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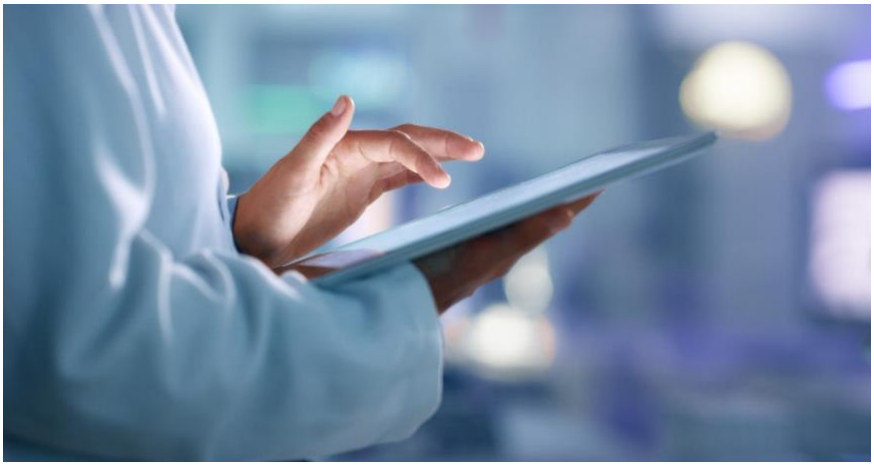
Diagnosis and Problem List

Requirements in outpatient care



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1 General information

1.1 Introduction

The diagnosis and problem list is a central element of medical documentation. Depending on the methodology or documentation guidelines used within an organization, there are different requirements for its representation in a medical information system.

1.2 Situation

In outpatient medicine, the care of a patient takes place over a long period of time, in some cases over a lifetime. Consequently, a patient-centered representation of medical data has become established within medical information systems.

The temporal dimension places specific requirements on the diagnosis and problem list. Additional aspects must be considered for the emerging cross-institutional patient-centered diagnosis and problem list.

1.3 Methodology of medical documentation

In Swiss outpatient care, different methods are used for medical documentation:

- Episode-oriented approach according to Solon et al.[1]
- Problem-oriented approach according to Weed [2]
- Consultation-oriented approach
- Document-oriented approach

The episode-oriented electronic health record according to Solon is a further development of Weed's methodology and imposes the highest requirements on modeling a medical information system. In practical implementation, it has been shown that the episode concept allows the seamless use of the other methods within the same medical information system. Consequently, the problem-oriented, consultation-oriented, and document-oriented methodologies can be considered simplified variants of the episode-oriented methodology.

This document outlines the requirements for the diagnosis and problem list in the context of the episode-oriented methodology.

1.4 Purpose

This document describes the basic requirements for the *diagnosis and problem list* in outpatient patient care.

It provides a comprehensive overview of the requirements in the ambulatory setting for modeling the *diagnosis and problem list*.

1.5 Limitations

This is the first version of the compiled diagnosis and problem list requirements. As a result, the textual description is relatively brief. Much detail can be found in the figures and tables.

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[1] SOLON, Jerry A., FEENEY, John J., JONES, Sarah H., RIGG, Robert D. and SHEPS, Cecil G. Delineating episodes of medical care. American Journal of Public Health and the Nations Health. [online]. 1967, 57(3), 401-408.

[2] WEED, L. L. Medical records that guide and teach. The New England journal of medicine, 1968, vol. 278, no. 11, pp. 593-600.

The description of the requirements has not yet been aligned with the modeling of standards. Primarily, aspects from existing and planned medical information systems in the outpatient sector have been considered.

In addition, the representation of health problems in the International Patient Summary (IPS) has not been analyzed in detail and is not yet included in this document.

The requirements, however, have been formulated with a broad scope. Depending on implementation and use in individual medical information systems or apps, fewer elements may be required.

The underlying episode-oriented methodology of medical documentation with the concept of Episodes of Care is only briefly explained as necessary for the purpose of this document.

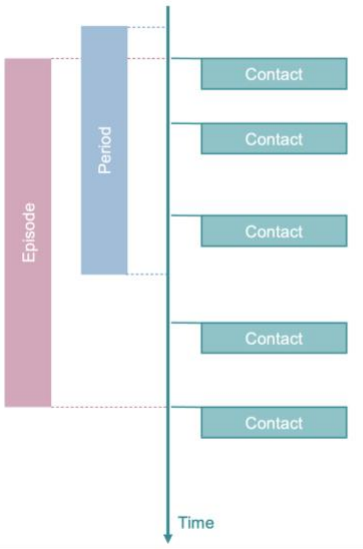
The list of attributes and values for health problems and metadata does not take into account information technology aspects such as normalization, cardinality, and mandatory fields.

2 Fundamentals

2.1 Treatment units

The care of a patient by service providers includes various treatment units, depending on how the boundaries are defined:

- **In organizational terms,** contact takes place between a patient and a service provider
- **In terms of time,** care covers a specific period, such as a day, week, month, or year
- **In terms of content**, an episode includes one or more contacts of the patient with one or more healthcare providers for the treatment of a specific medical health problem



Boundary setting	Treatment unit	Description
Organizational	Contact	Individual contact with a service provider, categorized by type of stay: outpatient / day patient / inpatient
Temporal	Period	All treatments within a certain period: day / week / year
Content-related	Episode	Multiple contacts with one or more healthcare providers for the treatment of a health problem
	Treatment section	Sections in the course of care with different care goals: - Initial contact - Prevention - Acute treatment - Rehabilitation - Care / nursing - Treatment break
	Treatment phase	Elements of a treatment section (with different care methodologies): - Diagnostics - Therapy (invasive, conservative, ICU stay) - Follow-up care - Waiting period

Figure 1- Treatment units for patient care[3]

[3] https://fischer-zim.ch/auszuege-pcs-buch/Strukturierung-von-Behandlungsverlaeufen-9701.htm

2.2 Problems and diagnoses

2.2.1 Problem solving

The relationship between patient and physician is asymmetrical, with each having their own role. The patient has one or more health problems and seeks the medical professional's help in the hope that these problems will be resolved and lead to recovery.

