, characteristics, resources, nursing outcomes, nursing interventions and action-guiding instructions). The group of nursing diagnosis had at that time already a monohierarchic structure with 3 domains, 22 classes, and 128 categories. The other classes/groups such as etiologies, characteristics, etc. did not have a hierarchic structure yet, but terms/concepts were managed next to each other in the database. The concepts/terms of the classes had relations, i.e. linkages to the relevant nursing diagnoses. During 2007 and 2009 the individual groups were systematically and monohierarchically structured by clustering and converted into the present classification structure.

The realization of ENP in the form of a database can be best described with terms of informatics and knowledge representation: with regard to its database presentation ENP can be termed as ontology.<sup>5</sup> In ENP, up-to-date nursing knowledge is presented through linkages (relations). The basis are the nursing diagnoses, characteristics, etiologies, resources, nursing outcomes and nursing intervention concepts which are managed in a database. Without linkages to each other this would have little benefit for the user in terms of knowledge representation. For this reason, the elements mentioned above are structured in a database and linked to each other based on nursing knowledge. Finally, a complete set of information in terms of nursing knowledge and in the form of nursing practice guidelines is achieved from the fragmented pieces of information on the horizontal level. A semantic net is created through linkages which can be helpful for decision-making within the context of the nursing care process. In an electronic patient or resident record the formulations are used to realize the nursing process documentation. Additionally, ENP is linked with several other terminology systems and classifications (see chapter 1.6).

### **Phase 4 (since around 2008) – The translation of ENP as a continuous process**

ENP is available as a database in German, English, Italian, and French. Book publications in English and French are still pending, however in the dissertation of Serge Haag the validity of ENP in French is described (Haag, 2009). The Italian translation of ENP (Wieteck, Moantovan, & Rigon, 2015) has begun with a thesis in the Master's program for specialist translations at the University of Bologna. Since then, Elisabetta De Vecchis leads the ENP translation into Italian as well as the validation works of the translation (Rabl, Mereu, & Kraus, 2016) as a member of the ENP development team.

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<sup>4</sup> The term taxonomy (also called classification scheme) describes a unified model or theoretical construct according to which single elements/objects are classified and divided into categories by certain criteria.

<sup>5</sup> Ontologies are descriptions of conceptualizations of a knowledge domain, in case of ENP it is the nursing knowledge for representation and control of the nursing care process. An ontology is a controlled vocabulary which formally relates objects and its descriptions and makes a statement on a special domain. Often, the term "semantic net" is used for ontology.

### 1.4.2 Further development today

Today, ENP is a nursing language with a monohierarchic structure providing nursing knowledge by means of practice guidelines. Figure 6 shows the systematic process of further development of ENP which has been established in this form since 2013 and is being continuously improved. A new database version will be provided annually. Book publications are generally published every two years.

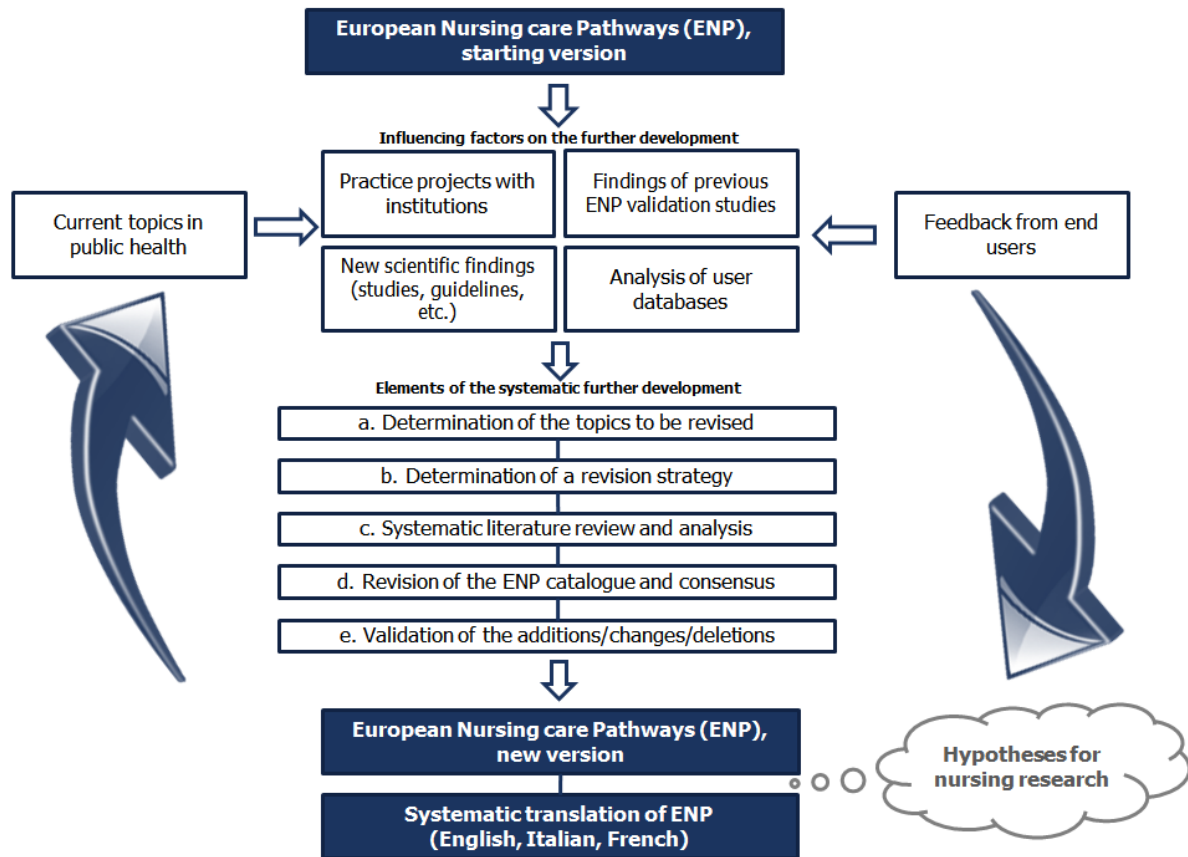


Figure 6: Process of the systematic further development of ENP today

With regard to the influence of health policy decisions, user feedback and new scientific findings in nursing and related disciplines of healthcare it is decided annually which ENP practice guidelines are subject to a systematic review and if necessary a revision. A systematic literature review is initiated as a central methodological step for update and review, which is carried out based on the following scheme (using the example of the ENP practice guideline “The patient suffers from fatigue (exhaustion/tiredness)”):

Revision step	Example from the development work of the ENP practice guideline “The patient suffers from fatigue (exhaustion/tiredness)”							
1. Specifying the revision strategy with the formulated question of the targeted literature search	<p>Conducting selective database search added by snowballing and a free hand search in selected journals by using the Boolean operators (AND, OR, NOT), truncations and phrase searches.</p> <p>Questions including:</p> <ul style="list-style-type: none"> <li>• What are the physiologically identifiable symptoms or characteristics of fatigue in persons concerned in the palliative phase?</li> <li>• Which symptoms or characteristics relevant for nursing are described in persons concerned with fatigue in palliative care?</li> <li>• What are causes of the symptom/phenomenon fatigue specifically in palliative care?</li> </ul>							
2. Definition of the preferred publication type and evidence level	<p>Preference for articles from peer-reviewed journals.</p> <p>Accepted study types: clinical studies, clinical trials, comparative studies, controlled clinical trials, evaluation studies, guidelines, meta-analysis, multicenter studies, practice guidelines, randomized controlled trials, reviews, scientific integrity reviews und systematic reviews.</p> <p>Individual case reports were excluded.</p>							
3. Determination of inclusion and exclusion criteria and the databases to be used	<p>Publications in German or English published from the year 1990 until January 2018.</p> <p>Exclusion of publications on people under the age of 18 as well as people with brain tumor, brain metastases, dementia or other cognitive impairments (fatigue here hardly distinguishable or recognizable).</p> <p>Search in databases which are accessible and recognized in nursing science: PubMed (Medline) and CINAHL as well as in the guideline register of the AWMF.</p>							
4. Development of search terms and determination of specific search phrases	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">fatigue OR tiredness OR weariness OR exhaustion</td> <td style="width: 5%; text-align: center;">A N D</td> <td style="width: 15%; text-align: center;">palliati* OR "end of life"</td> <td style="width: 5%; text-align: center;">A N D</td> <td style="width: 15%; text-align: center;">nurs* OR care OR caring</td> <td style="width: 5%; text-align: center;">A N D</td> <td style="width: 40%;"> diagnosis OR diagnoses  OR  symptom* OR sign OR signs OR syndrome* OR characteristic* OR indicator* OR mark OR marks OR feature*  OR  cause* OR source* OR reason* OR etiolog* </td> </tr> </table>	fatigue OR tiredness OR weariness OR exhaustion	A N D	palliati* OR "end of life"	A N D	nurs* OR care OR caring	A N D	diagnosis OR diagnoses OR symptom* OR sign OR signs OR syndrome* OR characteristic* OR indicator* OR mark OR marks OR feature* OR cause* OR source* OR reason* OR etiolog*
fatigue OR tiredness OR weariness OR exhaustion	A N D	palliati* OR "end of life"	A N D	nurs* OR care OR caring	A N D	diagnosis OR diagnoses OR symptom* OR sign OR signs OR syndrome* OR characteristic* OR indicator* OR mark OR marks OR feature* OR cause* OR source* OR reason* OR etiolog*		
5. Conducting database searches	Useful combination of search terms, operators, inclusion/exclusion criteria as well as filter criteria for complete search phrases <sup>6</sup> .							
6. Viewing and obtaining relevant literature in full text and evaluating of publications and studies in terms of quality (critical appraisal)	The databases retrieved 347 hits with the final search phrase which were evaluated for relevance by means of title and abstract screening. In the end, a total of 90 hits appeared relevant for revision. These publications were obtained in full text and after examination of their methodological quality, among others using the evaluation tools CONSORT, RIGHT and the STROBE statement, consistently compared to existing dysphagia-relevant elements in the ENP catalog. In accordance with snowballing, further potentially relevant publications were also considered, e.g. from the references section of the obtained primary literature.							

<sup>6</sup> Example of a complete search phrase: (fatigue[Title/Abstract] OR tiredness[Title/Abstract] OR weariness[Title/Abstract] OR exhaustion[Title/Abstract]) AND (palliati\*[Title/Abstract] OR "end of life"[Title/Abstract]) AND (nurs\*[Title/Abstract] OR care[Title/Abstract] OR caring[Title/Abstract]) AND ((diagnosis OR diagnoses) OR (symptom\* OR sign OR signs OR syndrome\* OR characteristic\* OR indicator\* OR mark OR marks OR feature\*)) OR (cause\* OR source\* OR reason\* OR etiolog\*)

	Finally the contents of 22 analyzed publications were considered and used for the ENP further development.
7. Revision of the ENP catalog according to the findings and facts from the literature	<ul style="list-style-type: none"> <li>• New addition, revision or deactivation of characteristics, etiologies, resources, nursing interventions and guiding intervention details</li> <li>• Literature support of all changed, new or deactivated items</li> <li>• Development of definitions, term explanations and reference texts</li> <li>• Evidence level of the revised practice guideline</li> </ul>
8. Consensus of the results in the ENP development team, also with consulted external experts in their fields as needed	
9. Validation of the revision through expert rating, a study or a clinical trial in nursing practice	<p>Did not took place within the framework of the development work of the ENP practice guideline “The patient suffers from fatigue (exhaustion/tiredness)”. Possible options are basically:</p> <ul style="list-style-type: none"> <li>• Expert rating</li> <li>• Clinical study</li> <li>• Pretest of the revisions in nursing practice</li> </ul>

Table 4: Process of the systematic literature search for the evidence-based further development of ENP using the example practice guideline „The patient suffers from fatigue (exhaustion/tiredness)“ (Hausherr, 2018)

The following table 5 shows a detail from a processing table for an ENP nursing diagnosis of the topic of breathing which was updated from mid-2016 to 2017 (vgl. Nißlein, 2017a; Nißlein, 2017b). By way of example, the revision of the etiologies<sup>7</sup> of the nursing diagnosis is shown. The columns represent the unique ID number of an etiology, the linguistic formulation of the etiology itself, the short reference to the literature from which the items have been developed or derived, the explanatory texts, as appropriate (e.g. for Latin technical terms), as well as the mark “X” which indicates the linkage of the etiology to the nursing diagnosis. Not shown in this detail are the linkage information of the ENP practice guideline to other instruments and concepts (see chapter 1.6) as well as the integrated time values of the ENP interventions (see chapter 4.7). The black text represents unchanged adopted items and elements in comparison to the original ENP version, red and/or red-crossed text indicates a change made to the new version. The following revisions could be:

- Addition of new items
- The linguistic modification of existing items (e.g. up to the technical expression)
- Deactivating the linkage of items to a nursing diagnosis (e.g. due to a better fit to another ENP nursing diagnosis)
- The complete deactivation of items (e.g. due to new scientific findings)

<sup>7</sup> Of course, the same type of documentation is maintained for characteristics, resources, nursing outcomes and interventions, as well.

				223 - The patient is at risk of atelectasis/pneumonia due to thick bronchial secretions
ID no.	Etiologies	Literature short references	if required: explanation of the etiology	
				Definition: Due to excessive secretion of thick, mucous secretion in the bronchi (dyscrinia), there is the risk of ventilation deficit (an obstructive ventilatory defect with increased resistance in the respiratory tract) of lung segments with incomplete expansion of the alveoli (atelectasis) and the development of pneumonia (Wied et al. 2012; Pschyrembel 2017).
3143	Abdominal surgery			
20813	Open heart surgery			
2951	Bronchial secretion with high viscosity		Viscosity describes the thickness of a fluid. The higher the viscosity, the more viscous and less flowable is the liquid.	X
2952	Glassy viscous bronchial secretion with glassy high viscosity		Viscosity describes the thickness of a fluid. The higher the viscosity, the more viscous and less flowable is the liquid.	X
2053	Non-productive cough	10;13;32;		*
2000	Exhaustion			*
15656	Impaired functioning of the bronchial mucous membrane caused by dust/allergens/noxa	39		X
20824	Acute respiratory disease	32		X
17430	Mucoviscidosis	24;27;28;32;33		X
20706	Bronchiectasis	7;15;17; ;24;29;30;31;37;35		X
20826	Chronic bronchitis	32		X
	Neuromuscular disease for the nursing diagnosis: Impaired self-cleansing function	3;9;10;13;11; 9 (ALS);22;27;32;34; 38		
	Acute or chronic injury/impairment of the spinal canal	39		X
	Recurrent respiratory diseases	32	Describes the recurrence of a respiratory disease after a clinically suspected, temporary cure or temporary improvement.	X
	Bronchial asthma	20;21;32;33		X
20608	Chronic obstructive pulmonary disease (COPD)	6;32 ;33		X

Table 5: Extract of the revision table of the ENP development team by example of the practice guideline “The patient is at risk of atelectasis/pneumonia due to thick bronchial secretions”

With this approach it is possible to examine the differentiations of nursing diagnoses among each other and to support individual items with literature and evidence-based knowledge e.g. from studies and systematic overviews – or to remove them according to the current state of knowledge. The red highlighted fields indicate which content has been newly added compared to the previous ENP version, a red cross indicates that the diagnosis listed above has been newly linked with the etiology.

### 1.4.3 Options for validation of ENP practice guidelines

Following the systematic further development works a validation of the developed contents and findings takes place whenever possible and particular in the case of far-reaching changes. The aim is to have another quality assessment process for the consented and systematically developed ENP practice guidelines (Creason, 2004). Depending on the validation method applied, this is to ensure correctness, completeness, an adequate level of granularity and selectivity of the individual practice guidelines as well as practicability.

With the beginning of the development of nursing classification systems in the 1980s various methods for validation testing have been developed and proposed. The following table 6 gives a short overview without the intention to be exhaustive:

Model	Measured construct	Short description	Literature
<b>Validation methods according to Gordon &amp; Sweeney</b>			
<b>Retrospective Identification Model</b>	Consensual validity, face validity, nursing diagnosis label	Use of the aggregated experience of nurses who retrospectively describe and evaluate nursing phenomena/nursing diagnoses (similar to focus groups)	(e.g. Creason, 2004; Gordon & Sweeney, 1979)
<b>Clinical Model</b>	Nursing diagnosis title	The direct observation of patients and their behavior by nurses as well as the documentation serve as source and basis of evaluation for the nursing diagnosis labels	
<b>Nurse Validation Model</b>	Content validity, face validity	The characteristics determining a nursing diagnosis are examined by two or more experienced nurses as to whether they occur in bundled, relevant form and corresponding frequency in practice	
<b>Validation methods according to Fehring</b>			
<b>Diagnostic Content Validation Model (DCV)</b>	Content validity, face validity	Evaluation of the characteristics of a nursing diagnosis by technically experienced (nursing) experts based on a five-level Likert scale, calculation of a weighted index for each characteristic	(e.g. Caldeira et al., 2012; Richard J. Fehring, 1987; Richard J. Fehring, 1994)
<b>Clinical Diagnostic Validation Model (CDV)</b>	Content validity, face validity, interrater reliability	Examination of the validity of a nursing diagnosis in a clinical situation by two experts either by patient observation or by patient survey. Calculation of a weighed interrater reliability index.	
<b>Etiologic Correlational Ratings Validation Model (ECR)</b>	Predictive validity	Creating a direct cause-effect relationship between a nursing diagnosis and its etiologies. Calculation of a correlation coefficient (etiological correlation rating) for the determination of the strength of an etiology or a risk factor for the prediction of a nursing diagnosis	
<b>Differential Diagnostic Validation Model (DDV)</b>	Discriminant validity (two nursing diagnoses), content validity, face validity	The characteristics of two similar nursing diagnoses are bundled in a survey instrument and blindly evaluated by a “significant number” of (nursing) experts and/or patients for each nursing diagnosis, possibly also in a clinical setting. Calculation of weighted index for both nursing diagnoses and comparison of them.	



<b>Delphi technique</b>	Content validity, face validity	Systematic, multi-level and written survey method of an expert panel while preserving the anonymity of the individual participants. Characteristics and defining elements of a nursing diagnosis are edited in the first rounds until a consensus is reached regarding usefulness, completeness and clarity.	(e.g. Grant & Kinney, 1992)
<b>Concept analyses</b>	Central attributes and characteristic features of concepts	Multi-level method for conceptual analysis as well unambiguous assignment of information(s) that are transported by a concept. Ambiguities should be excluded. Often also used as a precursor to other forms of validation.	(e.g. Walker & Avant, 2010; Whitley, 1997)
<b>Multivariate validation methods</b>			
<b>Factor analysis</b>	Construct validity	Method for reducing a large number of variables/observations to a few key influential factors. In the context of the validation of a nursing diagnosis, the analysis reveals whether the characteristics occur as one factor (ideal case) or as multiple factors.	(e.g. Chang, 1995; Hoskins, 1997; Kerr et al., 1993)
<b>Cluster analysis</b>	Construct validity	Method to identify similar or homogenous groups (cluster) of examination objects from a large, heterogenous data set. Suitability for generating a classification structure as well as for validation (objects from one cluster should have higher correlation than with objects from other clusters).	(e.g. Chang, 1994; Kerr et al., 1993)
<b>Magnitude Estimation Scaling</b>	Content validity, face validity	Method in which defined characteristics of certain nursing diagnoses are evaluated in relation to the extent of individual subjective experience of one group of experts regarding different concept dimensions (e.g. relevance, frequency of occurrence). By this evaluable ratio scales are generated.	(Grant, Kinney, & Guzzetta, 1990a, 1990b)
<b>Crossmapping</b>	Content validity, criteria validity	Method in which similar or interrelated terms or concepts of different (nursing) classification systems are identified, linked and examined for inconsistencies.	(Hyun & Park, 2002; Wieteck, 2008a)

Table 6: Selection of the most common methods for validation of nursing diagnoses/nursing classification systems (source: own illustration)

However, due to methodological aspects on the one hand as well as the special structure of ENP (see chapters 1.1 to 1.3) on the other hand, the tabulated methods are only of limited use for the validation of the European Nursing care Pathways. Usually, they merely focus on the label and/or certain characteristics or etiologies of a nursing diagnosis and would therefore cover a small range of ENP, but not the assigned etiologies or interventions as well as the ENP practice guideline in its entirety which completely covers the nursing care process. Furthermore, the well-known models only give an indication of whether a specific criterion is a reliable indicator for a nursing diagnosis, but not, for which reasons a criterion may be rejected. Last but not least, given the large number of known methods, including Fehring's still today, frequently used validation methods (1987; 1994), there is a large discrepancy between the continuous further development of the nursing classification systems and the often long-lasting periods of inactivity regarding the methodological progress of validity concepts, which increasingly raises questions about the reliability and power of the validation results. Finally, from the point of view of research practice many of these methods have major requirements for practicability, which are sometimes hard to meet (e.g. time requirements, costs, availability of cooperation partners or cooperating institutions, etc.).

