Scientific Background

European Nursing care Pathways – Version 3.4

July 2024

Dr. Pia Wieteck
Sebastian Kraus (M.Sc.)
Dr. Qiumei Jiang-Siebert
Alexandra Mannes (B.Sc. OT)
Dr. Natalie Hubenthal
Sabine Kopp (B.Sc.)
Stephanie Hausherr (MScN)
Dr. Holger Mosebach

Thieme RECOM

Contents

Scientific Background

Introduction

The nursing classification European Nursing care Pathways (ENP) has been developed to illustrate the nursing care process within the context of the nursing documentation in a uniform, 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 (e.g. the transfer from one facility to another) and an improvement in the transparency of nursing care services. The major targets of adopting the standardized nursing language ENP as an instrument refer to improving the communication among healthcare professionals, supporting process flows (e.g. the transfer from one facility to another) and an improvement in the transparency of nursing care services. The structure of ENP is designed to support nurses in making decisions as part of the nursing process by presenting the latest expertise. In addition, the use of standardized formulations in nursing process documentation is intended to generate figures, data and facts that can be used both for hypothesis formation/testing in the context of nursing research and for steering and controlling processes in nursing management and risk management. ENP is available both as book publication and as a database[1] or integrated into various software products. Due to the availability of the terminology in different languages (English, German, French, and Italian) within one 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 precombination of the elements of this nursing classification system (see chapter 1.2)

C) ENP … as the practice guidelines developed from the precombination and the nursing classification (see chapter 1.3) which offer nurses in practice professional support in illustrating the nursing care process by using standardized formulations, such as nursing diagnoses, characteristics, etiologies, resources, nursing outcomes, and nursing interventions.

Please cite this text as follows:
Wieteck, Kraus, Jiang-Siebert, Kopp, Hausherr & Mosebach (2024). Scientific background European Nursing care Pathways, Version 3.4. RECOM GmbH. Available online at: www.recom.eu/scientific-background

A summarized overview of the individual version changes of ENP (starting with version 2.0) is provided in a separate change documentation, which can be accessed via the RECOM website at https://www.recom.eu. In addition to this summarized overview of the central changes in the individual ENP versions, with the start of the ENP version jump from 3.0 to 3.1, an automatically generated, very comprehensive change documentation is also available on request at the level of the individual items, which may be of interest to software providers or in the context of dealing with ENP at database level. Please contact us by e-mail at info@recom.eu.

[1] A detailed description of the database model of ENP in the current version is available on request.

1. Structure of ENP

The three different parts of ENP are described below their structure is illustrated in figures. **Part A** of the figure shows the ENP **nursing classification system**. **Part B** illustrates how **precombinations** from the elements of the nursing classification system are created, which lead, for example, to nursing diagnoses and intervention concepts. **Part C** in the figure illustrates how a nursing diagnosis is transformed to a nursing practice guideline by linking it to characteristics, etiologies, resources, nursing outcomes and nursing intervention concepts. There are currently **586 (version 3.4)** nursing diagnoses-related practice guidelines defined. In the following, the categorization of ENP as a nursing classification and practice guideline will be explained. In the overall figure (see Figure 1), the relationship between the three parts is shown.

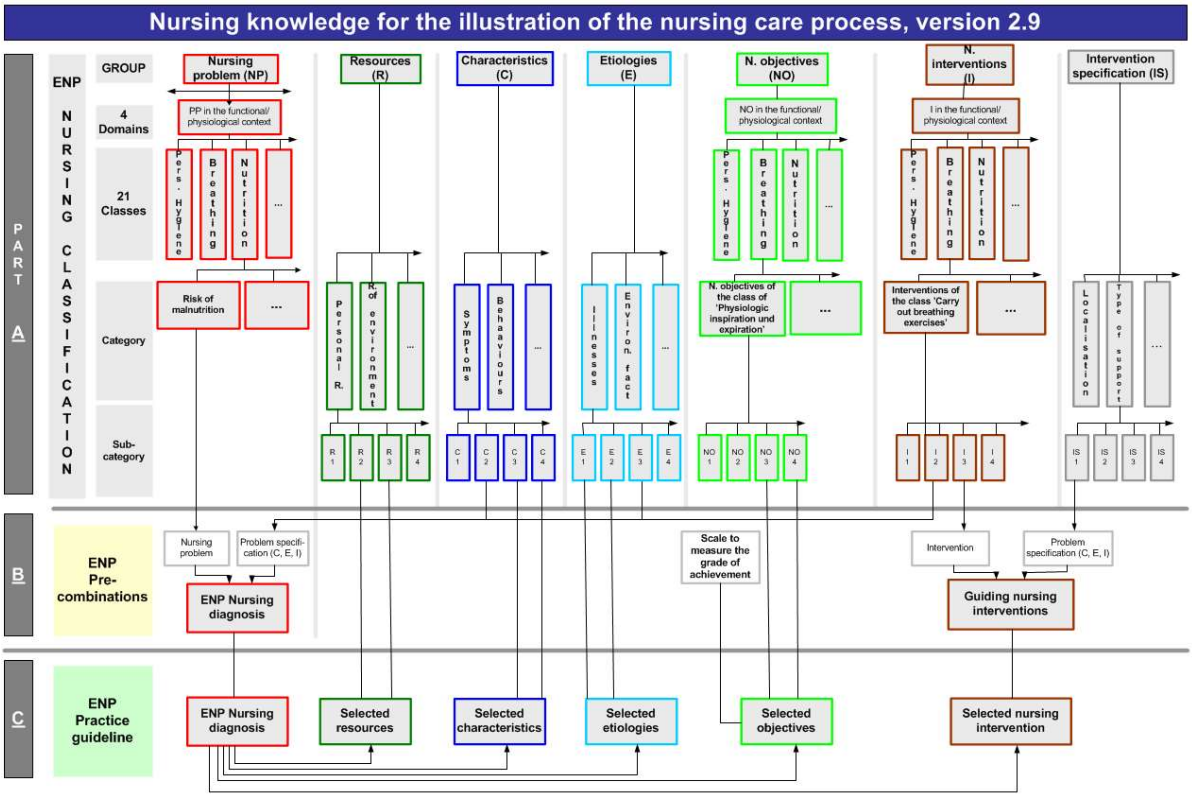


Figure 1: Hierarchical structure of the ENP classification system with its parts A, B and C

1.1 The ENP nursing classification – part A

For better understanding, the principles of organization theory are briefly explained. In general, a classification is an organization system based on the principle of class formation. A classification is a list of terms that normally has a hierarchical structure. The superordinate term to all other terms in the classification is usually referred to as general term and represents the all-embracing term. In ENP, the general term is called **"Nursing concepts/terms for illustrating 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, is divided into **4 domains** (nursing problems in the functional/physiological area, nursing problems in the emotional/psychosocial area, nursing problems with multi-dimensional risks, and environment-related nursing problems). The domain of nursing problems in the functional/physiological area, for example, is again divided into **11 classes**, to which **71 categories** are assigned. The following table lists the domains, classes and categories of ENP nursing problems. The division of domains and classes is identical in the three groups of nursing diagnoses, outcomes, and interventions.

Domain	Class	Category
Functional/physiological area 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. 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.	**Personal hygiene/clothing** Ability to plan and carry out conscious actions to clean and care for the body and to ensure that clothing is adapted to the environment.	Self-care deficit body washing[2]
		Self-care deficit oral hygiene
		Self-care deficit nail, ear, eye and nose care
		Self-care deficit hair care
		Self-care deficit dressing
	Respiration Includes the respiratory functions of ventilation (inspiration and expiration, function of the respiratory muscles), gas exchange between air and blood and the self-cleaning functions of the respiratory tract.	Impaired airway clearance
		Respiratory insufficiency
		Risk of respiratory insufficiency
		Risk of suffocation
		Risk of aspiration
		Risk of atelectasis/pneumonia
		Risk of impaired respiration postoperatively
	Nutrition Includes the activities, abilities, requirements and functions of humans to consume food for the purpose of growth, preservation, regeneration of tissue and energy production.	Impaired food intake
		Impaired swallowing
		Malnutrition
		Risk of malnutrition
		Impaired eating habits
		Dehydration/electrolyte imbalance
		Risk of impaired fluid and electrolyte balance
		Risk of impaired breastfeeding
		Impaired breastfeeding
		Risk of nutritional related complications
	Elimination A voluntary or involuntary excretion of urine, stomach or intestinal contents caused by muscle contraction.	Self-care deficit micturition/defecation
		Impaired urinary excretion
		Self-care deficit urinary incontinence
		Impaired stool excretion
		Self-care deficit stoma care
		Risk of stoma complications
		Impaired stoma care
		Risk of paralytic ileus
		Risk of urinary retention/renal failure
		Risk for incontinence
		Risk of infection of the urinary system
	Circulation Includes activities, functions that ensure the blood supply of the body with adequate and necessary	Impaired cardiovascular function
		Risk of impaired cardiovascular function
		Risk of thrombosis
		Risk of pulmonary embolism

[2] **Self-care deficit body washing, for example, is defined as:** Limited or lacking abilities and skills to carry out the necessary measures to clean the whole body with water and appropriate care products. This creates an imbalance between the self-care needs and self-care abilities of the person concerned. Each category is defined and is a component of the assigned ENP nursing diagnoses.

	volume and pressure. These include the pumping functions of the heart, the blood vessel functions for transporting blood through the body as well as functions for maintaining arterial blood pressure.	Risk of bleeding
		Risk of allergic reaction/anaphylactic shock
	Exercise/mobility Includes all activities and abilities of one's own movement to change body positions or shift from one place to another. This class also includes locomotion in various forms such as walking, running, etc.	Impaired movement
		Impaired walking
		Impaired movement sequence/pattern
		Risk of falling
		Risk of contracture
		Risk of spasticity
		Risk of paralysis
		Risk of impaired mobility
	Relaxing/sleeping/resting Includes all activities and mental functions which manifest themselves in a period, reversible and selective physical and mental detachment from the immediate environment and in which the body enters a state of rest and bodily functions are reduced.	Risk of sleep deficit
		Impaired sleep
		Impaired relaxation
	Tissue Integrity Includes all activities, behaviors and functions that affect or may affect the integrity of the body and/or organs.	Risk of dents
		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 of injury
		Risk of swelling/edema formation
		Risk of tissue damage
		Risk of infection/germ spreading
		Inflammation/infection
	Metabolism 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	Risk of hypo/hyperglycemia
		Risk of metabolic imbalance
		Metabolic imbalance

	the pituitary gland, thyroid gland, adrenal gland, etc.	
	Reproduction Includes all functions and activities associated with fertility, pregnancy, birth, and lactation.	Risk of complications for the mother and/or unborn child
		Risk of unwanted conception
		Impaired sexual life
	Body temperature Includes all functions and activities associated with the regulation of body temperature.	Risk of complications related to heat regulation
		Risk of hyper/hypothermia
Emotional/psychosocial area The domain includes all ENP practice guidelines that impair personal development, participation and/or emotional and social health due to limitations (e.g. physical, environmental), behaviors or other circumstances.	**Sensation/emotions** Includes all neurophysiological and neuropsychological processes that are caused by stimuli as a precursor to perception. Sensations can relate to pain or emotional feelings such as boredom, exhaustion, etc.	Pain
		Fear
		Impaired sensation
		Impaired well-being
		Feeling of boredom
		Personal suffering
		Exhaustion
		Risk of exhaustion
		Shame
	Perception Includes all processes and functions associated with the specific mental functions of recognizing and interpreting sensory stimuli (auditory, visual, gustatory, olfactory, tactile).	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
	Social interaction Includes any interrelated, reciprocal action between two or more persons, usually using any form of communication.	Risk of ineffective/inadequate communication
		Impaired communication
		Risk of impaired interaction
		Impaired interaction
		Impaired relationship
		Risk of unmet needs
	Action/behaviour Includes all activities and physical reactions of a human being that can be observed and/or measured. The totality of directly observable actions are behaviors that	Impaired adaptation
		Conspicuous behavior
		Impaired coping strategy
		Harmful behavior/addiction
		Risk of self-endangerment/danger to others

	represent externally observable expressions of a person on his environment.	Behavior dangerous to self/others
		Self-injurious behavior
		Risk of ineffective therapy
		Risk of unachieved health-related goals
		Risk of suicide
		Risk of escape
	Activity/daily routine Includes all actions/activities of a person's involvement in a life situation that focuses on the performance of tasks of a structured daily routine, such as organizing leisure time, carrying out household tasks, etc., and/or relate to 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 dependency care
	Personal development Includes all activities, requirements and functions to obtain a realistic picture of the world and oneself in order to be able to act and decide in one's own interest.	Impaired cognitive capacity
		Impaired decision-making capacity
		Impaired development
		Risk of impaired development
		Impaired future perspectives
		Impaired habits
		Impaired quality of life
		Impaired dying phase
		Impaired self-esteem
	Knowledge/information Includes all abilities and activities to acquire and use information and knowledge and to use these to promote, maintain and restore health.	Lack of information/abilities
		Impaired information processing
		Knowledge about health-promoting behavior
	Group Includes activities, actions and ideas that are related to social norms such as religion, roles, beliefs, value systems and influence one's own choices and decisions.	Risk of social exclusion
		Risk of social isolation
		Risk of financial/social ruin
		Risk of occupational detachment
		Role conflict
		Impaired practice of religion/belief
		Self-care deficit

Multidimensional risks The domain includes all ENP practice guidelines that lead to risks due to therapy/procedures, limitations (e.g. physical, environmental) and/or other circumstances that affect both the functional/physiological and the emotional/psychosocial areas and therefore cannot be clearly assigned to a class.	**Health risks non-specific** Includes all activities, treatments, therapies and (physical) changes that are associated with a potential risk to one's 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: pathological changes
		Risk of impaired mobility
		Health risks
Environmental nursing problems The domain includes all ENP practice guidelines that do not relate to the care receiver, but to risks for his/her social environment.	**Health risks for the environment** Includes all physical changes that pose a potential risk to the affected person's environment.	Risk of infection
N = 4	N = 21	N = 139

Table 1: Group of nursing problems classified into their domains, classes and categories in ENP version 3.4

In 2006 (version 2.3), the precombined terms/concepts of the ENP nursing diagnoses were separated into their components of nursing problem and specification and a **monohierarchical structure** was created by clustering. This reorganization enables data analyses at different aggregation levels. The clustering of nursing problems was realized in several steps by analyzing the inherent nursing concepts. The entire hierarchization processes were conceptually guided and followed previously defined rules based on fundamental definitional work on domains, classes, etc.

Between 2007-2008 the ENP nursing outcomes and interventions were broken down and clustered. These are also monohierarchical structures. The nursing outcomes and interventions are organized at the domain and class level both hierarchically and thematically according to the same structure as the nursing problems. At the level of categories there are abstractly formulated nursing outcomes and nursing intervention concepts. The structure of the domains and classes is harmonized in the three groups of nursing diagnoses, outcomes and interventions. Here is an example: category of nursing problems: "*self-care deficit body washing*", the assigned category of nursing outcomes is "*existing self-care ability body washing*", at the level of nursing interventions the category is "*nursing interventions for body washing*". Characteristics and etiologies have their own hierarchical structure. Since this development step, the term ENP nursing classification has also been used. Here is an example from the current ENP version 3.4:

Nursing diagnoses (n=566)

Domain: **Functional/physiological area**

Class: personal hygiene/clothing

Category: Self-care deficit body washing

Nursing diagnoses

Category: Self-care deficit oral hygiene

Nursing diagnoses

Nursing outcomes (n=2025)

Domain: **Functional/physiological area**

Class: Personal hygiene/clothing

Category: Existing self-care ability body washing

Nursing outcomes

Category: Existing self-care ability oral hygiene

Nursing outcomes

Nursing interventions (n=2641)

Domain: **Functional/physiological area**

Class: Personal hygiene/clothing

Category: Nursing interventions for body washing

Nursing interventions

Category: Nursing interventions for oral hygiene

Nursing interventions

Characteristics

Domain: **Functional/physiological area**

Class: personal hygiene/clothing

Category: Characteristics related to dental care

Characteristics

Etiologies

Domain: **Functional/physiological area**

Class: personal hygiene/clothing

Category: Hygiene behavior

Etiologies

Resources

Domain: **Functional/physiological area**

Category: Physical abilities

Resources

The hierarchies developed are relevant for the further development of ENP and for data analysis and generally remain invisible to end users and in the book publication, as the benefits of ENP for nursing practice can be seen in the horizontal structure (figure 1 part C).

Table 2 shows the current number of items from each group of ENP. Each item in the system only exists once, but can be linked multiple times with the exception of nursing diagnoses. Within the domains, classes and categories each element of a group has only one link to the next higher level. Each item has a unique ID number that does not change between versions. In ENP, items are not deleted, but only deactivated. This ensures that even old nursing care plans with wording that may no longer be valid can still be read and displayed.

Terms/concepts of the group	Number 2.10	Number 3.0	Number 3.1	Number 3.2	Number 3,3	Current
Nursing diagnoses	557	566	568	576	580	586
Characteristics	4,243	4,439	4,477	4,587	4.770	4,909
Etiologies	3,802	3,983	4,002	4,105	4.210	4,299
Resources	653	694	697	709	720	762
Nursing outcomes	1,865	1,930	1,947	1,975	2.025	2,080
Nursing interventions	2,632	2,653	2,675	2,632	2.639	2,704
Intervention specifications	5,011	5,732	5,827	6,146	6.811	7,192

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

Domain	Class				Category				Pre-combined ENP nursing diagnoses			
ENP version	3,0	3,2	3,3	3,4	3,0	3,2	3,3	3,4	3,0	3,2	3,3	3,4
Nursing problems in the functional/physiological area	11	11	11	11	70	71	71	71	294	300	300	303
Nursing problems in the emotional/psychosocial area	8	8	8	8	60	60	60	60	228	231	233	234
Nursing problems with multi-dimensional risks	1	1	1	1	6	6	6	7	41	42	44	46
Environmental nursing problems	1	1	1	1	1	1	1	1	3	3	3	3
Total:	21	21	21	21	137	138	138	139	566	576	580	586

Table 3: Number of elements of the ENP nursing problems group version 3.0 (May 2019) to version 3.2 (May 2021), version 3.3 (June 2022) and version 3.4 (July 2024)

1.2 Precombinations of terms in the ENP nursing classification – part B

In ENP, the elements of the nursing classification are precombined, i.e. the combination of individual terms and elements is considered in its entirety as a descriptor. For example, the vast majority (about 4/5) of all nursing diagnoses consist of an actual or potential nursing problem (term from the category level of the nursing problems group) and a specification (terms from the group of characteristics, etiologies or nursing interventions). Besides the nursing diagnoses, the nursing interventions are also precombined in ENP. For a better understanding, the following chapters illustrate the procedure and structure of the precombination using examples.

1.2.1 Precombined ENP nursing diagnoses

An ENP nursing diagnosis is created by combining a nursing problem from the monohierarchical structure of part A and a specification of an etiology or a characteristic of the respective nursing problem/phenomenon.

Example 1 – group nursing problem:

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

Category: Self-care deficit dressing

Nursing problem: **impaired dressing/undressing**

For example, the precombined ENP nursing diagnosis "The care receiver[3] is impaired in dressing/undressing due to impaired action/movement planning and execution" is composed of the nursing problem "impaired dressing/undressing" and the etiology "impaired action/movement planning and execution". The exemplary nursing diagnosis is assigned to self-care deficit dressing.

Another example is "The care receiver is at risk of atelectasis/pneumonia due to **dystelectasis** (improper inflation of the lungs)", as shown in the following figure:

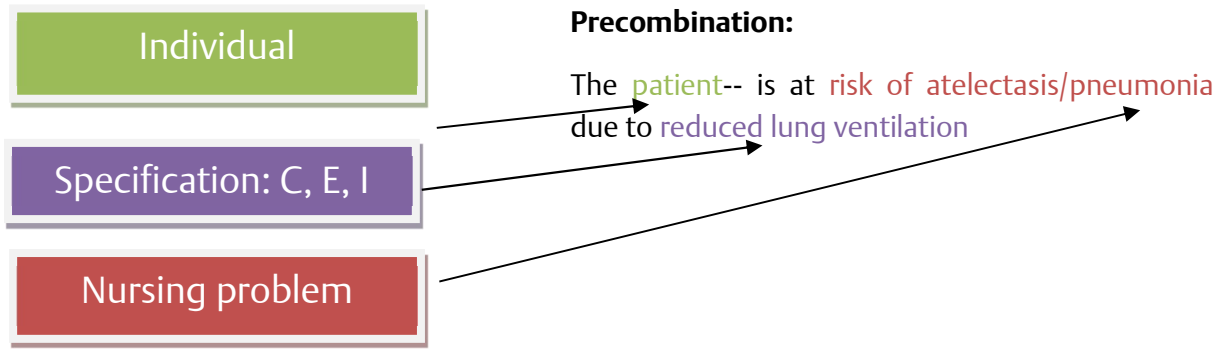


Figure 2: Precombination of an ENP nursing diagnosis

These examples show how the ENP nursing diagnosis is precombined from the terms of the nursing classification.