The physician's first task is to identify and structure the patient's problems. The physician then forms working hypotheses based on his knowledge, makes diagnostic or therapeutic decisions, and carries them out. Finally, the physician monitors progress, formulates new hypotheses as needed, and makes new decisions. This process is iterative and imperfect, without ultimate certainty as long as the patient is alive. The patient is therefore the *bearer of the problem*, and the physician is the *solver of the problem* - to the best of his knowledge and belief.[4]

2.2.2 Diagnoses, problems

All patient information is summarized into patterns and categorized as problems in the sense of health problems. During the diagnostic process, this information is refined into actual diagnoses, while other issues remain categorized as problems.[4]

Diagnoses and problems are not the same thing. At the beginning of the diagnostic process, a problem may be simple patient-reported information, such as a cough for three weeks or a fever of 39°C, an unexpected finding, such as a radiological lung shadow or a sonographic liver lesion, or an uninterpreted laboratory finding such as hypercalcemia or hyperbilirubinemia. During the diagnostic process, these findings are refined into actual diagnoses, while others remain as problems.

Medical diagnoses classify pathological processes using scientific terms. In Switzerland, the International Classification of Diseases (ICD) of the World Health Organization (WHO) is commonly used. In primary care, the International Classification of Primary Care (ICPC-2) of WONCA is widely used.

Additional information is required for a diagnosis and, in some cases for problems, as summarized in the following table:

Specification	**Values**
Localization	- left - right - bilateral - Anatomical term
Condition	- Suspected diagnosis - Confirmed diagnosis - Excluded diagnosis
Level of Certainty	- Anamnestically confirmed - Clinically proven - Radiologically confirmed - Histologically confirmed
Timing information	- Acute - Chronic
Follow-up Event	- Complication - Recurrence
Start Date	- Initial Diagnosis (date of diagnosis)
Status	- Active (problem or diagnosis requires diagnostic or therapeutic intervention)

[4] Arthur Uehlinger, former head physician at Schaffhausen Cantonal Hospital

	- Inactive (problem or diagnosis is not being processed and is dormant) - Closed
Goal	- Treatment goal agreed upon by physician and patient for this problem or diagnosis. Primarily used for chronic conditions. - Timeframe for achieving the goal

Table 1– Additional Diagnosis information

2.2.3 Lifecycle of a health problem

The name and type of a patient's health problem changes over time during the patient's care. The problem is recorded and may be renamed or specified as it progresses. During the diagnostic process, the clinician makes a suspected diagnosis and reformulates the problem accordingly. When a suspected diagnosis is confirmed, it is renamed as a diagnosis. Based on the therapy performed, the health problem is resolved, and the diagnosis is closed. Important closed diagnoses are added to the *past history*.

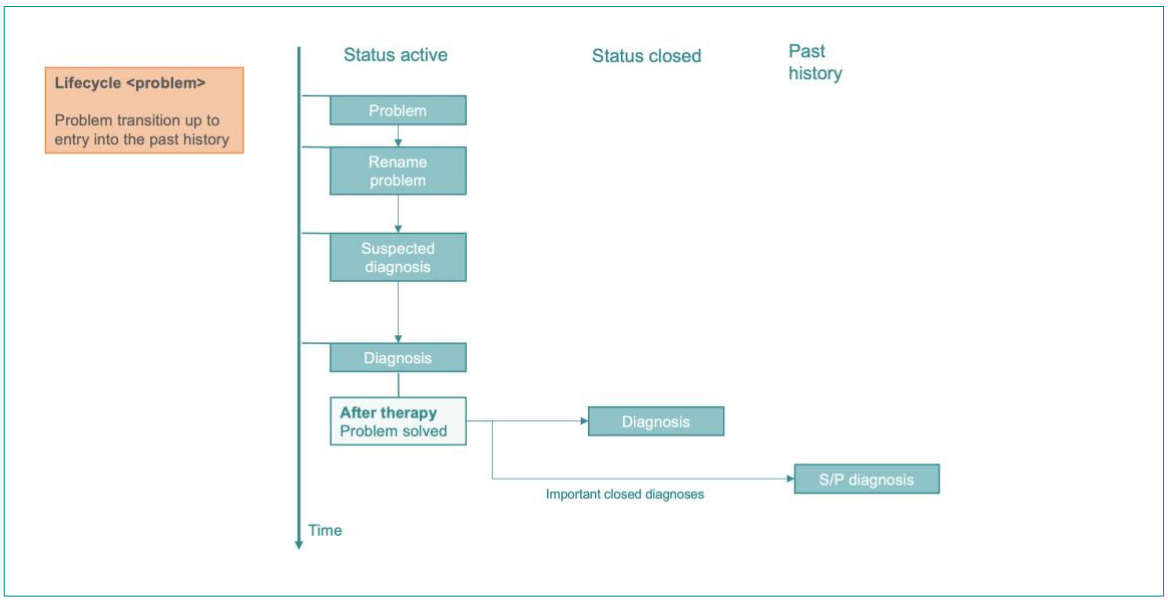


Figure 2- Lifecycle of a health problem from the problem to the past history

For example, a patient presents with abdominal pain that progresses to acute abdomen. The physician suspects cholecystitis and orders laboratory tests and an ultrasound. The diagnosis of cholecystitis is confirmed. The patient is treated, the health problem is resolved, and the diagnosis is closed. Because this is an important closed diagnosis, it is recorded in the past history as *S/P cholecystitis.*

2.2.4 Problem list

In 1968, the physician Lawrence Leonard Weed published an article in the *New England Journal of Medicine* in which he introduced his methodology for improving the medical record.[5] He replaced the structuring of the medical record according to various sources, such as x-ray findings, laboratory results, and physician notes with a structure that focused on a defined list

[5] WEED, L. L. Medical records that guide and teach. The New England journal of medicine, 1968, vol. 278, no. 11, pp. 593-600.

of a patient's medical problems. Organizing patient information around specific problems is intended to improve overview, clinical decision making, and medical education.

The central element of Weed's Problem-Oriented Medical Record (POMR) is the *problem list*. The patient's current and past diagnoses and problems are arranged in a hierarchical list in descending order of importance to the patient.

In everyday practice, problems and diagnoses are often linked or interrelated in complex ways. Therefore, diagnoses and problems are organized and numbered hierarchically according to their importance to the patient. The grouping is based on medical aspects, with a main diagnosis or overarching term and related problems and diagnoses listed below.

In addition, *primary data* can be added to the hierarchical problem list for each diagnosis or problem. Primary data includes relevant anamnestic, clinical, or additional information with associated keywords, measurements, and links to other items in the structured medical record.

The hierarchical, sequentially numbered problem list of all the patient's current and past health problems provides a clear index to the patient's medical record. The problem list proposed by Weed is now commonly referred to as the *diagnosis and problem list*.