Against this background the validation works of the ENP development team focus on the following methodological pillars:

- The examining of the validity of revised ENP practice guidelines in the clinical context or setting before the final inclusion in a new ENP version (so called “pretest”). For this purpose, nurses or other clinically active persons of the interdisciplinary care team with relevant experience in the respective area evaluate the revisions of the ENP development team regarding different aspects (professional correctness, completeness for accurate illustration of individual patient/resident/client situations, formulations, usability, etc.) from a direct user perspective in the environment of a hospital or an institution of geriatric care.
- The systematic scientific research in the form of a study as the highest quality type of validity. Conceivable are numerous study designs and realization possibilities. This highly resource-intensive form of validation with high expenditures has often been used in academic theses or in projects with developers of other concepts and instruments in the context of mapping works so far. Given the increasing dissemination of ENP, for example in institutions (e.g. university hospitals) or institutional networks with high numbers of beds or the almost nationwide use of ENP in some countries and certain nursing settings, the relevance and number of high quality systematic studies on the nursing classification system ENP, or by use of it, will clearly increase.
- Expert ratings in which selected experts assess, evaluate and possibly submit further suggestions for improvement of the revised ENP practice guideline(s) with regard to various dimensions according to defined criteria. Here, various forms of implementation are conceivable, too, either within the framework of multi-level conferences or in the form of standardized surveys.

The expert rating using standardized surveys are the currently most often used validation method of revised ENP practice guidelines. This is why in 2014 and 2015 the new development of a standardized survey instrument was considered which was first piloted on the revised ENP practice guidelines on the topic of dysphagia. Key concerns were the complete collection of all constituting elements as well as summative assessments on the various requirements ENP is trying to meet:

- Suitability of the structure of ENP for nursing practice
- Visibility of an interprofessional approach
- Adequate level of granularity
- Adequate level of clarity and selectivity
- Completeness of elements
- Technical correctness
- Suitability of ENP to support decision-making and process documentation
- Benefit and necessity of the consistent use of technical terms in the further development and revision of ENP (example: “cephalgia” instead of headaches).

In order to ensure at least some comparability with common instruments for validation of nursing diagnoses and existing study results, the IT supported expert rating was chosen as basic methodological approach in accordance with the frequently used DCV model by Fehring (1987; 1994). The basic idea is, that established experts evaluate all characteristics, etiologies, objectives, interventions as well as the thematically relevant ENP nursing diagnoses according a defined category system themselves using a standardized questionnaire. This part represents the essential part of the survey instrument.

After numerous draft concepts, the result was an interactive questionnaire based on Microsoft Excel, which guides the experts with native functions (e.g. macros, command buttons) through the revision. Beforehand, on the first pages the respondents received a short introduction on the purpose of the study, the structure of ENP as well as the handling of the electronic questionnaire. In the actual survey part, the participants were asked to evaluate the currently (non-) linkages of the individual nursing diagnoses available in ENP one after the other in three sections regarding the respective etiologies, characteristics and nursing interventions. For each of the elements a dropdown list was created, which default setting

indicated that the existing linkage “as it is” is technically correct without any changes. Vice versa, the default setting for non-linked elements indicated that such would not be meaningful. If a need for change was identified by the experts, the dropdown menu offers the possibility to specify the nature of it. Alternatives are offered for the various dimensions of the respective item: Completeness, accuracy, technical correctness and relevance. Figure 7 illustrates a section of the questionnaire concept from the expert rating in the course of the further development of the practice guideline on the subject of dysphagia.


		Pflegediagnosen (insg. 10!)			
Zurück	Weiter zu Ursachen von Schluckstörungen	1. Der Bewohner ist aufgrund einer/s beeinträchtigten Bolusformung/-kontrolle/-transports beim Schlucken in der oralen Vorbereitungs-/transportphase beeinträchtigt	2. Der Bewohner ist aufgrund eines Zungenstosses / von Zungenpressen beim Schlucken in der oralen Vorbereitungs-/transportphase beeinträchtigt	3. Der Bewohner ist aufgrund einer hypotonen Wangen-/ Lippen-/ Mundmuskulatur beim Schlucken in der oralen Vorbereitungs-/transportphase beeinträchtigt	4. Der Bewohner verschluckt sich häufig bei der Nahrungsaufnahme, das Schlucken ist in der oralen Transport-/ pharyngealen Phase beeinträchtigt
Kennzeichen					
Berichtet über Schluckstörungen bei fester Nahrung		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Aufreten der Schluckstörung überwiegend bei fester Nahrung		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Husten/Räuspern bei/nach dem Schlucken		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Husten/Räuspern bei/nach dem Schlucken von Flüssigkeiten		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Erstickungsanfälle nach dem Schlucken		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Erstickungsanfälle nach dem Schlucken von Flüssigkeit		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Atemnot, ggf. mit Zyanose bei/nach dem Schlucken		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Atemnot, ggf. mit Zyanose bei/nach dem Schlucken von Flüssigkeit		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Beobachtbare Schwierigkeiten beim Anschlucken		✓ Sinnvoll, unverändert	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Verbleibende Nahrungsreste auf der Zunge (nach dem Schlucken)		✓ Sinnvoll, unverändert	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Verbleibende Nahrungsreste am Gaumen (nach dem Schlucken)		✓ Sinnvoll, unverändert	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Äußerungen über/Beobachtung von Schluckstörungen		Sinnvoll, unverändert Sinnvoll, inhaltlich jedoch zu spezifisch Sinnvoll, inhaltlich jedoch zu allgemein Auflösen, inhaltlich zu spezifisch Auflösen, inhaltlich zu allgemein Auflösen, fachlich falsch Auflösen, fachlich unvollständig Auflösen, nicht dokumentationsrelev.	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Feuchtelgurgelige Stimmqualität nach dem Schlucken			Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Auffälliges positives Ergebnis bei der Phonationsprobe nach dem Schlucken			Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	✓ Sinnvoll, unverändert
Auffälliges positives Ergebnis bei der Phonationsprobe nach dem Schlucken von Flüssigkeit		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Auffälliges positives Ergebnis beim 50 ml. Wasserschlucktest		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Veränderte Schluckphasen (Schluckkontrollgriff)		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen
Fehlender Schluckreflex (Schluckkontrollgriff)		Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen	Nicht sinnvoll, unverknüpft belassen

Figure 7: Example section from the revision mask of the survey instrument

Due to the often considerable scope of the aspects to be evaluated by the experts, the guiding interventions<sup>8</sup> which are subordinate to the intervention concepts are omitted in the questionnaire for reasons of appropriateness. The resulting likelihood of participants rating the intervention concepts as too abstract due to a lacking knowledge of the specifications was therefore tolerated and taken into account in the evaluation. Following the principle outlined above on the next page of the questionnaire the experts have the opportunity to check their evaluation regarding linkages existing in previous ENP versions but which are deactivated now and to add etiologies, characteristics and nursing interventions necessary for nursing care from their point of view but currently missing in ENP and link those to respective nursing diagnoses. At the end of the questionnaire is a page with summary questions on the aspects outlined above (Likert scale, four point). The structure of the survey instrument has also been created for online survey projects by using the SoSciSurvey platform (<https://www.soscisurvey.de/>), so that in addition to a local editing with Microsoft Excel (offline) a browser-based expert rating (online) is also possible.

Of great importance for the validation work as well as the expressiveness of the results is the question of which persons can be considered experts in the research field for the evaluation of nursing diagnoses and associated elements. The discussed opinions on this are quite ambiguous, additionally numerous definition approaches have different criteria to distinguishing the expert from the amateur. Examples are

<sup>8</sup> See chapter 2.1.

the professional knowledge or excellence in the respective domain (Bromme, Jucks, & Rambow, 2004). An additional view holds that besides the specific knowledge and/or peak performances also practicability is a decisive attribute of an expert. Given the intention of a nursing classification system, supporting nursing practice in decision-making and performing, the last aspect is of very high relevance for the ENP development team. Consequently, the underlying understanding of this work follows the definition from knowledge sociology: “Experts can be understood as persons who – based on a specific practical and experiential knowledge referring to a clearly defined problem – have created the possibility to structure the concrete field of action as meaningful and guiding for others with their interpretations” (Bogner, Littig, & Menz, 2014: 13). The chosen definition thus deliberately deviates from the explanatory approaches commonly used in nursing, for example the nursing expert concept of Benner (2012) or the concretization approach of Jasper (1994), which focus more on problem-solving skills. Basically it has to be considered that the expert status in the nursing scientific context always depends on the particular research interest and thus the role is partly awarded by the researcher (Meuser & Nagel, 2002).

With specific reference to nursing diagnostics, Fehring (1994) proposes to select suitable experts on the basis of measurable parameters as part of his validation models. Based on the points given for meeting specific criteria, those persons who achieved a certain minimum number were therefore be accepted as experts in the validation works. Corresponding features are:

- A master’s degree or higher in a nursing-related course (highest weighting).
- An academic qualification work (master in a degree course or higher) on a topic of the nursing diagnose(s) to be validated.
- A period of at least one year since when professional expertise has been gained in the research field.
- Training certificates with reference to the contents of nursing diagnose(s) to be validated.
- Publications and/or published research results with regard to the contents of the nursing diagnose(s) to be validated.

The list shows that the attempt to consequently apply the rating criteria proposed by Fehring in the German speaking countries would (still) lead to a significant problem: a severe lack of suitable experts for participation in a validation study. Nursing science is a comparatively young discipline in Germany whose establishment has made great progress, but is far from finished. This is especially true with regard to other countries such as the US or the UK (Palm & Dichter, 2013). There has also been the possibility of a domestic German training on an academic, secondary qualifying level since the 1980s, although the number of offered courses has grown rapidly since then (Schaeffer & Wingenfeld, 2014). Primary qualifying courses which integrate or replace the “classic” vocational training have only been offered for about ten years, often still in model form. It is well-known that the degree courses based on vocational training such as nursing management, nursing education or nursing science in most cases are oriented for positions away from the point of care. However, it is reported that many graduates from the more recent, directly qualifying courses only have low affinity to working in direct care (Bollinger, Gerlach, & Grewe, 2006). Academic degrees that consistently focus on clinical work in direct care, such as clinical nurse specialist or advanced nursing practitioner, are increasingly required (see e.g. Deutscher Berufsverband für Pflegeberufe e.V., 2013), but are still largely at the beginning in Germany. As a result, there is currently an unbalanced distribution of nurses with academic degrees in Germany. Obtaining a sufficient number of clinically active and experienced nurses with at least a master’s degree as expert (the main criterion of Fehring) for a nursing diagnostic validation study has currently little chances for success in the German speaking countries and especially in Germany. Furthermore, a professional specialization of these persons

on the topic of the nursing diagnosis or practice guideline to be examined, here dysphagia, would be required, which would further limit the selection options.

The expert definition used in validation works on ENP the internationally often used criteria by Fehring couldn't be used for the reasons outlined. Particularly important is to move away from the premise that the experts participating in the review need to have an academic degree in nursing. According to the previous experience the necessity was also clear that a basic nursing vocational training is not a prerequisite for the participation in the study. The reason for this lies in the fact that although nurses are involved in the care of specific patient/resident/client groups, a clinical specialization in the corresponding direction virtually doesn't exist in this country as well abroad. An example for this is subject of dysphagia, which is also highly relevant for the profession of nursing: Only a few publications with direct nursing reference could be found as part of the systematic literature review for the revision of the ENP practice guidelines. If there is specific nursing literature available, it usually is from an author from neighboring professions and treats the role of nursing in the interdisciplinary treatment of dysphagia patients (e.g. Brady, 2008; Tanner, 2010). High quality publications on the subject from the profession itself are only occasionally found (Hines et al., 2011). In summary, from technical and quality-related considerations the following aspects were regarded to be a prerequisite and decisive for the selection and contact of appropriate experts, whereas a deliberate adaptation of these criteria is conceivable depending on the ENP practice guideline to be validated:

- Appropriate mastering of the German (technical) language in the context of the validation of a German-language classification system.
- Professional qualification with direct related to the subject of dysphagia, ideally at an academic level (e.g. speech therapy, linguistics, language therapy, etc.).
- At least two years of work experience in a clinical area with corresponding qualification for the treatment and care of persons with dysphagia.
- At least one pertinent methodological high quality publication on the subject (e.g. standard works, basic literature, systematic review).
- Active membership in a dysphagia-relevant (professional) association, commission or, alternatively, the active teaching and/or lecturing on the subject.

The data analysis is carried out using software like Microsoft Office and/or statistics programs (e.g. SPSS, Statistical Package for the Social Sciences). The information from the electronically filled out questionnaires was transferred for this reason in corresponding evaluation masks. To exclude transmission errors as much as possible, all data was checked again for correctness after entry. For the data analysis mainly descriptive approaches were used, including frequency calculations (absolute and relative), positional parameters (e.g. the arithmetic mean), scattering parameters (e.g. span) as well as graphical representations. Of major importance is also the quantification of all evaluations made by the experts regarding the (non-) linkage of each characteristic, etiology and intervention to each of the ten ENP nursing diagnoses. Based on this, a pre-defined limit value (cut-off value) can be used to determine which individual elements and (non-) linkages ...

- ... should be subject to a detailed technical review.
- ... have to be examined for clarity and granularity.
- ... have to be deactivated, supplemented or newly added.

In addition to the search for a suitable impulse limit for the technical revision, it is important to consider noticeable incongruencies in the rating of the experts during data evaluation and to get an idea of the

extent and reliability of the level of agreement in the assessments. Depending on the underlying data, different models for the calculation of the interrater reliability and interrater agreement are used.

### 1.5 Application of ENP

Corresponding to the classification of terminologies into interface terminologies, reference terminologies, and administrative terminologies, ENP can be counted as interface terminology. Interface terminologies are intended for front-end use and should therefore be applied by the end users (nurses) in the direct care (Bakken et al., 2000) to realize the nursing process and performance documentation in standardized manner.

The use of ENP is primarily intended for electronic patient records. For teaching, nursing schooling, or for training of staff in nursing institutions which intensively deal with the steps of the nursing care process, ENP can be a valuable support as the user is presented the up-to-date nursing knowledge through linkages. Implemented in a software patient data can be retrieved quickly and efficiently and are additionally available for evaluation purposes. The actual implementation and visualization of ENP can be very different from software product to software product<sup>9</sup>.

### 1.6 Linkages of ENP with other instruments

ENP is managed in a database for the implementation in software products such as electronic patient/resident/client records. The notations (unambiguous numbering of items) are automatically allocated within a group according to the database management. Each item in the ENP system has an unambiguous code within its group which remains stable and is updated in further versions. Such notations enable the linkage of the nursing classification system ENP to other instruments and classification systems, also called “mapping”. The currently or previously linked instruments are/were:

- **ICD-10** (International Statistical Classification of Diseases and Related Health Problems) **and OPS** (German Procedure Classification) codes for optimized coding of nursing-relevant secondary diagnoses in hospitals as well as for support of DRG coding.
- **LEP Nursing 3** (performance classification in nursing), a classification system for the documentation of (nursing) performance in healthcare. The performances and activities underlying the method LEP are provided with normative time values (see e.g. Baumberger & Raeburn, 2015) and were linked with the interventions of the ENP catalog. By this way it is provided to use the LEP time values in addition to the ENP’s own time values (cp. chapter 4.7) e.g. for the documentation of nursing expenditure or meaningful key figures. The mapping of ENP to LEP Nursing has not been maintained since 2014.
- **PPR** (“German Regulation on standards and principles for the staffing requirements in inpatient nursing”, abbr. Nursing staff regulation). The PPR as an element of the healthcare structure law from 1992 served as a daily determination of the nursing expenditure in inpatient nursing and thus as a performance-oriented calculation basis for the demand of nursing staff resources. Due to various reasons, including the comparatively abstract nursing categories and subsequently low realistic nursing minute values, but especially due to the enormous personnel requirements in German hospitals on the basis of the PPR data (21,000 full time jobs between 1993 and 1995), the PPR was discontinued in 1996 and completely abolished in the following year. Although the PPR is currently of no mandatory character (as of June 2019), it is used by many hospitals as internal controlling instrument still today (Thomas et al., 2014; Wieteck & Kraus, 2016).
- **IDEA (Interdisciplinary Databased Electronic Assessment)**, an interdisciplinary and electronic anamnesis catalog by which structured anamnesis information are collected as well as

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<sup>9</sup> An exemplary impression of the software implementation of ENP provides the homepage of the company RECOM under <https://www.recom.eu/en/software/overview.html>

subsequently the probable need for action is assessed. IDEA is based on the use of standardized knowledge and on the literature collection of anamnesis-relevant information. From nursing perspective, potentially relevant nursing diagnoses can be derived automatically by the linkages of IDEA to ENP, by collecting anamnesis information in the background by the software. For example, from the information collected in IDEA of a body mass index >30 (automatically calculated from the body height and weight) as well as information on the nutritional condition and nutritional preferences the suggested nursing diagnosis “the patient has an inadequate eating behavior” can be derived. However, the nurse decides on the suggested ENP nursing diagnosis given the individual care situation and actual relevance, who receives support in decision-making through the mapping of IDEA and ENP.