Each ENP care diagnosis since version 3.0 also receives a definition for unambiguous application (see also appendix G). This has been developed both for training purposes as well as for nurses who are unfamiliar with the nursing diagnostic concepts to support and promote a uniform understanding. Due to the high granularity of the ENP nursing diagnoses, i.e. their level of detail, accuracy and expressiveness, the definitions are generally not absolutely necessary in daily use by trained nursing staff, as they are already clearly formulated and offer little room for interpretation. The following is an example of the structure of the definition of an ENP nursing diagnosis.

[3] The designation can be replaced in software applications depending on the setting and gender (depending on the language used) of the person concerned, for example by patient, resident, client or a diverse gender designation. It is also possible to use the surname as an alternative.

00022 The care receiver is unable to perform body washing independently due to disorientation

Definition:

Limited or absent ability to wash whole body or body parts with water and/or other care products due to **impaired mental function of (self-)perception which is required to be able to orient to time, place, situation and/or person**.

It becomes clear that the two concepts of "disorientation" and "not being able to organize body washing independently" are considered in the definition. It is attempted to describe and/or to explain the key elements of an ENP nursing diagnosis by precisely defining the terms used.

If an ENP nursing diagnosis already contains a specification in the form of an etiology or a characteristic, both the offered etiologies and the characteristics refer to the two components of the respective nursing diagnosis. For a better understanding, here is an example.

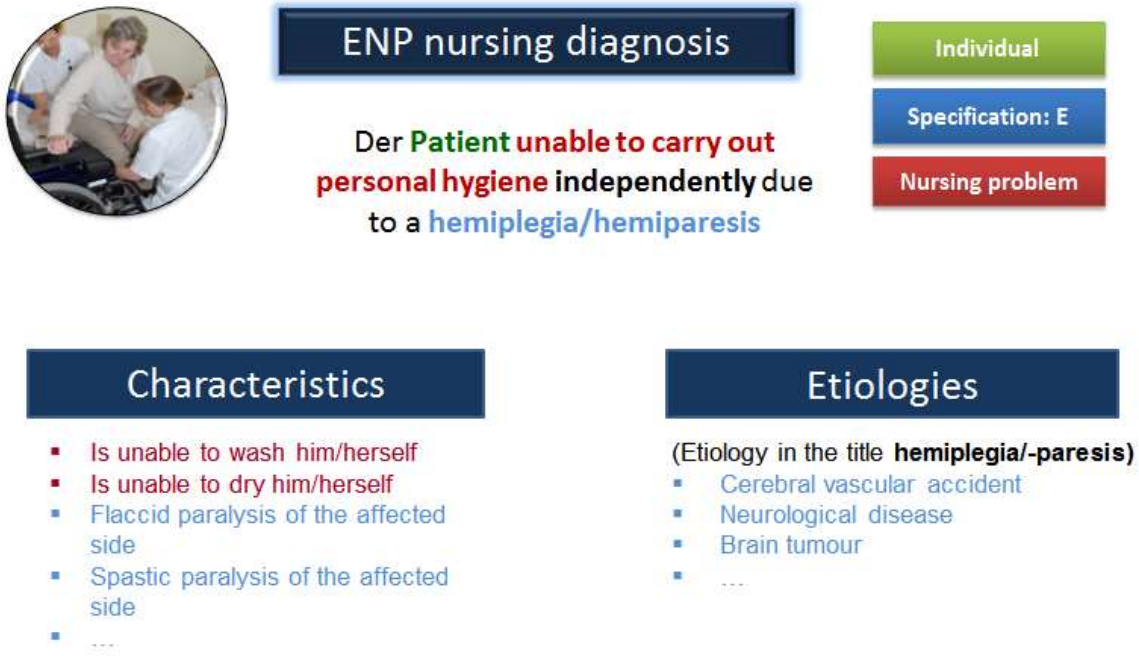


Figure 3: Reference points of the characteristics and etiologies in ENP

Nursing diagnoses for which it is professionally helpful to show the degree of impairment at the level of characteristics are presented using a Likert scaling of the degree of impairment/dependence. Here is an example:

The care receiver is **impaired in transfer ability**

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 depending on the clinical context of the associated ENP nursing diagnosis is desirable and on the development agenda for the medium to long-term future. This is to ensure a clear understanding of the individual gradations among all ENP users and thus a selection that is as uniform as possible.

1.2.2 Precombined ENP nursing interventions

Precombinations are also formed for the group of care interventions. In contrast to the ENP nursing diagnoses, however, the precombination here consists of various elements from the nursing interventions group and the intervention specifications group. The nursing interventions are assigned to intervention specifications. These can contain further information, for example, regarding frequency, the degree of care the person concerned needs to carry out the nursing intervention, number of nurses required, the aids or products required, localization/location to which the intervention relates, the time, etc.

The levels of precombined nursing diagnoses and nursing interventions are created from the ENP 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 differentiation between the nursing classification elements of ENP and the precombined elements is illustrated by the horizontal gray line in figure 1 above, while the relations are illustrated by the connecting lines. The following outlines how the nursing intervention concepts are assigned to guiding intervention specifications:

An example from the nursing interventions group:
Domain: Nursing diagnoses in the functional/physiological area
Class: Personal hygiene/clothing
Category: Carry out body washing
Subcategory: Carry out whole body wash individually
Carry out partial body washing
Support during shower
Support when bathing
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. The ENP interventions will therefore be further specified. In this way, the nursing care plan provides precise instructions for the individual and needs-based performance of nursing care. For example, the following intervention specifications are assigned to the nursing intervention “Carry out partial body washing individually”:

- Body part to wash:
  - Face
  - Hands
  - Arms
  - One arm
  - Chest
  - Abdomen
  - Back
  - Legs
  - One leg
  - Feet
  - One foot
  - Genital area
  - Genital area buttocks
- Specify level of support:
  - Supervise
  - Help through support
  - Partially take over
  - Take over completely
  - Activate/instruct
- Location of partial body washing:
  - In bed
  - Sitting at edge of the bed
  - At the washbasin
  - In the shower

- Pay attention to peculiarities
  - Observe rituals
- Indicate nursing product used
- Indicate number of personnel
- Frequency/time

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

- Specifying aspects of the underlying intervention concept
- Type of support
- Number of nurses
- Care products used
- Location details where the body washing can take place
- Interval information
- Time data
- Localization of body region
- Aids used
- Professional groups involved in the treatment process

1.3 Practice Guidelines in ENP – part C

Part C of the ENP structure (see figure 4), clearly shows how the practical guidelines are composed of the various elements of the groups. It also shows which other elements are part of every ENP practice guideline. Each practice guideline contains elements from the group of nursing problems, expanded via the intermediate step of precombination to nursing diagnoses, etiologies, characteristics, resources, outcomes and interventions.

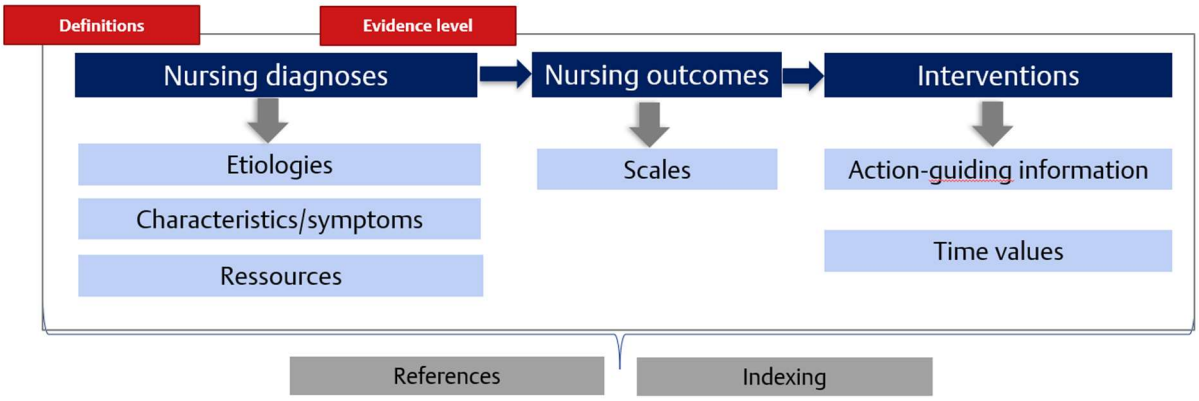


Figure 4: Extended presentation of the horizontal structure of an ENP practice guideline and the associated elements

The etiologies and characteristics of a nursing diagnosis formulated in an ENP practice guideline also refer to the specification. This is a special feature in the structure of the ENP nursing diagnoses. There are also ENP nursing diagnoses that have no precombination of specification and nursing problem, but consist only of individual and nursing problem. These nursing problem formulations only become a nursing diagnosis through the coding of etiologies and characteristics and are usually rest categories for nursing phenomena that could not yet be precombined into a nursing diagnosis. The development of precombined ENP nursing diagnoses is carried out when specific and effective intervention concepts are available or have been published. In this way, it is possible to present “best practice” or, whenever possible, “evidence-based nursing” in the sense of a practice guideline.

The horizontal structure of the nursing diagnosis-related practice guidelines is created through the linking of professionally related elements from the overall ENP structure across classes. The relationships between nursing diagnoses, characteristics, etiologies, resources, outcomes, interventions and intervention specifications are illustrated by the horizontal lines in figure 1. At the resulting micro level the ENP development team also speaks of an **ENP practice guideline**. It is therefore a professionally sound and, as far as possible, evidence-based classification of possible nursing objectives and concepts for measures to remedy/mitigate a current or potential nursing problem or a nursing diagnosis. In the past, the terms "modified practical theory" (Wieteck, 2003) or "nursing diagnosis-related pathway" (Wieteck, 2007a) were also used. Both descriptions are reflected in the term practice guideline.

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

> *An ENP practice guideline describes the systematically developed decision-making support for an appropriate, needs-based approach to specific nursing diagnostic problems based on current nursing expertise. The ENP practice guidelines show the action and decision-making range in which nursing activity takes place in a professionally appropriate manner after an ENP nursing diagnosis has been made.*

The result of the professional combination of the elements to a practice guideline is the section of ENP that is used in nursing practice, becomes visible in a software application and is individualized in nursing care planning to a nursing pathway for each care receiver. In line with the ENP development team's aspirations, these nursing diagnosis-related practice guidelines represent current nursing expertise.

Each ENP practice guideline is assigned further elements that are not necessarily obvious from an application perspective. Each (precombined) nursing diagnosis therefore has a systematically developed definition of the key conceptual terms contained in the diagnosis, in addition to the technical and content-related assignment of characteristics, etiologies, resources, outcomes, interventions and intervention specifications. Most - but deliberately not all - interventions in ENP are also assigned time values, which enable a variety of planning and evaluation options (see chapter 1.5). In addition, a level of evidence (LOE) is shown for each ENP practice guideline and each ENP nursing diagnosis, which is intended to ensure the greatest possible degree of transparency with regard to the development, revision and validation status of a practice guideline or nursing diagnosis (see chapter 2). Each ENP practice guideline is also indexed with several terms. This is intended to ensure that nursing diagnoses can be found quickly, particularly when used in electronic systems, even if terms other than those contained in the wording of the practice guidelines are used. Finally, the entire list of references is shown for each practice guideline in ENP, on the basis of which the (further) development (see chapter 1.7) took place.

1.4 Definitions of the ENP class terms

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

1.4.1 ENP nursing diagnoses

An ENP nursing diagnosis is defined as follows:

> ***ENP nursing diagnoses*** *generally represent a systematic clinical assessment of a care receiver's responses to current and/or potential health problems and/or life processes. Nursing diagnoses are therefore an integral part of the nursing process and form the basis for the selection of nursing interventions that are used to achieve the nursing outcomes developed together with the person being cared for. An ENP nursing diagnosis in particular is a linguistic expression that nurses use, if possible, together with the person and/or their relatives/significant others based on a systematic assessment/evaluation (assessment, nursing history, physical examination) of the health status and its psychological, physiological and developmental effects or response to health problems in order to make decisions about nursing outcomes and select appropriate nursing interventions.*

An ENP nursing diagnosis describes possible nursing diagnostic findings in a standardized form. The components of an ENP nursing diagnosis are a nursing problem and a specification. A small proportion, as of July 2021 approx. 16% (n=93), of ENP nursing diagnoses do not include a specification and serve as a "rest category" if none of the offered precombined nursing problems with specification apply. As part of the diagnostic process, the nurse in this case adds the characteristics and etiologies him/herself and translates the nursing problem into a nursing diagnosis. A precombination of specification and nursing problem was always made in ENP if there are specific intervention concepts for the ENP nursing diagnosis. A nursing problem in ENP is defined as follows:

> *Nursing problems are current impairments of the person affected that are due to their person or their environment. Or risks associated with the health condition or treatment of the person affected, which they cannot manage or resolve themselves and which restrict their independence and/or that of other people. Mental, environmental and developmental conditions or changes in the physiological state of health as well as age-related limitations can be the starting point for nursing problems. Professional action is required to identify the care problems, translate them into a nursing diagnosis and positively influence the state of health through planned care.*

Gordon and Bartholomeyczik state that a nursing diagnosis consists of three essential elements, "[...] which are also referred to as the PES scheme. These three component are: health problem (P), etiologic or

associated factors (E) [and] defining characteristics or clusters of signs and symptoms (S)" (Gordon & Bartholomeyczik, 2001, p. 38f). The group of nursing problems describes nursing problems at the category level in terms of content, which represent the 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 appropriate characteristics and etiologies from ENP. The characteristics in ENP do not refer exclusively to the nursing problem, but to the combination of the nursing problem and the specification.

The following table presents examples of ENP nursing diagnoses in the personal hygiene/clothing class and the category *self-care deficit body washing* from the domain of *functional/physiological nursing diagnoses* in order to illustrate the difference between nursing problem (=category) and nursing diagnosis in ENP.

Class	Category (= nursing problem)	ENP nursing diagnoses
Personal hygiene/clothing	Self-care deficit washing	The care receiver is unable to wash independently due to hemiplegia/hemiparesis
		The care receiver is unable to wash independently due to movement restriction
		The care receiver is unable to carry out personal hygiene independently due to limited physical capacity
		The care receiver may not exert himself/herself during body washing due to decreased cardiac output, there is a self-care deficit in body washing
		The care receiver is unable to use utensils for body washing due to limited hand function, there is a self-care deficit in body washing
		The care receiver is unable to perform body washing independently due to disorientation
		The care receiver should avoid movement between the pelvis and trunk due to spinal injury, there is a self-care deficit in body washing
		The care receiver is unable to wash independently due to vigilance impairment
		The care receiver does not carry out body washing adequately due to self-neglect
		The care receiver is unable to carry out intimate care as usual due to a wound in the genital area
		The care receiver is developmentally unable to carry out self-care in the area of personal hygiene independently
		The care receiver is unable to wash independently due to a sensory integration disorder
		The care receiver is impaired in independent body washing [nursing problem without specification]
		...

Table 4: ENP nursing diagnoses from the personal hygiene/clothing category (excerpt) to illustrate the difference between nursing problem and ENP nursing diagnosis

The operationalization of self-care deficit body washing presented here is determined by the development of the practice guideline. If it becomes clear during the development of a nursing diagnosis-related practice guideline that there are, for example, very specific intervention concepts for the self-care deficit body washing in hemiplegia, the ENP nursing diagnosis would be precombined and developed further. A literature analysis carried out as part of the ENP development for the nursing diagnoses in the self-care deficit body washing category shows that specific intervention concepts exist for the ENP nursing diagnoses listed in Table 29 (Helmbold & Berger, 2010).

The described structure of the ENP nursing diagnoses was chosen so that the users of the ENP terminology are offered differentiated and targeted intervention concepts to illustrate the nursing process.

Nursing diagnosis:

*The care receiver 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 language production (language disorder) acquired after completed language acquisition with slowed tedious word formation and with absence of grammatical structures in syntax as leading symptom (agrammatism).

When defining nursing diagnoses in a category (e.g. “risk of atelectasis/pneumonia”), the unspecified nursing diagnosis was used as a starting point for specific nursing diagnoses on the same topic, if applicable. The reason for this can be seen in the fact that for nursing diagnoses without specifications, only the conceptual term for the nursing phenomenon/problem usually had to be defined, but this can be found in most other nursing diagnoses in addition to their specification. On this basis, it was ensured that the definition of the recurring nursing problem/nursing phenomenon within a category is consistent and constant. The development of definitions was generally literature-based, ideally on the basis of concept analyses of the respective subject area. In view of the demand for the development and further development of ENP (“evidence-based”), the definitions should also be taken into account. The literature used to create the definition is listed in the bibliography associated with the ENP practice guideline.

1.4.2 ENP characteristics

Any analysis of a term inevitably leads to the defining characteristics of the term. In order to determine the content of a term and to define a nursing diagnostic concept, such as the ENP nursing diagnoses, it is crucial to specify the characteristics that can support the nursing diagnosis. In terminology, different meanings are assigned to the characteristics. “The totality of the characteristics of a concept determined at a given point in time is the sum of knowledge about this concept” (Arntz, Picht, & Mayer, 2004, S. 53f). This knowledge of the term helps to specify and define the content of the term. The characteristics also support the structuring of the terms and their classification in 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 the ENP nursing diagnoses, the characteristics are used to conceptualize them. The definition of the ENP characteristics is presented below.

> ***ENP characteristics** are indicators, symptoms and expressions of the person affected. These help to identify the nursing diagnosis/problems or to differentiate between the nursing diagnoses/problems. These characteristics or indicators can describe symptoms, other characteristics of the problem,*

biographical or historical, physiological or psychological indicators, a described verbal statement of the person affected about the problem, described reactions of a person or risk factors.

The characteristics of ENP relate both to the nursing problem it contains and to the problem specification.

1.4.3 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)". In the "Encyclopaedia of Philosophy and Philosophy of Science", the concept of cause is defined on the basis of Aristotle's four types of cause, Hume's modern understanding of causation and other philosophers (Mittelstraß, 1996, S. 442). A similar basic understanding was used for to define the etiologies of ENP development. Etiologies are formulated to further differentiate the nursing diagnosis if they are jointly responsible for or influence the risk or the causation and continuation of a health problem/condition (Brobst et al., 1997; Gordon, 2001). In ENP etiologies are defined as follows:

> ***ENP etiologies*** *are triggering and/or influencing factors that lead to or maintain the development of a nursing problem/nursing diagnosis. Etiologies/influencing factors can be the affected person's behavior, existing and known illnesses as well as describable limitations in the psychosocial area as well as in the area of physical and cognitive abilities. Etiologies/risk factors/influencing factors can also be found in the environment, socialization and experiences of the affected individual.*

As part of the nursing process, it is important to know the etiologies of nursing problems, as these often need to be taken into account in the context of intervention offers in order to resolve or alleviate a nursing problem or avert the risk of a potential nursing problem. For example, when planning and selecting appropriate nursing interventions, it makes a difference whether a person is unable to wash him/herself independently because the etiology is postoperative movement restriction or apraxia. The understanding of etiologies in ENP is based on the analysis of the concept of causes, which produces the following differentiation of the concept formation : Etiologies as causal relationship between cause and effect. *Etiologies as a causal chain or causal connection, which means "[...] the network of causes and effects in which an event is interwoven" (Hügli & Lübcke, 2001, p. 642).*

> *Contributing cause*, i.e. causes that are related to the effect but do not cause the effect on their own.
>
> *Decisive cause*, the cause to which a central aspect of the effect can be attributed.
>
> *Essential cause*, which is a necessary condition of the effect.

The various perspectives and distinctions of the term "etiologies" are always formulated in ENP in relation to the nursing diagnosis formulation. Of interest are the particular connections between the health problems/conditions identified in an individual, their etiology and the factors that maintain the problem. Several etiologies can be assigned to each ENP nursing diagnosis. This means that various 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, unwillingness to eat, lack of interest, fear, sense of shame*), conditions (e.g. *confused state, persistent loss of appetite, deformity of the soft palate, sucking weakness, exertional dyspnea, lack of self-esteem, restricted mobility*) knowledge-/ information deficits (e.g. *lack of information on breastfeeding, lack of access to information*), sociocultural influences (*e.g. family dynamic factors, unemployment*), habits/behavior (e.g. *ritualized compulsive behavior, feces smearing, lack of activity, inadequate setting of limits*), impaired interaction (e.g. *speaks a different language*), or restricted/impaired abilities (e.g. *limited cognitive abilities*).

1.4.4 ENP resources

In ENP, the resources (abilities) of the person affected are formulated for the nursing diagnosis which are important for the selection of nursing outcomes and the determination of nursing interventions. An ENP resource is defined as follows:

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

The development of resources is always formulated against the background of the most differentiated possible description and assessment of the health problem/condition from which the care/support need is derived. For example, it is crucial for the selection of nursing outcomes and interventions to know whether a person requiring care who has a self-care deficit in personal hygiene can sit or stand and, for example, can handle the washcloth independently. In contrast to the other groups in ENP, the formulated resource terms do not claim to be exhaustive. When formulating resources, nurses are asked to make individual additions as part of the diagnostic process.