Example diagnosis and problem list

1. Urinary tract infection (22/03/2024)
2. Coronary artery disease with/without
   - Arterial hypertension (ID 2009)
   - Heart failure
   - S/P myocardial infarction (2015)
3. Diabetes mellitus type 2 (ID 2007)
   - Polyneuropathy (ID 2014)
   - Nephropathy (ID 2017)
   - HbA1c 23.02.2024: 6.4%
4. Obesity WHO grade II
   - Initial BMI 35.9 kg/m2
   - Started Liraglutide therapy 03.04.2022
   - BMI 16.05.2024: 31.3. kg/m2
5. Husband in need of care
6. S/P cholecystectomy (1988)
7. S/P appendectomy (1965)

Figure 3 - An example of a simple diagnosis and problem list

2.3 Episode of Care

2.3.1 Concept

The problem-oriented management of medical records according to Weed reaches its limits in certain areas. In the case of long medical records, the user loses the overview, and the requirements of managed care cannot be satisfactorily met. In order to be able to compare the cost and quality of patient treatment, it must be possible to structure the data in the electronic medical record completely in terms of organization, time and content.

It must also be possible to differentiate between treatment cases in terms of commercial aspects within the practice, and the episode of illness as it occurs in the patient, from the beginning to the healing of a health problem.

The *episode of care* has been proposed by health services researchers as an appropriate unit for measuring cost-effectiveness and quality. The theoretical concept of *episodes of care* was published by Jerry A. Solon and colleagues in the American Journal of Public Health in 1967.[6]

The episode of care is the period of time during which a health problem persists, measured from the first to the last contact between the patient and the healthcare providers. An episode includes all information about a single health problem that is recorded in the medical record over a defined period of time for all contacts. An episode of care covers a patient's health problem from its beginning to its resolution. Documentation within the single contact is done per episode according to the SOAP principle. Exacerbations and complications of an episode are presented in separate episodes.

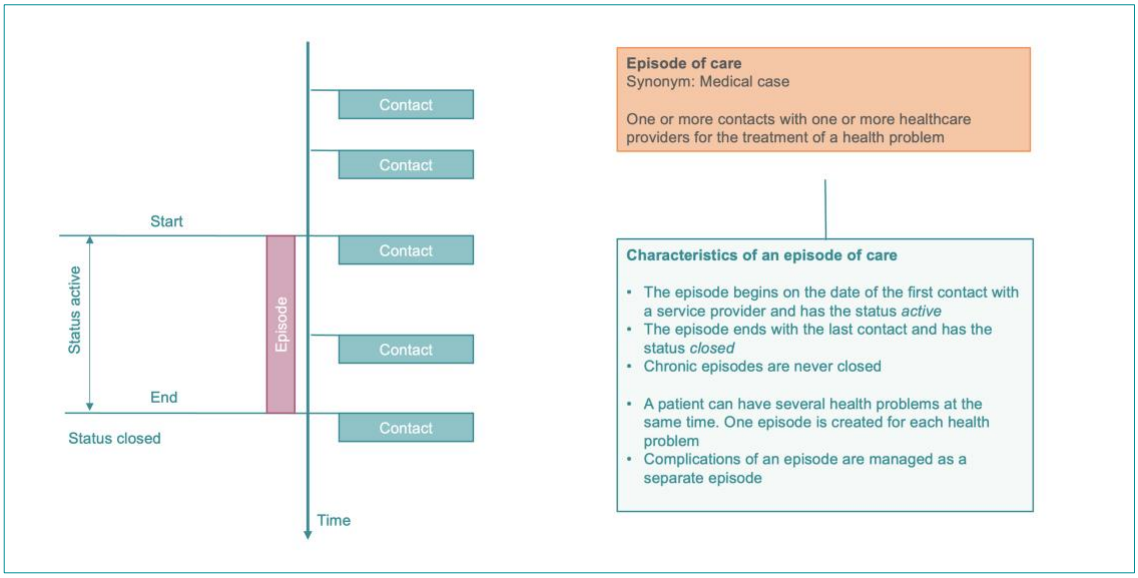
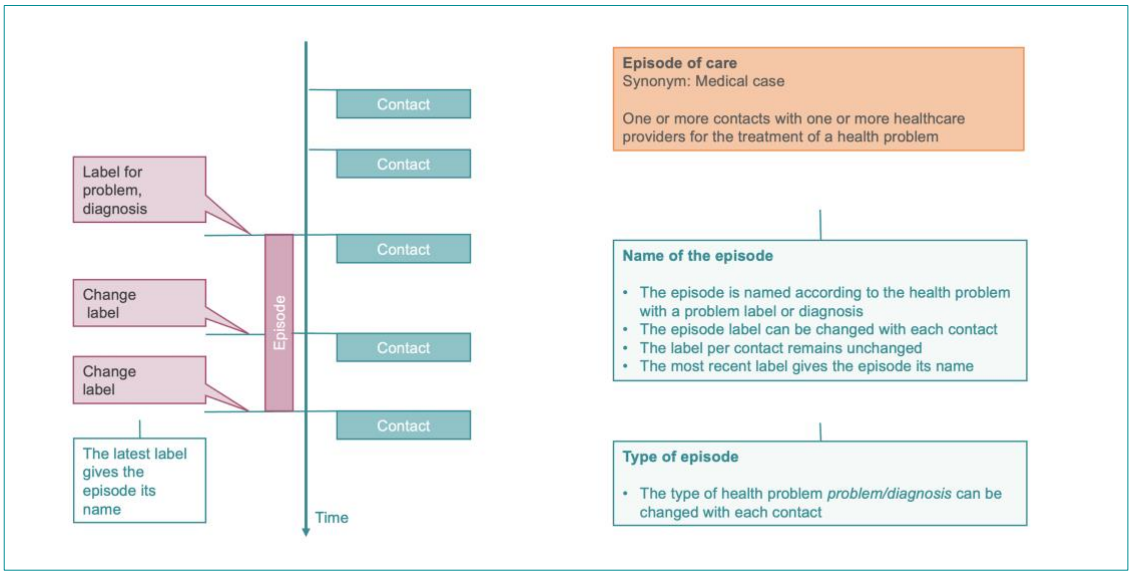


Figure 4 – Definition of 'episode of care'

2.3.2 Name of the episode



[6] SOLON, Jerry A., FEENEY, John J., JONES, Sarah H., RIGG, Robert D. and SHEPS, Cecil G. Delineating episodes of medical care. American Journal of Public Health and the Nations Health. [online]. 1967, 57(3), 401-408.