- **Search terms**, in the form of a search system for quick finding of ENP nursing diagnoses in electronic use. Not only directly contained terms are linked with the nursing diagnoses, but also synonyms and terms corresponding in scope of meaning.
- **Criteria of the MDK** (the German Medical Review Board of the Statutory Health Insurance Funds), for the classification of the need for care (level of care assignment through time values and grades of dependence). Against the background of the Second Act on Nursing (Pflegerstärkungsgesetz, PSG II), which came into effect in January 2017, in which the previous three levels of care were replaced by five care degrees (see e.g. Kimmel & Breuninger, 2016), the mapping of the criteria of the MDK with ENP will no longer be maintained, since the changes of the PSG II the practical relevance is no longer given. In contrast to levels of care (or the MDK criteria), the new nursing degrees valid from January 2017 are not directly linked to ENP, however through a mapping to the anamnesis IDEA (see above) und the nursing basic assessment (BAss) (Fachgesellschaft Profession Pflege e. V., 2018), there is an indirect connection to ENP.
- **Standardized assessment instruments** on various clinical care aspects such as fall risk, pressure sore risk, nutrition or respiration, which generate suggestions for potentially relevant ENP nursing diagnoses when implemented in an electronic patient/resident/client record and results-oriented algorithms depending on the present score value. If, for example, the assessment of the pressure sore risk using the Braden scale results in a score of 14 and thus a medium pressure sore risk, the ENP nursing diagnoses “The patient/resident/client has a pressure sore risk” is subsequently suggested. Here, as well, the decision on the actual correctness of the suggested nursing diagnosis in the individual care situation is up to the nurse.
- **PKMS (nursing complex measures score)** as well as other complex codes for automatic support of documentation demands and code generation. The PKMS is an instrument for the illustration of highly complex patient cases in hospitals which was originally established by the German nursing council (DPR) and serves as the basis for service accounting within the G-DRG system (exception: calendar days can not be coded on intensive care units). Services in the field of “general care” as well as “specialized care” are collected. In order to apply the PKMS for acute inpatient patients, one of the reasons for highly complex care must be listed in the relevant service area of the PKMS catalog and a corresponding intervention profile must be present. If one or more service characteristics are present, points for the corresponding calendar day are summed over the length of stay. The total number of points lead to an OPS procedure “9-20 ... Highly complex care”, if the number of points specified in the PKMS catalog is achieved (Wieteck et al., 2017). With appropriate implementation in software products, the mapping of ENP to PKMS enables a largely automated coding of the PKMS from the daily documentation with ENP, without additional forms, entry masks or collection efforts.
- **NANDA-I nursing diagnoses.** For about 40 years, the NANDA International (NANDA-I) organization has been engaged in the formulation, development and validation of nursing diagnoses (with corresponding defining characteristics and related factors) to represent the clinical, nursing diagnostic judgement of nurses in the form of a standardized taxonomy. As an internationally recognized and widespread nursing language, NANDA-I focuses so far exclusively on the first step of the nursing care process, more precisely the collection and clustering of

information and its transformation into a nursing judgement regarding relevant problem areas for the patient/resident/client - the nursing diagnostic process. In order to be able to illustrate and document the nursing care process in its entirety using standardized and classified language modules (determination of nursing outcomes based on the nursing diagnostics, planning of adequate nursing interventions, performance of nursing care as well as evaluation of nursing outcome), further classification systems are required which are mapped with the NANDA-I nursing diagnoses and serve the further steps of the nursing care process. For this purpose, various approaches exist. Explicitly against the background of the electronic use in computer systems as well as with the aim to fill the gap in the nursing care process, all ENP practice guidelines were mapped with the nursing diagnoses of NANDA-I as part of a research work on the validation of ENP. All ENP practice guidelines which could be assigned to a NANDA-I nursing diagnosis as part of the mapping work, were analyzed and the corresponding ENP nursing outcomes and ENP nursing interventions were linked to the NANDA-I nursing diagnoses in a new database after the removal of duplications. The resulting database, called NANDA-I PLUS<sup>10</sup>, thus provides users the complete scope of the NANDA-I nursing diagnoses, added by the meaningfully linked nursing outcomes and interventions from the ENP catalog.

Various studies and field tests have already reviewed many of the linkages to the described instruments (cp. e.g. Baltzer, Baumberger, & Wieteck, 2006; Gärtner, 2006, 2008; Schmid, 2007; Schütze, 2006).

### 1.7 Dissemination of ENP

ENP is currently (as of May 2019) used in a great number of outpatient and inpatient healthcare facilities (hospitals, nursing homes, etc.) in Germany, Austria, Luxembourg, and Italy in electronic patient/resident records for the complete nursing process documentation. ENP is not only used in the electronic record GRIPS of the company RECOM, but is also increasingly implemented as database in many software products of other vendors. In addition, besides the electronic format ENP is also used in print format by many institutions as well as for education and training, for example as a formulation aid for handwritten nursing planning or as teaching material in nursing education. This wide range of usage forms and distributions makes it difficult to accurately quantify the national and international use of ENP. Nonetheless, the following list tries to give a more accurate picture of the use of ENP in German-speaking countries:

#### Germany

About 25 hospitals and more than 400 institutions of inpatient and residential elderly care use ENP in different software products. Exact figures can not be determined with certainty due to the implementation of ENP as database in third-party software, as already mentioned, but reliable estimates suggest that at least 50,000 nurses work with ENP in Germany. Until now five educational institutions have integrated ENP as an integral part in their curriculum. Due to the new education law for the nursing professions, which comes into effect in 2020 and in which nursing diagnostics is specifically named as a core competency for trainees for the first time, there is a noticeable increasing interest in ENP in this area. Finally, since 2016, ENP has been delivered to more than 3,000 nurses in training and education in the form of a free learning software (the so-called ENP Trainer<sup>11</sup>).

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<sup>10</sup> Further information on the database NANDA-I PLUS can be found on the website of RECOM under <https://www.recom.eu/klassifikationen/nanda-i-plus.html>.

<sup>11</sup> See <https://www.recom.eu/get-enp.html>



## Austria

In Austria, 18 hospitals, more than 100 outpatient nursing services as well as about 80 residential elderly homes use ENP in three different software products. The outpatient nursing services in Austria can not be compared to those in Germany in terms of size. The more than 100 outpatient nursing services working with ENP have more than 8,000 nursing employees who realize the nursing documentation with ENP daily.

## Luxembourg

Three acute-care hospitals, one rehabilitation clinic, five residential elderly homes as well the two biggest providers of outpatient care, who altogether care for 90 % of all patients in Luxembourg, use ENP in two different software products. Also in Luxembourg the outpatient nursing services are different in terms of size than in Germany. The two outpatient nursing services employ more than 4,000 people of nursing working with ENP. Here, also the accounting positions were mapped with ENP to support accounting of services from the daily documentation. It is foreseeable that the dissemination of ENP in Luxembourg will continue to increase especially in inpatient treatment areas. Several institutions currently intensively discuss the nursing classification system.

## 2. Changes of the versions

In the following, the changes of the ENP versions will be described starting with version 2.0. In addition to the new and deactivated nursing diagnoses listed below, also those diagnoses will be shown which were modified in meaning and/or were validated. In addition to these diagnoses, numerous measures for standardization were carried out and suggestions from end users were continuously incorporated after expert verification. Also, there are ongoing further developments in the structure and architecture of ENP.

### 2.1 ENP version 2.0 to 2.4

Not every version is published in a book. In-between the book publications there will be additional interim versions in the ENP database. The practical test of ENP, for example, was carried out in several hospitals in 2005 using ENP version 2.3. After and during the practical test in Canton St Gallen major changes were carried out in ENP, which will be shown in the following. For insights into the version history starting with 2.0, please refer to the book publication of Wieteck (2004b).

#### ENP version 2.3 to 2.4

- Hierarchization on the level of nursing diagnoses, development of the ENP taxonomy to establish a monohierarchic structure used for data evaluation.
- Hierarchization works on the level of nursing outcomes, development of an outcome taxonomy.
- Hierarchization works on the level of nursing interventions.
- Examination of nursing diagnoses regarding fluctuating abstraction levels and overlapping. In this course, from version 2.3 (n = 557 nursing diagnoses) to version 2.4 (n = 516 nursing diagnoses) 41 nursing diagnoses have been integrated into others and therefore deactivated.
- Support of ENP through further literature work. The sources used to support the practice guidelines from version 2.0 (n = 279) consisting of nursing literature, reference books and studies, to version 2.5 were increased to a total number of 520. International literature was increasingly used.
- Work on gaps regarding completeness and level of detail found in practice tests (see e.g. Kossaibati & Berthou, 2006).

## 2.2 ENP version 2.4 to 2.5 (2008/2009)

### New ENP practice guidelines (n=14)

- 848 The patient has **malnutrition** due to an **eating disorder**  
849 The patient has **malnutrition** due to a **cognitive impairment**  
851 The patient is at **risk of malnutrition** due to **cognitive impairment**  
850 The patient is at **risk of malnutrition**  
855 The patient is **impaired in well-being** due to **tube feeding**  
852 The patient is **unable to keep/can only with effort keep attention** to the contra-lesional (=neglected) **space or side of the body** (=neglect)  
853 The patient is **impaired in the ability to take up and process information**  
856 The patient is **impaired in the ability to acquire self-care competencies**, risk of ineffective therapy  
857 The patient has **pressure sore**, there is **difficult wound healing**  
858 The patient has **arterial ulcer**, there is **difficult wound healing**  
859 The patient has **venous leg ulcer**, there is **difficult wound healing**  
861 The patient's **well-being is affected** due to **chronic wound**  
858 The patient has **diabetic foot syndrome**, there is **difficult wound healing**  
887 The patient is at **risk of ineffective treatment** due to **lack of information/skills** associated with **diabetes/hypo/hyperglycemia**

Table 7: New ENP practice guidelines version 2.5

### Extensively revised practice guidelines (n=30)

- 555 The patient has **malnutrition**  
558 The patient **refuses food intake** (food refusal), there is a **risk of malnutrition**  
554 The patient demonstrates **neglect of food intake**, there is a **risk of malnutrition**  
134 The patient has **involuntary urine loss** due to an **increased abdominal pressure** (stress incontinence)  
135 The patient has **involuntary urine loss** due to **heavy imperative urgency** (urge incontinence)  
137 The patient has **involuntary urine loss at regular times due to a full bladder** (spontaneous reflex emptying)  
138 The patient has urinary dribbling/**involuntary urine loss** due to an **chronic urinary retention**  
574 The patient has an intact urogenital tract and is **unable to avoid involuntary urine loss** (functional urinary incontinence)  
130 The patient has **urinary incontinence** (multiple incontinence uncategorized incontinence type)  
845 The patient has a **continuous loss of urine** due to **extraurethral incontinence**  
012 The patient is **unable to wash independently** due to **restricted mobility**  
018 The patient is **unable to carry out personal hygiene** independently due to **hemiplegia/hemiparesis**  
007 The patient is unable to carry out personal hygiene independently due to **physical restrictions in coping with stress**  
027 The patient is not allowed to exert himself whilst carrying out personal hygiene due to a **reduced cardiac output**, there is a **self-care deficit personal hygiene**  
029 The patient is **unable to hold bathing articles** due to **restricted mobility**, there is a self-care deficit personal hygiene  
022 The patient-- is unable to organize **personal hygiene independently** due to being **disorientated**  
011 The patient should avoid movement between the pelvis and torso due to an **injury of the spinal column**, there is a **personal hygiene self-care deficit**  
013 The patient is **completely dependent in personal hygiene** due to a **measurable altered consciousness**  
033 The patient does **not perform personal hygiene adequately**, a **personal hygiene self-care deficit** exists  
016 The patient is **unable to carry out perineal hygiene as accustomed** due to a **wound in the genital area**  
001 The patient's **personal hygiene is impaired** due to other reasons (rest category)  
676 The patient has a **chronic wound**, there is **difficult wound healing**  
339 The patient's **wound is healing by second intention**, there is a **disturbance of wound healing**  
331 The patient's **wound is healing by first intention**, there is a **risk of impaired wound healing**  
278 The patient is at **risk of complications** due to a **blunt injury to the extremities**  
092 The patient is **restricted when eating** due to a **disturbance in sensation** and **reduced muscle innervation** of one side of the face  
094 The patient is **restricted when eating** due to a **reduced ability to close the mouth**, partly digested foodstuffs fall out of the mouth  
078 The patient is **restricted in carrying out nail care** independently  
827 The patient is **restricted** in independent **foot care**  
069 The patient is **restricted in carrying out hair care independently**

Table 8: Extensively revised practice guidelines version 2.5

### Deactivated practice guidelines: (n=9)

- The patient has a purulent, coated wound, risk of germ spreading  
The patient has an **elevated risk of skin damage** caused by the application of detergent substances  
The patient has an **elevated risk of inflammation of the eyes** due to germ spreading caused by body care performances  
The patient is **unable to wash hair independently**  
The patient has **long toe nails** and is unable to cut them independently  
The patient has **thick horny skin** at the feet and is unable to remove it independently

The patient **has dirt under his finger nails** and is unable to remove it independently  
 The patient is **restricted when drinking** due to a **reduced ability to close the mouth**, fluid flows out of the mouth  
 The patient is restricted when eating and drinking, **food particles collect in cheek pouch** of the affected side

Table 9: Deactivated practice guidelines version 2.5

## Literature used (n=520)

### 2.3 ENP version 2.5 to 2.6 (2009 to May 2011)

#### New ENP practice guidelines (n=24)

- 867 The patient has ineffective **self-cleansing function of the lung** (rest category)
- 868 The patient is **restricted** in independent **eye care** (rest category)
- 869 The patient is at **risk of atelectasis/pneumonia** due to other reasons (rest category)
- 870 The patient is **restricted in swallowing** (rest category)
- 872 The patient is at **risk of a fluid/electrolyte deficit** (rest category)
- 873 The patient is at **risk of inadequate breast feeding** (rest category)
- 877 The patient is **handicapped during breast feeding** (rest category)
- 878 The patient's **eating behavior is inadequate** (rest category)
- 879 The patient is **restricted in urination** (rest category)
- 880 The patient has **ineffective bowel elimination** (rest category)
- 881 The patient is **otherwise impaired in stoma care**
- 886 The patient is at **risk of sudden infant death syndrome**
- 892 The child aged older than 4 years **defecates** without organic reasons (encopresis)
- 882 The relative/important person is **unable to carry out self-care activities** independently
- 883 The relative/important person is at **risk of being unable to carry out self-care activities** of person concerned **independently**
- 894 The patient has colonization/infection of **multi-resistant organisms**, there is the **risk of germ spreading**
- 889 The patient has **hypertensive crisis** due to an **autonomic dysreflexia**
- 893 The patient is at **risk of autonomic dysreflexia** due to **paraplegia**
- 896 The patient's **daily organization/life organization is affected** due to **dementia**
- 887 The patient is at **risk of ineffective treatment** due to **lack of information/skills** associated with **diabetes/hypo/hyperglycemia**
- 891 The patient is at **risk of delayed development**
- 897 The patient's **communication is restricted** due to a **language disorder**
- 898 The patient has **dermatitis associated with elimination/incontinence, impaired wound healing**
- 895 The patient's **activity level is low, risk of serious health problems**

Table 10: New ENP practice guidelines version 2.6

The added rest categories were established in collaboration with project hospitals. These are required because, in addition to the specific pre-combined nursing diagnoses, there are nursing problem areas of another kind.

#### Extensively revised practice guidelines (n=30):

- 519 The patient has a **sexually transmitted disease**, there is a **risk of infection** for the sex partner
- 354 The patient is at **risk of hypoglycemia or hypoglycemia**
- 383 The patient has an **infectious disease**, there is a risk of **spreading infection to the surrounding environment**
- 263 The patient has an unstable **cardiovascular situation** due to **reduced cardiac output**
- 610 The patient is at **risk of cardiovascular complications** due to **reduced cardiac output**
- 261 The patient is at **risk of cardiovascular complications** due to **hypertonic circulatory changes**
- 260 The patient is at **risk of cardiovascular complications** due to **hypertonic circulatory changes**
- 696 The child aged older than 5 **wets** her/himself without organic reasons (enuresis)
- 160 The patient is at **risk of pressure sore** (adaption to the current expert standard)
- 103 The patient **receives parenteral feeding via infusion**, there is a **risk of nutritional related complications**
- 097 The patient is receiving **enteral tube feeding**, there is an impaired **food intake**
- 326 The patient is at **risk of being under or over infused** due to **intravenous infusion therapy**
- 651 The patient is at **risk of complications** due to **central venous catheter/infusion therapy**
- 451 The patient's independent **daily organization/organization of life is restricted** due to **age-related reduction processes**
- 535 The patient's **daily organization/life organization is affected** due to a **thought disorder**
- 450 The patient is impaired in the **independent daily organization/organization of life** due to **disorientation**
- 634 The patient is **impaired in the daily organization/organization of life** due to **memory disorders**
- 793 The patient is at **risk of complications** due to **arterial access**
- 627 The patient's **quality of drive is lowered**, there is a **risk of self-care deficit**
- 428 The patient's **reference to reality is affected** due to a **psychotic experience**, there is a **risk of self-care deficit**
- 429 The patient is **impaired in structuring of the daily routine**, there is a **risk of self-care deficit**
- 426 The patient is **restricted in the organization of life**, there is a **risk of self-care deficit**

- 313 The patient is **restricted in organizing daily life/daily routine independently** due to **disturbance of the self**
- 621 The patient is **impaired in the daily organization/organization of life** due to **continual recurring thoughts which cannot be suppressed by logic/reason** (compulsive thoughts)
- 425 The patient is **restricted in the independent daily organization/organization of life** due to a **handicap**
- 152 The patient is **restricted in the organization** of life due to an **ostomy** (artificial opening for the bowels)
- 467 The patient is **restricted in organizing recreational activities** independently
- 500 The patient demonstrates repeatedly **self-injury behavior**, there is an **impaired problem solving strategy/coping strategy**
- 684 The patient displays **avoidance behavior** due to a **lack of confidence in his/her own physical strength**
- 131 The patient is at **risk of dermatitis associated with elimination/incontinence**

Table 11: Extensively revised practice guidelines version 2.6

### Deactivated practice guidelines (n=9):

- 188 The patient is at **risk of circulatory collapse** during **mobilization procedures** (merged into diagnosis "hypotension", ID 260)
- 325 The patient has a **CVC** (central venous catheter) there is a **risk of inflammation of the vein** (merged into diagnosis ID 651)
- 324 The patient has an **intravenous cannula in situ**, there is a **risk of an inflammation of the vein** (merged into diagnosis ID 651)
- 326 The patient is at **risk of being under or over infused** due to **intravenous infusion therapy** (merged into diagnosis 651)
- 887 The patient is at **risk of ineffective treatment** due to **lack of information/skills** associated with **diabetes/hypo/hyperglycemia**
- 082 The patient has a **fixation of the nasogastric tube, risk of skin irritation** (merged into diagnosis ID 097)
- 098 The patient has **gastrointestinal pain** due to tube feeding (merged into diagnosis ID 097)
- 106 The patient has blood sugar fluctuations due to **diabetes**, there is a **risk of hyperglycemia or hypoglycemia** (merged into diagnosis ID 354)
- 107 The patient is at **risk of not achieving health related aims** due to a **lack of information/skills** associated with **diabetes**

Table 12: Deactivated practice guidelines version 2.6

### Literature used n=1018

#### 2.4 ENP version 2.6 to 2.7 (May 2011 to August 2012)

The main driving force for the development work between versions 2.6 and 2.7 were two major projects with hospitals. On the one hand the incorporation of "therapeutic care" and on the other the peculiarities of children's hospitals. Also, validation works on ENP lead to the revision of some pathways.