The standardized resource formulations in ENP include behaviors, attitudes that promote action, support services from the social environment or physiological states that help to develop and support coping strategies and interventions to remedy health problems and to overcome (health) crises by drawing on personal and socially mediated resources (resilience).

1.4.5 ENP nursing outcomes

The nursing outcome should be achieved through targeted nursing care and the promotion of individual resources. Nursing outcomes should be realistic, achievable, verifiable, positively formulated and related to the nursing problem/diagnosis. Several possible nursing outcomes are assigned to an ENP nursing diagnosis. The nurse decides on one or more nursing outcomes depending on the condition of the person being cared for. An ENP nursing outcome is defined as follows:

> ***ENP nursing outcomes*** *define the nursing outcomes that nurses plan with or for the person affected and which are to be achieved within an agreed period of time. The expected results are described in the form of actual states to be achieved in the future. The nursing outcomes can relate to physical performance and abilities, physiological parameters, knowledge, behavior and personality traits, findings, emotional experience and subjective feelings as well as the recognition of physical changes.*

It is possible to use the nursing outcome formulations for outcome measurement. Each ENP nursing outcome is linked to a five-point Likert scale for assessing the degree to which the outcome has been achieved. There are different types of five-point scales. What they all have in common is that 5 means that the outcome has been achieved and 1 means that the nursing outcome has not yet been achieved. Here are a few examples:

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

Etiology: Mental illness

Characteristic: 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 assessment criteria for assessing the degree of outcome achievement are:

5 = completely achieved
4 = largely achieved
3 = moderately achieved
2 = slightly achieved
1 = not achieved

Coding with 1 would mean that the person being cared for has not achieved the nursing outcome *Takes part in group activities without being asked* in relation to the nursing diagnosis (0% outcome achievement), coding "little" would mean that slight, weak approaches to outcome achievement are recognizable (up to 25% outcome achievement), a "moderate" rating indicates that the target has been achieved to a medium extent (26-50%), "extensive" outcome achievement is coded if the outcome has been achieved to over 50% (51-75% outcome achievement) and "complete" outcome achievement is coded if the outcome has been achieved to over 75%. Another type of scaling is realized in ENP by operationalized items of the outcome. For example, the three nursing outcomes for body washing have been described as in the following table.

Five-level scaling "Body washing"					
	Value 5	Value 4	Value 3	Value 2	Value 1
Is able to wash and dry body independently	Is able to wash and dry body independently	Is able to wash and dry body independently by **using aids** and/or **extended wash time** (> 15 Min.)	Is able to wash and dry the body independently with **verbal guidance** and the **provision** of materials	Is able to **partially** wash and dry the body **independently**, nurse takes over hard-to-reach areas of the body	Is **completely dependent** on the performance of body washing
Is able to wash and dry upper body independently	Is able to wash and dry the upper body independently	Is able to wash and dry body independently by **using aids** and/or **extended wash time** (> 7 Min.)	Is able to wash and dry the upper body independently with **verbal guidance** and **provision** of materials	Is able to wash and dry body partly, nurse takes over body parts difficult to achieve	Is completely dependent on the performance of the upper body wash
Is able to wash and dry face and hands independently	Is able to wash and dry face and hands independently	Is able to wash and dry face and hands with **extended washing time** (> 3 min.)	Is able to wash and dry face and hands independently with verbal guidance and provision of materials	Is able to partially wash and dry **face and hands independently**, nurse must follow up	Is completely dependent on washing face and hands

Table 5: Five-level scaling of ENP nursing outcomes for body washing

Another example is from the class sensation and the category “Free from pain”.

Five-level scaling “Free from pain”					
	Value 5	Value 4	Value 3	Value 2	Value 1
Is painfree	Has (no) pain rated between 1-2 on the numeric rating scale	Has **pain** rated between 3-4 on the **numeric rating scale**	Has **pain** rated between 5-6 on the **numeric rating scale**	Has **pain** rated between 7-8 on the **numeric rating scale**	Has **pain** rated between 9-10 on the **numeric rating scale**

Table 6: Five-level scaling of ENP nursing outcomes from the category “Free from pain”

The final example from the sensation class and the category “Requirements adapted to abilities”:

Five-level scaling “Requirements adapted to abilities”					
	Value 5	Value 4	Value 3	Value 2	Value 1
The **expected physical demands** of the personal hygiene activity correspond to the current **physical abilities**	The **expected physical demands** of the personal hygiene activity correspond to the current **physical abilities**	The **expected physical demands** of the personal hygiene activity **partially** correspond to **the physical abilities**, this is shown in the form of **complete exhaustion** after the personal hygiene activity	The expected physical demands of the personal hygiene activity partially correspond to the physical abilities, this is shown in the form of significantly altered vital parameters and/or pain after the personal hygiene activity	The expected physical demands of the personal hygiene activity do not correspond to physical abilities, this is shown in the form of significantly altered vital parameters with exceeded limits and/or pain, the personal hygiene activity had to be interrupted (several times)	The **expected physical demands** of the personal hygiene activity **exceed the physical abilities**, this is shown in the form of circulatory collapse, respiratory insufficiency or other crises, **the personal hygiene activities cannot be continued as planned**

Table 7: Five-level scaling of ENP nursing outcomes from the category “Requirements adapted to abilities”

Currently, around 50 differentiated or operationalized assessment scales have been developed from the ENP nursing outcomes. We are continuously working on the further transfer of the ENP nursing outcomes into operationalized items. The aim is to develop further, specifically operationalized outcome indicators that can be used in the form of self-assessment tools both for the person to be cared for and as a measuring instrument for nurses. The result indicators developed to date are available as software packages or as a database.

It is important to discuss the outcome achievement with the person affected and/or in the team so that a uniform assessment of the outcome achievement in the care team is possible. Implementing regulations such as guidelines for action by RECOM Especially outcome formulations such as *“Participates in group activities without being asked”* are subject to a certain degree of subjectivity and can be assessed differently from person to person.

1.4.6 ENP nursing interventions and ENP intervention specifications

Nursing interventions in ENP are all actions carried out directly on and with the person being cared for (e.g. carry out whole body washing) and indirectly for them (e.g. prepare medication) in the context of nursing care, which are carried out by nursing staff on the basis of the nursing diagnostic process. An ENP nursing intervention is defined as follows:

> *An **ENP nursing intervention** is the linguistic term for an intervention concept. The intervention concepts are abstract formulations of nursing actions that consist of numerous sub-steps. The ENP nursing intervention concepts can refer to direct, indirect or administrative nursing actions that are initiated and carried out by nurses to achieve outcomes based on clinical decision-making processes and nursing expertise.*

Here is an example to illustrate this: The nursing action "carry out basal-stimulating whole body washing according to Bobath" consists of numerous individual sub-steps. These partial interventions begin with hand disinfection, preparation of materials, greeting and informing the person to be cared for, the actual body washing (which in turn can be described in numerous individual steps such as positioning the person affected, dressing/undressing etc.) and ends with ensuring that the care receiver has no further wishes after the body washing and that, for example, the nurse call system can be reached. The individual steps of the nursing intervention formulated in ENP are not described in detail, but have been conceptualized as part of the training. For nursing process documentation, it is also of little use to include the individual action steps of an intervention concept in the documentation (cf. Göpfert-Divivier, Mybes, & Igl, 2006, among others).

Intervention specification

The specialist literature requires that the written nursing interventions must provide answers to the following commonly questions. These are: "Who does what, when, how, with what? From these requirements for the formulation of a nursing intervention, it can be deduced that nursing intervention concepts should have an action-guiding character. This requirement for the formulations is taken into account in ENP by the intervention specifications. ENP intervention specifications are defined as follows:

> *ENP intervention specifications are additional detailed information relating 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.*

1.4.7 Explanatory texts on characteristics, etiologies, resources and intervention specifications

The need to establish (as required) explanatory texts for various ENP items arose from a development that began in 2008. Increasing feedback from users pointed to a heterogeneity in the use of partly foreign and partly German-language technical terms as well as a more nursing-specific jargon, particularly at the level of ENP characteristics, etiologies and resources. Examples include the mixed use of the terms "headache" and "cephalgia". In order to reduce this mixed use of terms of different kinds, it was necessary to decide in which of the two directions existing terms should be harmonized on the one hand and new terms to be included in ENP on the other. A survey of selected users was conducted in order to reach a decision in the interests of ENP users. The result was a clear vote in favor of the consistent use of German or foreign-language specialist terms, which was predominantly justified by the participants with the argument "we are a profession, we need a specialist language with established specialist terms". This vote also corresponds to the changing demands on nursing terminologies over the course of time.

At the same time, however, the need to provide an explanation of the relevant Latin/Greek technical terms became apparent, as it cannot be assumed that every technical term is known to all users, given the variety of settings and specialist areas of the nursing profession and the individual professional socialization of nurses. Against this background, the explanatory texts for characteristics, etiologies, resources and intervention specifications were created at both the structural and content level of ENP and have since been gradually completed as required. The following table shows some examples of explanatory texts for ENP characteristics in the practice guideline "The care receiver s impaired in verbal communication due to **Broca's aphasia** (motor aphasia)".

ID	Characteristics	Explanation
22,080	Strongly pronounced agrammatism	Denotes a disorder of language production characterized by the absence of grammatical structures, e.g. individual words are strung together without a 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	Word neologisms in which the word used differs in more than one sound from the target sound. In the standard language the "new" word does not exist and therefore has no meaning (e.g. "flower" becomes "fluler").
22,058	Phonematic paraphasias	Describes the phonetic change of a word by replacing, adding, omitting or rearranging individual sounds (e.g. "Pospital" instead of "hospital")
22,081	Occasional semantic paraphrasia	Describes the incorrect occurrence of a word that has a similar meaning to the actual target word or is significantly different. 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. when naming.
22,043	Increased language effort	Difficulties in motor skills of speech due to an impairment of articulation, phonation and/or speech rhythm

Table 8: Examples of explanatory texts for ENP items, here at characteristic level

1.5 Time values in ENP

In addition to the other elements, ENP time values are linked to a large number of nursing interventions or intervention specifications (but deliberately not all) and are summed on a case-by-case basis. Various factors such as severity, location of service provision, etc. are taken into account to ensure that the summed time values are appropriate to the situation. The time values are estimates that were negotiated with nurses in an empirical process over many years. The time values are weighted by the contextual reference to the nursing diagnosis. For example, different time values are assigned for a person in need of care with dementia in the context of a whole body washing than for a whole body washing, e.g. for a person who is unable to perform personal hygiene independently due to physical weakness. The process of assigning time values began in 1996 and was continuously adjusted with the first software application in the field with focus groups of nurses. Further adjustments to the time values were also made on the basis of own time value measurements as part of research work, and expenditure-related information from scientific literature was also taken into account when determining the time values where possible. When

linking the LEP Nursing 3 and ENP interventions in 2004, it was noticeable that a high proportion of the assigned time values correspond.

In ENP, the time values can be specified at different levels. For one thing, at 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. One example for this is the intervention “carry out special oral hygiene”. Regardless of the care products, aids or wiping techniques used for special oral hygiene, a nursing time of 5 minutes is calculated in each case. However, the time values can be determined at the level of the intervention specifications, resulting in a cumulative time value based on the individual nursing situation, depending on the specific performance of the nursing intervention or the selected intervention specification. One example for this is the nursing intervention “carry out whole body washing”. Here, the aggregated time value results from the respective selection of intervention specifications, more precisely: the location of the whole body washing, the necessary level of support, special features of body washing and the number of nurses required to perform the whole body washing (see figure 5).

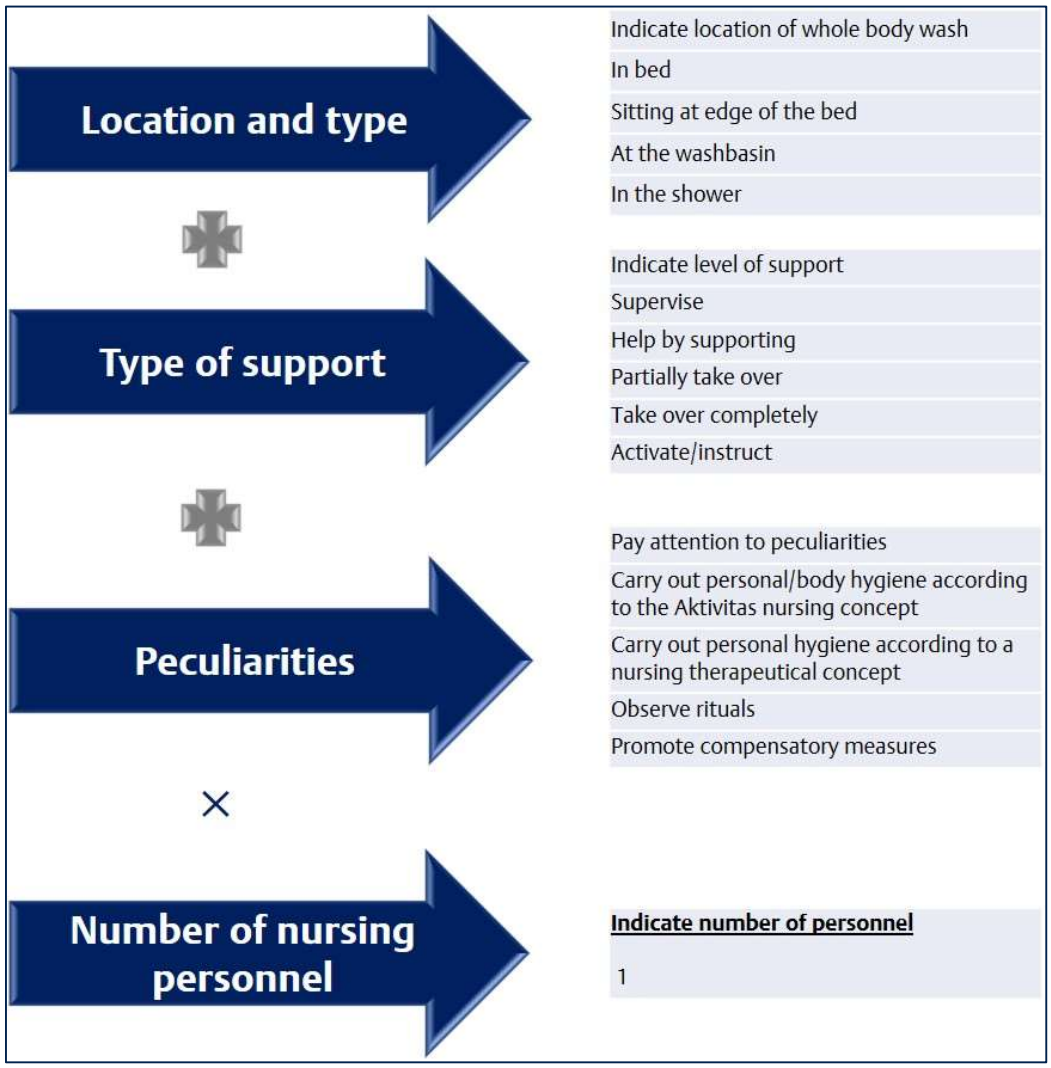


Figure 5: Example of the cumulative calculation of ENP time values (excerpt)

If, for example, a nurse (x 1) were to carry out a whole body washing at the washbasin (18 minutes), integrate activating/instructive elements (+5 minutes) and observe a ritualization on the part of the person being cared for (+1 minute), this would result in a total time value of 24 minutes. If two nurses had to participate in the whole body washing for certain reasons (x 2), this would result in a time value of 48 minutes.

Finally, there are some interventions in ENP for which no time value was deliberately and purposefully assigned. The main reason for this is that some nursing intervention can hardly or not at all be standardized. Examples for such areas include a wide range of activities in the context of counselling, guidance and patient education which can vary greatly depending on the specific content, compliance and competencies of the individual person affected in terms of the nursing effort required. In such situations, it seems more expedient to ask ENP users to enter a manual time value, for example by means of a software-controlled prompt, in order to record valid and reliable time expenditures.

Advantages of time values recorded as part of the (digital) standard documentation with ENP

First and foremost, time values that can be used from the daily standard documentation and without any further data collection effort enable the recording of the actual nursing effort performed in a facility / on a ward / in a shift / for a specific group of people requiring nursing care. In this way, the time values create an absolutely necessary basis for carrying out a wide variety of analyses, evaluations and calculations - and also for arguing with various interest groups. Only when it is known how much time is actually required to care for a certain group of care receivers, for example, can staff requirements be discussed. The possibilities for conceivable analyses based on the nursing time performed, the services provided, etc. are virtually unlimited. One example would be case-related evaluations:

ENP classes	Number of persons Service	Minute value summed	Disorientation related to % Proportion in relation to services of the case
Personal hygiene/clothing	13	198	20,79
Respiration	9	45	4,72
Nutrition	36	180	18,9
Elimination			
Circulation	20	53	5,56
Exercise/mobility	22	165	17,33
Relaxation/sleep/rest			
Tissue integrity	20	53	5,56
Metabolism			
Reproduction			
Body temperature	12	35	3,7
Sensation			
Perception			
Interaction	3	50	5,25
Action/behaviour			
Activity/daily routine			
Personal development			
Knowledge/information	1	35	3,7
Society			
Health risks			
Treatment	7	90	9,45
Medication	10	48	5,04
TOTAL	153	952	100

Table 9: Example of a case-related time value evaluation with ENP

Another option would be to link the estimated nursing time with the actual nursing time and the associated costs. The list of arguments, examples and usage scenarios can be extended in many ways; the evaluations listed here are examples. At the same time, it is a natural fact that time values can only ever be an approximation of reality. Due to the special feature in ENP that the recorded time values are calculated individually for a large number of interventions based on the respective intervention specifications and therefore a whole body washing can have different time requirements depending on the given care situation, ENP comes much closer to reality compared to other time value systems.

Origin of the time values assigned to the ENP interventions

The process of assigning time values for ENP interventions began in 1996 and was continuously adjusted together with the first software application in the clinical setting by means of focus groups with nurses. The ENP time values were further refined and adjusted using own time value measurements as part of research work. In addition, whenever possible, cost-related information from the specialist literature, which is used for the further development of ENP, is taken into account and implemented. Finally, a comprehensive verification and adaptation of the ENP time values was carried out in the course of mapping (i.e. linking) ENP with the LEP Nursing 3 classification (LEP = performance classification in nursing), in the course of which the respective time values were compared and a high level of agreement was established. Just like the professional content in ENP, the assigned time values are subject to continuous review and further development. Notwithstanding the greatest possible care in the development and maintenance of the time values in ENP, institutions that use ENP as part of a digital record should always have the option of overwriting the ENP time values with their own time values. This can be necessary and useful in special settings and specialist areas where the time required for many different nursing activities differs significantly from the average time required. One possible example would be early neurological rehabilitation.

1.6 Linkages between ENP with other instruments

ENP is managed in a database for the integration into software products such as electronic records. The notations (unique numbering of the items) are assigned automatically within a group as part of database management. Each item in the ENP system has a unique code within its group which remains stable and is maintained even with further versions. This type of notation enables the ENP nursing classification system to be linked to other instruments, concepts and classification systems, also known as “mapping”. The currently or formerly linked instruments are/were:

- **ICD-10** (International Statistical Classification of Diseases and Related Health Problems) and **OPS codes** (German operation and procedure codes) for optimized coding of nursing-relevant secondary diagnoses in hospitals and to support of DRG coding.
- **LEP Nursing 3** (performance classification in nursing), a classification system for the documentation of (nursing) services in the healthcare sector. The services and activities defined in the LEP method are assigned to standardized time values (see e.g. Baumberger & Raeburn, 2015) and were linked to the interventions in the ENP catalog. In this way, in addition to the use of the ENP's own time values (see chapter 1.5), e.g. for the documentation of the nursing effort or the generation of significant key figures, it was also possible to use the LEP time values. Maintenance of the mapping from ENP to LEP Nursing has not been continued since 2014.
- **PPR /PPR 2.0** (“German Regulation on standards and principles for the staffing requirements in inpatient nursing care”, or nursing staff regulation for short). The PPR in its original form as an element of the Healthcare Structure Act 1992 of 1992 was used for the daily determination of the nursing expenditure in inpatient care and thus as a performance-oriented basis for calculating the need for nursing staff resources. For various reasons, including the relatively abstract nursing

categories and the subsequently unrealistic nursing minute values, but especially due to the enormous staffing requirements in German hospitals (21,000 full-time positions between 1993 and 1995) that became apparent on the basis of the PPR data, the PPR was discontinued as early as 1996 and abolished completely the following year. Although the PPR in its original form no longer has any binding character, it is still used by many hospitals today as an internal management tool (Thomas et al., 2014; Wieteck & Kraus, 2016). In the course of the discussion about suitable and urgently needed staff assessment tools for nursing care, the nursing staff regulation was revived in 2019. A model based around a "PPR 2.0", a form of the original PPR that has been further developed to include service levels A4 and S4, is being discussed as an addition to the lower nursing staff limits that have since been introduced (cf. e.g. Jahn, 2021). The PPR 2.0 is intended to serve as an interim solution for determining nursing staff requirements in direct patient care on all somatic wards in the hospital until it is replaced in future by a staff assessment tool that has yet to be developed. Mapping with PPR 2.0 has been completed for the area of general nursing care (A area) with ENP version 3.3, so that the service content can be generated automatically from the standard documentation with ENP if implemented accordingly in digital records.