Figure 5- Naming of an episode of care

When a new health problem arises, an episode of care is created at that contact with a problem or diagnosis as its name. For each subsequent contact, the episode can be renamed based on the diagnostic or therapeutic process. The label entered for each contact must be retained so that the chronological display of contacts always shows the name that was valid at that time. This allows you to see the progress and transitions from contact to contact. The episode of care, as described by the World Organization of Family Doctors (WONCA), is shown below with an example:

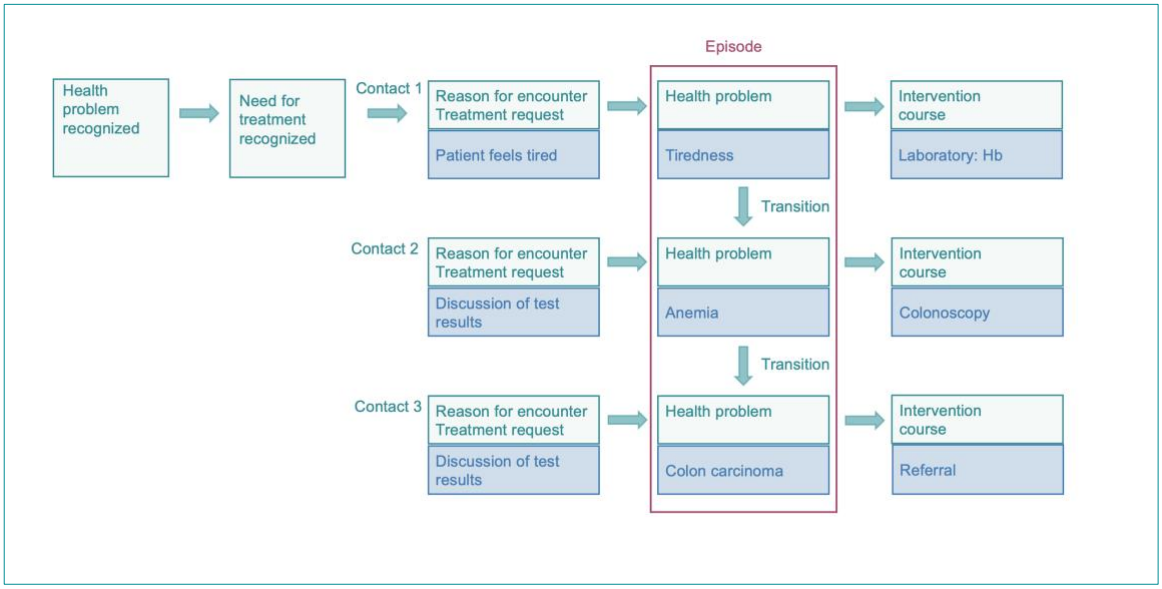


Figure 6 - WONCA - Episode of care with example

3 Requirements

Based on the principles described above, the requirements for the *diagnosis and problem list* within an episode-oriented medical record can be defined.

3.1 Basic element - The health problem

The smallest logical information unit in the diagnosis and problem list is an individual *health problem*, which corresponds to an *episode* in the context of the *Episode of Care*.

During treatment, a health problem may be renamed several times, depending on the progress of diagnosis and treatment. It may evolve into a suspected diagnosis, be confirmed later as a diagnosis, or remain a problem.

A diagnosis can be either acute or chronic. Once a diagnosis has been successfully treated, the health problem is closed. Similarly, a problem that has been solved can also become a closed problem.

All relevant closed diagnoses together form part of the past medical history. Accordingly, the past medical history consists of closed health problems from the patient's own documentation and the anamnestic information on important illnesses, accidents, maternities, and surgical procedures.

In the episode-oriented methodology, a complication or recurrence of a health problem is recorded and managed as a separate episode.

With a few exceptions, a closed health problem remains closed forever and should not be reactivated, i.e. set to *acute*. If the same health problem occurs again, a new episode must be created.

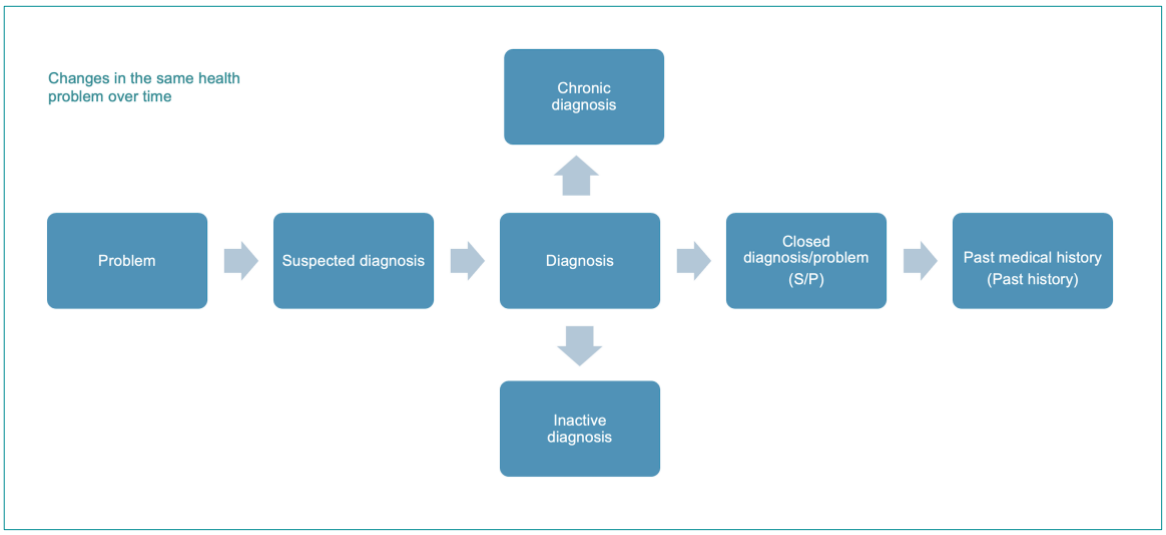


Figure 7- Health problem - Lifecycle during the course of the treatment

3.1.1 Attributes for a Health Problem (Episode)

Depending on the clinical situation and the status in the lifecycle of the health problem, different attributes are required for the health problem. Some attributes tend to be static, while others are updated each time the health problem is modified.

Versioning and maintaining links to the Electronic Medical Record (EMR) is essential for mapping the episode-oriented electronic medical record. At any point in time (contact), it must be possible to see what the health problem looked like at that time in the electronic health record.