### New ENP practice guidelines (n=11)

- 898 The patient has **dermatitis associated with elimination/incontinence**, there is difficult wound healing
- 900 The patient is unable to wash him/herself independently due to a **sensory integration disorder**
- 902 The patient displays **motor and/or behavioral abnormalities** when there are adjustment responses to the environment, **impaired perception/sensory integration** disorder
- 903 The patient shows **no reaction to stimuli**, impaired **consciousness**
- 901 The patient is at risk of **irritations of the mucous membrane/dents** due to a **denture plate**
- 905 The newborn baby is at **risk of neonatal hyperbilirubinemia**
- 904 The patient has **renal impairment/kidney failure**, there is a **metabolic disorder**
- 1017 The patient is **developmentally delayed**
- 1034 Relatives/important persons' **education does not promote development**, there is a **risk of delayed development**
- 1032 The patient is **restricted in swallowing** due to an **impaired bolus formation/control/transport**
- 1033 The patient is at **risk of aspiration** due to a **lack of/insufficient protective reflexes**

Table 13: New ENP practice guidelines version 2.7

### Extensively revised practice guidelines (n=20):

- 522 The patient's **production of mother milk is impaired, risk of under feeding** the baby
- 184 The patient's ability to **sit independently** is **impaired**
- 712 The patient's ability to **change position in bed** is **impaired**
- 160 The patient is at **risk of pressure sores**
- 084 The patient has **limited independence** when **eating/drinking**

842	The patient is unable to perform self-care in <b>nutrition independently</b> due to the <b>stage of development</b>
849	The patient has <b>malnutrition</b> due to a <b>cognitive impairment</b>
555	The patient has <b>malnutrition</b>
851	The patient is at <b>risk of malnutrition</b> due to <b>cognitive impairment</b>
608	The patient is <b>impaired in transfer skills</b>
015	The patient is at risk of complications due to a <b>reduced body awareness</b>
309	The patient is at risk of complications due to a <b>quantitative impaired consciousness</b>
411	The patient is <b>unable to perceive/process environmental stimuli adequately</b> , there is a risk of misinterpretation
840	The patient has not developed skills and abilities for his age due to an <b>impaired development of perception</b>
537	The patient is restricted in dressing and undressing due to a <b>hemiplegia</b>
529	The patient is <b>restricted in dressing and undressing</b> due to other reasons
154	The patient is at <b>risk of kidney failure</b>
234	The patient is at risk of atelectasis/pneumonia due to <b>reduced lung ventilation</b>
828	The patient is at <b>risk of reduced lung ventilation</b>
359	The patient is at <b>risk of complications</b> due to a <b>raised bilirubin</b>
814	The patient is at <b>risk of social exclusion</b> due to <b>behaviors</b> that breach the principles and valid standards of the community
815	The patient has an <b>altered social behavior</b> due to an <b>altered parent-child relationship</b> that breaches the principles of set standards, there is a <b>risk of social exclusion</b>
748	The patient is at <b>risk of delayed development</b> due to <b>separation from the parents/important person</b>
838	The patient is at <b>risk of delayed development</b> due to <b>being premature</b>
891	The patient is at <b>risk of delayed development</b>
92	The patient is restricted when eating due to hypotonic cheek/lip/mouth muscles
681	The patient is restricted when eating due to chewing difficulties
87	The patient often chokes when eating, swallowing is impaired
90	The patient often chokes when drinking, swallowing is impaired
95	The patient's swallowing is impaired due to pressing of the tongue
96	The patient is restricted when swallowing due to reduced/altered pharyngeal/esophageal peristaltic movement
870	The patient has other/multiple reasons for dysphagia

Table 14: Extensively revised practice guidelines version 2.7

#### Deactivated practice guidelines (n=5):

811	The patient is at risk of <b>social exclusion</b> due to an <b>altered social behavior</b> that breaches the principles of valid social norms
52	The patient has an impaired swallow reflex, there is a risk of aspiration during oral hygiene
88	The patient has no swallow reflex, there is a risk of aspiration
89	The patient has no cough, pharyngeal reflex, there is a risk of saliva aspiration
94	The patient is restricted when eating due to a reduced ability to close the mouth, partly digested foodstuffs fall out of the mouth

Table 15: Deactivated practice guidelines version 2.7

#### Literature used N=1214

The practice guidelines were supported at the current version (2012) on the basis of 1,214 national and international literature sources, e.g. German rules and standards as well as recommendations such as expert standards, guidelines of the MDS (Medical Service of the Central Association of Health Insurance Funds), legal peculiarities like activities according to §87b SGB XI etc.

### 2.5 ENP version 2.7 to 2.9 (August 2012 to August 2014)

In addition to a comprehensive literature-based and systematic revision of about one fifth of the nursing diagnostic part of all practice guidelines (nursing diagnosis label, characteristics, etiologies), this revision phase brought four new and with regard to the criteria transparency, clarity and comprehensibility major structural extensions for the nursing classification system ENP:

- The successive development of a definition for each ENP nursing diagnosis (see also chapter 2.7)
- The successive development and indication of the evidence level (LOE) for each nursing diagnosis as well as the complete ENP practice guidelines (see chapter 3)
- The documentation of the revision history for each systematically developed practice guideline shows the number and time of revisions for each nursing diagnosis as well as each practice guideline.
- The successive establishment of explanatory texts (when required) for items on the level of characteristics, etiologies, and resources. These are used, for example, for Latin technical terms, ambiguous or rarely used terms and should bridge lack of clarity or potential knowledge gaps of the ENP users.

The following section (tables 16 and 17) from the original German revision documentation of the ENP development team serves as an example of the class breathing to illustrate the changes:

Type of text		ID number	ENP text of the nursing diagnosis
	Revision history: 1989*, 2003, 2009, 2014, 2017, 2019		
		<b>ENP practice guideline</b>	<b>ENP nursing diagnosis</b>
	<b>Evidence level</b>	<b>LOE 3.1b</b>	<b>LOE 3.1b</b>
<b>Class</b>		10,052	<b>Respiration</b>
<b>Category</b>		10,484	<b>Risk of atelectasis/pneumonia</b>
<b>Diagnosis</b>		223	The patient is at risk of atelectasis/pneumonia due to <b>thick bronchial secretions</b>
<b>Definition</b>			Due to the <b>secretion of mucous deposit products of the glands in the bronchi which can only be hardly/not coughed up</b> , there is the risk of ventilatory defect/collapse of segments or the complete lung and/or the development of an inflammation of the lung tissue.

Table 16: Section of a revision documentation of the ENP development team: definition of the nursing diagnosis, evidence level and revision history were added 2014 as new elements

ID	Characteristics	Explanation
22,080	Strongly pronounced agrammatism	Denotes a disorder of language production characterized by the lack of grammatical structures, e.g. some words are strung together without any grammatical link.
22,036	Strongly halting speech flow	
7,140	Pronounced word finding difficulties	
22,060	Uses commonplace phrases	
22,052	Uses meaningless phrases and/or stereotypes	

22,049	Phonematic neologisms	New word creations in which the used word differs in more than one sound from the target sound. In the standard language the “new” word doesn’t exist and thus has no meaning (e.g. “flower” becomes “fluler”).
22,058	Phonematic paraphasia	Describes the phonetic change of a word through replacing, adding, omitting or shifting of individual sounds (e.g. “Pospital” instead of “hospital”)
22,081	Verbal semantic paraphasia	Describes the wrong use of the word which is similar to the meaning of the target word or is contextually inappropriate. Example: “I married my sister 20 years ago.”
22,082	Conduite d’approche	Denotes the gradual semantic or phonematic approach to the searched word, e.g. in naming.
22,043	Increased language effort	Difficulties in motor activity of speech due to an impairment of articulation, phonation and/or speech rhythm

Table 17: Examples for explanations of ENP items on the level of characteristics

The need to establish explanatory texts for various ENP items emerged from a development beginning in 2008. Increasing feedback from users indicate a heterogeneity in the use of partly foreign and partly German technical terms as well as a more nursing specific jargon especially on the level of characteristics, etiologies and resources of ENP. Examples include the mixed use of terms such as “headache” and “cephalgia”. To reduce this mixed use of terms of different kind, it had to be decided in which of the two directions, on the one hand, existing terms should be unified and, on the other hand, new terms to be included in ENP should be aligned. For decision-making also in the interest of ENP users, a survey of selected users was conducted. The result showed a clear vote in favor of the consistent use of German or foreign-language technical terms, which was predominantly justified with the argument: “we are a profession, we need a technical language with established technical terms” by the respondents. This vote is also consistent with the changing demands on nursing terminologies over time.

At the same time, the requirement became apparent to provide corresponding explanations, if necessary, in particular to Latin/Greek technical terms, because due to the variety of settings and specialist areas of the nursing profession as well as the individual professional socialization of nurses it cannot be assumed that these terms are known to all users. Against this background, the explanatory texts for characteristics, etiologies, and resources were created on structural as well as context levels of ENP, and have since been gradually filled in as the need arises.

The following table presents those ENP practice guidelines which have been newly created, extensively revised or deactivated during the development from ENP version 2.7 to 2.9.

### New ENP practice guidelines (n=17)

LOE of the guideline	LOE of the diagnosis	Year of development	ID	ENP nursing diagnosis label 2.9
LOE 2.1	LOE 2.1	2014*	1080	The patient is at <b>risk of impaired mobility</b>
LOE 2.1	LOE 2.1	2014*	1072	The patient is <b>impaired in well-being</b> [nursing problem without specification]
LOE 2.1	LOE 2.1	2013*	1071	The patient is <b>impaired in carrying out the activities of daily living</b>
LOE 2.1	LOE 2.1	2013*	1070	The newborn baby has <b>neonatal hyperbilirubinemia</b>

LOE 2.1	LOE 2.1	2013*	1068	The patient is at <b>risk of impaired wound healing</b> due to <b>intertrigo</b>
LOE 2.1	LOE 2.1	2013*	1067	The patient has <b>electrolyte imbalance</b>
LOE 2.1	LOE 2.1	2013*	1066	The patient has an <b>allergic reaction</b> , there is the <b>risk of anaphylactic shock</b>
LOE 2.1	LOE 2.1	2013*	1064	The patient has a <b>fluid deficit</b>
LOE 2.1	LOE 2.1	2013*	1063	The patient is at risk of <b>pulmonary complications</b> due to <b>surgery</b>
LOE 2.1	LOE 2.1	2013*	1062	The patient has <b>insufficient respiration</b>
LOE 2.1	LOE 2.1	2012*	1041	The patient is at <b>risk of complications</b> due to <b>tick bite</b>
LOE 2.1	LOE 2.1	2012*	1040	The patient is at <b>risk of delayed development</b> due to <b>physical/medical neglect</b>
LOE 2.1	LOE 2.1	2012*	1039	The patient is at <b>risk of delayed development</b> due to <b>psychological abuse/emotional neglect</b>
LOE 2.1	LOE 2.1	2012*	1035	The patient is at <b>risk of delayed development</b> due to <b>physical abuse</b>
LOE 2.1	LOE 2.1	2012*	1038	The patient is at <b>risk of delayed development</b> due to a <b>suspected sexual abuse/rape</b>
LOE 2.1	LOE 2.1	2012*	1037	The patient is at <b>risk of delayed development</b> due to <b>sexual abuse/rape</b>
LOE 2.1	LOE 2.1	2012*	1037	The patient is at <b>risk of physical abuse</b>

Table 18: New ENP practice guidelines version 2.9

### Extensively revised practice guidelines (n=112)

LOE of the guideline	LOE of the diagnosis	Systematic update	ID	ENP nursing diagnosis label 2.9
LOE 3.2	LOE 3.2	1989*, 1994, 2007, 2014	407	The patient is <b>impaired in communication</b> due to <b>hypacusis (hardness of hearing)</b>
LOE 3.2	LOE 3.2	1991*, 2004, 2007, 2014	416	The patient is <b>impaired in verbal communication</b> due to a <b>global aphasia</b>
LOE 3.2	LOE 3.2	1991*, 2004, 2007, 2014	419	The patient is impaired in verbal communication due to <b>motor aphasia</b> (Broca's aphasia)
LOE 3.2	LOE 3.2	1991*, 2004, 2007, 2014	417	The patient is impaired in verbal communication due to a <b>sensory aphasia</b> (Wernicke's aphasia)
LOE 2.1	LOE 2.3	1992*, 1994, 2003, 2008, 2014	412	The patient is <b>impaired in verbal communication</b> due to <b>physical weakness</b>
LOE 3.2	LOE 3.2	2006*, 2014	387	The patient has <b>difficulty in expressing his/her own wishes/needs</b> , there is a <b>risk that these cannot be adequately fulfilled</b>
LOE 2.1	LOE 2.3	2000*, 2006, 2014	424	The patient is <b>impaired in verbal communication</b> due to a <b>speech disorder</b> (impairment of motor-articulatory skills)



LOE 2.1	LOE 2.1	2010*; 2014	897	The patient is impaired in communication due to a <b>language disorder</b>
LOE 3.2	LOE 3.2	1990*, 2006, 2014	414	The patient is unable to <b>make contact in the accustomed way</b> , an impaired interaction exists
LOE 2.1	LOE 2.3	2005*, 2011, 2014	411	The patient is <b>unable to perceive/process environmental stimuli adequately, there is a risk of misinterpretation</b>
LOE 3.2	LOE 3.2	2000*, 2004, 2006, 2014	746	The patient is <b>restricted in establishing and maintaining relationships with other people</b> , social interaction is affected
LOE 2.1	LOE 2.3	1993*, 2004, 2007; 2014	186	The patient is <b>impaired in the ability to walk</b>
LOE 2.1	LOE 2.3	1992*, 1994, 2004, 2008, 2014	193	The patient is <b>restricted when walking</b> due to <b>uncertainty in the use of walking aids</b>
LOE 3.2	LOE 3.2	1992*, 2001, 2011, 2014	608	The patient is <b>impaired in transfer skills</b>
LOE 3.2	LOE 3.2	1990*, 2004, 2007, 2011, 2014	181	The patient is <b>impaired</b> in the ability <b>to change position in bed</b> independently
LOE 2.1	LOE 2.1	1989*, 1994, 2004, 2008, 2014	592	The patient is unable to <b>move about in the wheelchair independently</b> in the living space
LOE 3.2	LOE 3.2	2001*, 2004, 2008, 2014	648	The patient has <b>restricted mobility</b> due to <b>reduced stamina/physical strength</b>
LOE 2.1	LOE 2.3	1992*, 1994, 2004, 2007, 2014	179	The patient has limited mobility due to an <b>amputation</b> of a lower extremity
LOE 2.1	LOE 2.3	1990*, 1994, 2002, 2006, 2007, 2014	171	The patient is at <b>risk of contracture</b>
LOE 3.2	LOE 3.2	1991*, 1994, 2007, 2014	178	The patient has limited mobility due to a <b>contracture</b>
LOE 3.2	LOE 3.2	1991*, 1994, 2004, 2008, 2014	165	The patient is at <b>risk of thrombosis</b> due to <b>immobility/restricted mobility</b>
LOE 3.2	LOE 3.2	1992*, 1994, 2004, 2009, 2014	261	The patient is at <b>risk of cardiovascular complications</b> due to <b>hypertonic circulatory changes</b>
LOE 2.1	LOE 2.3	1993*, 1994, 2005, 2009; 2014	610	The patient is at risk of <b>cardiovascular failure</b> due to <b>cardiac insufficiency</b>
LOE 2.1	LOE 2.3	1989*, 1994, 2004, 2011, 2014	234	The patient is at <b>risk of atelectasis/pneumonia</b> due to <b>reduced lung ventilation</b>
LOE 3.2	LOE 3.2	2005*, 2007, 2014	347	The patient is restricted in <b>taking medication independently</b> , there is a <b>risk of ineffective therapy</b>
LOE 3.2	LOE 3.2	1992*, 2004, 2008, 2011, 2014	688	The patient is at <b>risk of aspiration</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2004, 2008, 2014	12	The patient is <b>unable to wash independently</b> due to <b>restricted mobility</b>
LOE 3.2	LOE 3.2	1991*, 1994, 2004, 2008; 2014	22	The patient is unable to organize <b>personal hygiene independently</b> due to being <b>disorientated</b>

LOE 3.1	LOE 3.1	1991*, 1994, 2004, 2008, 2014	33	The patient does not perform <b>personal hygiene</b> adequately due to <b>self-neglect</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2004, 2008, 2014	7	The patient is unable to carry out personal hygiene independently due to <b>physical restrictions in coping with stress</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2003, 2007, 2014	18	The patient is <b>unable to carry out personal hygiene</b> independently due to <b>hemiplegia/hemiparesis</b>
LOE 3.1	LOE 3.1	1991*, 2000, 2004, 2008, 2014	13	The patient is <b>completely dependent in personal hygiene</b> due to a <b>measurable altered consciousness</b>
LOE 3.1	LOE 3.1	2001*, 2004, 2008, 2014	536	The patient is <b>unable to shower/bathe independently</b>
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2007, 2009, 2014	37	The patient is <b>restricted in carrying out oral hygiene</b> independently
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2009, 2014	46	The patient wears <b>dentures</b> and is unable to <b>carry out mouth/denture care</b> independently
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2008, 2014	69	The patient is <b>restricted in carrying out hair care independently</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2004, 2007, 2014	72	The patient is <b>restricted in carrying out shaving/beard grooming</b> independently
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2009, 2014	78	The patient is <b>restricted in carrying out nail care</b> independently
LOE 3.2	LOE 3.2	1989*, 1994, 2004, 2009*, 2014	827	The patient is <b>restricted</b> in independent <b>foot care</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2003, 2007; 2014	63	The patient is at <b>risk of skin damage</b> due to <b>dry skin</b>
LOE 3.2	LOE 3.2	1991*, 1994, 2004, 2008, 2014	66	The patient is at <b>risk of skin damage</b> due to <b>tendency to intertrigo</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2004, 2011, 2014	84	The patient is <b>restricted when eating/drinking</b> due to <b>limited independence</b>
LOE 3.2	LOE 3.2	2002*, 2004, 2008, 2014	554	The patient demonstrates <b>neglect of food intake</b> , there is a <b>risk of malnutrition</b>
LOE 2.1	LOE 2.3	2003*, 2008; 2014	559	The patient is at <b>risk of developing obesity</b> due to <b>deficient dietary behavior</b>
LOE 3.2	LOE 3.2	2002*, 2008, 2014	562	The patient is at <b>risk of fluid deficit</b> due to <b>oligodipsia/adipsia</b> (reduced/nonexistent thirst)
LOE 2.1	LOE 2.3	2009*, 2014	872	The patient is at <b>risk of a fluid/electrolyte deficit</b>
LOE 2.1	LOE 2.3	2008*, 2014	850	The patient is at <b>risk of malnutrition</b>
LOE 2.1	LOE 2.3	2008*; 2014	851	The patient is at <b>risk of malnutrition</b> due to <b>cognitive impairment</b>
LOE 3.2	LOE 3.2	2004*, 2007, 2008, 2014	558	The patient <b>refuses food intake</b> (food refusal), there is a <b>risk of malnutrition</b>
LOE 3.1	LOE 3.1	2004*; 2008, 2014	555	The patient has <b>malnutrition</b>

LOE 3.2	LOE 3.2	1990*, 2003, 2009; 2014	97	The patient is receiving <b>enteral tube feeding</b> , there is an impaired <b>food intake</b>
LOE 3.1	LOE 3.1	1989*, 2003, 2009, 2011; 2014	87	The patient <b>often chokes when eating</b> , <b>swallowing is impaired in the oral transport/pharyngeal stage</b>
LOE 3.1	LOE 3.1	1989*, 2003, 2009, 2011; 2014	90	The patient <b>only chokes when drinking</b> , <b>swallowing is impaired in the oral transport/pharyngeal stage</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2004, 2008, 2014	127	The patient is impaired in independent <b>urinary/stool elimination</b>
LOE 3.2	LOE 3.2	2003*, 2006, 2014	132	The patient does not reach the toilet in time due to <b>impaired mobility</b> , there is a <b>risk of wetting</b>
LOE 3.2	LOE 3.2	2003*, 2006, 2008; 2012, 2014	130	The patient has <b>involuntary urine loss</b> (mixed incontinence) due to <b>detrusor overactivity</b> and an <b>insufficient sphincter apparatus</b>
LOE 3.2	LOE 3.2	2006*, 2008, 2012, 2014	574	The patient is <b>unable to avoid urine loss</b> with an <b>intact urogenital tract</b> (functional urinary incontinence)
LOE 3.2	LOE 3.2	1990*, 2003, 2006, 2008, 2012, 2014	134	The patient has <b>involuntary urine loss</b> (stress incontinence) due to <b>insufficient sphincter apparatus</b> with increased abdominal pressure
LOE 3.2	LOE 3.2	2003*, 2006, 2008, 2012, 2014	137	The patient has <b>involuntary urine loss</b> (reflex incontinence) due to <b>involuntary, uninhibited detrusor contractions</b>
LOE 3.2	LOE 3.2	2003*, 2006, 2008, 2012, 2014	135	The patient has <b>involuntary urine loss</b> due to <b>heavy/imperative urgency</b> (urge incontinence)
LOE 3.2	LOE 3.2	1990*, 2003, 2006, 2012, 2014	143	The patient is at <b>risk of a reduced frequency of defecation</b> (risk of constipation)
LOE 3.2	LOE 3.2	2003*, 2006, 2012, 2014	576	The patient has a <b>reduced frequency of defecation</b> associated with hard/dry bowel movements (constipation)
LOE 3.2	LOE 3.2	1989*, 2003, 2006, 2012, 2014	145	The patient has <b>involuntary bowel movements</b> (fecal incontinence)
LOE 3.2	LOE 3.2	1991*, 1994, 2003, 2006, 2012, 2014	321	The patient is at <b>risk of an ascending urinary tract infection</b> due to an <b>indwelling transurethral catheter</b>
LOE 3.2	LOE 3.2	1991*, 2003, 2006, 2012, 2014	322	The patient is at <b>risk of an infection of the organs of elimination</b> due to a <b>suprapubic catheter</b>
LOE 3.2	LOE 3.2	1992*, 1994, 2004, 2007, 2011, 2014	529	The patient is <b>restricted in dressing and undressing</b> independently
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2008, 2014	170	The patient is <b>unable to put on/take off the compression stockings independently</b> , a <b>self-care-deficit when dressing</b> exists
LOE 2.1	LOE 2.3	2001*, 2004, 2007, 2014	530	The patient shows <b>no interest in clean/neat clothing</b> , there is a <b>risk of self-neglect of clothing/outer appearance</b>
LOE 2.1	LOE 2.3	1991*, 1994, 2004, 2008, 2014	537	The patient is <b>restricted in dressing and undressing</b> due to a <b>hemiplegia</b>
LOE 3.2	LOE 3.2	1990*, 1995, 2004, 2014	299	The patient is <b>unable to sleep throughout the night</b> , there is a <b>risk of sleep deficit</b>