- **IDEA (Interdisciplinary Databased Electronic Assessment)**, an interdisciplinary and electronic medical history catalog which is used to collect structured medical history information and to assess the potential need for action. IDEA is based on a standardized knowledge-based and literature-supported collection of information relevant to the medical history. From a nursing perspective, the links between IDEA and ENP can be used to derive potentially relevant nursing diagnoses in an automated manner by bundling the medical history information in the background in the software. For example, the information collected in IDEA on a body mass index >30 (automatically calculated from height and body weight) and information on nutritional status and dietary preferences can result in the suggested nursing diagnosis "The care receiver has an inadequate nutritional behavior". However, it is always the nurse who decides whether the suggested ENP nursing diagnosis are actually applicable in the individual care situation, although the mapping of IDEA and ENP provides support in the decision-making process.
- An **index catalog (search terms)**, in the form of a search system for quick retrieval of ENP nursing diagnoses in the context of electronic use. The nursing diagnoses are not only directly linked to the terms they contain, but also to synonyms, terms with corresponding meanings and central intervention concepts in the context of the respective nursing diagnosis.
- **Criteria of the MDK** (the German Medical Review Board of the Statutory Health Insurance Funds), for the classification of the need for care (care level assignment by time values and degree of dependence). Against the background of the Second Act on Nursing (Pflegestärkungsgesetz, PSG II), which came into effect in January 2017 and replaced the previous three care levels with five care grades (see e.g. Kimmel & Breuninger, 2016), the mapping of the MDK criteria with ENP will no longer be maintained from then on, as the practical relevance is no longer given due to the changes of PSG II. In contrast to care grades (or the MDK criteria), the new care levels valid since January 2017 are not directly linked to ENP, but are are indirectly linked to ENP via a mapping to the IDEA anamnesis (see above) and the Basic Nursing Assessment (BAss) included therein (see Fachgesellschaft Profession Pflege e. V., 2018).
- **Standardized assessment instruments** for various clinical care aspects such as fall risk, pressure ulcer risk, nutrition or respiration, which generate suggestions for potentially relevant ENP nursing diagnoses by integrating them into an electronic record and using result-oriented algorithms depending on the available score value. For example, if the assessment of pressure ulcer risk using the Braden scale results in a score of 14 and therefore a medium risk of pressure ulcers, the ENP nursing diagnoses "The care receiver is at risk of pressure ulcers" is suggested. Here, as well, the decision as to whether the suggested nursing diagnosis actually applies in the individual care situation lies with the nursing professional.

- **Nursing-relevant complex codes of the G-DRG system** for automated support of documentation requirements and code generation. A prime example of ENP mapping in this area was the Nursing Complex Measurement Score (Pflegekomplexmassnahmen-Score, PKMS), which was relevant until the end of 2020. The PKMS was originally created by the German Nursing Council (Deutscher Pflegerat, DPR) as an instrument for mapping highly complex nursing cases in hospitals and served as the basis for billing services for highly complex nursing care within the G-DRG system (exception: no calendar days in the intensive care unit were to be coded). Services in the area of "general care" as well as in the area of "special care" were recorded. In order to apply the PKMS for patients receiving acute inpatient care, one of the reasons for highly complex care in the corresponding service area had to be present and a correspondingly listed nursing intervention profile had to apply. If one or more service characteristics applied, points were added up for the respective calendar day over the length of stay. The total number of points resulted in an OPS procedure "9-20 ... Highly complex care", if the number of points specified in the PKMS catalog was reached (Wieteck et al., 2017). With appropriate implementation in software products, the mapping of ENP to PKMS enabled largely automated coding of the PKMS from the standard documentation with ENP, without the need for additional forms, input masks or data collection efforts. The following nursing-relevant complex codes of the OPS (German operation and procedure codes) continue to be relevant and are primarily linked to ENP at intervention level:
    - 8-559 Multidisciplinary and other early rehabilitation,
    - 8-552 Neurological-neurosurgical early rehabilitation
    - 8-550 Geriatric early rehabilitative complex treatment
- **NANDA-I nursing diagnoses.** For approximately 40 years, NANDA-I has been dedicated to the formulation, development and validation of nursing diagnoses (with associated defining characteristics and etiologies) to represent the clinical, nursing diagnostic judgment of nursing professionals in the form of a standardized taxonomy. NANDA-I, as an internationally recognized and widely used nursing terminology, has so far focused exclusively on the first steps of the nursing process, more precisely the collection and bundling of information and its transfer into a nursing judgment regarding problem areas relevant to the person to be cared for - the nursing diagnostic process. In order to be able to illustrate and document the nursing process in its entirety using standardized and classified linguistic components (definition of nursing objectives based on the nursing diagnosis, planning of adequate nursing interventions, performance of nursing care and evaluation of the nursing outcome), further classification systems are therefore required that are mapped with the contents of the NANDA-I nursing diagnoses and that serve the further steps of the nursing process. There are various approaches to this. Explicitly against the background of electronic use in computer systems and with the aim of filling the outlined gap in the nursing care process, all ENP practice guidelines were mapped with the NANDA-I nursing diagnoses as part of a research project to validate ENP. All ENP practice guidelines that 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 removing duplicates. The resulting database, called NANDA-I-PLUS[4], thus offers users the full scope of the NANDA-I nursing diagnoses, supplemented by content-based linked nursing outcomes and interventions from the ENP catalog.
- **SNOMED CT (Systematized Nomenclature of Medicine – Clinical Terms)**. The international and cross-domain terminology of medical origin, which dates back to 1974, is considered one of the most comprehensive nomenclatures in the world. In contrast to many other terminologies, one of SNOMED CT's main aims is to be used as a so-called reference terminology. Reference terminologies essentially focus on the representation of terms for reuse in a digital or machine context. They are therefore essentially intended for use in the "back end" (i.e. in the background of digital information processing and transmission) and not for direct use by users in a graphical

[4] Further information on the NANDA-I PLUS database can be found on the RECOM website at https://www.recom.eu/en/classifications-EN/nanda-i-plus.html

user interface. In other words, the main aim is to avoid the problem of “mapping everything to everything” between different terminologies and classification systems and instead provide a central standardized translation language (SNOMED International, 2019). This focus promises international comparability, consolidation and evaluation of health-related data through clear “electronic readability”. SNOMED CT comprises a total of around 800,000 terms in 18 so-called axes and around 1 million relationships (semantic relationships), which can be used to describe around 300,000 concepts. Since January 1, 2021, SNOMED CT has been licensed throughout Germany by the Federal Institute for Drugs and Medical Devices (Bundesinstitut für Arzneimittel und Medizinprodukte, BfArM) and is available free of charge to all interested persons or institutions as part of the so-called Medical Informatics Initiative (MII) after submitting an appropriate application (Bundesinstitut für Arzneimittel und Medizinprodukte (BfArM), 2021). Although there are still some open questions, particularly from a practical nursing perspective and the nursing classification context, regarding the feasibility, the degree of abstraction of SNOMED CT, the completeness of the content for the nursing profession and the like (cf. e.g. Kim et al, 2020), the mapping of ENP nursing diagnosis titles and ENP nursing interventions with SNOMED CT was initiated in order to support the desirable goal of seamless use of different standardized (nursing) professional languages on a common basis. The first results of the linkages are expected with the upcoming ENP version 3.4.

Many of the linkages to the instruments described have already been tested in various studies and field tests (cp. e.g. Baltzer, Baumberger, & Wieteck, 2006; Gärtner, 2006, 2008; Schmid, 2007; Schütze, 2006).

1.7 The development and 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). Summarized change documentation from one version to the next is also published annually in a separate document, which is available on the Internet (www.recom.eu/change-documentation). The central development steps of ENP and the current, systematic further development strategy are briefly outlined below. ENP is registered as a standardized nursing classification using internationally standardized object identifiers (OID)[5] for object recognition in the area of “German Healthcare System”. This makes it possible to exchange information and data between telematic systems such as electronic files. Information on ENP can be found on the homepage of the German Institute of Medical Documentation and Information (DIMDI)[6].

1.7.1 Historical review

The development of ENP began in 1989 at a German nursing school with the central objective of standardizing nursing process documentation and developing corresponding educational guidelines. In the course of development, a group of nursing teachers from various nursing schools participated. The implementation of ENP as software began in a relational database began at the same time as the first publication of the ENP practice guidelines in 1994.

[5] In the context of informatics so called "Object Identifier" are used as globally unambiguous and permanent identifier for a specific information object. In the context of information technology, so-called "Object Identifiers" (OID) are used as globally unique and permanent identifiers for a specific information object.
[6] See https://www.bfarm.de/DE/Kodiersysteme/Services/OID-Register/_node.html (accessed on 02.07.2024).

Phase 1 (1989–1998) - inductive development

The starting point for the inductive approach was the objective of harmonizing the educational content and the actual organization of nursing process planning. Specific care situations (n = 2138) were used to create a nursing care plan as part of practical instruction in nursing training. The nursing care plan agreed with the trainee and the nursing team was then reflected on in the teaching team. The formulations found and agreed upon by experts for illustrating the nursing situation in the form of nursing problems/diagnoses, outcomes, and interventions were additionally supported by specialist literature and then cataloged. The inductive development phase was characterized by four central research questions (Wieteck, 2004b):

- Which nursing diagnoses are made in nursing practice and are thus required as standardized formulations to illustrate the individual nursing process?
- Which characteristic, etiology and resource formulations occur in which nursing diagnosis and should be offered as a standardized formulation?
- Which objectives are agreed (together with the patient affected) as part of the nursing care process and are documented in the nursing care plan?
- Which nursing interventions are selected and which text modules can be used to illustrate them? Which nursing interventions are described in the current nursing literature and can be offered as text blocks?

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

- **Qualitative, participant observation** of specific care situations that were carried out in the context of practice instructions with a trainee and a nursing teacher. As part of the nursing diagnostic process, the nursing diagnoses were identified, nursing interventions were defined and formulated in a nursing care plan. If possible, the descriptions of the nursing care plans were based on already known and described nursing concepts. If this was impossible, own concept analyses were carried out according to Walker/Avant (Opel, 2004).
- Reflection on the nursing care plan with nursing practitioners and subsequently in the teaching team in terms of a **consensus** on the diagnostic process and the formulations for its illustration.
- Comparison of the identified nursing diagnoses, outcomes and interventions with specialist literature and cataloging of newly found results (Wieteck, 2004b). The ENP development team called it a “modified practice theory” - in other words, it is a nursing diagnosis-related pathway. Today, the term “ENP practice guideline” is used.

According to the ENP developers, these nursing diagnosis-related pathways (situation-specific or practice-oriented theories) represent current nursing expertise. As already mentioned, the development of a nursing diagnosis-related pathway is based on inductive methods on the one hand, and on literature work/analyses (Wieteck, 2004b) and validation work on the other (see also chapters 1.7.2 and 1.7.3).

The nursing diagnostic process as well as the process of developing a nursing diagnosis-related pathway is understood as a process of hypothesis formation in ENP development (Gordon & Bartholomeyczik, 2001; Schrems, 2003). The suggestions of Dickoff, James, and Wiedenbach (1968, pp. 420-422) and their definition of the “situation-producing theory” or (“prescriptive theories”), as well as that of the “practice-oriented theory”(Walker & Avant, 1998), which already contains key components of the nursing process, such as the target content of nursing actions and the resulting instructions for action, were expanded in

the course of ENP project to include the dimensions of nursing diagnoses with characteristics, etiologies and resources in accordance with the nursing process model. While Dickoff, James, and Wiedenbach place practice-oriented theory at the last stage of the four-stage process of theory formation, the ENP developers place the modified practice-oriented theory at the second stage of the process (see figure 6) (Dickoff et al., 1968). This is based on the view that the nursing diagnoses-related pathways/ENP practice guidelines, which are created by linking nursing diagnoses with characteristics, etiologies and resources, nursing outcomes and interventions, are hypotheses and do not yet represent a prescriptive theory. Crucial to this assumption is that the hypotheses developed are preliminary findings in the field of nursing care. The established hypotheses can be confirmed, disproved or modified by new findings. This process is reflected in a continuous process of updating ENP.

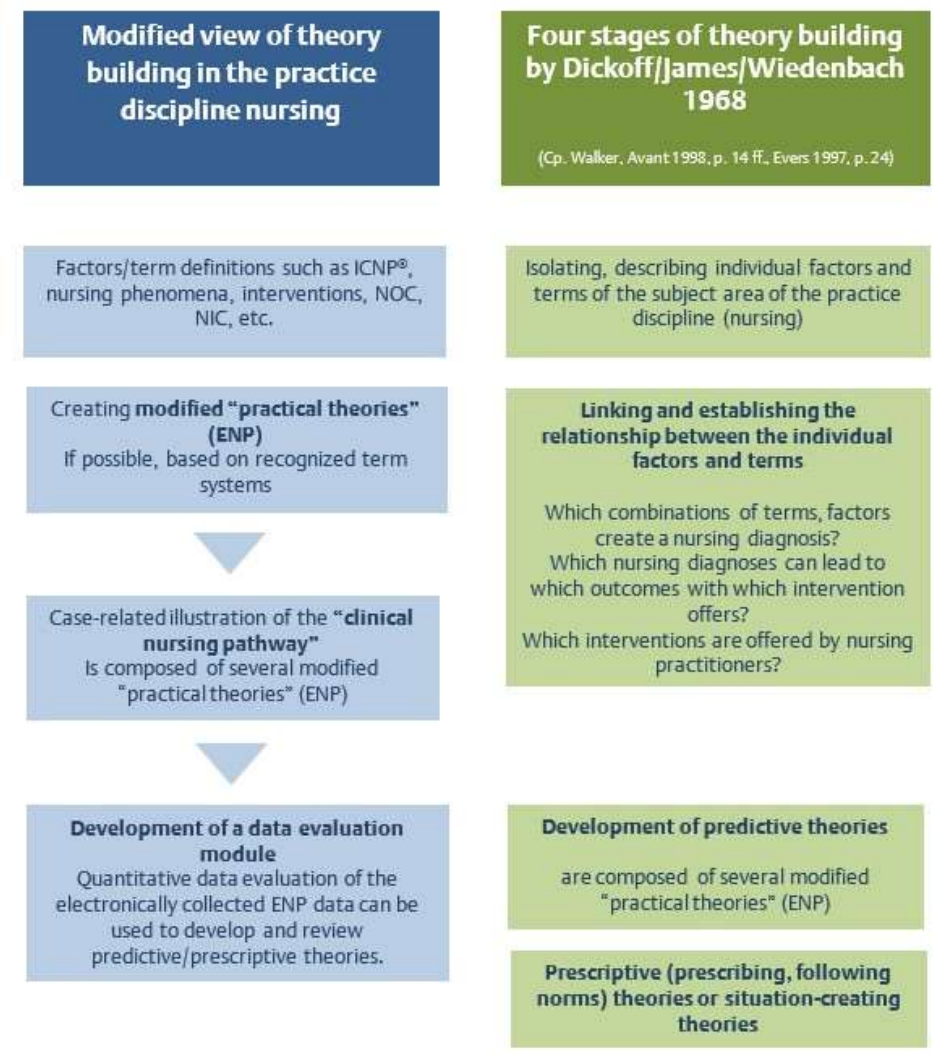


Figure 6: Integration of the modified "practice-oriented theory" into the stages of theory formation (source: Wieteck, 2007c based on Dickoff et al. 1968)

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

Phase 2 (1998 to date) user feedback and validation work for the further development of ENP

ENP has been maintained in a database since 1994 and can be integrated by software manufacturers in electronic files for nursing process documentation. With the first application of ENP in electronic nursing process documentation in 1996 (Deppmeyer, 1999; Wieteck, 2001), user feedback has been evaluated as an important aspect of the further development of ENP to date (Wieteck, 2013). With the realization of ENP in a database, it was ensured that each term in ENP has a notation (i.e. unique numbering or ID number), which, however, is not printed in the current book publications for reasons of readability and lack of relevance for the end users.

Validation work on ENP has been carried out since 2001. Studies on content and/or criterion validity testing, among others, are another important part of the further development of ENP. A rough overview of existing validation work is provided in section 1.7.3; detailed information on the current systematic further development process itself can be found in section 1.7.2 below.

Phase 3 (2005–2009) - development of the classification structure

In the book publication up to 2004, ENP does not yet have an independent taxonomy structure. The ENP practice guidelines at the time were assigned to activities of daily living (ATL). The hierarchization work led step by step to the current classification structure. First, a taxonomy[7] was developed for the ENP nursing diagnoses. The classification structure of the ENP nursing diagnoses was mentioned for the first time in a specialist article, which is also the first time ENP was referred to as a nursing classification system (Wieteck, 2006a). In 2006, ENP had seven classes, now called groups (nursing diagnoses, characteristics, etiologies, resources, nursing outcomes, nursing interventions and action-guiding information). At this point, the group of nursing diagnoses already had a monohierarchical structure with 3 domains, 22 classes and 128 categories. The other classes/groups such as etiologies, characteristics, etc. did not yet have a hierarchical structure, but the terms/concepts were managed in the database on a secondary level. The respective concepts/terms of the classes had relations, i.e. linkages to the relevant nursing diagnoses. The respective concepts/terms of the classes had relations, i.e. linkages to the relevant nursing diagnoses. Between 2007 and 2009, the individual groups were structured systematically in a monohierarchical manner by clustering and transferred to the current classification structure.

The realization of ENP in the form of a database can best be described using terms from the fields of computer science and knowledge representation: ENP can be described as an ontology[8] in terms of its database presentation. In ENP, current nursing expertise is presented through linkages (relations). The basis is formed by the nursing diagnoses, characteristics, etiologies, resources, nursing outcomes and nursing intervention concepts, which are managed in a database. These would be of little use to users in terms of knowledge representation without links to each other. For this reason, the elements mentioned above are structured in the database and connected by nursing-related links. Finally, linking the individual pieces of information on a horizontal level results in a complete set of nursing information in the form of guidelines for nursing practice. The links create a semantic network that is helpful for making decisions as part of the nursing process. In an electronic record, the formulations provided in ENP are used to realize the nursing process documentation. ENP is also linked to numerous other conceptual systems and classifications (see section 1.6).

[7] The term taxonomy (or classification scheme) describes a standardized model or theoretical construct that is used to classify individual elements/objects according to certain criteria and thus divide them into categories.

[8] Ontologies are descriptions of conceptualizations of a knowledge domain, in the case of ENP the nursing expertise to represent and control the nursing process. An ontology is a controlled vocabulary that describes objects/phenomena and their relationships to each other in a formal way and makes a statement about a specific domain. The term “semantic network” is also frequently used for ontology.

Phase 4 (since approx. 2008 to date) - 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, but Serge Haag's doctoral thesis describes the validation of ENP in French (Haag, 2009b). The Italian translation of ENP (Wieteck, Moantovan, & Rigon, 2015) begun with a final thesis in the Master's degree program for specialist translation at the University of Bologna. Since then, Elisabetta de Vecchis has been responsible for translating ENP into Italian. The translations of ENPs are subject to continuous validation work (cf. Rabl, Mereu, & Kraus, 2016).