Attribute	**Values**	**Explanations, comments**
Type	• Problem • Diagnosis	see lifecycle of health problem
Subtype	• Main problem/diagnosis • Secondary problem/diagnosis	
Status	• Active • Inactive • Closed	Active = problem or diagnosis requires diagnostic or therapeutic intervention. Inactive= Problem or diagnosis is not being addressed and is dormant.
Condition	• Suspected diagnosis • Confirmed diagnosis • Excluded diagnosis	Type = Diagnosis
Progression	• Acute • Chronic	Chronic = long-term diagnosis
Name - Prefix	• Blank • Suspicion of • Status after (S/N)	This allows the name to be automatically set for the display according to the lifecycle of the health problem without the need for the user to change the name.

Name	• free text and/or • Selection from clinical catalog	Original text ICD, ICPC not sufficient as name. Name must be historicized. The most recent name gives the episode its name. For efficient work, free text input with semantic reference to the code should be possible.
Localization	• irrelevant • left • right • on both sides • anatomical term	
Comments	• free text	Optional
Coding	• Nomenclature • Codes	ICD10, ICPC-2, SNOMED-CT etc.
Invoice Code	• Nomenclature • TI code	TI-code for outpatient billing in TARMED or TARDOC. Required for process automation in the information system.
Start Date	• date • Accuracy - Exact - To the month - Approximately to the month - To the year - Approximately to the year	Date of the start time of the problem, date of diagnosis (initial diagnosis or ID for short). Exact (day.month.year) Exact month: (month.year) Approximate month: (approx. month.year) Exact year: (year) Approximate year: (approx. year)
Start Date Age	• Age	Age of the patient at start time, calculated based on the date of birth
Security Level	• Unknown • Anamnestically confirmed • Clinically confirmed • Radiologically confirmed • Histologically confirmed	Primarily used when Type=Diagnosis
Event Type	• Illness • Accident • Maternity	When health problems are to be automatically transferred to the past hostory or for process automation in accounting. Maternity = pregnancies, abortions, births
Follow-up Event	• None • Complication • Recurrence	With link to the original health problem. Necessary to map total cost and quality
Past History	• Yes • No	Indicates whether a closed health problem becomes part of the past history
Treatment goal	• Definition • Timeframe	The treatment goal is agreed between the doctor and patient. The period required to achieve the goal is agreed between the doctor and patient.

Table 2- Attributes of health problem (episode)

3.1.2 Metadata for a Health Problem (Episode)

Depending on the status in the lifecycle of the health problem, different metadata are required for the health problem. Some metadata tends to be static, while others are updated each time the health problem is modified. Versioning and maintaining links to the Electronic Medical Record (EMR) is required to map the episode-oriented electronic medical record.

Attribute	Values	Explanations, comments
First Author	• ID creator • Title, last name, first name • ID Organization/Institution • Name of the organization/institution	ID = GLN, UID etc. Healthcare professional who created the health problem. Organization/institution where the healthcare professional worked at the time.
Recorder	• ID creator • Title, last name, first name • ID Organization/Institution • Name of organization/institution	ID = GLN, UID etc. Healthcare professional who recorded or arranged for this version to be recorded. Organization/institution where the healthcare professional worked at the time. In Switzerland, a distinction is made between the attending physician and the responsible physician. This distinction may need to be considered when automating billing processes.
User	• ID user • Last name, first name • ID Organization/Institution • Name of organization/institution	ID = GLN, UID etc. User who entered or edited the health problem. This can be the physician or, for example, a medical practice assistant (MPA) making a preliminary entry on behalf of the physician.
First contact	• Date, Time • Link to contact	Contact = Occasion, Encounter Contact whose documentation in the EMR led to the initial recording of the health problem
Last contact	• Date, Time • Link to contact	Contact = Consultation, Encounter Contact where medical information on this health problem was last documented in the EMR
Diagnostician	• ID creator • Title, last name, first name • ID Organization/Institution • Name of organization/institution	ID = GLN, UID etc. Healthcare professional who made the diagnosis.
Validations	• ID • Title, last name, first name • Timing	ID = GLN, UID etc. For example, the first author is an assistant physician. The attending physician validates the recorded health

		problem. The medical director performs the final validation.
Source	• Manual • Interface • Migration	- Manual = user at workstation. - Interface = automated entry into the EMR via an API. - Migration = entry into the current EMR as part of a data migration.
Documentation Timestamp	• Date • Time	Transaction date/time: Date/time when a version is saved in the Medical Record (EMR)
Versioning	• Version number • Link to previous entry	Essential for tracking changes

Table 3- Attributes Metadata on the health problem (episode)

3.2 Linear lists

Linear lists can be created automatically based on the stored individual health problems (episodes) and their attributes:

- Episode list
- Diagnosis list
- Problem list
- Personal medical history (past history)