LOE 3.2	LOE 3.2	1990*, 1995, 2004, 2007, 2014	282	The patient is <b>hampered when falling asleep</b> , there is a <b>risk of sleep deficit</b>
LOE 2.1	LOE 2.3	1991*, 1995, 2003, 2007, 2014	479	The patient is <b>unable to relax</b>
LOE 2.1	LOE 2.3	1992*, 1994, 2003, 2007, 2009, 2014	467	The patient is <b>restricted in organizing recreational activities</b> independently
LOE 2.1	LOE 2.1	2006*, 2009, 2014	451	The patient is <b>restricted in the independent daily organization/organization of life</b> due to <b>age-related reduction processes</b> (frailty syndrome)
LOE 2.1	LOE 2.3	2006*, 2010, 2014	450	The patient is impaired in the <b>independent daily organization/organization of life</b> due to <b>disorientation</b>
LOE 2.1	LOE 2.1	2006*, 2009, 2014	634	The patient is <b>impaired in the daily organization/organization of life</b> due to <b>memory disorders</b>
LOE 2.1	LOE 2.3	2006*, 2009, 2014	535	The patient is <b>impaired in the daily organization/organization of life</b> due to a <b>thought disorder</b>
LOE 2.1	LOE 2.1	2006*, 2009, 2014	896	The patient's <b>daily organization/life organization is affected</b> due to <b>dementia</b>
LOE 2.1	LOE 2.1	1993* 2003, 2009, 2014	452	The patient is <b>restricted in the independent daily organization/organization of life</b> due to a <b>handicap</b>
LOE 2.1	LOE 2.1	2003*, 2007, 2014	547	The patient is <b>restricted in styling the outward appearance</b> and is thereby <b>affected in his/her well-being</b>
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2008, 2014	187	The patient is at <b>risk for falls</b>
LOE 2.1	LOE 2.1	2005*, 2007, 2014	203	The patient has an <b>impaired postural control/balance</b> , is at <b>risk for falls</b> due to <b>Parkinson's disease</b>
LOE 2.1	LOE 2.3	1993*, 2004, 2007, 2014	216	The patient is at <b>risk for falls</b> due to an <b>impaired balance</b> when walking/standing/sitting
LOE 3.2	LOE 3.2	1989*, 1995, 2003, 2007, 2010, 2012, 2014	160	The patient is at <b>risk of pressure sores</b>
LOE 2.1	LOE 2.3	1991*, 1995, 2004, 2007, 2014	431	The patient <b>withdraws from social events</b> , there is a <b>risk of social isolation</b>
LOE 2.1	LOE 2.1	2001*, 2008, 2014	429	The patient is <b>impaired in structuring of the daily routine</b> , there is a <b>risk of self-care deficit</b>
LOE 2.1	LOE 2.3	2002*, 2008, 2014	626	The patient demonstrates a <b>tendency to run away</b> , there is a <b>risk of self-harm</b>
LOE 2.1	LOE 2.1	2003*, 2007, 2014	217	The patient is <b>impaired in the spatial orientation</b> due to <b>balance disorder</b>
LOE 3.2	LOE 3.2	2002*, 2005, 2008, 2014	317	The patient is at <b>risk of self-injury/endangering others</b> due to <b>disorientation</b>
LOE 2.1	LOE 2.3	2005*, 2008, 2014	743	The patient shows acute <b>behavior which endangers self/others</b>
LOE 3.2	LOE 3.2	1990* 2003, 2007 2014	489	The patient has acute pain

LOE 3.2	LOE 3.2	2003*, 2007, 2014	645	The patient has <b>chronic pain</b>
LOE 2.1	LOE 2.3	1991*, 2004, 2007, 2014	493	The patient has <b>pain of the musculoskeletal system</b>
LOE 2.1	LOE 2.3	1991*, 2004, 2007, 2014	491	The patient has <b>joint pain</b> with <b>functional/mobility restrictions</b>
LOE 2.1	LOE 2.3	1990*, 1994, 2004, 2009, 2014	354	The patient is at <b>risk of hyperglycemia or hypoglycemia</b>
LOE 2.1	LOE 2.3	2003*, 2006, 2009, 2014	676	The patient has a <b>chronic wound</b> , there is <b>difficult wound healing</b>
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2014	497	The patient is <b>anxious</b> , senses a real/fictitious threat
LOE 3.2	LOE 3.2	1990*, 1994, 2004, 2014	190	The patient is <b>afraid of falling</b>
LOE 2.1	LOE 2.3	1990*, 1994, 2004, 2014	498	The patient is <b>afraid of falling out of the bed</b>
LOE 2.1	LOE 2.3	2004*, 2008, 2014	703	The patient suffers from a <b>state of agitation</b>
LOE 2.1	LOE 2.3	1991*, 2004, 2007, 2014	464	The patient <b>feels bored</b> due to a <b>lack of meaningful tasks</b>
LOE 2.1	LOE 2.3	2004*, 2008, 2014	503	The patient suffers from <b>homesickness</b>
LOE 2.1	LOE 2.1	1989*, 1994, 2004, 2008, 2014	68	The patient is <b>impaired in well-being</b> due to <b>pruritus</b>
LOE 3.2	LOE 3.2	1989*, 1994, 2004, 2008, 2014	39	The patient has a <b>reduced chewing activity/flow of saliva</b> , there is a <b>risk of thrush and parotitis</b>
LOE 2.1	LOE 2.1	1991*, 1994, 2004, 2008, 2014	131	The patient is at <b>risk of dermatitis associated with elimination/incontinence</b>
LOE 3.2	LOE 3.2	2005*, 2006, 2008, 2011, 2014	857	The patient has <b>pressure sore</b> , there is <b>difficult wound healing</b>
LOE 3.2	LOE 3.2	2003*, 2008, 2014	622	The patient is at <b>risk of an increased (extracellular/intravascular) fluid volume</b>
LOE 2.1	LOE 2.1	2003*, 2008, 2011, 2014	887	The patient is at risk of ineffective treatment due to <b>lack of information/skills</b> associated with <b>diabetes/hypo-/hyperglycemia</b>
LOE 2.1	LOE 2.3	2006*, 2011, 2014	569	The patient has the <b>risk of skin damage</b> due to <b>sensitive/thin skin</b>
LOE 2.1	LOE 2.3	2006*, 2009, 2014	383	The patient has an <b>infectious disease</b> , there is a risk of <b>spreading infection to the surrounding environment</b>
LOE 2.1	LOE 2.1	2009*, 2014	894	The patient has colonization/infection of multi-resistant organisms, there is the risk of germ spreading
LOE 3.2	LOE 3.2	1989*, 2003, 2006, 2009, 2014	339	The patient's wound is healing by second intention, there is a disturbance of wound healing

Table 19: Extensively revised practice guidelines version 2.9

## Deactivated practice guidelines (n=13)

As part of the revision the nursing diagnoses listed below have been merged or transferred to a new diagnosis.

ID	ENP nursing diagnosis label
52	The patient has an impaired swallow reflex, there is a risk of aspiration during oral hygiene
88	The patient has no swallow reflex, there is a risk of aspiration
89	The patient has no cough, pharyngeal reflex, there is a risk of saliva aspiration
94	The patient is restricted when eating due to a reduced ability to close the mouth, partly digested foodstuffs fall out of the mouth
561	The patient is at risk of fluid deficit
654	The patient must eat a low protein diet due to a protein intolerance, there is a risk of dietary related complications
828	The patient is at risk of reduced lung ventilation
235	The patient has shallow breathing and is unable to perform active breathing exercises, there is a risk of atelectasis/pneumonia
249	The patient is unable to cough up due to a glottis closure defect, there is a risk of atelectasis/pneumonia
198	The patient has restricted freedom of movement due to external factors
206	The patient has impaired mobility due to pain on weight bearing
647	The patient has postoperative restricted mobility
490	The patient has joint pain including pain on initiation of movement

Table 20: Deactivated practice guidelines version 2.9

## Literature used N=3,545

The practice guidelines of version 2.9 (2014) are supported by 3,545 national and international literature sources. These include German regulations, guidelines and recommendations such as the national expert standards, etc., as well as numerous international guidelines.

### 2.6 ENP version 2.9 to 2.10 (September 2014 to May 2017)

In addition to technical and content-related revisions of the ENP catalog, huge efforts were made in the revision period between the ENP version 2.9 and 2.10 for the methodology of the ENP development procedures as well as the creation of a new methodological and research-practically adequate validation option for the created or revised ENP content (see chapter 1.4.2 and 1.4.3) and thus a large amount of resources spent in structural and content-related work of ENP.

Those ENP practice guidelines which have undergone changes in content, have been terminologically refined or added in version 2.10 are listed in the following table<sup>12</sup>. Most of the changes or new developments are based on suggestions from users who use ENP in their daily nursing practice. For detailed information on the changes on item level there is a separate revision documentation available on request for each revised practice guideline. During the further development from ENP version 2.9 to 2.10 no practice guideline was deactivated.

<sup>12</sup>Not listed in the table are terminologically or content-related revisions of individual items with no relevance for the context/topic of one or many assigned practice guidelines.

## New ENP practice guidelines (n=5)

LOE of the guideline	LOE of the diagnosis	ID	ENP nursing diagnosis label
LOE 2.1	LOE 2.1	1081	The patient is <b>impaired in interaction</b> due to <b>inadequate emotional/affective reaction patterns</b>
LOE 2.1	LOE 2.1	1082	The patient is <b>impaired in communication</b> due to a <b>formal thought disorder</b>
LOE 2.1	LOE 2.1	1084	The patient has a <b>bladder emptying dysfunction/urinary incontinence</b> , there is an <b>impaired help-seeking behavior</b>
LOE 2.1	LOE 2.1	1120	The patient has a <b>urostomy</b> (surgical urinary diversion), there is a <b>self-care deficit stoma care/management</b>
LOE 2.1	LOE 2.1	1121	The patient is at <b>risk</b> of developing a <b>stoma complication</b>

Table 21: New ENP practice guidelines version 2.10

## Extensively systematically further developed practice guidelines version 2.10

LOE of the guideline	LOE of the diagnosis	ID	ENP nursing diagnosis label
LOE 3.2	LOE 3.2	149	The patient has an <b>ostomy</b> (artificial opening for the bowels), there is a <b>self-care deficit stoma care/management</b> (previously: The patient has a <b>self-care deficit in stoma care</b> )
LOE 2.1	LOE 2.1	148	The patient has a <b>stoma</b> , there is a <b>need of information</b> (previously: The patient has an <b>ostomy</b> (artificial opening for the bowels), there is a <b>need of information</b> )
LOE 2.1	LOE 2.1	153	The patient has a <b>colostomy</b> (artificial opening for the bowels), <b>information/skills are lacking</b> in order to carry out irrigation independently (previously: The patient has a <b>ostomy</b> (artificial opening for the bowels), <b>information/skills are lacking</b> in order to carry out irrigation independently)
LOE 3.2	LOE 3.2	268	The patient has <b>fever</b> (pyrexia), there is a <b>risk of complications</b> (previously: The patient has <b>hypothermia</b> , there is a <b>risk of complications</b> )
LOE 2.1	LOE 2.1	580	The patient has <b>skin changes</b> in the area around the stoma, there is <b>impaired stoma care</b> (previously: The patient has <b>skin changes</b> in the area around the ostomy, there is <b>impaired stoma care</b> )
LOE 2.1	LOE 2.1	581	The patient has <b>stoma necrosis</b> , there is an <b>impaired stoma care</b>
LOE 2.1	LOE 2.1	582	The patient has <b>stoma retraction</b> , there is an <b>impaired stoma care</b>
LOE 2.1	LOE 2.1	583	The patient has <b>stoma prolapse</b> , there is an <b>impaired stoma care</b>
LOE 2.1	LOE 2.1	584	The patient has <b>parastomal hernia</b> , there is an <b>impaired stoma care</b>
LOE 2.1	LOE 2.1	674	The patient is <b>impaired in the ability</b> to <b>adapt to the altered state of health</b>

LOE 2.1	LOE 2.1	881	The patient has any <b>other problem stoma</b> which impairs stoma care (previously: The resident/patient/client is otherwise impaired in stoma care)
LOE 2.1	LOE 2.1	1063	The patient is at <b>risk of respiratory complications</b> due to <b>surgery</b>
LOE 3.2	LOE 3.2	134	The patient has <b>involuntary urine loss</b> (stress incontinence) due to <b>insufficient sphincter apparatus with increased abdominal pressure</b>

Table 22: Extensively revised practice guidelines version 2.10

### Terminologically and/or selectively revised practice guidelines (n=19)

LOE of the guideline	LOE of the diagnosis	ID	ENP nursing diagnosis label
LOE 2.1	LOE 2.1	68	The patient is <b>impaired in well-being</b> due to <b>pruritus</b>
LOE 3.2	LOE 3.2	130	The patient has <b>involuntary urine loss</b> (mixed incontinence) due to <b>detrusor overactivity</b> and an <b>insufficient sphincter apparatus</b>
LOE 3.2	LOE 3.2	137	The patient has <b>involuntary urine loss</b> (reflex incontinence) due to <b>involuntary, uninhibited detrusor contractions</b>
LOE 2.1	LOE 2.1	138	The patient has <b>chronic urinary retention</b> and <b>involuntary urine loss (overflow incontinence)</b>
LOE 2.1	LOE 2.1	151	The patient has a <b>mycosis</b> (fungal infection) <b>of the area round the ostomy, stoma care is hampered</b>
LOE 2.1	LOE 2.1	160	The patient is at <b>risk of pressure sores</b>
LOE 2.1	LOE 2.1	359	The patient has <b>jaundice</b> due to <b>increased bilirubin</b>
LOE 2.1	LOE 2.1	369	The patient is at <b>risk of aspirating</b> due to <b>vomiting/tendency to vomit</b> as a result of a <b>surgical intervention</b> (PONV = postoperative nausea and vomiting)
LOE 2.1	LOE 2.1	383	The patient has an <b>infectious disease</b> , there is a <b>risk of germ spreading</b>
LOE 3.2	LOE 3.2	574	The patient is <b>unable to avoid urine loss</b> with an <b>intact urogenital tract</b> (functional urinary incontinence)
LOE 2.1	LOE 2.1	696	The child aged older than 5 <b>wets</b> her/himself without organic reasons (enuresis)
LOE 2.1	LOE 2.1	706	The patient is <b>currently impaired in well-being</b> due to <b>nausea</b>
LOE 2.1	LOE 2.1	905	The newborn baby is at <b>risk of neonatal jaundice</b>
LOE 2.1	LOE 2.1	1070	The newborn has <b>neonatal jaundice</b> , there is the risk of complications
LOE 3.2	LOE 3.2	165	The patient is at <b>risk of venous thrombosis</b> due to <b>immobility/restricted mobility</b>
LOE 2.1	LOE 2.1	279	The patient is at <b>risk of venous thrombosis</b> due to <b>varicosis</b>
LOE 2.1	LOE 2.1	591	The patient has other <b>risk factors</b> which favor the <b>risk of thrombosis</b>
LOE 2.1	LOE 2.1	859	The patient has <b>venous leg ulcer</b> , there is <b>difficult wound healing</b>
LOE 3.2	LOE 3.2	135	The patient has a strong/ <b>imperative urgency</b> associated with <b>involuntary urine loss</b> (urge incontinence)

Table 23: Terminologically and/or selectively revised practice guidelines version 2.10



As of May 2017, the 557 ENP practice guidelines of version 2.10 are based on the analysis of altogether approx. 3,960 publications. For the content-related revisions of ENP from version 2.9 to 2.10, a total of 410 systematically researched, national and international publications were used.

## 2.7 ENP version 2.10 to 3.0 (June 2017 – May 2019)

The further development works for ENP version 3.0 in May 2019 included, in addition to numerous technical aspects which are presented in tabular form below, the completion and final concept of two structural elements whose development started in 2014. On the one hand, there is the systematic development of a definition for every nursing diagnosis of the ENP catalog (as of May 2019: 566 nursing diagnoses), and on the other hand the indication of evidence levels for all nursing diagnoses as well as for all practice guidelines in ENP. For further information on the evidence level in ENP, see chapter 3.

For the development of the definitions for the ENP nursing diagnoses binding criteria have been developed for reasons of adequate quality, consistency, and stringency:

- The essential criterion of a definition is the determination and explanation of the essence of a subject, a (nursing) phenomenon or a concept. It was therefore of central importance not to repeat the essential concept terms of a nursing diagnosis in the definition, but to describe them accurately. This also included not to simply replace a concept term wherever possible through a synonym without further description. An example for clarification:

### Nursing diagnosis:

*The patient is impaired in verbal communication due to **Broca's aphasia**(motor aphasia)*

### Definition:

*Impaired ability to actively express oneself with spoken words due to a central disorder of speech production (language disorder) after completed language acquisition with slowed tedious word formation and with lacking grammatical structures in syntax as the guiding symptom (agrammatism).*

- When defining nursing diagnoses of a category (e.g. “risk of atelectasis/pneumonia”) it was started, if applicable, by defining the nursing diagnosis without specification, which was the basis for specific nursing diagnoses on the same topic. The reason for this was that in nursing diagnoses without specifications generally only the concept term of the nursing phenomenon/problem had to be defined, which, however, can be found in mostly all other nursing diagnoses additionally to the specification. On this basis it was ensured that the definition of the recurrent nursing problem/nursing phenomenon within one category is consistent.
- The development of definitions was principally literature-based, ideally on the basis of concept analyses of the respective topic. Considering the demand for the (further) development of ENP (“evidence-based”), the definitions should not be an exception. The literature used for the creation of definitions is shown in the references for each ENP practice guideline.
- All definitions of nursing diagnoses which were created during 2012 and May 2017 (approx. 120), i.e. the completion of ENP version 2.10, were reviewed again with regard to currentness, syntax and correctness and revised as necessary in order to ensure a clear description of the concept terms and their correlations in the nursing diagnoses.

The work on the definitions gave the ENP development team the opportunity to review all nursing diagnosis labels in ENP regarding syntax, and to examine and unify formulations and use of technical terms without changing the scope of meaning of the nursing diagnosis, if not required by the elements of the

corresponding practice guidelines. In this way, the wording could be optimized in a total of 317 ENP nursing diagnoses of version 3.0, 239 ENP nursing diagnoses' formulations remained unchanged against version 2.10. The following table shows the linguistic improvements using a few examples<sup>13</sup>.