1.7.2 Systematic further development today

Today, ENP is a nursing language that has monohierarchical structures and provides nursing expertise in the form of practice guidelines. Figure 7 below shows the systematic further development process of ENP with its basic steps, which has been established in this form since 2013 and is being continuously improved. A new database version of ENP is made available annually. Books are usually published every three years. A more detailed description of the evidence-based development background of ENP and the principles and methodologies used for this is provided in a separate document, which can be downloaded free of charge: www.recom.eu/developmental-background

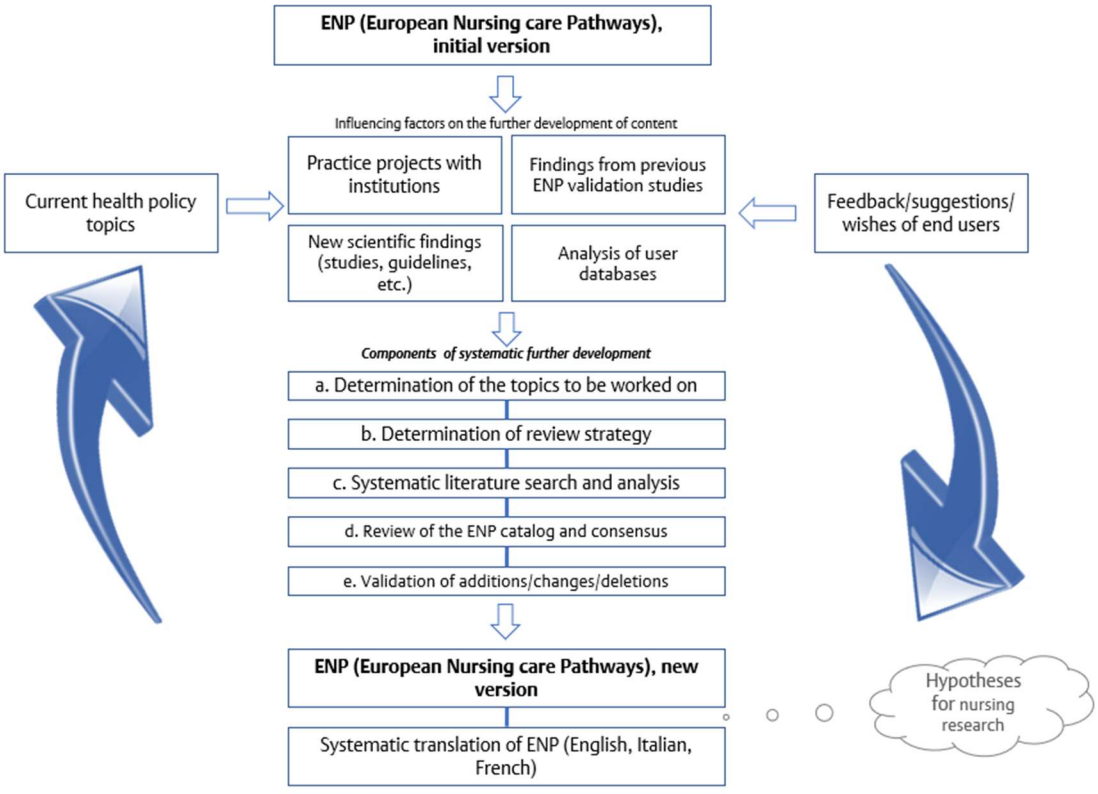


Figure 6: Process of systematic further development of ENP today

Influenced by health policy decisions, user feedback and new scientific findings from nursing and related healthcare disciplines, a decision is made each year as to which ENP practice guidelines will undergo a systematic review and, if necessary, revision. The central methodological step for updating and reviewing is to initiate an international, systematic literature search, which is carried out using the following scheme (using the example of the ENP practice guideline “The care receiver suffers from fatigue (exhaustion/tiredness)”).

<table>
<tr><th>Revision step</th><th>Example from the development of the ENP practice guideline “The care receiver suffers from fatigue (exhaustion/tiredness)”</th></tr>
<tr><td>Defining the revision strategy with formulation of the question for the targeted literature search</td><td>Conducting a selective database search, supplemented by snowballing and a free hand search in selected journals using Boolean operators (AND, OR, NOT), truncation and phrase searches.
Questions (excerpt):
• What are the physiologically identifiable symptoms or characteristics of fatigue in people affected in the palliative phase?
• Which symptoms or characteristics relevant from a nursing perspective are described for persons affected with fatigue in palliative care?
• What are the causes of the symptom/phenomenon fatigue, specifically in palliative care?</td></tr>
<tr><td>Definition of the preferred publication type and the favored level of evidence</td><td>Preference for articles from peer-reviewed journals.
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.
Individual case reports were excluded.</td></tr>
<tr><td>Determination of inclusion and exclusion criteria and the databases to be used</td><td>Publications in German or English published from 1990 up to and including January 2018.
Exclusion of publications concerning people under the age of 18 and people with brain tumors, brain metastases, dementia or other cognitive impairments (fatigue can hardly be distinguished or recognized here).
Search in the PubMed (Medline) and CINAHL databases, which are recognized and accessible in nursing science, as well as in the AWMF guideline register.</td></tr>
<tr><td>Development of search terms and determination of specific search phrases</td><td>
<table>
<tr><td rowspan="5">fatigue OR tiredness OR weariness OR exhaustion</td><td rowspan="5">AND</td><td rowspan="5">palliati* OR “end of life”</td><td rowspan="5">AND</td><td rowspan="5">nurs* OR care OR caring</td><td rowspan="5">AND</td><td>diagnosis OR diagnoses</td></tr>
<tr><td>OR</td></tr>
<tr><td>symptom* OR sign OR sings OR syndrome* OR characteristic* OR indicator* OR mark OR marks OR feature*</td></tr>
<tr><td>OR</td></tr>
<tr><td>cause* OR source* OR reason* OR etiolog*</td></tr>
</table>
</td></tr>
<tr><td>Conducting database searches</td><td>Useful combination of search terms, operators, inclusion/exclusion criteria as well as filter criteria for complete search phrases9.</td></tr>
<tr><td>Review and procurement of relevant literature in full text and evaluation of publications and studies with regard to quality (critical appraisal)</td><td>After removing duplicates, the databases yielded a total of 347 hits with the final search phrases, which were checked for relevance using a title and abstract screening. In the end, a total of 90 hits appeared to be relevant for revision. These publications were obtained in full text and, after examination of their methodological quality using the CONSORT, RIGHT and the STROBE statement assessment tools, among others, were consistently compared with the existing elements in the ENP catalog. In accordance with the snowball principle, other potentially relevant publications were also considered, e.g. from the references section of the procured primary literature. Finally, the contents of 22 analyzed publications were considered and used for the further development of ENP.</td></tr>
<tr><td>Revision of the ENP catalog based on the findings and facts from the literature</td><td>• New inclusion, revision or deactivation of characteristics, etiologies, resources, nursing interventions and guiding intervention details
• Literature support for all changed, newly added or deactivated items</td></tr>
</table>

[9] 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*))*

Consensus of the results in the ENP development team, also with consulted external experts in their fields as needed	• Development of definitions, explanation of terms and information texts • Report of the evidence level of the revised practice guideline
Validation of the revision e.g. through expert rating, a study or a clinical trial in nursing practice	Did not take place as part of the further development of the ENP practice guideline "The care receiver suffers from fatigue (exhaustion/tiredness)". Possible options are basically: • Expert rating • Clinical study • Pretest of the revisions in nursing practice

Table 10: Process of systematic literature research for the evidence-based further development of ENP using the example of the practice guideline "The care receiver suffers from fatigue (exhaustion/fatigue)" (cf. Hausherr, 2018)

Table 11 below shows an excerpt from an editing table for an ENP nursing diagnosis in the area of respiration, which was updated between mid-2016 and 2017 (cf. Nißlein, 2017a; Nißlein, 2017b). One example of this is the revision of the etiologies[10] associated with the nursing diagnosis. The columns each represent the unique ID number of an etiology, the linguistic formulation of the etiologies themselves, the short reference to the literature from which the items have been developed or derived, the explanatory texts associated with the etiologies as required (e.g. for Latin technical terms) and a marker in the form of an "X" which indicates the links between the etiology and the nursing diagnosis. Not shown in this excerpt is the linking information of the ENP practice guideline to other instruments and concepts (see chapter 1.6) as well as the time values assigned to the ENP interventions (see chapter 1.5). Black text represents items and elements that have been adopted unchanged from the original ENP version, whereas red and/or red crossed-out text indicates a change that has been adopted in the new version. Corresponding revisions may be necessary:

- The inclusion of new items
- The linguistic modification of existing items (e.g. towards technical terminology)
- Deactivating the linking of items to a nursing diagnosis (e.g. due to a better fit with another ENP nursing diagnosis)
- The complete deactivation of items (e.g. due to new scientific findings)

[10] Corresponding documentation is of course also maintained for each ENP practice guideline with regard to characteristics, resources, nursing outcomes and interventions.

Überarbeitungstabelle Klasse Atmung - Kategorie Risiko der Atelektasenbildung/Pneumonie (Auszug) Thieme RECOM

				European Nursing care Pathways	European Nursing care Pathways
ID-Nr.	Ursache	Literatur-Kurzverweise	Definition der Ursache (bei Bedarf)	236 - Der Patient hat aufgrund von Schmerzen eine oberflächliche Atmung, es besteht das Risiko einer Atelektase/Pneumonie	223 - Der Patient hat aufgrund von fest sitzendem Bronchialsekret das Risiko einer Atelektase/Pneumonie
3114	Schmerzbedingte Schonatmung			X	
20812	Unzureichende Schmerztherapie			X	
3142	Operativer Eingriff im Brust-/Thoraxbereich			X	
3143	Operativer Eingriff im Bauchraum			X	
20813	Operativer Eingriff am offenen Herzen			X	
2951	~~Zähes~~ Bronchialsekret mit hoher Viskosität		Viskosität beschreibt die Zähigkeit einer Flüssigkeit. Umso größer die Viskosität, desto zähflüssiger und weniger fließfähig ist die Flüssigkeit.		X
2952	~~Glasig-zähes~~ Bronchialsekret mit glasig-hoher Viskosität		Viskosität beschreibt die Zähigkeit einer Flüssigkeit. Umso größer die Viskosität, desto zähflüssiger und weniger fließfähig ist die Flüssigkeit.		X
~~2953~~	~~Unproduktiver Husten~~	10;13;32;			~~X~~
~~2909~~	~~Erschöpfung~~				~~X~~
15656	Funktionsbeeinträchtigung der Bronchialschleimhaut durch Staub/Allergene/Noxen	39			X
20824	Akute Atemwegserkrankung	32			X
17430	Mukoviszidose	24;27;28;32;33			X
20706	Bronchiektase	7;15;17 ;24;29;30;31;37:35			X
20826	Chronische Bronchitis	32			X
	Akute oder chronische Verletzung/Beeinträchtigung des Spinalkanals	39			x
	Rezidivierende Atemwegserkrankungen	32	Beschreibt das Wiederauftreten einer Atemwegserkrankung nach einer klinisch vermuteten, zeitweiligen Heilung bzw. zeitweiligen Besserung.		x
	Asthma bronchiale	20;21;32;33			x
20608	Chronisch obstruktive Lungenerkrankung (COPD)	6;32 ;33			X

Table 11: Excerpt from a original German revision table of the ENP development team using the example of the practice guideline "The care receiver is at risk of atelectasis/pneumonia due to thick bronchial secretions"

With this approach, it is possible to check the distinctions between the nursing diagnoses and to substantiate the individual items with literature and evidence-based knowledge, e.g. from studies and systematic reviews – or to reject them according to the current state of knowledge. The fields in red indicate which content has been added compared to the previous ENP version, a red cross shows that the diagnosis listed above has been newly linked to the etiology.

1.7.3 Options for validating ENP practice guidelines

Following the systematic further development work, the content and results are validated whenever possible, particularly in the case of far-reaching changes. The aim here is to conduct a further quality assurance process on the ENP practice guidelines agreed and systematically revised by the ENP development team (Creason, 2004) in order to ensure the technical correctness, completeness, appropriate level of granularity and selectivity of the individual practice guidelines as well as their suitability for use in practice, depending on the validation method used.

With the beginning of the development of nursing classification systems in the 1980s, various methods for validity testing were developed and proposed. Table 12 below provides a brief overview of this without claiming to be exhaustive:

Model	Measured construct	Short description	Literature
Validation methods according to Gordon & Sweeney			
Retrospective Identification Model	Consensual validity, face validity, nursing diagnosis title	Use of the aggregated experiences of nurses who retrospectively describe and evaluate nursing phenomena/nursing diagnoses (similar to focus groups)	(e.g. Creason, 2004; Gordon & Sweeney, 1979)
Clinical Model	Nursing diagnosis title	The direct observation of care receivers and their behavior by nurses as well as the documentation serves as a source and assessment basis for the nursing diagnosis titles	
Nurse Validation Model	Content validity, face validity	The characteristics that determine a nursing diagnosis are checked by two or more experienced nurses as to whether they occur in a bundled, relevant form and corresponding frequency in practice	
Validation methods according to Fehring			
Diagnostic Content Validation Model (DCV)	Content validity, face validity	Evaluation of the characteristics of a nursing diagnosis by experienced (nursing) experts using a five-point Likert scale, calculation of a weighted score for each characteristic	(e.g. Caldeira et al., 2012; Richard J. Fehring, 1987; Richard J. Fehring, 1994)
Clinical Diagnostic Validation Model (CDV)	Content validity, face validity, interrater reliability	Verification of the validity of a nursing diagnosis in a clinical situation by two experts either by observation or by interviewing care receivers. Calculation of a weighted interrater reliability ratio.	
Etiologic Correlational Ratings Validation Model (ECR)	Predictive validity	Establishing a direct cause-and-effect relationship between a nursing diagnosis and its etiologies. Calculation of a correlation coefficient (etiological correlation rating) to determine the strength of an etiology or a risk factor for predicting a nursing diagnosis	
Differential Diagnostic Validation Model (DDV)	Discriminant validity (two nursing diagnoses), content validity, face validity	The characteristics of two similar nursing diagnoses are bundled in a survey instrument and assessed in a blinded manner by a “sufficient number” of (nursing) experts and/or care receivers for each nursing diagnosis, possibly also in a clinical setting. Calculation of weighted key figures for both nursing diagnoses and comparison of these.	
Delphi technique	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 revised in the first rounds until a consensus is reached regarding usefulness, completeness and clarity.	(e.g. Grant & Kinney, 1992)
Concept analyses	Central attributes and characteristic features of concepts	Multi-level process for conceptual analysis and clear assignment of information conveyed by a term. Ambiguities should thus be excluded. Often also used as a precursor for other forms of validation.	(e.g. Walker & Avant, 2010; Whitley, 1997)

Multivariate validation methods			
Factor analysis	Construct validity	Method for reducing a large number of variables/observations to a few key influential factors. As part of the validation of a nursing diagnosis, the analysis shows whether the characteristics occur as one factor (ideal case) or as several.	(e.g. Chang, 1995; Hoskins, 1997; Kerr et al., 1993)
Cluster analysis	Construct validity	Method to identify similar or homogenous groups (cluster) of test objects from a large, heterogenous data set. Suitability both for generating a classification structure and for validation (objects from one cluster should have a higher correlation than with objects from other clusters).	(e.g. Chang, 1994; Kerr et al., 1993)
Magnitude Estimation Scaling	Content validity, face validity	Method in which defined characteristics of certain nursing diagnoses are assessed by a group of experts with regard to various concept dimensions (e.g. relevance, frequency of occurrence) in connection with the extent of individual subjective experience. This generated evaluable ratio scales.	(Grant, Kinney, & Guzzetta, 1990a, 1990b)
Crossmapping	Content validity, criteria validity	Methodology in which similar or related terms or concepts from different (nursing) classification systems are identified, linked and checked for inconsistencies.	(Hyun & Park, 2002; Wieteck, 2008a)

Table 12: Selection of the most common methods for validating nursing diagnoses/nursing classification systems (source: own presentation)

However, the procedures outlined in the table are only suitable for validating the European Nursing care Pathways to a limited extent due to methodological aspects on the one hand and the special structure of ENPs (see chapter 1) on the other. Generally, they only focus on the label and/or certain characteristics or etiologies of a nursing diagnosis and would therefore only cover a very limited section of ENP, but not the etiologies or interventions assigned to an ENP practice guideline or an ENP practice guideline it its entirety covering the entire nursing care process. In addition, the well-known models usually only provide information on whether a specific criterion can be considered a reliable indicator for a nursing diagnosis, but not on the reasons why a criterion should be rejected. Last but not least, with the large number of known approaches, including the validation procedures according to Fehring (1987; 1994)which are still frequently used today, there is a large discrepancy between the continuous further development of nursing classification systems and an often long-lasting stagnation with regard to the methodological progress of validation concepts, which increasingly raises questions about the reliability and power of the validation results. Finally, from a practical research point of view, many of these methods make great demands on feasibility and practicability, some of which are difficult to overcome (cf. time requirements, costs, availability of cooperation partners or cooperating institutions, etc.).

Against this background, the validation work of the ENP development team focuses on the following methodological lines:

- Testing of validity of revised ENP practice guidelines in the clinical context or setting prior to their final inclusion in a new ENP version (so called “pretest”). For this purpose, nurses or other clinically active members of the interdisciplinary care team with relevant experience in the relevant subject area evaluate the changes made by the ENP development team with regard to various aspects (e.g. technical correctness, completeness for the accurate illustration of the individual situation of the person in need of care, formulation, usability, etc.) from a direct user perspective in the immediate environment of a hospital or geriatric care facility.

- The implementation of expert ratings, in which experts assess and evaluate the revised ENP practice guideline(s) according to defined criteria with regard to various dimensions and, where appropriate, submit further suggestions for improvement. Here too, various forms of implementation are conceivable, either within the framework of multi-level symposia or in the form of standardized surveys.
- Conducting a systematic scientific investigation in the form of a study as the "highest quality" form of validation. Numerous study designs and implementation options are conceivable. This form of validation, which requires a great deal of resources, has so far mostly been used in the form of academic theses or in projects with the developers of other concepts and instruments in the context of mapping work. Against the background of the increasing spread of ENP, for example in facilities (e.g. university hospitals) or facility networks with a large number of beds, or the almost universal use of ENP in certain nursing settings in some countries, the importance and number of high-quality systematic studies on the ENP nursing classification system and its benefits will become significantly more relevant in the foreseeable future.

Expert rating by means of a standardized survey is currently the most frequently used validation method for revised ENP practice guidelines, which is why fundamental considerations were initiated in 2014 and 2015 regarding the development of a new standardized survey instrument, which was piloted for the first time on the revised ENP practice guidelines on the topic of dysphagia. The core concerns were the complete collection of all constituent individual elements as well as the query of summarized assessments with reference to various requirements that ENP attempts to meet:

- Suitability of the ENP structure for practical nursing work
- Visibility of an interprofessional approach
- Adequacy of the degree of accuracy (granularity)
- Adequacy of the degree of clarity and selectivity
- Completeness of the 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 headache).

In order to ensure at least some degree of comparability with common instruments for validating the content of nursing diagnoses and existing study results, the computer-based expert rating was chosen as the basic methodological approach, analogous to the frequently used DCV model by Fehring (1987; 1994). The basic idea is that designated experts use a standardized questionnaire and a defined category system to self-assess all characteristics, etiologies, objectives, interventions and thematically relevant ENP nursing diagnoses. This section represents the essential part of the survey instrument. After numerous concept drafts, an interactive questionnaire based on Microsoft Excel was developed, which guides the experts through the process using the program's own convenience functions (e.g. macros, command buttons). Beforehand, respondents were given a brief introduction to the purpose of the study, the structure of ENP and how to use the electronic questionnaire on the first pages of the instrument. In the actual survey part, the participants were asked to evaluate the current (non-) linkages of the individual nursing diagnoses in ENP one after the other in three sections regarding the respective etiologies, characteristics and nursing interventions. A drop-down list has been created for each of these elements, the default setting of which states that an existing link "as it is" is still meaningful in terms of function and content. Conversely, if elements are not linked, there is a pre-selection that this would also not be appropriate. If a need for change has been identified from the perspective of the experts, it is possible to specify the type of change using the selection menu. Alternatives are offered for various dimensions relating to the respective item: completeness, accuracy, technical correctness and relevance. Figure 8 illustrates a section of the questionnaire concept from an expert rating as part of the further development of the practice guidelines on the topic of dysphagia.