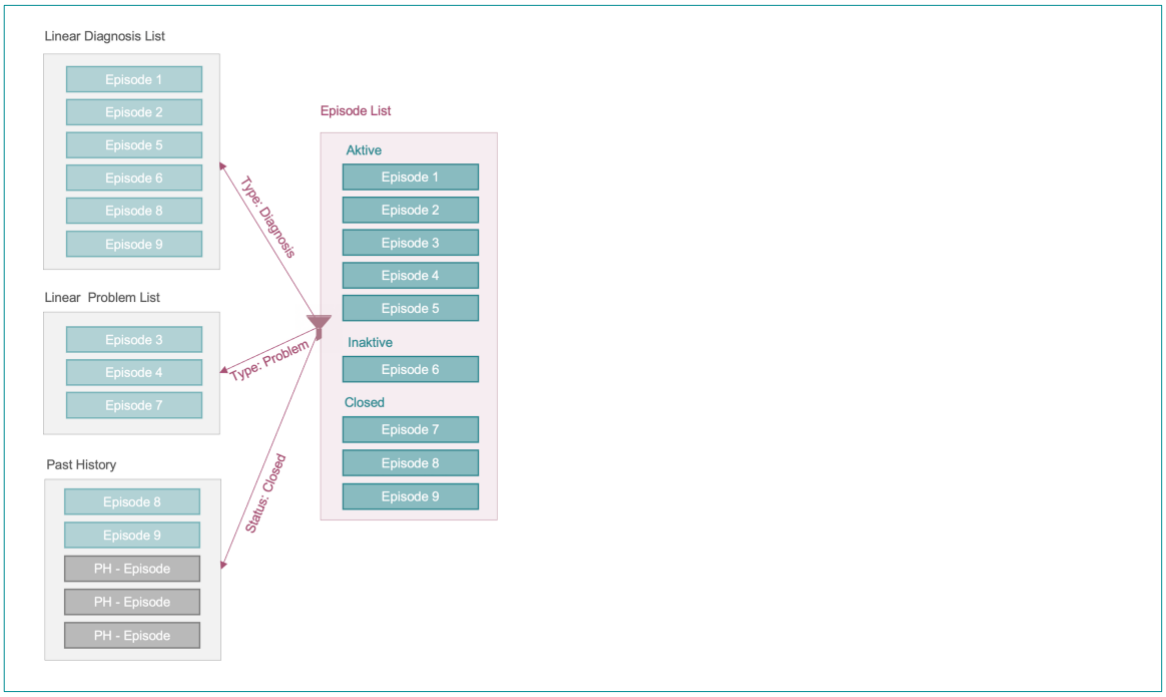


Figure 8- Health problems in list form

3.2.1 Episode list

The sum of all health problems results in a linear list of episodes, i.e. an *episode list*. The display can be grouped by further attributes, e.g. active, inactive and closed episodes, or filtered, e.g. only active episodes. Grouping active episodes into chronic and acute categories can also be helpful.

In patient care, the list of active episodes represents the health problems that the healthcare professional is diagnosing or treating. In this sense, it can be used to create an "agenda" for the encounter right out of the box.

3.2.2 Diagnosis list

A filter on the "Type" attribute (diagnosis, problem) of the episode list can be used to create a linear list of diagnoses. This list can be grouped, sorted, and further filtered according to various criteria.

3.2.3 Problem list

A filter on the "Type" attribute (diagnosis, problem) of the episode list can be used to create a linear list of problems. This list can be grouped, sorted, and further filtered according to various criteria.

3.2.4 Past history

A value can be set for closed health problems to indicate whether they are part of the past history or not. This allows closed health problems (episodes) to be displayed or automatically transferred to the past history. The past history itself can be grouped into illnesses or accidents using the *Event* attribute, or displayed chronologically using the date.

The more detailed considerations regarding the *past history* are described in a separate chapter below.

3.2.5 Persistence of user settings

It should be possible to persist the grouping, filtering, and sorting of a patient's episode list, diagnosis list, and problem list as set by the user or a user group.

3.3 Diagnosis and problem list

3.3.1 Overview

The *diagnosis and problem list* is not just a simple list but a structured hierarchy that integrates links to related diagnoses and problems (episodes) and other entries in the medical record.

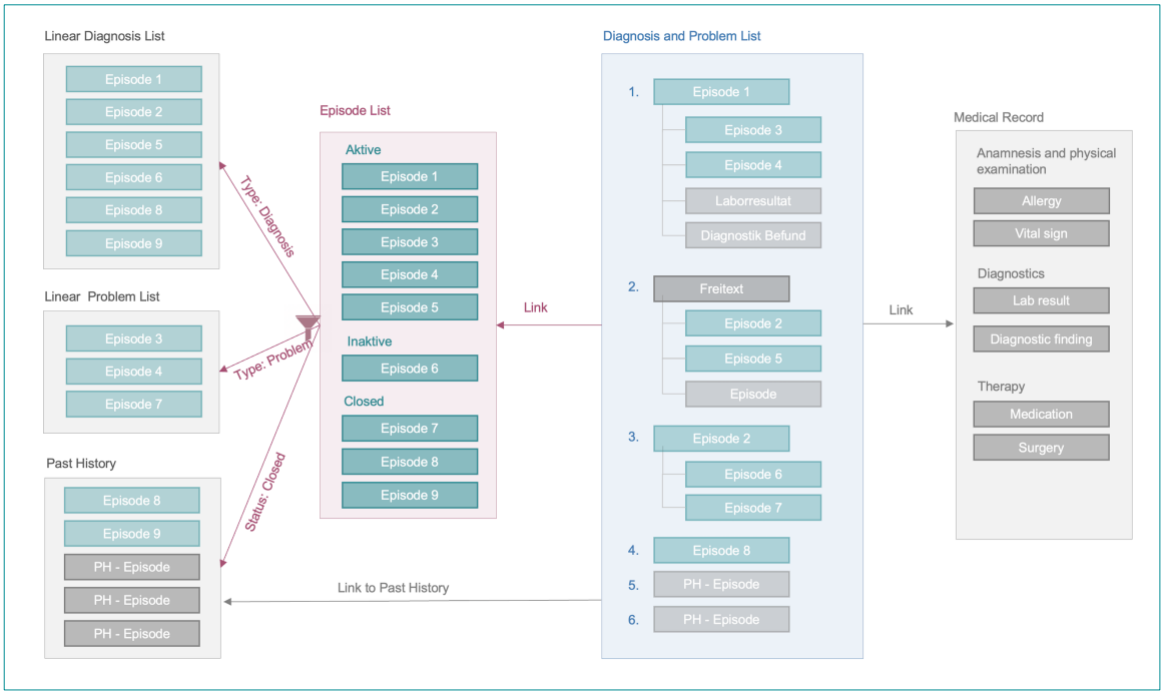


Figure 9- Diagnosis and Problem List in a linked tree

3.3.2 Hierarchical grouping

Problems and diagnoses are often related or interconnected in complex ways. Therefore, diagnoses and problems are hierarchically organized and numbered according to their importance to the patient. The grouping is based on medical aspects, with main diagnosis or superordinate term and the associated problems and diagnoses indented.

In addition, the *primary data* can be added to the hierarchical problem list for each diagnosis or problem. The primary data includes relevant anamnestic, clinical, and additional information with associated keywords, measurements, and links to other items in the structured medical record.

3.3.3 Tree structure

The diagnosis and problem list is a user-generated grouping of health problems (episodes) in a hierarchical data structure based on clinical criteria.

The diagnosis and problem list is therefore a tree structure with main nodes, sub nodes and end nodes, with each node serving primarily as a link to other medical information in the electronic medical record (EMR

Each individual node is one of the following:

- A link to a health problem (episode)
- A link to past history record
- A link to a structured medical record entry, such as anamnesis, physical examination, vital signs, allergies, laboratory values, brief diagnostic findings, medications, minor procedures, or surgeries
- Free text, entered by the user

In practice, two to three hierarchies are used.

The main nodes are numbered consecutively. When inserting new main nodes or rearranging the order of the existing main nodes, all main nodes are automatically renumbered consecutively, starting with 1. Sub nodes and end nodes are not numbered, but are visually linked.