ENP nursing diagnoses label version 2.10	ENP nursing diagnosis label version 3.0
The patient has <b>gout</b> , there is a <b>risk of nutritional related complications</b>	The patient is at risk of <b>nutritional related complications</b> due to a <b>uricopathy</b> (gout)
The patient is at <b>risk of a fluid/electrolyte deficit</b> due to <b>pyrexia</b>	The patient is at <b>risk of dehydration/electrolyte deficit</b> due to <b>pyrexia</b> (fever)
The patient is <b>forbidden to strain</b> during defecation, there is a <b>risk of complications</b>	The patient has to <b>avoid abdominal pressure during defecation</b> , there is a <b>risk of complications</b>
The patient has a <b>colostomy</b> (artificial opening for the bowels), <b>information/skills are lacking</b> in order to carry out irrigation independently	The patient has an information deficit/lacking abilities to <b>independently irrigate the colostomy</b>
The patient is at <b>risk of nosebleeds</b> (epistaxis)	The patient is at <b>risk of epistaxis</b> (nosebleeds)
The patient is at risk of a non-physiological body temperature	The patient is at <b>risk of hyper-/hypothermia</b>

Table 24: Exemplary comparison of changes in nursing diagnoses labels in ENP 3.0 and 2.10

Furthermore, as part of this comprehensive review of the ENP catalog a number of nursing diagnoses could be linguistically refined, but also optimized regarding their hierarchical positioning within ENP, i.e. their thematic assignment to superordinate categories and classes (see chapter 1.1). The following table list all 13 nursing diagnoses which have been moved within the hierarchy of ENP 3.0, and if necessary, linguistically improved.

ID	ENP version	Nursing diagnosis label	Class	Category
15	ENP 2.10	The patient is at risk of complications due to a reduced body awareness	Health risks (non-specific)	Risk of complications: altered awareness
	ENP 3.0	The patient is at risk of awareness-related complications due to a reduced body awareness	Perception	Risk of complications due to perceptual disorders
309	ENP 2.10	The patient is at risk of complications due to a quantitative impaired consciousness	Health risks (non-specific)	Risk of complications: altered awareness
	ENP 3.0	The patient is at risk of awareness-related complications due to a quantitative impaired consciousness	Perception	Risk of complications due to perceptual disorders
585	ENP 2.10	The patient is at risk of complications due to a urinary excretion obstruction	Health risks (non-specific)	Risk of complications: pathologic changes
	ENP 3.0	The patient has urinary retention due to obstruction, there is the risk of complications	Elimination	Risk of anuria / renal failure
140	ENP 2.10	The patient has postoperative urinary retention, there is the risk of complications	Elimination	Impaired urinary elimination
	ENP 3.0	The patient has postoperative urinary retention, there is the risk of complications	Elimination	Risk of anuria / renal failure

<sup>13</sup> An overview of all changes to the ENP nursing diagnoses labels in version 3.0 is available upon request.

604	ENP 2.10	The patient is at risk of edema formation/deformation of the stump area due to an amputation	Tissue integrity	Risk of impaired wound healing
	ENP 3.0	The patient is at risk of edema formation/deformation of the stump area due to an amputation	Tissue integrity	Risk of swelling/edema formation
613	ENP 2.10	The patient demonstrates aimless/involuntary motor activity, is hampered in carrying out the activities of daily living	Activity/daily routine	Impaired performance of activities
	ENP 3.0	The patient is impaired in the course of movement due to a movement disorder	Exercise/mobility	Impaired sequence of movement/movement pattern
837	ENP 2.10	The carer does not have all the information/skills required to take over the care of the person concerned	Knowledge/information	Lack of information/abilities
	ENP 3.0	The relative/important person is unable to carry out self-care activities independently due to lack of information/skills	Activity/daily routine	Dependent care
511	ENP 2.10	The patient feels sexually attracted to people of the same sex, and suffers from his deviant sexual preference	Society	Norm conflict
	ENP 3.0	The patient perceives a norm conflict due to a deviant sexual preference and suffers from it	Sensation	Personal suffering
384	ENP 2.10	The patient has a humiliating/degrading manner of communication, there is a risk of social isolation	Society	Risk of social isolation
	ENP 3.0	The patient has a humiliating/degrading manner of communication, there is a risk of social exclusion	Society	Risk of social exclusion
563	ENP 2.10	The patient is at risk of complications due to a metabolic dehydration	Health risks (non-specific)	Risk of complications: dehydration
	ENP 3.0	The patient has a metabolic-related fluid deficit, there is a risk of dehydration-related complications	Nutrition	Dehydration/electrolyte imbalance
564	ENP 2.10	The patient has dehydration due to loss of body fluids/lack of substitution of liquid, there is a risk of complications	Health risks (non-specific)	Risk of complications: dehydration
	ENP 3.0	The patient is at risk of dehydration-related complications due to loss of body fluids/lack of substitution of liquid	Nutrition	Dehydration/electrolyte imbalance
258	ENP 2.10	The patient has had lung surgery, there is a risk of secondary bleeding, pleural effusion, pneumothorax and atelectasis formation	Health risks (non-specific)	Risk of complications: postoperative
	ENP 3.0	The patient is at risk of respiratory complications due to surgery on the lungs	Respiration	Risk of impaired respiration postoperatively
589	ENP 2.10	The patient is at risk of complications due to a raised (extracellular/intravascular) fluid volume	Health risks (non-specific)	Risk of complications: pathologic changes
	ENP 3.0	The patient is at risk of complications due to hyperhydration (excess of body fluid)	Nutrition	Risk of impaired fluid and electrolyte balance

Table 25: Hierarchically shifted ENP practice guidelines in version 3.0

Comprehensively and systematically further developed ENP practice guidelines as well as newly created ENP practice guidelines are presented in the following table. As with the development of ENP version 2.9 to 2.10, no practice guidelines are deactivated with version 3.0. Again, the feedback and suggestions from ENP users from daily nursing practice have contributed many valuable impulses to the further development. More information on changes on the level of items provided in this scientific background are available upon request.

### New ENP practice guidelines (n=10)

LOE of the guideline	LOE of the diagnosis	ID	ENP nursing diagnosis label
LOE 2.1	LOE 2.1	1122	The patient has a <b>ulcus cruris mixtum/uncategorized ulcer cruris</b> , there is impaired wound healing
LOE 1.4	LOE 1.4	1123	The patient is unable to carry out self-care elimination independently <b>due to stage of development</b>
LOE 2.1	LOE 2.1	1124	The child/newborn is at <b>risk of developing impaired attachment capabilities</b> to the parents/guardians
LOE 1.4	LOE 1.4	1146	The patient has <b>ineffective bowel elimination</b>
LOE 2.1	LOE 2.1	1147	The patient has a knowledge deficit on <b>health-promoting behavior</b> in <b>neonatal care</b>
LOE 1.4	LOE 1.4	1148	The patient is at risk of being premature due to <b>cervical shortening/insufficiency</b>
LOE 1.4	LOE 1.4	1174	The patient has a <b>knowledge deficit</b> on <b>health-promoting behavior</b>
LOE 2.1	LOE 2.1	1175	The patient is at <b>risk of developing frailty syndrome with age</b>
LOE 2.1	LOE 2.1	1176	The patient is at <b>risk of developing urinary incontinence</b>
LOE 1.4	LOE 1.4	1178	The newborn is at risk of complications due to <b>neonatal withdrawal syndrome</b>

Table 26: New ENP practice guidelines version 3.0

### Extensively systematically further developed practice guidelines (n=5)

LOE of the guideline	LOE of the diagnosis	ID	ENP nursing diagnosis label
LOE 2.1	LOE 2.1 (in future: LOE 3.1a)	808	The patient suffers from <b>fatigue</b> (exhaustion/tiredness) (previously: The patient suffers from <b>fatigue</b> (exhaustion/tiredness))
LOE 3.1b	LOE 3.1b	223	The patient is at risk of atelectasis/pneumonia due to <b>thick bronchial secretions</b>
LOE 2.1 (in future: LOE 3.1a)	LOE 2.1 (in future: LOE 3.1a)	896	The patient is impaired in the independent daily organization/organization of life due to <b>dementia</b>
LOE 2.1	LOE 2.1 (in future: LOE 3.1a)	220	The patient has <b>dyspnea</b> , there is insufficient respiration (previously: The patient has <b>shortness of breath (dyspnea)</b> , there is <b>insufficient respiration</b> )
LOE 2.1	LOE 2.1	809	The patient has <b>impaired relational/attachment capacities</b> to the parents/guardians (previously: The patient has a <b>difficult relationship with his/her parents</b> )

Table 27: Extensively revised ENP practice guidelines version 3.0

Not included in the table are numerous terminology or content changes or revisions to individual ENP elements (e.g. characteristics, etiologies or interventions) which are assigned to several practice guidelines and/or does not refer to a single practice guideline or nursing diagnosis in its entirety. Altogether, corresponding works amount to more than 100 individual developmental activities. The majority of this was related on the level of ENP interventions. The following is an example to illustrate the result of such selective further developments for a better understanding, which does not only have an impact on one but usually several nursing diagnoses or practice guidelines. So is the exemplary intervention

“Determine/carry out control of tissue glucose/blood glucose” linked to the ENP nursing diagnoses “The patient is at risk of hypoglycemia due to **late dumping syndrome**” as well as “The patient is at **risk of hyperglycemia/hypoglycemia**”. Red elements in the table represent changes in terms of modified or new added items:

Intervention 347: Determine/carry out monitoring of tissue glucose/blood glucose		
ID number	Detailed intervention	Explanation
8189	Carry out selective control of blood glucose	
8190	Blood glucose determination <del>with Haemo-Gluco</del> test using visually evaluating test strips (without device)	Optical reading of the blood glucose value from a test strip without a measuring device. The value is determined in color comparison with predefined scale as necessary.
8191	With electronic measuring tool and code strip	
8192	Using the laboratory	
23880	<u>Carry out continuous glucose monitoring (CGM)</u>	
18063	Continuous automatic <del>measurement (glucose monitoring)</del> Glucose monitoring in subcutaneous fatty tissue (CGM)	Synonym: continuous glucose monitoring, CGM. A method in which the tissue glucose value in the intercellular fluid (interstitial glucose) is measured by means of a sensor placed in the subcutaneous fatty tissue at very close intervals and transmitted to a reading device which may also be integrated in an insulin pump. In addition to the current glucose value, the glucose data of the last few hours of each value control will be displayed graphically and a trend is indicated in which direction the glucose value is moving. Often, CGM systems include warning features, that automatically warn of impending hyper- or hypoglycemia.
23881	<u>Carry out flash glucose monitoring (FGM)</u>	
23882	Tissue glucose determination using flash glucose monitoring (FGM)	A method to determine the tissue glucose value in the intercellular fluid (interstitial glucose) generally by means of a sensor placed at the upper arm, and a reading device. In addition to the current glucose value, the glucose data of the last few hours of each value control will be displayed graphically and a trend is indicated in which direction the glucose value is moving.
8193	<u>Determine support given</u>	
8194	Give guidance in self-monitoring of the <del>tissue/blood glucose BG</del> value	
23883	Support the determination of the tissue/blood glucose value	
8195	Take over control of <del>BG</del> tissue/blood glucose monitoring	
8196	Carry out <del>BG</del> tissue/blood glucose monitoring by laboratory assistant	
23884	<u>Carry out calibration of the glucose meter</u>	

Literature used for the further development of the intervention
Schlüter, S. (2013). Diabetestechnologie - Glukosemessung und Insulinpumpen. Diabetes aktuell, 11(6), pp. 266-269.
Heinemann, L. & Freckmann, G. (2015). CGM Versus FGM; or, Continuous Glucose Monitoring Is Not Flash Glucose Monitoring. Journal of Diabetes Science and Technology, 9(5), pp. 947-950. doi: 10.1177/1932296815603528
Ancona, P. et al. (2017). The performance of flash glucose monitoring in critically ill patients with diabetes. Critical Care and Resuscitation, 19(2), pp. 167-174.
Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen (IQWiG) (Ed.). (2015). Kontinuierliche interstitielle Glukosemessung (CGM) mit Real-Time-Messgeräten bei insulinpflichtigem Diabetes mellitus. Abschlussbericht. IQWiG-Berichte - NR. 289. Retrieved from <a href="https://www.iqwig.de/download/D12-01_Abschlussbericht_Kontinuierliche-Glukosemessung-mit-Real-Time-Messgeraeten.pdf">https://www.iqwig.de/download/D12-01_Abschlussbericht_Kontinuierliche-Glukosemessung-mit-Real-Time-Messgeraeten.pdf</a> (Accessed: 27.11.2017).
Garg, S. K. & Akturk, H. K. (2017). Flash Glucose Monitoring: The Future Is Here. Diabetes Technology & Therapeutics, 19(S2), pp. S1-S3. doi: 10.1089/dia.2017.0098

Table 28: Exemplary change documentation of the further development of the ENP intervention "Determine/carry out monitoring of tissue glucose/blood glucose"

When used in a software, the revision of ENP looks from a user perspective as follows:

Intervention 347 in ENP version 2.10	Intervention 347 in ENP version 3.0
<div style="border: 1px solid #ccc; padding: 5px;"> <p><b>Blutzuckerkontrollen festlegen/durchführen</b></p> <p>Blutzuckerkontrollen durchführen</p> <p><input type="checkbox"/> Blutzuckerbestimmung mit Haemo-Glucotest</p> <p><input type="checkbox"/> Mit elektronischem Messgerät und Codestreifen</p> <p><input type="checkbox"/> Mithilfe des Labors</p> <p><input type="checkbox"/> Kontinuierliche automatische Messung (Glukosemonitoring)</p> <p>Unterstützungsleistung bestimmen</p> <p><input type="checkbox"/> Zur Selbstbestimmung des BZ-Werts anleiten</p> <p><input type="checkbox"/> BZ-Kontrolle übernehmen</p> <p><input type="checkbox"/> BZ-Kontrolle durch Laborassistentin durchführen</p> </div>	<div style="border: 1px solid #ccc; padding: 5px;"> <p><b>Gewebezucker- / Blutzuckerkontrollen festlegen/durchführen</b></p> <p>Punktuelle Blutzuckerkontrollen durchführen</p> <p><input type="checkbox"/> Blutzuckerbestimmung mittels visuell auszuwertenden Teststreifen (ohne Gerät)</p> <p><input type="checkbox"/> Mit elektronischem Messgerät und Codestreifen</p> <p><input type="checkbox"/> Mithilfe des Labors</p> <p>Kontinuierliche Gewebezuckermessung durchführen (CGM)</p> <p><input type="checkbox"/> Kontinuierliche automatische Glukosemessung im Unterhautfettgewebe (CGM)</p> <p>Gewebezuckermessung mittels Flash Glucose Monitoring (FGM) durchführen</p> <p><input type="checkbox"/> Gewebezuckermessung mittels Flash Glucose Monitoring (FGM)</p> <p>Unterstützungsleistung bestimmen</p> <p><input type="checkbox"/> Zur Selbstbestimmung des Gewebe- / Blutzuckerwerts anleiten</p> <p><input type="checkbox"/> Bei der Bestimmung des Gewebe- / Blutzuckerwertes unterstützen</p> <p><input type="checkbox"/> Gewebe- / Blutzuckerkontrolle übernehmen</p> <p><input type="checkbox"/> Gewebe- / Blutzuckerkontrolle durch Laborassistentin durchführen</p> <p><input type="checkbox"/> Kalibrierung des Glukosemessgerätes /-sensors durchführen</p> </div>

Table 29: Further development of the ENP intervention "Determine/carry out monitoring of tissue glucose/blood glucose" from a user perspective

The currently available 566 practice guidelines (as of May 2019) are based on the appraisal of more than 5,900 publications. From these, approx. 1,950 systematically searched publications were used to develop the definitions of the ENP nursing diagnoses during June 2017 and May 2019 as well as the content works for the version jump of ENP version 2.10 to 3.0.

### 3. Evidence grades of the ENP nursing diagnoses and practice guidelines

Initially originating from evidence-based medicine, evidence level (LOE) originally provided the hierarchical categorization of the formal and content-related quality of clinical studies and do so until today. In other words, the assignment of a clinical study to an evidence level serves to describe the strength and expressiveness of the findings and thus prove the scientific “value” of the study. Essential influencing factors on this expressiveness include the type of study performed as well as the examined endpoints such as the quality of life or the survival rate. In the course of time further classification models have been developed for the assignment of clinical studies to evidence level, as well as other application areas for the indication of evidence levels. Internationally, there is now a large number of different scales and definitions, so that one can talk of one general standard (if any) only within a clearly defined scope of definition, but not universally valid (Perleth & Raspe, 2007).

In the early 2000s, the discussion about levels of evidence and the corresponding criteria also resonated in nursing science. However, contrary to the concept originating in medicine, the focus here is not on an individual study or module such as a singular characteristic or etiology. Moreover, a level of evidence here comprises the entirety of a nursing classification component, such as a nursing diagnosis including its determining elements (for example, characteristics and etiologies or risk factors). Also, contrary to the original medical sense, the level of evidence of a nursing diagnosis only indirectly represents the expressiveness or value, however, the focus is on the notification about of the developmental status of a nursing diagnosis or a practice guideline. In other words, the indication of evidence levels should establish the greatest possible degree of transparency regarding the development, revision and validation status of the elements of the nursing classification system to all users and interested parties. The higher the evidence level of, for example, a nursing diagnosis, the lower the doubts about its quality, relevance and scientific substantiation (Kunz et al., 2007).

Evidence levels for the ENP nursing diagnoses and ENP practice guidelines have been successively developed and indicated since 2014. In addition to creating transparency, an important goal in the development was to make evidence levels comparable with those of other nursing classification systems. Against this background, the evidence levels of ENP are closely aligned with the classification criteria of NANDA International (cp. Herdman & Kamitsuru, 2018), although critical aspects of this classification system can also be discussed<sup>14</sup>. In this way, it should be ensured that the expressiveness as well as developmental status of individual nursing diagnoses of different classification systems essentially can be compared with each other.

The indication of evidence levels for ENP refers to two levels. On the one hand, the nursing diagnostic statement, i.e. a nursing diagnosis and its definition, characteristics, etiologies, and resources, on the other hand for the complete practice guideline, i.e. plus the nursing outcomes and nursing interventions which corresponds to the nursing diagnosis. The main reason for this differentiated illustration is the fact, that currently in many cases the diagnostic part of an ENP practice guideline is at a different (often more advanced) developmental level than the corresponding outcomes and interventions or the complete ENP

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<sup>14</sup> The criteria for classifying a NANDA-I nursing diagnosis to an evidence level can be viewed under <http://www.nanda.org/nanda-i-resources/level-of-evidence-criteria/> (accessed 14.06.2019)

practice guideline. In order to illustrate such a constellation transparently for each interested person, two evidence levels are indicated for each case.

With version 3.0 of ENP (May 2019), the gradual process of indicating evidence levels for all nursing diagnoses or practice guidelines was completed, so that the respective developmental status can now be viewed for the entire catalog. The following list shows the evidence levels of ENP in detail:

### **LoE – level 1: New practice guidelines in development status / inductively developed nursing diagnoses and practice guidelines**

ENP practice guidelines are generally developed inductively, which means that the nursing practitioners working with ENP identify a gap in ENP. The development often originates in the identification of a relevant phenomenon in nursing practice and is subsequently implemented. The result is consented with nursing practice. Subsequently, the diagnosis is included in the ENP catalog (LoE 1.4). Less frequently, the new development of an ENP practice guideline is influenced by literature reviews, health policy developments or other impulses outside of nursing practice. If this is the case, a development proposal is first developed (see LOE 1.1/1.2/1.3) which is then discussed with experts from clinical practice and evaluated by them.

#### **LoE 1.1 Nursing diagnosis labels only (development order, not included in the ENP catalog)**

The subject as well as the main conceptual terms of the ENP nursing diagnosis are clearly clarified and supported by literature. The syntactic and structural requirements are examined. Also, potential overlapping with other ENP practice guidelines are essentially examined and avoided.

#### **LoE 1.2 Nursing diagnosis label as well as definition, characteristics, etiologies and resources only (development order, not included in the ENP catalog)**

The ENP nursing diagnosis is clearly formulated, the content of the definition is consistent with the label. The definition differs terminologically from the core concepts of the diagnosis label in the sense of a paraphrase or description. The diagnosis and the definition as well as the characteristics, etiologies and resources developed in this phase are supported by literature references.