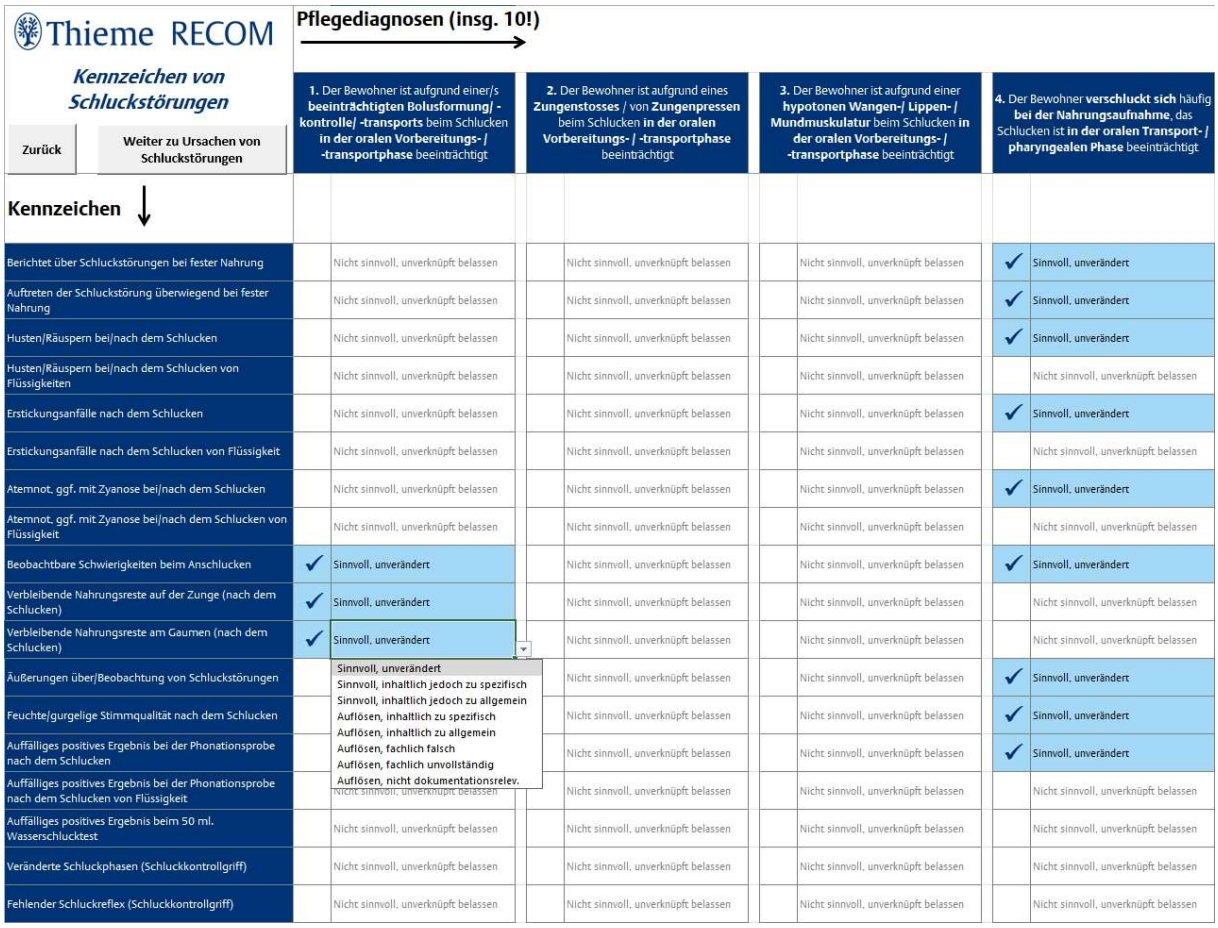


Figure 7: Example excerpt from the original German edit mask of the survey instrument

Due to the often considerable scope of the aspects to be examined by the experts, the guiding interventions[11] subordinate to the intervention concepts were not included in the questionnaire for reasons of appropriateness. The resulting probability that the intervention concepts would be classified as too abstract by the participants due to a lack of knowledge of the specifications was therefore tolerated and taken into account accordingly in the evaluation. On the subsequent page of the questionnaire, the experts have the opportunity, in accordance with the principle outlined above, to check their assessment of links that existed in previous versions of ENP but have since been deactivated and, in their view, to add etiologies, characteristics and nursing interventions that are necessary for nursing care but are currently still missing in ENP and link them to the nursing diagnoses they believe are relevant. The questionnaire concludes with one page of summarizing questions on each of the aspects mentioned above (four-point Likert scale). The structure of the survey instrument was also implemented for online survey projects using the SoSciSurvey platform (https://www.soscisurvey.de/), so that in addition to local processing with Microsoft Excel (offline), a browser-based expert rating (online) is also possible.

Of great importance for the implementation of the validation work and for the validity of the results is the question of which persons can be considered experts in the research field when assessing nursing diagnoses and the associated elements. The views discussed here are by no means uniform, and the numerous approaches to definition are also subject to different criteria for distinguishing expertise from the layperson. Examples include professional knowledge or excellence in the respective domain (Bromme, Jucks, & Rambow, 2004). A more far-reaching view states that, in addition to specific knowledge and/or

[11] See chapter 1.4.6.

top performance, practical effectiveness in particular is a decisive attribute of an expert. Given the intention of a nursing classification system to effectively support nursing practice in decision-making and action, this last point is considered particularly relevant by the ENP development team. Consequently, the understanding of an expert on which this work is based is in line with the following definition from the sociology of knowledge: “Experts can be understood as people who - based on a specific practical and experiential knowledge that relates to a clearly definable problem area - have created the possibility to structure the concrete field of action in a meaningful and action-guiding way for others with their interpretations” (Bogner, Littig, & Menz, 2014: 13). The chosen definition therefore deliberately deviates from the explanatory approaches commonly used in nursing, such as the nursing expert concept by Benner (2012) or the concretization approach by Jasper (1994), which focus more strongly on situational problem-solving skills. In principle, however, it should be noted that expert status in the context of nursing science is always dependent on the respective research interest and the role is therefore partly determined by the researcher (Meuser & Nagel, 2002).

With specific reference to nursing diagnostics, Fehring (1994) suggests selecting suitable experts on the basis of measurable parameters as part of his validation models. Based on the points given for the fulfillment of specific criteria, those persons who have achieved a certain minimum number of points are included in the validation work. Corresponding features are included:

- A Master’s degree or higher in a nursing-related degree program (highest weighting).
- An academic qualification thesis (Master’s degree in a nursing degree program or higher) on the topic of the nursing diagnoses to be validated.
- A period of at least one year since gaining professional expertise in the subject area to be researched.
- Training certificates with reference to the content of nursing diagnoses to be validated.
- Publications and/or published research findings related to the contents of the nursing diagnoses to be validated.

The list shows that an attempt to consistently apply the classification criteria proposed by Fehring in the German speaking countries would (still) lead to a considerable problem: a severe lack of experts suitable for participation in a validation study. Nursing science is a comparatively young discipline in Germany whose establishment has made great progress but is still far from complete. This is especially true with regard to other countries such as the US or the UK (Palm & Dichter, 2013). The possibility of continuing education in Germany at an academic, secondary qualification level has only existed since the end of the 1980s, although the number of courses on offer has grown rapidly since then (Schaeffer & Wingenfeld, 2014). Primary qualifying degree courses that integrate or replace “traditional” vocational training have only been offered for around ten years, often still in model form. It is well-known that degree courses based on vocational training such as nursing management, nursing education or nursing science are in most cases are oriented towards a position away from the point of care. However, many graduates from the more recent, directly qualifying degree courses also report only a low affinity for a job in direct nursing care (Bollinger, Gerlach, & Grewe, 2006). Academic degrees that are consistently focused on clinical work directly in the care setting, such as Clinical Nurse Specialist, Advanced Nursing Practitioner, or initial training (dual) nursing degree programs, have been increasingly established in recent years, but there are still relatively few graduates in nursing practice in institutions. There is also still a lack of suitable integration concepts and structures for academically trained nursing staff in direct care practice (cf. e.g. Claaßen et al., 2021; Deutscher Berufsverband für Pflegeberufe e.V., 2013; Reuschenbach & Darmann-Finck, 2018). The recruitment of a sufficient number of clinically active and experienced nurses with at least a Master's

degree as experts (Fehring's main criterion) for a nursing diagnostic validation study therefore unfortunately still has little chance of success in German-speaking countries, particularly in Germany. In addition, these persons would have to specialize in the respective subject area specified by the nursing diagnoses or practice guidelines to be examined, in this case dysphagia, which would further limit the selection options.

For the reasons outlined above, it is necessary to deviate from the Fehring criteria that are frequently used internationally when defining experts in the context of validation work on ENP. In particular, it is advisable to abandon the requirement that experts participating in the study must necessarily have an academic education in nursing. Experience to date has also made it clear that even basic professional nursing training is not currently a prerequisite for participation in the study. The reason for this lies in the fact that although nurses are very often involved in the care of specific groups of people in need of care, clinical specialization in this area is virtually non-existent both in Germany and abroad. One example for this is the topic of dysphagia, which is also highly relevant for the nursing profession: only a few publications directly related to nursing could be found in the systematic literature search carried out for the revision of the ENP practice guidelines. If nursing-specific literature is available, it is usually written by one or more authors from related professions and deals with the role of nursing in the interdisciplinary care of dysphagia patients at a more general level (e.g. Brady, 2008; Tanner, 2010). There are only a few high-quality publications on the subject from the profession itself (Hines et al., 2011). In summary, from a professional and quality-related perspective, the following aspects were ultimately regarded as prerequisites and decisive for the selection and approach of suitable experts, whereby a considered 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.
- A professional qualification directly related to the topic of dysphagia, ideally at an academic level (e.g. speech therapy, linguistics, language therapy, etc.).
- At least two years of professional experience in a clinical area of care and support for people with dysphagia corresponding to the qualification.
- The existence of at least one relevant and methodologically high-quality publication on the topic (e.g. standard works, basic literature, systematic review).
- Active membership in a dysphagia-related (professional) association, a commission or alternatively active teaching and/or lecturing activities on the subject.

Data analysis is carried out using software packages such as Microsoft Office and/or statistical programs (e.g. SPSS, Statistical Package for the Social Sciences). The information from the electronically completed questionnaires was transferred to corresponding evaluation masks for this purpose. To exclude transmission errors as much as possible, all data was checked again for correctness after entry. Descriptive methods were mainly used to analyze the data, including frequency calculations (absolute and relative), location parameters (e.g. the arithmetic mean), scattering parameters (e.g. range) and graphical representations. It is also essential to quantify all the assessments made by the experts regarding the (non-) linkage of each characteristic, etiology and intervention to each of the ten ENP nursing diagnoses. On this basis, a predefined limit value (cut-off value) can be used to determine which individual elements and (non-) linkages...

- ... should be subject to a more detailed technical examination.
- ... have to be checked with regard to their clarity and granularity.
- ... have to be dissolved, supplemented or newly added.

In addition to the search for a suitable threshold value for the technical and content-related revision, it is important to focus on conspicuous incongruities in the experts' assessments during the data evaluation and to get an idea of the extent and reliability of the agreement of the assessments. Depending on the underlying data, different models are used to calculate interrater reliability and interrater agreement.

2. Evidence level of ENP nursing diagnoses and practice guidelines

Originating in the context of evidence-based medicine, level of evidence (LOE) originally served (and still serve today) as a hierarchical categorization of the formal and substantive quality of clinical studies. In other words, the assignment of a clinical study to an evidence level serves to describe the strength and significance of the results obtained and thus to prove the scientific "value" of the study. Key factors influencing this significance include the type of study conducted and the endpoints examined, such as quality of life or survival rate. Over time, further classification models for the assignment of clinical studies to evidence levels have been developed, as well as other areas of application for the indication of evidence levels. Internationally, there is now a large number of different scales and definitions, so that one can only speak of a universally valid standard (if at all) within a clearly defined area of application, but not universally valid (Perleth & Raspe, 2007).

At the beginning of the 2000s, the discussion about levels of evidence and the corresponding criteria also reached nursing science. However, unlike the concept originating in medicine, the focus here is not on a single study or a single component such as a singular characteristic or a single etiology. Instead, a level of evidence here comprises the entirety of a nursing classification component, such as a nursing diagnosis including the elements that determine it (such as characteristics and etiologies as well as risk factors). Also, in contrast to the original medical sense, the level of evidence of a nursing diagnosis only indirectly represents the significance or value, whereas the focus is on the notification of the development status of a nursing diagnosis or a practice guideline. In other words, the indication of evidence levels is intended to establish the greatest possible degree of transparency with regard to the development, revision and validation status of the elements of a nursing classification system for all users and interested parties. The higher the evidence level for a nursing diagnosis, for example, the less doubt there is 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 specified since 2014. In addition to creating transparency, an important goal during the development was also to ensure comparability of the evidence levels with those of other nursing classification systems. Against this background, the evidence levels of ENPs are closely aligned with the classification criteria of NANDA International (cf. Herdman & Kamitsuru, 2018), although critical aspects of this classification system can also be discussed[12]. In this way, it should be ensured that the expressiveness and development status of individual nursing diagnoses of different classification systems 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 also for the practice guideline as a whole, i.e. plus the nursing outcomes and nursing interventions associated with the nursing diagnosis. The main reason for this differentiated presentation is the fact that the diagnostic part of an ENP practice guideline is currently often at a different (often more advanced)

[12] The criteria for classifying a NANDA-I nursing diagnosis to an evidence level can be viewed online at https://www.nanda.org/nanda-i-resources/level-of-evidence-criteria/ (accessed 08.09.2022)

stage of development than the associated outcomes and interventions or the ENP practice guideline as a whole. In order to make such a constellation immediately transparent for any interested person, two levels of evidence are shown in each case.

With version 3.0 of ENP (May 2019), the step-by-step process of identifying evidence levels for all nursing diagnoses and practice guidelines was completed, so that the respective development status can now be viewed for the entire catalog, which is continuously updated as part of the further development work. The following list shows the evidence levels of ENP in more detail:

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

ENP practice guidelines are in many cases developed inductively, which means that the nursing practitioners working with ENP identify a gap in the catalog. The development therefore often begins with the identification of a relevant phenomenon in nursing practice and is then implemented. The result is consented with nursing practice. The diagnosis is then included in the ENP catalog (LoE 1.4). Less frequently, the development of a new ENP practice guideline is stimulated by literature evaluations, health policy developments or other impulses that do not originate from 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 suitable 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 and the main conceptual terms of the ENP nursing diagnosis are clearly defined and supported by the literature. The syntactic and structural requirements are checked. Also, potential overlaps with other ENP practice guidelines are essentially examined and avoided.

LoE 1.2 Nursing diagnosis label and definition, characteristics, etiologies and resources only (development order, not included in the ENP catalog)
The ENP nursing diagnosis is clearly formulated and 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 supplemented by nursing outcomes and nursing interventions to a practice guideline (development order, not included in the ENP catalog)
The nursing diagnostic statement is supplemented by nursing outcomes and nursing interventions and supported by literature references. The resulting ENP practice guideline is at an early stage and can be made available to end users in individual cases for evaluation and project planning purposes and improved together with the ENP development team. In the official ENP catalog and 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 and 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 the

associated constant comparisons of the corresponding actual nursing process planning. The technical accuracy and relevance of the practice guidelines developed in this way are confirmed or supplemented by international specialist literature. It is included in the official ENP catalog.

LoE – level 2: Nursing diagnoses and practice guidelines confirmed by international literature analyses, 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 as well as the nursing interventions and outcomes assigned to the nursing diagnosis are confirmed by national and international literature analyses.

LoE 2.2 Additional concept analysis for the nursing diagnosis

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

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

In addition to the literature foundation of all elements of the nursing diagnosis and practice guideline, consensus studies are carried out with experts in the respective field. The studies include 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 the nursing diagnosis or practice guideline is based on a systematic, international literature analysis and evaluation of the nursing diagnosis and nursing interventions with a documented and verifiable 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 analysis and evaluation of the nursing diagnosis and nursing interventions with a documented and verifiable search strategy and subsequent evaluation by experts selected by defined criteria using standardized questionnaires, online surveys or similar procedures (so-called expert rating).

LoE 3.2 Clinical studies of nursing diagnoses and practice guidelines that cannot be generalized to the total population

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

LoE 3.3 Well-designed clinical studies with small, non-generalizable sample sizes
The study refers to the nursing diagnosis as well as all characteristics and 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) is used, but with a limited sample size that is not representative of the total population.

LoE 3.4 Well-designed clinical studies with a random sample of sufficient size to allow generalizability to the total population
The study refers either to the nursing diagnosis as well as all characteristics or etiologies related to the diagnosis, or to 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) of sufficient size is used to generalize the results to the total population.

With reference to the current version 3.3 of ENP, the evidence levels are distributed among the 580 ENP nursing diagnoses and practice guidelines as follows. Not shown are nursing diagnoses or practice guidelines under development that are not yet an official part of ENP (LoE 1.1 to LoE 1.3).

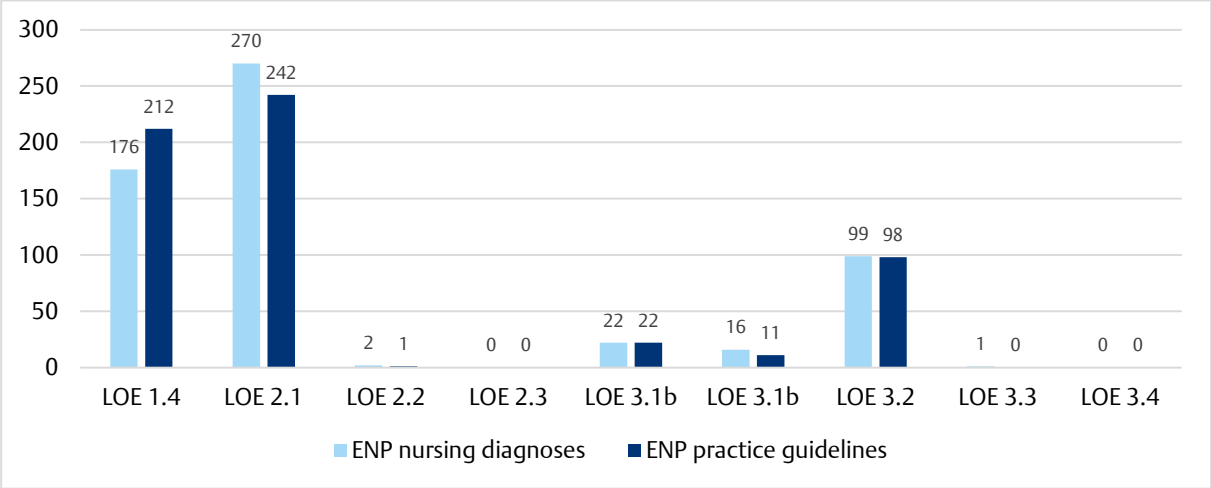


Figure 8: Distribution of evidence levels for ENP nursing diagnoses and ENP practice guidelines in version 3.4

3. Quality of the ENP practice guidelines

The nursing diagnoses-related pathways in ENP are the result of inductive development in Germany (Wieteck, 2004b). To this day, users continue to influence the further development of ENP. They report requirements for the illustration of nursing diagnoses and nursing interventions directly from nursing care practice to the ENP development team. This practice-oriented development strategy promotes the development of a specialist nursing language that is highly accepted by nursing practice. These demands from nursing practice are taken up and defined as a development task.

The systematic literature support for the ENP practice guidelines includes both international and national specialist literature and studies. This systematic literature foundation of ENP has been massively increased in recent years, significantly improving the quality of the practice guidelines. The systematic further development and validation of ENP is also increasingly receiving important impetus and impulses in the form of Bachelor's, Master's and doctoral theses (cf. e.g. Augustin, 2022; Burggraf, 2019; Haller, 2017; Hausherr, 2020, 2022; Nißlein, 2017a, 2017b; Werner, 2021). Each ENP practice guideline is supported

with current specialist literature, in the context of the discussion on content validation of nursing diagnostic terms, Woodtli (1988) already refers to this as a sign of content validation. Detailed, further information on the evidence-based further development of ENP is also described in the so-called development background, which is available for download at www.recom.eu/developmental-background. In many cases, the scientific development work on ENP also leads to international specialist publications on specific clinical topics, such as the effectiveness of acupressure as a nursing intervention for persons with fatigue (Jiang-Siebert, Wieteck, & Kraus, 2024).

There are several content and criterion validation works (cf. e.g. Berger, 2010; Hardenacke, 2007; Hausherr, 2020; Helmbold, 2010; Helmbold & Berger, 2010; Konrad, 2009; Nißlein, 2017b; Schmitt, 2010; Wieteck, 2006b, 2006c, 2008b), others are currently in the planning phase or are being/were carried out as part of academic theses. In Berger's (2010) criterion validity testing, 1,931 narrative nursing process planning formulations were mapped with ENP in the hospital setting. The formulations are taken from examination papers that were graded 1-2. In total, 73% of the formulation could be mapped completely, 14% of the formulations partially and 13% of the formulations could not be mapped. Schmitt's criterion validity study in the field of neonatal intensive care came to similar conclusions (Schmitt, 2010). These works refer to the practice guideline as a whole. The systematic literature analyses & syntheses by Helmbold (2010) and Helmbold and Berger (2010) also refer to a practice guideline in its entirety. Using the example of nursing diagnoses of malnutrition, the validity limitations found in the study of Hardenacke (2007) can be used to understand the subsequent processing and further development of the ENP diagnoses of malnutrition (Helmbold, 2010).

Some studies and projects on the evaluation of ENP have been and are carried out in the context of the practical application of ENP. In a large-scale hospital implementation project, Baltzer and his colleagues came to the following conclusions: "ENP formulations are practice-oriented and comprehensible" and "ENP can be used to illustrate nursing care processes completely and comprehensibly" (Baltzer et al., 2006, p. 9). The evaluation project of the Canton of St. Gallen, carried out in four different clinics in the canton, aimed to test the technical language ENP for a cantonal decision on its implementation. Against this background, ENP was tested in various institutions and specialist disciplines. See the final report on the conception and piloting of the implementation of ENP at the hospitals and clinics of the Canton of St Gallen (Kossaibati & Berthou, 2006). As part of the evaluation project, the nursing experts at the respective pilot facilities assessed the nursing plans documented with ENP with regard to the criteria “verifiability”, “guidance for action”, “nursing relevance”, “clarity”, “comprehensibility” and “completeness”. “In at least 80% of the nursing care plans analyzed, the documented content met the analysis criteria” (Kossaibati & Berthou, 2006, S. 41).