The individual nodes can be freely moved by the user. When a node is moved, all its child nodes are automatically moved as well. This means that if a parent node is moved within the top level, all of its child nodes are automatically moved as well. As a result, an entire group can be moved within the top level, which users often do when reorganizing the main problems.

For links to structured information from the Electronic Medical Record (EMR), such as BMI, it must be possible to specify whether the link is a static link that displays the content at the time the link was created, or a dynamic link that always displays the current value.

3.3.4 Editing nodes

The node in the diagnosis and problem list is a link to a health problem (episode) or a structured information unit from the Electronic Medical Record (EMR). If the information displayed on a node is to be edited, this must be done on the linked item.

3.3.5 Remove

If desired, the user can remove a node. This removes the link from the list, while the linked item remains unchanged in the Electronic Medical Record (EMR).

3.3.6 History

Every change in the diagnosis and problem list tree structure should be logged. It should be possible to reconstruct the diagnosis and problem list for any point in time in the past.

3.3.7 Representation

Health problems can be represented in a medical information system as follows:

[Prefix] [Name] [Localization] [(Date)] [Coding]. For diagnoses, the prefix [ID] or [Initial Diagnosis] or [first diagnosed] may be added to the date.

Examples:

[Suspected] [humerus fracture] [left] [(14.01.2025),] [S52.50]
→ Suspected humerus fracture left (14.01.2025), S52.50

[Null] [Diabetes mellitus type 2] [Null] [(Initial Diagnosis 2004),] [E11.90]
→ Diabetes mellitus type 2 (Initial Diagnosis 2004), E11.90
→ Diabetes mellitus type 2 (ID 2004), E11.90

3.4 Context-related diagnosis and problem list

According to the patient-centered electronic medical record (EMR), there is a master diagnosis and problem list for each patient that reflects the grouping and prioritization of all diagnoses and problems from the patient's perspective.

However, in daily clinical practice, different versions of the diagnosis and problem list are required depending on the context:

- Specialist diagnosis and problem list (custom sorting, subset)
- Specific forms, checklists, and guidelines
- Reports, referrals

Accordingly, alternative sort sequences, groupings, or subsets are derived and persisted based on the master diagnosis and problem list. See the explanations in "*Defining The Contextual Problem List*"[7]

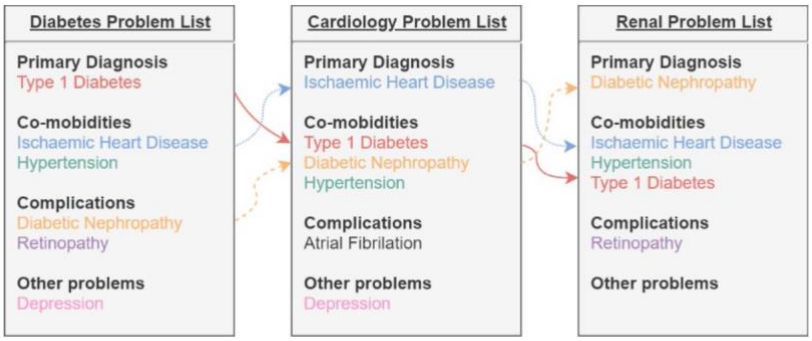


Figure 1. Shared problem records within three contextual problem lists.

In the medical information system, it must be possible to manage additional diagnosis and problem lists per specialty or organizational unit as a subset of the master list.

Report templates used for the automated generation of medical reports require different representations and selections of diagnosis and problem lists depending on the report type.

For diagnosis or problem specific forms, only the items relevant to that diagnosis or problem should be displayed. For example, in the case of a diabetes monitor.

3.5 The past medical history

The past medical history, or simply past history, includes the patient's relevant past illnesses, accidents, maternities, and surgeries. As listed in the lifecycle of a health problem, a relevant closed health problem (episode) is part of the past history. The past history consists of:

- Anamnestically recorded and documented past illnesses and accidents
- Anamnestically recorded and documented past surgeries
- Health problems recorded and closed in the organization's medical information system (EMR)
- Surgical procedures documented in the organization’s medical information system (EMR)

The past medical history can be modeled in a number of ways – either as a completely separate entity, or as a list derived from existing entries in the medical record, formed from closed health problems and surgical procedures.

With a completely separate past medical history entity, closed health problems and surgical procedures must be redundantly recreated.

In the case of a list derived from existing records, illnesses and accidents recorded in the past history must be directly documented as closed health problems.

There are advantages and disadvantages to both approaches. Typically, much of the past history is recorded in the diagnosis and problem list, making the second approach more advantageous. In particular, the links between the health problem and the rest of the Electronic Medical Record (EMR) are directly preserved. For example, all SOAP entries for the health problem remain accessible in the past history.

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[7] Meredith, J., McNicoll, I., Whitehead, N., & Ademoye, K. (2020). Defining the Contextual Problem List. In L. B. Pape-Haugaard, C. Lovis, M. Cort, P. Weber, & S. K. Andersen (Eds.), Digital Personalised Health and Medicine (pp. 567-571). IOS Press. https://doi.org/10.3233/SHTI200224