#### **LoE 1.3 Nursing diagnosis and definition, characteristics, etiologies and resources are completed with nursing outcomes and nursing interventions to a practice guideline (development order, not included in the ENP catalog)**

The nursing diagnostic statement is supplemented with outcomes and nursing interventions and supported by literature references. The resulting ENP practice guideline is in an early stage and can be made available to end users in individual cases for evaluation and project planning and improved together with the ENP development team. In the official ENP catalog as well as in the book publications, however, only diagnoses with an evidence of at least 1.4 are included.

#### **LoE 1.4 Inductively developed practice guideline: nursing diagnosis and definition, characteristics, etiologies, resources, nursing outcomes and nursing interventions are developed from nursing practice**

The nursing diagnosis, its definition, characteristics, etiologies, resources as well as associated nursing outcomes and nursing interventions were developed on the basis of empirical observations of specific care situations from nursing practice and a subsequent process of cluster and topic formation as well as associated, constant comparisons of corresponding real nursing process plans. The correctness of the technical content and the relevance of practice guidelines developed in this way are confirmed or



supplemented by specialist literature or textbook knowledge. Followed by the admission to the official ENP catalog.

**LoE – level 2: Nursing diagnoses and practice guidelines confirmed by international literature reviews, nursing practice and/or consensus studies**

**LoE 2.1 Nursing diagnosis label, definition, characteristics, etiologies and resources (nursing diagnostic statement) or nursing diagnosis label, definition, characteristics, etiologies, resources and nursing outcomes and interventions (entire practice guideline) are confirmed by international literature**

The nursing diagnosis, its definition and characteristics, etiologies and resources in the sense of the nursing diagnostic statement or the entire ENP practice guideline, i.e. the elements mentioned and in addition the nursing interventions and outcomes associated with the nursing diagnosis are confirmed by national and international literature reviews.

**LoE 2.2 Additional concept analysis for the nursing diagnosis**

Additional to the literature support of diagnosis label, definition, characteristics, etiologies, resources, nursing interventions and nursing outcomes, a concept analysis of the key nursing diagnostic terms with detailed literature review is carried out. The concept analysis supports the nursing diagnosis and the definition and includes discussion and support of characteristics.

**LoE 2.3 Consensus studies of existing nursing diagnoses/practice guidelines by experts**

In addition to the literature basis of all elements of the nursing diagnosis and practice guideline, consensus studies are carried out with experts in the respective specialist area. The studies included expert opinions, Delphi or cross-mapping studies with other nursing classification systems, and similar research designs with diagnostic content.

**LoE – level 3: Research-based nursing diagnoses and practice guidelines (validation and review)**

**LoE 3.1 a) Literature synthesis**

The further development of a nursing diagnosis or practice guideline is based on a systematic, international literature review and evaluation on the nursing diagnosis and nursing interventions with documented and proven search strategy.

**LoE 3.1 b) Literature synthesis and expert rating**

The further development of the nursing diagnosis or practice guideline is based on a systematic literature review and evaluation on the nursing diagnosis and nursing interventions with documented and proven search strategy as well as subsequent evaluation by experts selected by defined criteria, using standardized questionnaire, online surveys or similar procedures (expert ratings).

**LoE 3.2 Clinical studies of nursing diagnoses and practice guidelines which can not be generalized to the total population**

The study refers to the nursing diagnosis as well as all characteristics and etiologies that are related to the diagnosis or the entire practice guideline (including nursing outcomes and nursing interventions). The studies can be of qualitative or quantitative nature. This also includes studies which examine the concurrent validity in the clinical context. The sample size is limited and not random (non-probabilistic).

### LoE 3.3 Well-designed clinical studies with small sample sizes, which can not be generalized

The study refers to the nursing diagnosis as well as all characteristics and etiologies that are related to the diagnosis or the entire practice guideline. The studies can be of qualitative or quantitative nature. This also includes studies which examine the concurrent validity in the clinical context. A random sample (probabilistic sample) is used, but with limited sample size, which is not representative for the total population.

### LoE 3.4 Well-designed clinical studies with random sample of sufficient size to allow generalizability to the total population

The study refers to either the nursing diagnosis as well as all characteristics or etiologies related to the diagnosis, or the practice guideline as a whole. The studies can be of qualitative or quantitative nature. This also includes studies which examine the concurrent validity in the clinical context. A random sample (probabilistic sample) with sufficient size is used to generalize the results to the total population.

Referring to the current version 3.0 of ENP, the evidence levels are distributed among the 566 ENP nursing diagnoses or practice guidelines as follows. Not shown are nursing diagnoses or practice guidelines under development which are not yet an official part of ENP (LoE 1.1 to LoE 1.3).

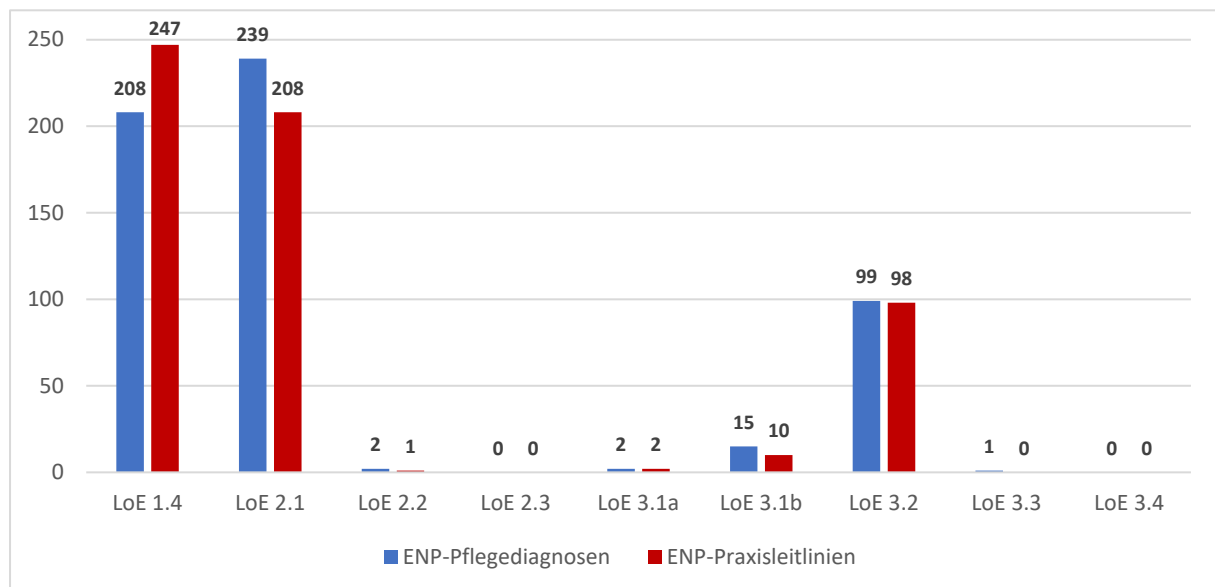


Figure 8: Distribution of evidence levels for ENP nursing diagnoses and ENP practice guidelines in version 3.0

## 4. Definitions of the class terms in ENP

In order to enhance clarity of the European Nursing care Pathways as nursing language and classification system, linguistic structures and definitions for the individual ENP groups have been determined by the ENP development team over the course of the development. These are presented in the following sections.

### 4.1 Definition: ENP nursing diagnoses

An ENP nursing diagnosis is defined as follows:

*ENP nursing diagnoses generally are a systematic clinical judgement of the patient's responses to actual or potential health problems and/or life processes. Nursing diagnoses are thus part of the nursing process and form the basis for the selection of nursing interventions by means of which the nursing outcomes agreed upon with the patient are achieved. A nursing diagnosis in ENP in particular is the term nurses use,*

*if possible, together with the person affected and/or his/her relatives based on the systematic assessment/evaluation (assessment, nursing anamnesis, physical examination) of the health status and mental, physiological and developmental state, or the response to health problems to make decisions on that basis for nursing outcomes and appropriate nursing interventions.*

An ENP nursing diagnosis describes possible nursing diagnostic findings in a standardized form. The elements of an ENP nursing diagnosis are a nursing problem and a specification. A small proportion of the ENP nursing diagnoses, approx. 15 % (n=85) as of May 2019, does not include a specification and serves as “rest category”, when none of the offered pre-combined nursing problems with specification apply. As part of the diagnostic process, the nurse in this case adds the characteristics and etiologies him/herself and transforms the nursing problem into a nursing diagnosis. A pre-combination of specification and nursing problem was conducted, if there are specific intervention concepts for the ENP nursing diagnosis. A nursing problem in ENP is defined as follows:

*Nursing problems are actual impairments of the person affected which are due to his/her person or his/her environment. Or, there are risks associated with the affected person’s health status or treatment which he/she cannot cope with or eliminate and which restrict his/her independence and/or those of others. Psychological, environmental and developmental conditions or changes of the physiological health status as well as age-related restrictions can be the starting point of nursing problems. Professional action is required to determine the nursing problem, transfer it into a nursing diagnosis and to positively influence the health status through planned care.*

Gordon und Bartholomeyczik (2001) say that a nursing diagnosis consists of three essential elements, “[...] which are also termed as PES scheme”. These three components are: Health problems (P), Etiologic and related factors (E) [and] defining characteristics or cluster of signs and symptoms (S)”(Gordon & Bartholomeyczik, 2001, p. 38f). On the level of category the group of nursing problems describe nursing problems which represent disjunctive features to which the nursing diagnosis terms are assigned. Due to the composition of an ENP nursing diagnosis from a nursing problem and a specification, it already includes at least two essential elements of a nursing diagnosis, as proposed by Gordon & Bartholomeyczik. As part of the diagnostic process the nurse selects adequate characteristics and etiologies from ENP. The characteristics in ENP do not exclusively refer to the nursing problem, but to the combination of the nursing problem and the specification.

In the following table, ENP nursing diagnoses of the class *Personal hygiene/clothing* and the category *Self-care deficit personal hygiene* from the domain *1 nursing diagnoses: functional/physiological context*, are presented as examples to illustrate the difference between nursing problem (=category) and nursing diagnosis in ENP.

Class	Category (= nursing problem)	ENP nursing diagnoses
<b>Personal hygiene/clothing</b>	Self-care deficit personal hygiene	The patient is unable to carry out personal hygiene independently due to <b>hemiplegia/hemiparesis</b>
		The patient is unable to wash independently due to <b>restricted mobility</b>
		The patient is unable to carry out personal hygiene independently due to <b>physical restrictions in coping with stress</b>
		The patient is not allowed to exert himself whilst carrying out personal hygiene due to a <b>reduced cardiac output</b> , there is a self-care deficit personal hygiene

		The patient is unable to hold bathing utensils for carrying out personal hygiene due to a <b>restricted hand function</b> , a personal hygiene self-care deficit exists
		The patient is unable to organize personal hygiene independently due to <b>disorientation</b>
		The patient should avoid movement between the pelvis and torso due to an <b>injury of the spinal column</b> , there is a personal hygiene self-care deficit
		The patient is unable to wash independently due to <b>vigilance impairment</b>
		The patient does not perform personal hygiene adequately due to <b>self-neglect</b>
		The patient is unable to carry out perineal hygiene as accustomed due to a <b>wound in the genital area</b>
		The patient is unable to carry out personal hygiene self-care independently <b>due to stage of development</b>
		The patient is unable to wash him/herself independently due to a <b>sensory integration disorder</b>
		The patient is <b>impaired in personal hygiene</b> [nursing problem without specification]
		...

Table 30: Exemplary ENP nursing diagnoses from the category personal hygiene/clothing (excerpt) illustrating the difference between nursing problem and ENP nursing diagnosis

The operationalization of self-care deficit personal hygiene presented here is determined by the development of the practice guideline. If during the development of the nursing practice guideline it becomes clear that there are specific intervention concepts, for example, for self-care deficit personal hygiene in hemiplegia, the ENP nursing diagnosis will be further developed pre-combined. In a literature review conducted as part of the ENP development of the nursing diagnoses of the sub-category self-care deficit personal hygiene, it is shown that specific intervention concepts exist for the ENP nursing diagnoses listed in table 29 (Helmbold & Berger, 2010).

To provide the user of ENP with differentiated and purpose-oriented intervention concepts, the already described structure of the ENP nursing diagnoses was chosen.

#### 4.2 Definition: ENP characteristics

Any analysis of a concept inevitably leads to the defining characteristics of the term. To establish a conceptual content and to define a nursing diagnostic concept such as the ENP nursing diagnoses, naming the characteristics that can support the nursing diagnosis is decisive. In terminology, the characteristics are assigned different meanings. *"The entirety of the defined attributes of a concept at a given time is the sum knowledge about this concept"* (Arntz, Picht, & Mayer, 2004, p. 53f). This knowledge about the concept supports to specify and define the knowledge. Also, characteristics support to structure concepts and classify them into a taxonomy.

In the nursing diagnostic process the characteristics are used as indicators to confirm a nursing diagnosis (Gordon & Bartholomeyczik, 2001, p. 43ff.). As part of the development of ENP nursing diagnoses the characteristics are used to conceptualize these. In the following, the definition of the ENP characteristics are presented.

**ENP characteristics** are indicators, symptoms and expressions of the person affected. These help to identify the nursing diagnosis/problems or to differentiate the nursing diagnosis/problem from each other. These indicators can describe symptoms, further features of the problem, biographical or historical, physiological or psychological indicators, a reported verbal expression of the person affected regarding the problem, reported reactions of a human being or risk factors.

The characteristics of ENP refer to the existing nursing problem as well as the problem specification.

### 4.3 Definition: ENP etiologies

Etiologies can be defined as a term “for an incident or a set of incidents which causally produce another incident, the effect (causality)”. Mittelstraß defines the concept of etiology in the Encyclopedia of philosophy and theory of science) on the basis of four etiology types according to Aristoteles, the modern cause-effect relations according to Humes and other philosophers (Mittelstraß, 1996, S. 442). A similar basic understanding was used for the definition of the etiologies in the ENP development. Etiologies shall further differentiate the nursing diagnosis, if they are responsible or influential in causing and maintaining the health problem/condition (Brobst et al., 1997; Gordon, 2001). In ENP etiologies are defined as follows:

**ENP etiologies** are causal and/or influencing factors which lead to the development of a nursing diagnosis and/or to its continuation. Etiologies/influencing factors may be the behavioral patterns of the affected person, existing or known illnesses as well as describable restrictions both in the psychosocial area or in the area of physical and cognitive restrictions. Also, etiologies/influential factors can be found in the environment, the socialization and the experiences of the person affected.

As part of the nursing care process it is important to be aware of the etiologies of nursing problems, as they often have to be taken into account for intervention offers in order to solve or cure a nursing problem. For example, there is a difference for the planning and selection of adequate nursing interventions, in whether an individual is unable to wash himself/herself, because the etiology is either the restriction of movement after surgery or apraxia. The understanding of etiologies in ENP also follows the philosophical analysis of the concept which gives the following differentiation : Etiologies as causal relation between etiologies and effect. *Etiologies as chain of causation and causal relation, that means “[...] that network of causes and effect into which an event is interwoven” (Hügli & Lübcke, 2001, p. 642).*

*Contributive etiologies* are etiologies that are associated with a cause, but are not the single cause.

*Decisive etiology* is a cause that can be proven to be of major importance for the effect.

*Essential etiology* which is a necessary condition for the effect.

The different perspectives and distinctions of the concept 'etiology' are always formulated in ENP in relation to the nursing diagnosis. Of particular interest are the special relationships between the identified health problems/conditions of an individual, its etiologies and the factors that maintain the problem. Each ENP nursing diagnosis can be assigned several etiologies. This means that different etiologies can influence or cause the diagnosis. The selected etiologies in the diagnostic process form the basis for the selection of adequate interventions.

The etiology formulations can be diseases (e.g. *mania, right-sided heart failure, eating disorder, multiple sclerosis*), motives for behavior (e.g. *need for self-affirmation, aversion to food intake, lack of interest, fear, sense of shame*), conditions (e.g. *confused state, prolonged loss of appetite, deformation at the soft palate, sucking weakness, dyspnea at exertion, lack of self-esteem, limited mobility*) knowledge-/ information deficits (e.g. *lacking knowledge on breast feeding, lack of access to information*), socio-cultural influences (e.g. *family dynamic factors, unemployment*), habits/behavior (e.g. *ritualized compulsive behavior, stool smearing, lack of activity, insufficient setting of boundaries*), impaired interaction (e.g. *speaks a different language*), or restricted/impaired abilities (e.g. *restricted cognitive abilities*).

#### 4.4 Definition: ENP resources

In ENP, the resources (abilities) of the person concerned are formulated in addition to the nursing diagnosis which are relevant for the selection of the nursing outcomes and nursing interventions. An ENP resource is defined as follows:

ENP resources are descriptions of conditions, physical, mental and psychosocial abilities, behaviors and/or factors of the social environment that help to develop coping strategies and/or to support nursing interventions.

The development of resources is always formulated against the background of the preferably differentiated description and assessment of the health problem/condition from which the care/support need is derived. For example, knowing whether a patient with self-care deficit personal hygiene is able to sit or stand and hold the facecloth by him/herself, is critical for the selection of nursing outcomes and interventions. Resources in contrast to the other groups in ENP make no claim to completeness. Nurses are asked to add individual entries of resource formulations as part of the diagnostic process.

The standardized resource formulations of ENP refer to behaviors, activity-promoting attitudes, support of the social environment or physiological conditions that help to develop and support coping strategies and interventions to address health problems and to cope with (health) crises by drawing on personal and socially mediated resources (resilience).

#### 4.5 Definition: ENP nursing objectives

The nursing outcome should be achieved by targeted nursing care and the promotion of individual resources. Nursing outcomes should be realistic, achievable, verifiable, positively formulated and based on the nursing problem/diagnosis. A nursing diagnosis can be assigned to several possible outcomes. The nurse selects one or many nursing outcomes depending on the patient's condition. An ENP nursing outcome is defined as follows:

*ENP nursing outcomes determine the nursing results that nurses plan together with the person affected and which are to be achieved within an agreed time frame. The expected results are described in the form of actual conditions to be achieved in the future. The nursing outcomes can refer to physical performances and abilities, physiological parameters, knowledge, behaviors and personality traits, findings, emotional experience and subjective sensation as well as the identification of physical changes.*

Using nursing outcome formulations for outcome measurement is possible. For this purpose, ENP nursing outcomes are linked with a five-level Likert scale to assess the grade of outcome achievement. There are different types of five-level scales. Common to all is that 5 means the outcome was achieved and 1 that the nursing outcome has not yet been achieved. Here are a few examples:

**ENP nursing diagnosis:** *The patient withdraws from social events, there is a risk of social isolation*

**Etiology:** Psychological illness

**Characteristics:** Withdraws to the room

**Nursing outcome:** Participates in leisure time activities

The nurse rates the outcome achievement on a five-level Likert scale. The linked evaluation criteria for assessing the level of outcome achievement are:

- 5 = completely achieved
- 4 = largely achieved
- 3 = moderately achieved

2 = slightly achieved  
 1 = not achieved

The coding 1 means that the patient has not achieved the nursing outcome *"Participates in group activities without being asked"* with regard to the nursing diagnosis (0 % outcome achievement). The coding "less" means that weak signs of outcome achievement are observable (up to 25 % outcome achievement), a "moderate" evaluation shows that there is an average outcome achievement (26–50 %), "extensively achieved" is coded if the outcome has been achieved by more than 50 % (51–75 % outcome achievement) and "completely achieved" is coded if the outcome has been achieved above 75 %.

Another type of scaling is realized in ENP by operationalized items of the outcome. For example, the three nursing outcomes for personal hygiene have been described as in the following table.