An intervention study was carried out to examine whether the use of ENP (then called “text modules for nursing process documentation”) in a software program has an effect on the quality of nursing process documentation in a geriatric care facility. The frequency and valence analysis evaluations clearly show positive effects on the quality of documentation (Wieteck, 2001). In a further study, the extent to which the “nursing interventions actually carried out” (recorded by observation) corresponded with the “documented nursing services using ENP” was examined. In the multicenter descriptive cross-sectional study, a total of 1,068 nursing interventions codes were evaluated in 34 patient cases using the parallel test method. The percentage agreement of the results in the two facilities was 76% on average. However, the study leaves open the question of whether and to what extent the 24% of incorrect coding are due to nurses’ omissions or missing items in the ENP nursing intervention (Wieteck, 2007b). ENP data analyses from hospitals, inpatient nursing facilities and outpatient nursing services were published in two further studies. ENP data from the nursing process documentation was used here with regard to different questions (Haag, 2009b; Konrad, 2009; Wieteck, 2004a). In a scientific paper, Wieteck (2009), shows that ENP in the example presented has the granularity, i.e. the clarity, fine granularity and selectivity, to derive, for example, the audit questions of the pressure ulcer expert standard from the daily nursing process documentation. 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 was carried out on the translation of ENP into Italian, English and French. For this, there is collaboration with the University of L'Aquila as well as many hospitals in Luxembourg.

ENP has also been used as a basis in some studies, e.g. to optimize work processes or revenue management (Haag, 2009a; Schmid, 2006) and/or to evaluate the quality of nursing work (Konrad, 2009; Wieteck et al., 2004).

Among many other aspects, the strength of ENP lies in its fine granularity, which meets the documentation requirements of nurses in German-speaking countries. The classification was developed in a German-speaking context and therefore no cultural adaptations are necessary for the German-speaking world. International data exchange could be ensured via mapping (Wieteck, 2007c). ENP can also be used to meet the requirements of the German Medical Service of the National Association of Statutory Health Insurance Funds (MDS, Medizinischer Dienst der Spitzenverbände der Krankenkassen e.V.) set out in the policy statement on the nursing process and documentation (Medizinischer Dienst der Spitzenverbände der Krankenkassen e.V. (MDS), 2005).

In contrast to other precombined 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. This is one of the reasons why comparisons of quality criteria with other classification systems are challenging and not easy to implement.

4. Critical remarks

As with all other nursing classification systems, ENP is currently not yet complete enough to cover all nursing topics required to describe nursing phenomena and interventions as part of the process documentation. This is shown by various studies and evaluation projects. Approx. 23% of NANDA-I nursing diagnoses could not be mapped via ENP according to the results of a 2008 study (Wieteck, 2008c). In addition, around 18% of the wording in the nursing care plans had to be individually added at this time. This statement refers to the entire nursing process (nursing diagnoses, nursing outcomes, nursing interventions) (Berger, 2008, 2010; Schmitt, 2010; Wieteck, 2004b). Although the gaps discovered in the studies at the time have since been closed in many areas, it will continue to be almost impossible to develop a technical language such as ENP that encompasses all settings and specialist areas of nursing to a level of absolute completeness from a technical perspective, despite the greatest efforts, given the rapid growth in knowledge and the simultaneous rapid ageing of existing knowledge in nursing. However, this circumstance does not only affect ENP, but also confronts the development teams of all nursing classification systems with major challenges. In principle, it should be noted that ENP must be continuously developed in order to meet the changing requirements in nursing practice as well as in nursing management, nursing controlling and nursing training.

Summary

As nursing knowledge is constantly and rapidly expanding and changing, the validation process of ENP is also a continuous requirement as part of the further development of the system. Nevertheless, it does not seem wrong to speak of a high level of maturity of the system. Indications of this are both the use in now all sectors of nursing care to map the nursing process and the positive feedback from users. The quality of ENP is also supported by the fact that there is a high degree of agreement in terms of content between the existing NANDA-I and ICNP systems and that the expressiveness and clarity of ENP nursing diagnoses were rated by the experts with approx. 84% as equally good/higher in comparison to the NANDA-I nursing diagnoses (Wieteck 2008).

5. Use and dissemination of ENP

Corresponding to the classification of terminologies into interface terminology, reference terminology and administrative terminology, ENP can be categorized as an interface terminology. Interface terminologies are intended for use in front-end applications, i.e. they should be used by the end users - nurses - in direct care (Bakken et al., 2000) to implement the nursing process and performance documentation in a standardized form.

The use of ENP is primarily intended for nursing process planning and documentation in the digital record in all (nursing) healthcare settings. ENP can be a valuable support for teaching purposes, for nursing and geriatric care training or for training employees in nursing facilities in which an intensive examination of the nursing process steps is taught and practiced, as the current nursing expertise is made available to users through the linkages. Trainees are also supported in learning specialist terminology. Implemented in software, the data of the care receivers can be retrieved quickly and efficiently and is also available for evaluation purposes. However, the actual implementation and visualization of ENP can vary greatly between software products[13].

Since the first half of 2020, ENP has also been available in the form of a web application called "ENP Online[14]", which was developed in particular for training and teaching purposes as well as for practical guidance. ENP Online combines professional pedagogical aspects & nursing diagnostics in a vivid way. The tool is a browser-based learning platform for studying the nursing terminology ENP and the associated nursing planning and documentation, among other things. ENP Online is available in two versions. Firstly, the free basic version, which allows you to view, search and study the entire ENP catalog without time limits and thus serves as a practical ENP browser and reference work. The premium version, for which a fee is charged, also allows you to actively create and edit nursing care plans, save, export and import the ENP nursing care plans created, as well as print and edit them at a later date. The main advantage of this web-based version over locally installed programs is that there are no hardware or software requirements apart from any internet-enabled device such as a smartphone, tablet or computer, and ENP Online can also be used independently of the operating system used. In addition to German, ENP Online is also available in French, with other languages such as English to follow.

Dissemination of ENP

ENP is currently (as of October 2024) used in a large number of outpatient and inpatient healthcare facilities (hospitals, nursing homes, etc.) in Germany, Austria, Luxembourg, and Italy in electronic software solutions for complete nursing process documentation. ENP is not only used in the electronic record GRIPS from RECOM, but is also increasingly being implemented as a database in many software products from other vendors. In addition, ENP is used by many institutions as well as training and further education facilities not only in electronic from but also in print format, for example as a formulation aid for handwritten nursing care planning or as teaching material in nursing training. This wide range of forms of use and distribution channels almost precludes the possibility of an exact quantification of the national and international use of ENP. Nonetheless, the following list attempts to provide as accurate a picture as possible of the use of ENP in German-speaking countries:

Germany

Around 50 hospitals and over 560 outpatient and inpatient geriatric care facilities use ENP in various software products. Exact figures can not be determined with absolute certainty due to the implementation of ENP as a database in third-party software, but according to reliable estimates, it can be assumed that at least 80,000 nurses in Germany work with ENP.

[13] An exemplary impression of the software implementation of ENP can be found on the RECOM homepage at https://www.recom.eu/en/software/overview.html

[14] Cf. https://enp-online.org/

Due to the new training and examination regulations for the nursing professions that came into force in 2020, in which, among other things, nursing diagnostics is specifically named for the first time as a core competence to be acquired by trainees, there is, however, a noticeable increase in 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). Finally, since 2016, ENP has been delivered to more than 4,000 nurses in training and further education in the form of a free learning software (the so-called "ENP Trainer" for local installation on a Windows PC), also beyond the borders of Germany. However, the development of the ENP Trainer has since been discontinued, as it has been replaced by the ENP Online web application presented at the beginning of this chapter. As of October 2024, the ENP Online web application, which is still relatively new, already has more than 23,000 registered accounts for users, mainly from German-speaking countries, since it went live for the interested public in March 2020. In addition, twelve vocational colleges for nursing professions have already set out to integrate ENP Online into their teaching throughout the entire training period. Two other vocational colleges and two universities have so far decided to implement the education version of the RECOM GRIPS digital record, which has been specially adapted for training and further education purposes and in which ENP is the central professional component.

Austria

In Austria, 20 hospitals, over 100 outpatient care services and around 80 inpatient geriatric care facilities now use ENP in three different software products. In terms of size, the outpatient nursing services in Austria cannot be compared with the outpatient nursing services in Germany. The more than 100 outpatient care services that work with ENP have over 10,000 members of nursing staff who use ENP to document the nursing process on a daily basis.

Luxembourg

Three acute care hospitals, one rehabilitation clinic, six inpatient geriatric care facilities and the five largest outpatient care providers, which together care for around 90% of all patients in Luxembourg, use ENP both in two different software products and bilingually (German and French) at most locations. Outpatient care services in Luxembourg are also structured differently in terms of size than in Germany. The five outpatient nursing services employ over 7,000 nursing staff who work with ENP. The billing items were also mapped with ENP so that the billing service is supported from the daily standard documentation. The trend of increasing use of ENP in Luxembourg, particularly in inpatient care, which has been constant for several years, is expected to continue in the future, and several facilities are currently working intensively with the nursing classification system.

6. Further specialist literature and documents on ENP

In addition to the scientific background available here, there is a large amount of further literature on the European Nursing care Pathways. Finally, a selection of these publications should be mentioned.

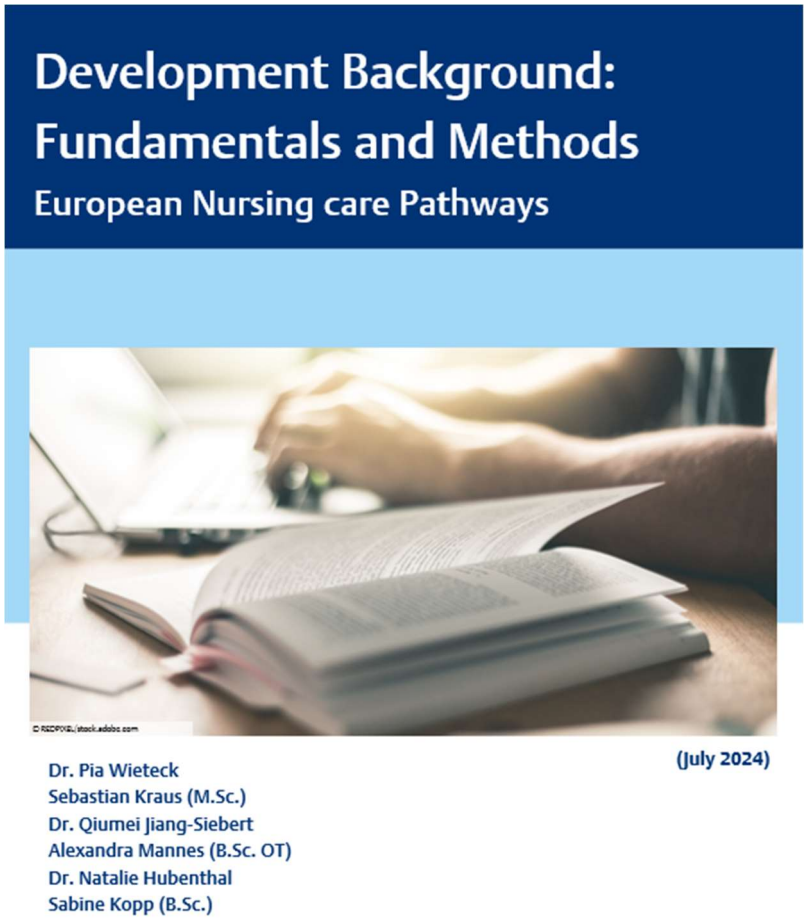
ENP Practice Guidelines: Nursing Diagnoses, Nursing Outcomes, Nursing Interventions

This is the German book publication of all ENP practice guidelines from the nursing diagnoses with their characteristics, etiologies and resources to all associated nursing outcomes and nursing interventions. The fourth new edition, available from January 2023, is based on ENP version 3.3 with all 580 practice guidelines. In addition to background information on working with nursing diagnoses and ENP, the "ENP Knowledge" section of the book also provides some case examples to provide initial experience in nursing planning with ENP.

For reasons of practicability and usability, the specialist literature on which the ENP practice guidelines are based is not printed in the book, but can be accessed as a PDF file on the Internet at www.recom.eu/literatur-enp.

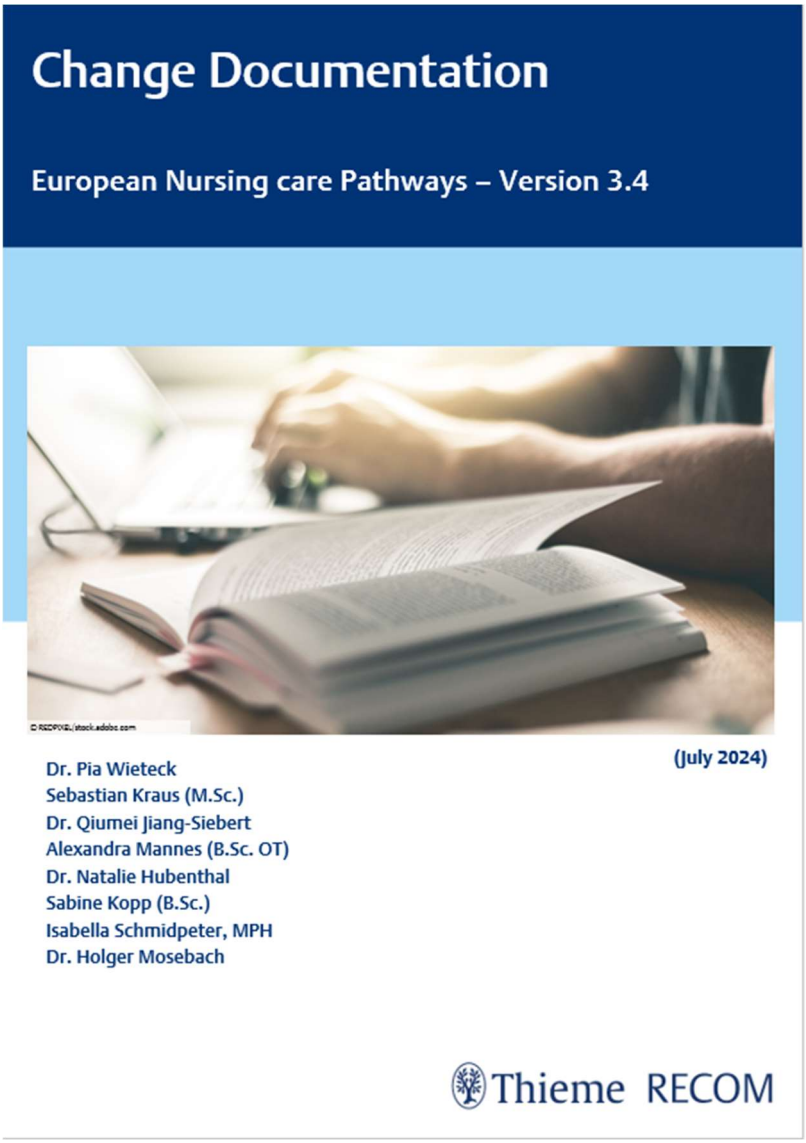
ENP development background: basics and methods

A separate document is available for an in-depth discussion of the methodologies, quality and rules of evidence-based further development of ENP. In addition to a detailed description of the international, systematic literature search for the best possible evidence as the core of the ENP further development work, this document also addresses in detail the criteria and instruments for critical appraisal, evidence selection and data extraction. The ENP development background are available for download: www.recom.eu/developmental-background



Change documentation European Nursing care Pathways

Each new version of ENP involves a number of changes and innovations, both in terms of content and structure. Starting with ENP version 2.0, the changes for each new version of ENP are summarized with regard to the most important aspects[15]. This includes, for example, information on the number and title of new ENP practice guidelines or information on practice guidelines that have been deactivated. Significant changes in the wording of various ENP items are listed here, as are shifts in the ENP hierarchy, structural innovations such as the new definitions for all ENP nursing diagnoses in 2019 and all relevant changes with the new version. The latest change documentation is also available to download free of charge: www.recom.eu/change-documentation



In addition to this summarized overview of the central changes in the individual ENP versions, as already mentioned at the beginning of the ENP version jump from 3.0 to 3.1, an automatically generated detailed change documentation is also available on request in Excel format at the level of the individual ENP items, which may be of interest to software providers or in the context of dealing with ENP at database level.

[15] Up to and including the scientific background from 2021 (ENP version 3.2), this summarizing change documentation was not in a separate document, but could be found in the appendix of the scientific background.

References

Arntz, R., Picht, H., & Mayer, F. (2004). *Einführung in die Terminologiearbeit* (5. ed.). Hildesheim u. a.: Georg Olms Verlag AG.

Augustin, K. (2022). *Motivierende Gesprächsführung als pflegerische Intervention bei Alkoholabhängigkeit – Evidenzbasierung in den „European Nursing care Pathways".* (Bachelorarbeit), Medizinische Fakultät der Albert-Ludwigs-Universität, Freiburg im Breisgau.

Bakken, S. et al. (2000). Representing Nursing Activities within a Concept-oriented Terminological System: Evaluation of a Type Definition. *Journal of the American Medical Informatics Association, 7*(1), pp. 81-90.

Baltzer, M., Baumberger, D., & Wieteck, P. (2006). *Pilotprojekt LEP Nuring 3/ENP* (pp. 23). Bern. Spital Bern.

Bartholomeyczik, S., Haasenritter, J., & Wieteck, P. (2009). Instrumente zur Abbildung des Pflegeaufwands in der DRG-Systematik. Literaturanalyse. *Pflegewissenschaft, 12*(9), pp. 669-687.

Baumberger, D. & Raeburn, S. (2015). LEP Nursing 3 für die Pflegedokumentation und die Sekundärnutzung von Pflegedaten. *NOVAcura, 46*(10), pp. 17-19.

Benner, P. (2012). *Stufen zur Pflegekompetenz. From Novice to Expert* (2. ed.). Bern: Huber.

Berger, S. (2008). Kriteriumsvalidität von ENP. Abbildung von individuell formulierten Pflegeprozessplanungen mit ENP. *Pflegewissenschaft, 10*(8), pp. 1-8.

Berger, S. (2010). *Kriteriumsvalidität von ENP Abbildung von individuell formulierten Pflegeprozessplanungen mit der standardisierten Pflegefachsprache ENP*. Kassel: RECOM.

Bogner, A., Littig, B., & Menz, W. (2014). *Interviews mit Experten. Eine praxisorientierte Einführung*. Wiesbaden: Springer VS.

Bölicke, C. (2001). Definitionen zu Standards, Richtlinien, Leitlinien und Standardpflegeplänen. *Pflege aktuell, 55*(2), pp. 96-99.

Bollinger, H., Gerlach, A., & Grewe, A. (2006). Die Professionalisierung der Pflege zwischen Traum und Wirklichkeit. In J. Pundt (Ed.), *Professionalisierung im Gesundheitswesen. Positionen - Potenziale - Perspektiven.* Bern: Huber, pp. 76-92.

Brady, A. (2008). Managing the patient with dysphagia. *Home Healthcare Nurse, 26*(1), pp. 41-46. doi: 10.1097/01.NHH.0000305554.40220.6d

Brobst, R. A. et al. (1997). *Der Pflegeprozess in der Praxis*. Bern: Huber.

Bromme, R., Jucks, R., & Rambow, R. (2004). Experten-Laien-Kommunikation im Wissensmanagement. In G. Reinmann & H. Mandl (Eds.), *Der Mensch im Wissensmanagement: Psychologische Konzepte zum besseren Verständnis und Umgang mit Wissen*. Göttingen: Hogrefe, pp. 176-188.

Bundesinstitut für Arzneimittel und Medizinprodukte (BfArM). (2021). Digitalisierung im Gesundheitswesen: BfArM stellt medizinische Terminologie SNOMED CT in Deutschland zur Verfügung. Retrieved from https://www.bfarm.de/SharedDocs/Pressemitteilungen/DE/2021/pm1-2021.html (Accessed: 04.04.2022).

Burggraf, S. (2019). *Analyse der Risiken einer Dislokation bei postoperativer Mobilisation nach Osteosynthese am Beispiel einer ENP Praxisleitlinie.* (Bachelorarbeit), DIPLOMA Private Fachhochschule Nordhessen, Studiengang Medizinalfachberufe.

Caldeira, S. M. A. et al. (2012). Validation of nursing diagnoses - the Differential Diagnostic Validation Model as a strategy. Retrieved from http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/2532/pdf_1258 (Accessed: 16.10.2014).

Chang, B. L. (1994). Validity of Concepts for Selected Nursing Diagnoses. *Clinical Nursing Research, 3*(3), pp. 183-208.

Chang, B. L. (1995). Nursing diagnoses and construct validity of pain, self-care deficit and impaired mobility. *International Journal of Nursing Studies, 32*(6), pp. 556-567.

Claaßen, A. C. et al. (2021). Handlungsfelder und Arbeitsbereiche nach dem dualen Pflegestudium – Eine Verbleibstudie an der FH Münster. *HeilberufeSCIENCE, 12*(1-2), pp. 30-38. doi: 10.1007/s16024-021-00350-2

Creason, N. S. (2004). Clinical Validation of Nursing Diagnoses. *International Journal for Nursing Terminologies and Classifications, 15*(4), pp. 123-132.