Five-level scaling "Personal hygiene"					
	Value 5	Value 4	Value 3	Value 2	Value 1
Is able to <b>wash and dry body independently</b>	Is able to <b>wash and dry body independently</b>	Is able to wash and dry body independently by <b>using aids</b> and/or <b>extended wash time</b> (> 15 Min.)	Is able to wash and dry body independently with <b>verbal guidance</b> and <b>provision</b> of material	Is able to wash and dry body <b>partly independently</b> , nurse takes over body parts difficult to reach	Is <b>completely dependent</b> on personal hygiene being carried out
Is able to <b>wash and dry upper part of the body</b> independently	Is able to <b>wash and dry upper part of the body</b> independently	Is able to wash and dry body independently by <b>using aids</b> and/or <b>extended wash time</b> (> 7 Min.)	Is able to wash and dry body independently with <b>verbal guidance</b> and <b>provision</b> of material	Is able to wash and dry <b>body partly independently</b> , nurse takes over body parts difficult to reach	Is <b>completely dependent</b> in performing washing of upper part of the body
Is able to <b>wash and dry face and hands</b> independently	Is able to <b>wash and dry face and hands</b> independently	Is able to wash and dry face and hands with <b>extended wash time</b> (> 3 Min.)	Is able to wash and dry body independently with <b>verbal guidance</b> and <b>provision</b> of material	Is able to wash and dry <b>body partly independently</b> , nurse takes over body parts difficult to reach	Is <b>completely dependent</b> in performing washing of face and hands

Table 31: five-level scaling of ENP outcomes of the class "Demands adapted to abilities"

A further example is from the class Feeling and the category "Painfree".

Five-level scaling "Painfree"					
	Value 5	Value 4	Value 3	Value 2	Value 1
Is <b>painfree</b>	Feels <b>(no) pain</b> , which was <b>evaluated</b> between 1-2 <b>on the numeric scale</b>	Feels <b>pain</b> , which was evaluated between 3-4 on the <b>numeric scale</b>	Feels <b>pain</b> , which was evaluated between 5-6 on the <b>numeric scale</b>	Feels <b>pain</b> , which was evaluated between 7-8 on the <b>numeric scale</b>	Feels <b>pain</b> , which was evaluated between 9-10 on the <b>numeric scale</b>

Table 32: five-level scaling of ENP outcomes from the category "Painfree"

The last example is from the class feeling and the category "Demands adapted to abilities":

	Five-level scaling "Demands adapted to abilities"				
	Value 5	Value 4	Value 3	Value 2	Value 1
The <b>physical demands expected</b> for personal hygiene activities are in keeping with the <b>actual physical abilities</b>	The <b>physical demands expected</b> for personal hygiene activities are in keeping with the <b>actual physical abilities</b>	The <b>physical demands expected</b> for personal hygiene activities are <b>partly in keeping with the physical abilities</b> , which is demonstrated by <b>total exhaustion</b> after personal hygiene activities	The <b>physical demands expected</b> for personal hygiene activities are <b>partly in keeping with the physical abilities</b> , which is demonstrated by <b>severely changed vital parameters and/or pain</b> after personal hygiene activities	The <b>physical demands expected</b> for personal hygiene activities are <b>not in keeping with the physical abilities</b> , which is demonstrated by <b>severely changed vital parameters with exceeding of limit values and/or pain, personal hygiene activities</b> had to be <b>interrupted</b> several times	The <b>physical demands expected</b> for personal hygiene activities <b>exceed the physical abilities</b> , which is demonstrated by circulatory collapse, respiratory insufficiency or other crises, <b>personal hygiene activities cannot be continued as planned</b>

Table 33: Five-level scaling of ENP outcomes from the category "Demands adapted to abilities"

Currently, about 50 differentiated or operationalized evaluation scales for ENP nursing outcomes have been developed. The conversion of ENP nursing outcome into operationalized items is being continuously carried out. The aim is to develop further result indicators which serve as self-evaluation instruments for patients/residents/clients as well as measurement instrument for nurses. The result indicators developed so far are available in the software application or database.

To enable a standardized evaluation of outcome achievement in the nursing team, it is important to discuss the outcome achievement with the patient and/or the team. Especially outcome formulations such as "Participates in group activities without being asked" are subject to a certain subjectivity and can be evaluated differently.

#### 4.6 Definition: ENP nursing interventions

Nursing interventions in ENP are all performances as part of nursing care carried out directly for and with the patient (e.g. whole body wash) as well as indirectly for patients (e.g. prepare medication) which are carried out by nurses on the basis of the nursing diagnosis process. An ENP nursing intervention is defined as follows:

*An ENP nursing intervention is the linguistic expression for the intervention concept. The intervention concepts are abstract formulations of nursing actions which consist of numerous sub steps. The ENP intervention concepts can refer to direct, indirect or administrative nursing actions, which are initiated and performed by nurses for outcome achievement based on clinical decision-making and nursing knowledge.*

An example to clarify: the nursing performance "Carry out 30° positioning according to Seiler" consists of numerous partial steps. This partial interventions begin among others with the disinfection of hands, preparation of material, greeting of the patient, information of the patient, the actual positioning procedure (which in turn can be described in several single steps, such as place head rest in flat position, remove pillow, etc.) and ends with the reassurance that the patient has no further desire after positioning and that, for example, is able to reach the bell. The individual practical steps of the nursing interventions



in ENP are not described, but have been conceptualized in the context of education. For nursing process documentation it is also not useful to enter the individual practical steps of an intervention concept into a patient record (vgl. hierzu u.a. Göpfert-Divivier, Mybes, & Igl, 2006).

### **Intervention specification**

In literature it is demanded that written nursing interventions have to answer the following commonly known questions. These are: “Who does when, what, how, with what? From these demands for nursing interventions it can be deduced that nursing intervention concepts should have action-guiding character. This requirement is taken into account in ENP through the intervention specifications. ENP intervention specifications are defined as follows:

*ENP intervention specifications are additional detailed information which refer to the nursing intervention. Those can include the following dimensions: detailed description of the nursing intervention, the type of support for the performance of the intervention, frequency and scheduled time of the intervention (including time intervals of the interventions), nursing products and aids used, sequence of interconnected interventions, topology, location and path information as well as the amount, number of nurses required for the adequate performance of the nursing intervention.*

### **4.7 Time values in ENP**

In addition to the other elements, time values in ENP are linked to a variety of nursing interventions or intervention specifications and are summed on a case-by-case basis. For the situation-based illustration of the summed time values, different factors are taken into account such as severity levels, location of performance, etc. The time values are estimates that were negotiated over years in an empirical process with nurses. In addition, the integrated time values are weighted by the contextual reference of the nursing diagnosis. For example, for a patient/resident with dementia there are different time values for personal hygiene than for a patient who is unable to carry out personal hygiene independently due to physical weakness. The process of time values has started in 1996 and was continuously adjusted in focus groups of nurses with the first software application used in practice. By means of own time value measurements as part of research studies, further adjustments of the time values were also made, and, if possible, expenditure-related information from scientific literature was taken into account for the creation of the time values. During the linkage of LEP Nursing 3 and ENP interventions in 2004 it became apparent that the integrated time values correspond to a high degree.

In ENP, the time values can be integrated on different levels. For one thing on the level of the intervention concept itself, so that a time value generally applies to the ENP nursing intervention regardless of the selected intervention specification. An example for this is the intervention “carry out special oral hygiene”. Regardless of the nursing products, aids or wiping techniques used for the performance of oral hygiene, a nursing time of 5 minutes is calculated in each case. The time values can be located on the level of the intervention specifications, so that depending on the concrete performance of the nursing intervention or the chosen intervention specification, resulting in a cumulative time value based on the individual nursing situation. An example for this is the nursing intervention “whole body wash”. Here, the aggregate time value results in the selection of intervention specifications, more precisely: the location of whole body wash, the required level of support, special features of personal hygiene as well as the number of staff needed to perform whole body wash (see figure 9).

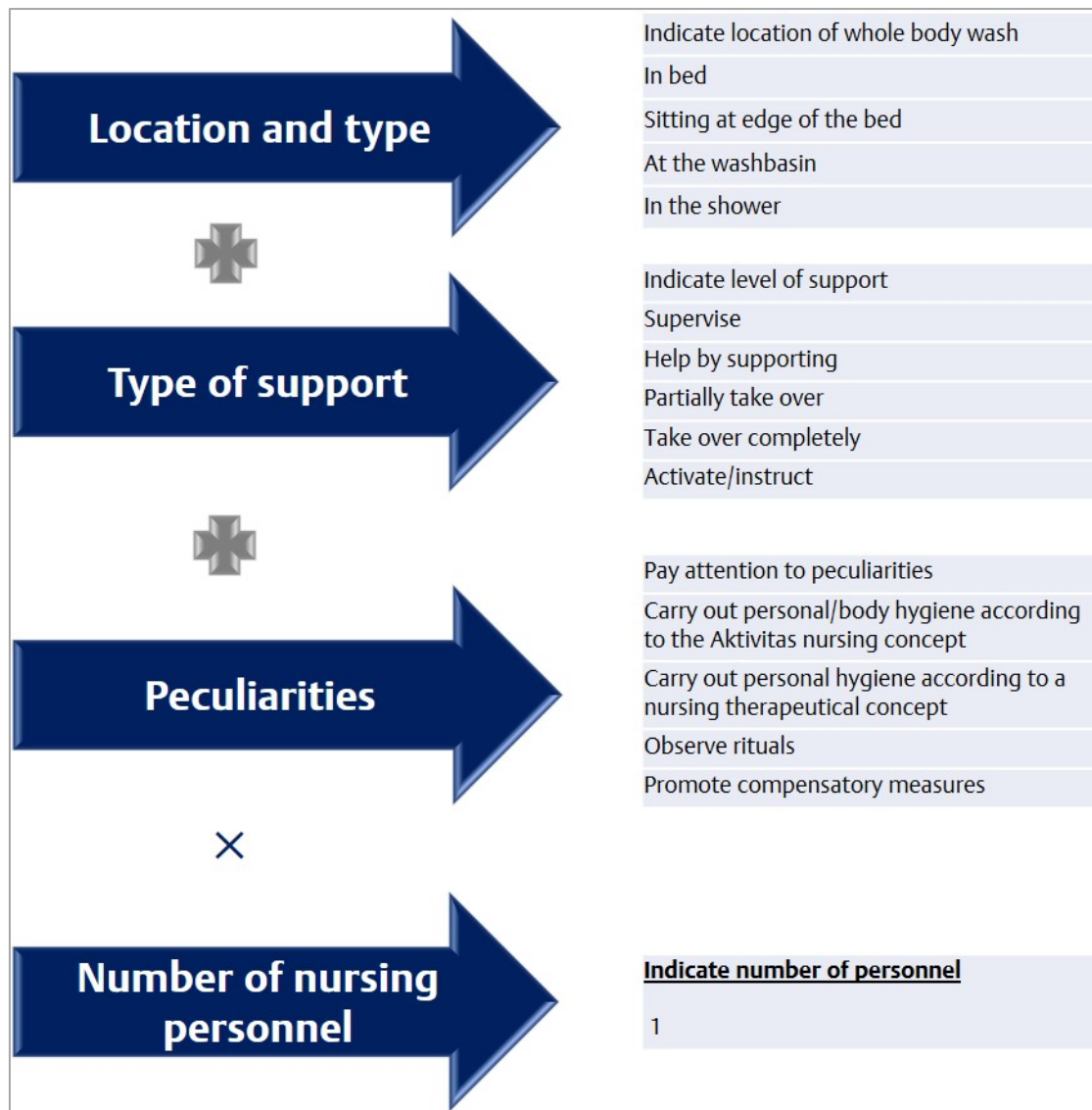


Figure 8: Example for cumulative calculation of ENP time values (extract)

If, for example, a nurse (x1) were to carry out whole body wash at the washbasin (18 minutes), integrating activating therapeutic elements (+5 minutes) and adhering to an existing ritualization of the patient/resident/client (+1 minute), this would result in a total time value of 24 minutes. If two nurses had to participate in whole body wash for certain reasons (x2), a time value of 48 minutes would be the result.

Finally, there are some interventions in ENP for which no time value has been deliberately and purposefully assigned. The main reason for this is that some nursing intervention can hardly or not be normalized. Examples for such areas are e.g. many activities in the context of counselling, guidance and patient education which can vary greatly in the nursing effort depending on the specific content, compliance and competencies of the individual patient/resident/client. In such situations, it seems more purposeful in order to collect valid and reliable time expenditures to prompt users to enter time values manually, for example by means of software-controlled prompts.

## 5. Quality of the ENP practice guidelines

The nursing diagnoses-related pathways in ENP have been developed inductively in Germany (Wieteck, 2004b). Until today users have great influence on the development of ENP. Users report requirements for the illustration of nursing diagnoses and nursing interventions to the ENP development team. These demands from the practice will be defined as development input. For example, in 2010, “unclear speech” and “meaningless speech” were submitted as part of the illustration of communication impairments in residents with dementia. After the discussion on content with the nurses on site and a first literature analysis, the following practice guideline was developed: “The patient is restricted in communication due to a language disorder”. After positive feedback of nurses on site the next steps are an in-depth literature analysis and systematic comparison with possible similar nursing diagnoses.

Literature references of ENP practice guidelines relate to international and national studies. This literature support has been massively increased during the last five years which improved the quality of the practice guidelines significantly. The systematic further development of ENP is also receiving important impulses in the form of bachelor, master and doctoral theses (cp. e.g. Haller, 2017; Hausherr, 2018; Nißlein, 2017a, 2017b). Each ENP practice guideline is supported with current literature, in the context of the content validation discussion of nursing diagnostic terms Woodtli (1988) already refers to this as a sign of content validity.

There are several content and criterion validation works (cp. e.g. Berger, 2010; Hardenacke, 2008; Helmbold, 2010; Helmbold & Berger, 2010; Schmitt, 2010; Wieteck, 2006b, 2006c, 2008b), others are due to be published or are carried out as part of academic theses. As part of the criterion validation of Berger (2010), 1.931 narrative formulations of nursing plans were mapped with ENP in the hospital setting. The formulations were taken from examination papers, which were graded 1 or 2. Altogether, 73 % of the formulation could be illustrated completely, 14 % partially and 13 % not at all. The criterion validity study by Schmitt in the field of neonatal intensive care comes to similar results (Schmitt, 2010). These works refer to the complete practice guideline. Also the literature analysis of Helmbold (2010) and Helmbold and Berger (2010) refers to a complete practice guideline. Using the nursing diagnoses of malnutrition, the validity limitations found in the study of Hardenacke (2008) can be used to understand the subsequent review and further development of the ENP diagnoses of malnutrition (Helmbold, 2010).

Some studies and projects on the evaluation of ENP were carried out with regard to the practical application of ENP. For example, Baltzer (2006) and colleagues conclude in a broad hospital implementation project: “ENP formulations are practice-oriented and comprehensible” and “With ENP, nursing processes can be illustrated clearly and completely” (Baltzer et al., 2006, p. 9). The evaluation project of Canton St Gallen, carried out in four different hospitals, aimed at testing the nursing language ENP for a cantonal implementation decision. Against this background, ENP was tested by different institutions and disciplines. See the final report on the *Conception and piloting of the implementation of ENP in hospitals of Canton St Gallen* (Kossaibati & Berthou, 2006). As part of the evaluation project, the nursing experts of the pilot institutions rated the nursing plans documented with ENP with regard to the criteria “verifiability”, “guidance”, “nursing relevance”, “clarity”, “comprehensibility” and “completeness”. “In at least 80 % of the analyzed nursing care plans, the documented contents met the analysis criteria.” (Kossaibati & Berthou, 2006, p. 41).

In an intervention study it was examined whether the application of ENP (at that time called “text modules for nursing process documentation”) in a software influences the quality of nursing process documentation in a nursing home. The frequency and valence analytic evaluations show significantly positive effects on the documentation quality (Wieteck, 2001). In another study it was examined to what extent “actually carried out nursing interventions” (collected by observers) correspond with the “documented nursing services using ENP”. In the multicenter descriptive cross-sectional study using the parallel test method, a total of 1,068 nursing intervention codings were evaluated in 34 patient cases. The percentage agreement of the rater results in the institutions was 76 % on average. However, in the study the question remains open as to whether and to what extent the 24 % of incorrect codings are due to

failure by nurses or lacking nursing intervention items in ENP (Wieteck, 2007b). ENP data analyses in hospitals, inpatient nursing institutions and outpatient nursing services were published in two further studies. Here, ENP data from the nursing process documentation was used with regard to different questions (Haag, 2009; Konrad, 2009; Wieteck, 2004a). In a research paper Wieteck (2009) shows that ENP has the granularity, i.e. the clarity, fineness, and selectivity, for example, to answer audit questions of the expert standard on pressure ulcer from the daily nursing process documentation (Wieteck, 2009). ENP is also discussed in the context of the illustration of nursing services within the DRG system (Bartholomeyczik, Haasenritter, & Wieteck, 2009; Wieteck & Kraus, 2015, 2016). In addition, validation work on the translation of ENP into Italian, English and French was carried out. For this, there is collaboration with the University of L'Aquila as well as many hospitals in Luxembourg.

The strength of ENP is to be seen in the granularity, which is in accordance with the German documentation requirements for nurses. The classification has been developed in the German context which is why cultural adaptations to the German-speaking area are not necessary. An international data exchange can be ensured by a mapping (Wieteck, 2007c). Also, the requirements of the policy statements on the nursing care process and documentation by the MDS (German Medical Service of the Central Association of Health Insurance Funds) can be met with ENP (Medizinischer Dienst der Spitzenverbände der Krankenkassen e. V. (MDS), 2005).

In contrast to other pre-combined nursing classifications ENP structures nursing diagnoses, outcomes, and interventions which offer nursing knowledge, individually combined as practice guidelines in a horizontal structure for decision-making. Therefore, comparisons of quality criteria with other classification systems are difficult.

## 6. Critical remarks

ENP is currently not fully complete to describe all necessary nursing phenomena and interventions relevant for process documentation. This is the result of various studies and evaluation projects. Approx. 23 % of NANDA-I nursing diagnoses could not be illustrated with ENP according to a study of 2008 (Wieteck, 2008c). In addition, about 18 % of the formulations in the nursing care plans had to be added individually at this time. This statement refers to the complete nursing process (nursing diagnoses, nursing outcomes, nursing interventions) (Berger, 2008, 2010; Schmitt, 2010; Wieteck, 2004b). In the broad practical test in St Gallen, Kossaibati and Berthou (2006) come to the conclusion that it is noticeable the technical language comes from Germany and recommend a Swiss adaptation to promote acceptance. The results confirm, as well as other studies, that ENP is not yet complete in all specialist areas of nursing. In some areas, elements of some pathways were perceived as inconsistent and not up to date with the scientific findings. This is why the following aspects were formulated to adapt and remove limitations of the hospitals and clinics in the Canton St Gallen experienced in the project.

- Linguistic and conceptual helvetization (Swiss adaptation): including the illustration of the Swiss nursing competencies and nursing understanding and the replacement of non-Swiss terms by a Swiss equivalent,
- update of ENP contents (in particular consideration of international, or foreign-language literature as well as nursing research),
- standardization of level of detail,
- completion of ENP contents: in the area of oncologic care, transcultural care, addiction, psychosocial aspects, etc.

The validity of the ENP practice guideline has not yet been tested on a high scientific level. There is evidence that individual ENP nursing diagnoses are not complete and could be improved (Hardenacke, 2008).

## Summary

Since nursing knowledge is constantly expanding with rapid progression, the validation process of ENP is also a continuous requirement as part of the further development of the system. However, it does not seem wrong to speak of a high maturity of the system. Indications for this are the application in all sectors of nursing for the illustration of the nursing process as well as the positive user feedback. The quality of ENP indicates that there is a high level of agreement between the systems NANDA-I and ICNP and that expressiveness and clarity of ENP nursing diagnoses were rated by experts about 84 % as equal to or higher than NANDA-I nursing diagnoses (Wieteck 2008).

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