Deppmeyer, C. (1999). Vom Anspruch zur Wirklichkeit - Der Umgang mit Pflegeplanung und Pflegedokumentation. *Die Schwester/Der Pfleger, 38*(9), pp. 743-745.

Deutscher Berufsverband für Pflegeberufe e.V. (2013). Advanced Nursing Practice. Pflegerische Expertise für eine leistungsfähige Gesundheitsversorgung. Retrieved from www.dbfk.de/download/download/Advanced-Nursing-Practice---Pflegerische-Expertise-2013-02.pdf (Accessed: 30.12.2014).

Dickoff, J., James, P., & Wiedenbach, E. (1968). Theory in a practice discipline Part I. Practice oriented theory. *Nursing Research, 17*(5), pp. 415-435.

Fachgesellschaft Profession Pflege e.v. (2018). Pflegerisches Basis-Assessment (BAss). Herausgegeben vom Vorstand der Fachgesellschaft Profession Pflege am 29.08.2016. Aktualisiert am 01.02.2018. Retrieved from http://www.pro-pflege.eu/files/inhalte/downloads/BAss-Beschreibung_%2007.02.2018.pdf (Accessed: 14.05.2017).

Fehring, R. J. (1987). Methods to validate nursing diagnoses. *Heart & Lung: Journal of Critical Care, 16*(6 part 1), pp. 625-629.

Fehring, R. J. (1994). Symposium on Validation Models. 3: The Fehring Model. In R. M. Carroll-Johnson & M. Paquette (Eds.), *Classification of Nursing Diagnoses: Proceedings of the Tenth Conference*. Philadelphia: J. B. Lippincott Company, pp. 55-62.

Field, M. J. & Lohr, K. N. (Eds.). (1992). *Guidlines for Clinical Practice: From Development to Use*. Washington: National Academy Press.

Gärtner, R. (2006). *Von der Pflegeprozessdokumentation zur Leistungstransparenz? Überprüfung der mit ENP verbundenen LEP Nursing 3 Zeitwerte in einer orthopädischen Klinik.* (Diplom- und Prüfungsarbeit für die staatl. Abschlussprüfung), Katholische Stiftungsfachhochschule, München.

Gärtner, R. (2008). Von der Pflegeprozessdokumentation zur Leistungstransparenz? Überprüfung der mit ENP verbundenen LEP Nursing 3 (beta) Zeitwerte in einer orthopädischen Klinik. *Pflegewissenschaft, 10*(06), pp. 368-373.

Göpfert-Divivier, W., Mybes, U., & Igl, G. (2006). Identifizierung von Entbürokratisierungspotenzialen in Einrichtungen der stationären Altenpflege in Deutschland: Abschlussbericht. Retrieved from http://www.bmfsfj.de/RedaktionBMFSFJ/Abteilung3/Pdf-Anlagen/entbuerokratisierung-in-der-stationaeren-altenhilfe,property=pdf,bereich=bmfsfj,sprache=de,rwb=true.pdf (Accessed: 23.12.2011).

Gordon, M. (2001). *Handbuch Pflegediagnosen. Das Buch zur Praxis* (3. ed.). München; Jena: Urban & Fischer.

Gordon, M. & Bartholomeyczik, S. (2001). *Pflegediagnosen. Theoretische Grundlagen* (1. ed.). München, Jena: Urban& Fischer.

Gordon, M. & Sweeney, M. A. (1979). Methodological Problems and Issues in Identifying and Standardizing Nursing Diagnosis. *Advances in Nursing Science, 2*(1), pp. 1-15.

Grant, J. S. & Kinney, M. R. (1992). Using the Delphi Technique to Examine the Content Validity of Nursing Diagnoses. *Nursing Diagnosis, 3*(1), pp. 12-22.

Grant, J. S., Kinney, M. R., & Guzzetta, C. E. (1990a). A methodology for validating nursing diagnoses. *Advances in Nursing Science, 12*(3), pp. 65-74.

Grant, J. S., Kinney, M. R., & Guzzetta, C. E. (1990b). Using Magnitude Estimation Scaling to Examine the Validity of Nursing Diagnoses. *Nursing Diagnosis, 1*(2), pp. 64-69.

Haag, S. (2009a). *Effizienzoptimierung der stationären Pflege Analyse von interventionsbezogenen Bedarfs- und Aufwandszeitwerten*. Bad Emstal: RECOM.

Haag, S. (2009b). *Effizienzoptimierung der stationären Pflege. Analyse von interventionsbezogenen Bedarfs- und Aufwandszeitwerten.* (Promotionsarbeit zur Erlangung des akademischen Grades Dr. rer. pol.), Universität Trier.

Haller, J. (2017). *Das Pflegeproblem Harninkontinenz: Eine Literaturanalyse zur Weiterentwicklung der Pflegediagnose Belastungsinkontinenz des Pflegeklassifikationssystems European Nursing care Pathways (ENP).* (Abschlussarbeit zur Erlangung des akademischen Grades Bachelor of Arts), Fachhochschule für angewandte Wissenschaften Würzburg-Schweinfurt.

Hardenacke, D. (2007). Die Validität dreier ENP-Pflegediagnosen am Beispiel der Mangelernährung. *Pflegewissenschaft, 10*(10), pp. 530-538.

Hausherr, S. (2018). *Inhaltliche Anforderungen an Pflegeklassifikationssysteme zur adäquaten Pflegediagnostik bei erwachsenen Patienten mit Fatigue am Beispiel der European Nursing care Pathways (ENP).* (Bachelorarbeit), Katholische Universität Eichstätt-Ingolstadt, Fakultät für Soziale Arbeit, Studiengang Pflegewissenschaft.

Hausherr, S. (2020). *European Nursing care Pathways (ENP): Inhaltsvalidierung einer Pflegediagnose mit Fokus Gedächtnisstörung und beeinträchtigter Tages-/Lebensgestaltung.* (Masterarbeit), Paracelsus Medizinische Privatuniversität, Salzburg.

Helmbold, A. (2010). Weiterentwicklung von ENP im Bereich Mangelernährung auf Grundlage einer Validierungsstudie und einer Literaturstudie. *Pflegewissenschaft*(5), pp. 292-299.

Helmbold, A. & Berger, S. (2010). Literaturanalyse zur Körperwaschung - Ein Schritt im Validierungsprozess der ENP-Pflegediagnosen. *Pflegewissenschaft, 12*(2), pp. 100-107.

Herdman, T. H. & Kamitsuru, S. (Eds.). (2018). *NANDA International. Nursing Diagnoses. Definitions and Classification 2018-2020* (11 ed.). New York u.a.: Thieme.

Hines, S. et al. (2011). Identification and nursing management of dysphagia in individuals with acute neurological impairment (update). *International Journal of Evidence-based Healthcare, 9*(2), pp. 148-150. doi: 10.1111/j.1744-1609.2011.00211.x

Hoskins, L. M. (1997). How to do a Validation Study. In M. J. LeMone (Eds.), *Classification of Nursing Diagnoses: Proceedings of the Twelfth Conference*. Glendale: Cinahl Information Systems, pp. 79-86.

Hügli, A. & Lübcke, P. (Eds.). (2001). *Philosophie-Lexikon* (4. ed.). Reinbek bei Hamburg: Rowohlt.

Hyun, S. & Park, H.-A. (2002). Cross-mapping the ICNP with NANDA, HHCC, Omaha System and NIC for unified nursing language system development. *International Nursing Review, 49*(2), pp. 99-110.

Jahn, P. (2021). Untergrenzen oder Personalbemessung in der Pflege. *Der Urologe, 60*(6), pp. 796-802. doi: 10.1007/s00120-021-01566-w

Jasper, M. A. (1994). Expert: a discussion of the implications of the concept as used in nursing. *Journal of Advanced Nursing, 20*(4), pp. 769-776. doi: 10.1046/j.1365-2648.1994.20040769.x

Wieteck, P. & Kraus, S. (2024). Acupressure, a promising intervention for fatigue, within the European nursing care pathways (ENP): An integrative review. *International Nursing Review, First published: 29 May 2024*. doi: https://doi.org/10.1111/inr.12989

Kaspar, M. (2023). *Die systematische Überarbeitung und Weiterentwicklung einer Pflegediagnose des Pflegeklassifikationssystems European Nursing Care Pathways.* Bachelorarbeit an der Fakultät für Angewandte Sozialwissenschaften der Hochschule München. Studiengang Bachelor Pflege dual.

Kerr, M. E. et al. (1993). Taxonomic Validation: An Overview. *Nursing Diagnosis, 4*(1), pp. 6-14.

Kim, J. et al. (2020). Towards implementing SNOMED CT in nursing practice: A scoping review. *Int J Med Inform, 134*, pp. 104035. doi: 10.1016/j.ijmedinf.2019.104035

Kimmel, A. & Breuninger, K. (2016). Pflegereform 2017. *Gesundheitswesen, 78*(07), pp. 477-488. doi: 10.1055/s-0042-101411

Konrad, H. (2009). *Pneumonieprophylaxe bei Krankenhauspatienten: Analyse von Daten der Pflegeklassifikation ENP® in elektronischen Patientenakten*. Kassel: Recom.

Kossaibati, S. & Berthou, A. (2006). *Konzeption und Pilotierung der Einführung von ENP an den Spitälern und Kliniken des Kantons St. Gallen -Schlussbericht*: Institut de santé et d`economie (ISE).

Kratschus, H. (2022). *Pflegeklassifikationssysteme und European Nursing Care Pathways - Implikationen zur Überarbeitung der Pflegediagnose Menschen mit Bewegungsblockade/Starthemmung aufgrund von Freezing.* Bachelorarbeit im Studiengang Gesundheit des Fachbereichs Gesundheit an der Fachhochschule Bielefeld.

Kunz, R. et al. (Eds.). (2007). *Lehrbuch evidenzbasierte Medizin in Klinik und Praxis* (2. ed.). Köln: Deutscher Ärzte-Verlag.

Medizinischer Dienst der Spitzenverbände der Krankenkassen e.V. (MDS). (2005). Grundsatzstellungnahme Pflegeprozess und Dokumentation. Handlungsempfehlungen zur Professionalisierung und Qualitätssicherung in der Pflege. Retrieved from https://www.mds-ev.de/fileadmin/dokumente/Publikationen/SPV/Grundsatzstellungnahmen/30_Pflegeprozess_Dok_2005.pdf (Accessed: 13.03.2024).

Meuser, M. & Nagel, U. (2002). ExpertInneninterviews - vielfach erprobt, wenig bedacht. In A. Bogner, B. Littig & W. Menz (Eds.), *Das Experteninterview*: VS Verlag für Sozialwissenschaften, pp. 71-93.

Mittelstraß, J. (Ed.). (1996). *Enzyklopädie Philosophie und Wissenschaftstheorie Band 4: Sp-Z*. Stuttgart, Weimar: Verlag J.B. Metzler.

Nißlein, A. (2017a). Eine Brücke zwischen Pflegewissenschaft und Praxis bauen - von der wissenschaftlichen Erkenntnis ins klinische Setting. *Pflege Professionell*(12), pp. 5-8.

Nißlein, A. (2017b). *Evidence-based Nursing und Professionalisierung im Kontext der beruflichen Pflege. Systematische Weiterentwicklung und Validierung des Pflegeklassifikationssystems European Nursing care Pathways am Beispiel einer Praxisleitlinie.* (Master's Thesis zur Erlangung des akademischen Grades Master of Education), Lehrstuhl für Berufspädagogik, Technische Universität München.

Ollenschläger, G. et al. (1999). Leitlinien - Bedeutung, Verbindlichkeit und Qualität: Welche Problematik liegt in der Entwicklung und Einführung von Leitlinien? Retrieved from http://www.evimed.info/mediapool/46/460824/data/Publ2/osna99.pdf (Accessed: 10.05.2017).

Opel, B. (2004). Die Entwicklung von ENP-Pflegediagnosen durch eine Begriffsanalyse nach Walker/Avant. Wieteck (Ed.), *ENP - European Nursing care Pathways. Standardisierte Pflegefachsprache zur Abbildung von pflegerischen Behandlungspfaden*. Bad Emstal: RECOM Verlag, pp. 37-50.

Palm, R. & Dichter, M. (Eds.). (2013). *Pflegewissenschaft in Deutschland - Errungenschaften und Herausforderungen. Festschrift für Sabine Bartholomeyczik*. Bern: Huber [u.a.].

Perleth, M. & Raspe, H. (2007). Levels of Evidence - Was sagen sie wirklich aus? Retrieved from https://www.ebm-netzwerk.de/was-ist-ebm/images/levels_evidence.pdf (Accessed: 16.05.2019).

Rabl, C., Mereu, N., & Kraus, S. (2016). Validierung der Übersetzung einer Pflegeklassifikation mit der Methode der Rückübersetzung. *Pflegewissenschaft, 18*(5), pp. 444-453. doi: 10.3936/1421

Reuschenbach, B. & Darmann-Finck, I. (2018). Pflege studieren – Intentionen, Strukturen und Erfahrungen. In K.-H. Sahmel (Ed.), *Hochschuldidaktik der Pflege und Gesundheitsfachberufe* (1. ed.). Berlin, Heidelberg: Springer, pp. 63-75.

Schaeffer, D. & Wingenfeld, K. (2014). Entwicklung von Pflegewissenschaft in Deutschland. In D. Schaeffer & K. Wingenfeld (Eds.), *Handbuch Pflegewissenschaft*. Weinheim [u.a.]: Beltz Juventa, pp. 9-18.

Schmid, B. (2006). *Homogenitätsprüfung des Pflegeaufwandes in DRG-Fallgruppen.* (Diplomarbeit), Katholische Stiftungsfachhochschule, München.

Schmid, B. (2007). Homogenitätsprüfung des Pflegeaufwandes in der DRG-Fallgruppe: Erklärungsansatz zur Kostenhomogenität von DRG-Fallgruppen durch Pflegediagnosen/Pflegeaufwand. *PrInterNet, 9*(9), pp. 532-541.

Schmitt, A. (2010). Kriteriumsvaliditätsprüfung von ENP auf einer neonatologischen Intensivstation. *PrInterNet, 12*(4), pp. 224-232.

Schrems, B. (2003). *Der Prozess des Diagnostizierens in der Pflege*. Wien: Facultas.

Schütze, F. (2006). *Interdisziplinäre Zusammenarbeit bei der Erlössicherung.* (Diplomarbeit), Katholische Stiftungsfachhochschule, München.

SNOMED International. (2019). SNOMED CT Starter Guide. Retrieved from https://confluence.ihtsdotools.org/display/DOCSTARTDE?preview=/61153991/87039892/doc_StarterGuide_de_INT_20190611.pdf (Accessed: 13.03.2024).

Tanner, D. C. (2010). Lessons from nursing home dysphagia malpractice litigation. *Journal of Gerontological Nursing, 36*(3), pp. 41-46. doi: 10.3928/00989134-20100202-06

Thomas, D. et al. (2014). Instrumente zur Personalbemessung und -finanzierung in der Krankenhauspflege in Deutschland. Diskussionspapier zur Personalbemessung und -finanzierung in der Krankenhauspflege in Deutschland. *IBES Diskussionsbeitrag, No. 204*. Retrieved from http://econstor.eu/bitstream/10419/101317/1/796268495.pdf (Accessed: 31.07.2015).

Walker, L. O. & Avant, K. C. (1998). *Theoriebildung in der Pflege*. Wiesbaden: Ullstein Medical.

Walker, L. O. & Avant, K. C. (2010). *Strategies for theory construction in nursing* (5 ed.). Boston: Prentice Hall.

Werner, G. (2021). *Die Wirksamkeit der keimarmen Ernährung zur Infektionsprophylaxe bei Neutropenie und ein Vergleich der aktuellen wissenschaftlichen Erkenntnisse mit den Empfehlungen in den European Nursing care Pathways (ENP).* Bachelorarbeit am Institut für Pflegewissenschaft der Paracelsus Medizinischen Privatuniversität Salzburg.

Whitley, G. G. (1997). Three Phases of Research in Validating Nursing Diagnoses. *Western Journal of Nursing Research, 19*(3), pp. 379-399.

Wieteck, P. (2001). *Interventionsstudie zur Qualitätsentwicklung der Pflegedokumentation mit Hilfe eines EDV-gestützen Pflegeplanungsprogrammes in einer stationären Einrichtung.* (Diplomarbeit), Evangelische Fachhochschule Darmstadt, Fachbereich Pflege- und Gesundheitswissenschaft.

Wieteck, P. (2003). European Nursing care Pathways (ENP): Pflegerische Behandlungspfade auf der Basis von praxisnahen Theorien entwickeln. *PR-InterNet, 5*(11), pp. 84-94.

Wieteck, P. (2004a). Ergebnisse einer quantitativen Datenauswertung mittels ENP® in deutschen und österreichischen Einrichtungen. *PrInterNet, 6*(9), pp. 486-494.

Wieteck, P. (2006a). Arbeiten mit ENP® - Pflegeprozessdokumentation der Zukunft. *Heilberufe, 58*(11), pp. 62-63.

Wieteck, P. (2006b). *Content Validity of ENP® Nursing Diagnoses through Cross Mapping of ICNP® Focus Terms*. Bad Emstal: RECOM.

Wieteck, P. (2006c). ENP®-ICNP®-Crossmapping. *PrInterNet, 08*(02), pp. 109-118.

Wieteck, P. (2007a). Dokumentation mithilfe der standardisierten Pflegefachsprache ENP®: Pflegeprozess detailliert und aktuell abbilden. *Pflegezeitschrift, 60*(5), pp. 257-259.

Wieteck, P. (2007b). Übereinstimmung von Interventionsdokumentationen mit tatsächlich durchgeführten pflegerischen Leistungen. *PrInterNet, 9*(2), pp. 113-120.

Wieteck, P. (2007c). *Validitätsprüfung ausgewählter Bestandteile der ENP® (European Nursing care Pathways): ENP® - ein Instrument zur prozessorientierten, fallbezogenen und handlungsbegründenden Pflegeprozessdokumentation. Dissertation zur Erlangung des akademischen Grades Doctor rerum medicinalium. Universität Witten/Herdecke, Institut für Pflegewissenschaft, Fakultät für Medizin*.

Wieteck, P. (2008a). Furthering the development of standardized nursing terminology through an ENP-ICNP cross-mapping. *International Nursing Review, 55*(3), pp. 296-304. doi: 10.1111/j.1466-7657.2008.00639.x

Wieteck, P. (2008b). Furthering the development of standardized nursing terminology through an ENP®-ICNP® cross-mapping. *International Nursing Review, 55*(3), pp. 296-304. doi: 10.1111/j.1466-7657.2008.00639.x

Wieteck, P. (2008c). *Validierung von Pflegediagnosen der Pflegeklassifikation ENP (European Nursing care Pathways). Crossmappings von ENP mit ICNP und NANDA. Edition Pflegewissenschaft. Band 1*. Bad Emstal: RECOM.

Wieteck, P. (2009). Transfer der Expertenstandards in die Pflegepraxis. Ausblicke bezüglich des Nutzens einer elektronischen Patientenakte mit ENP. *Pflegewissenschaft, 11*(04), pp. 227-239.

Wieteck, P. (Ed.). (2004b). *ENP® - European Nursing care Pathways. Standardisierte Pflegefachsprache zur Abbildung von pflegerischen Behandlungspfaden* (1. ed.). Bad Emstal: RECOM Verlag.

Wieteck, P. (Ed.). (2013). *Praxisleitlinien Pflege. Planen und Dokumentieren auf Basis von Pflegediagnosen der Klassifikation ENP* (2 ed.). Kassel: RECOM.

Wieteck, P. (Ed.). (2014). *ENP-Pflegediagnosen für die Altenpflege. Formulierungshilfen für Ausbildung und Praxis*. Kassel: RECOM.

Wieteck, P. et al. (2004). Ergebnisse einer quantitativen Datenauswertung mittels ENP® in deutschen und österreichischen Einrichtungen. *PR-InterNet, 6*(9), pp. 486-494.

Wieteck, P. et al. (Eds.). (2017). *Handbuch 2017 für PKMS und OPS 9-20. Kodierung und Dokumentation, aktuelle berufspolitische Diskussion, aktivierend-therapeutische Pflege* (8. ed.). Kassel: RECOM.

Wieteck, P. & Kraus, S. (2015). Personalbedarf messen: aber wie? *CNE Pflegemanagement*(5), pp. 14-17.

Wieteck, P. & Kraus, S. (2016). *Personalbedarf Pflege. Sektorenübergreifende Analyse der Pflegesituation und ihre Bemessungsgrundlagen mit Handlungsempfehlungen*. Kassel: RECOM.

Wieteck, P., Moantovan, F., & Rigon, L. A. (Eds.). (2015). *Percorsi per la pratica infermieristica. Pianificazione, assistenza e documentazione con i percorsi assistenziali ENP*. Rozzano: Casa Editrice Ambrosiana.

Woodtli, A. (1988). Identification of Nursing Diagnoses and Defining Characteristics: Two Research Models. *Research in Nursing & Health, 11*(6), pp. 399-406.