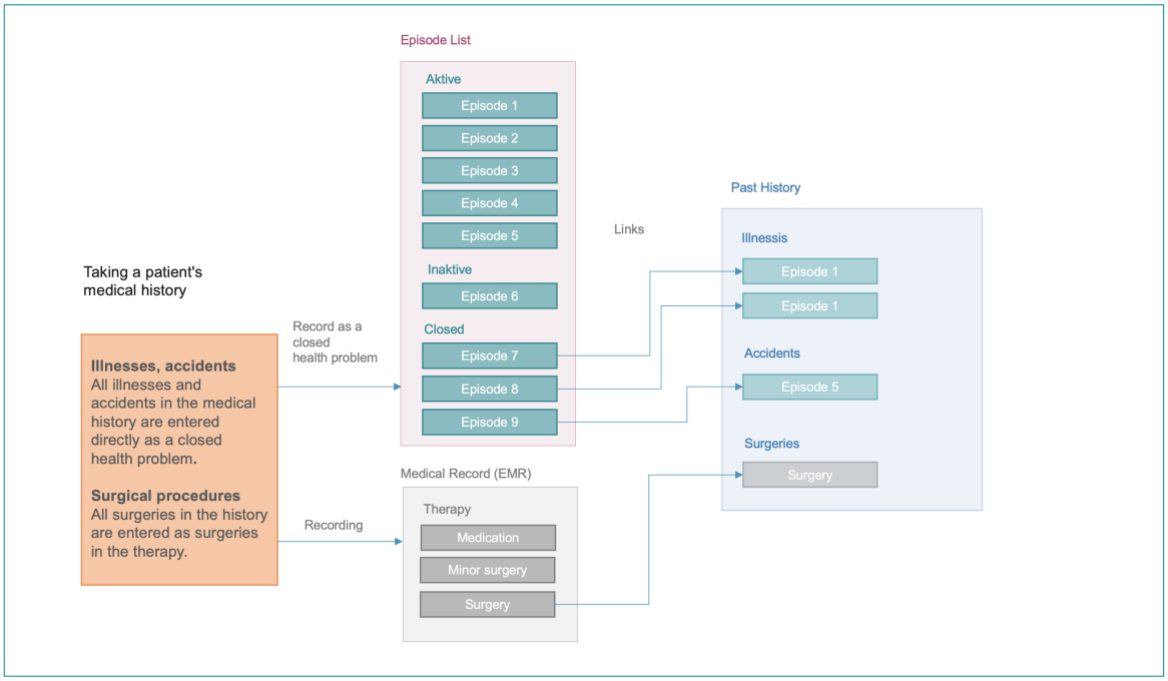

Figure 10- Past history with links to health problems and surgical procedures

4 Diagnosis and problem list examples

Examples from two ambulatory health medical information systems are included to illustrate specific aspects.

4.1 Medical Information System curaMED[8]

Health problems can be displayed on a medical dashboard in different lists, such as a linear diagnosis list, a linear problem list, a linear past history list, and a hierarchical diagnosis and problem list:

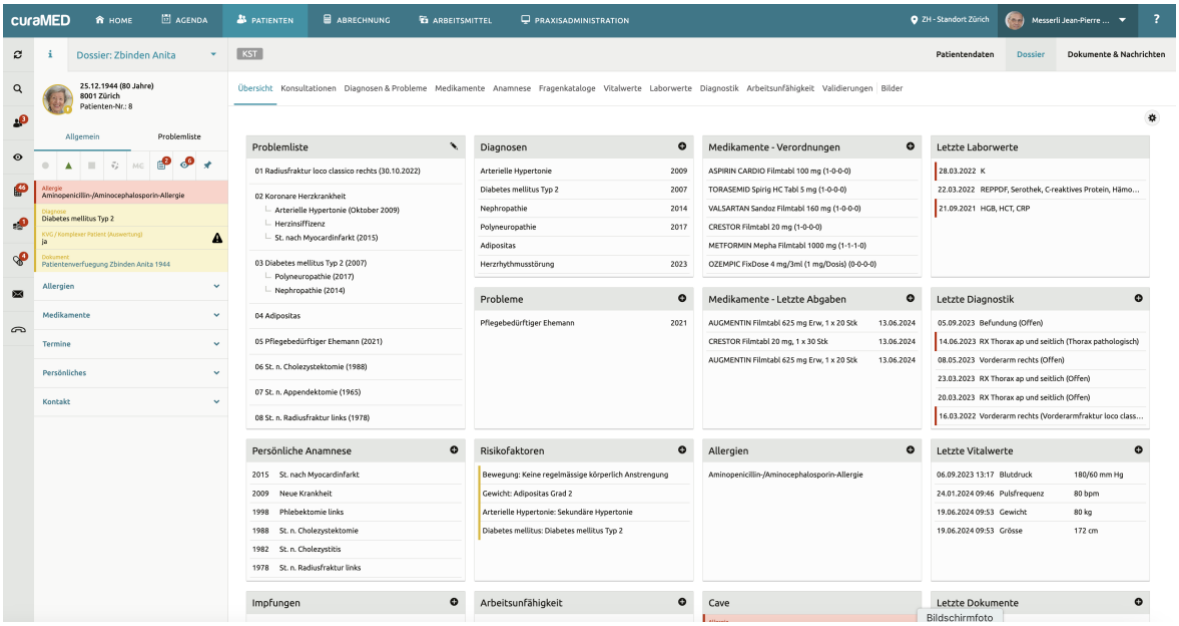

Figure 11 - Medical dashboard with different lists (MIS: curaMED)

In the editing view of the diagnosis and problem list, all problems, diagnoses, and past history entries are listed in the right area below the selection list and can be dragged and dropped to the desired position in the tree structure of the diagnosis and problem list.

In the diagnosis and problem list itself, a branch or a group can be moved within the tree structure. If necessary, a node can be entered as free text. Clicking on a node opens the editing window for the health problem or medical record entry.

[8] https://www.swisscom.ch/de/business/enterprise/angebot/health/solutions/curamed.html

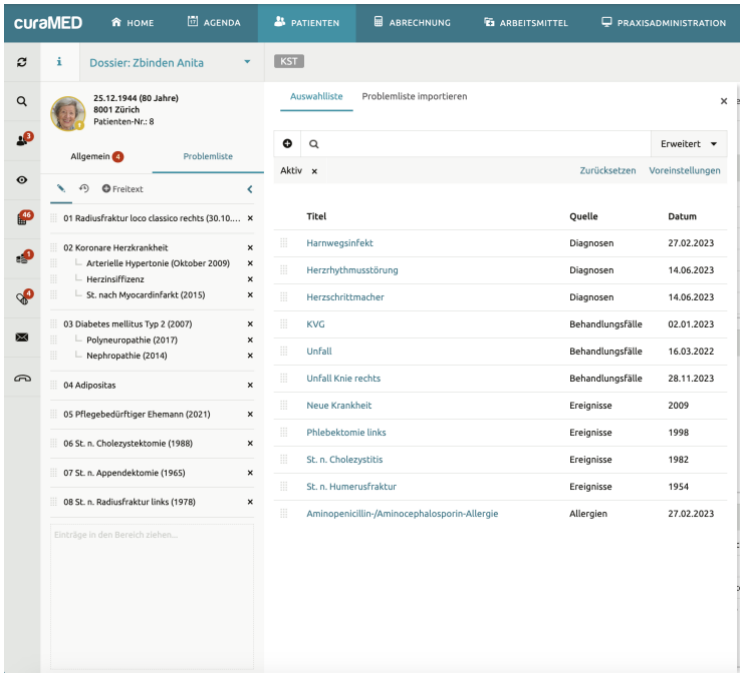

Figure 12- Editing the diagnosis and problem list as links to the EMR

4.2 Medical Information System triaMED© [9] [10]

The episode list is displayed as a linear list of health problems and can be sorted and filtered by various criteria, such as *active, inactive, closed,* or by *problem and diagnosis*.

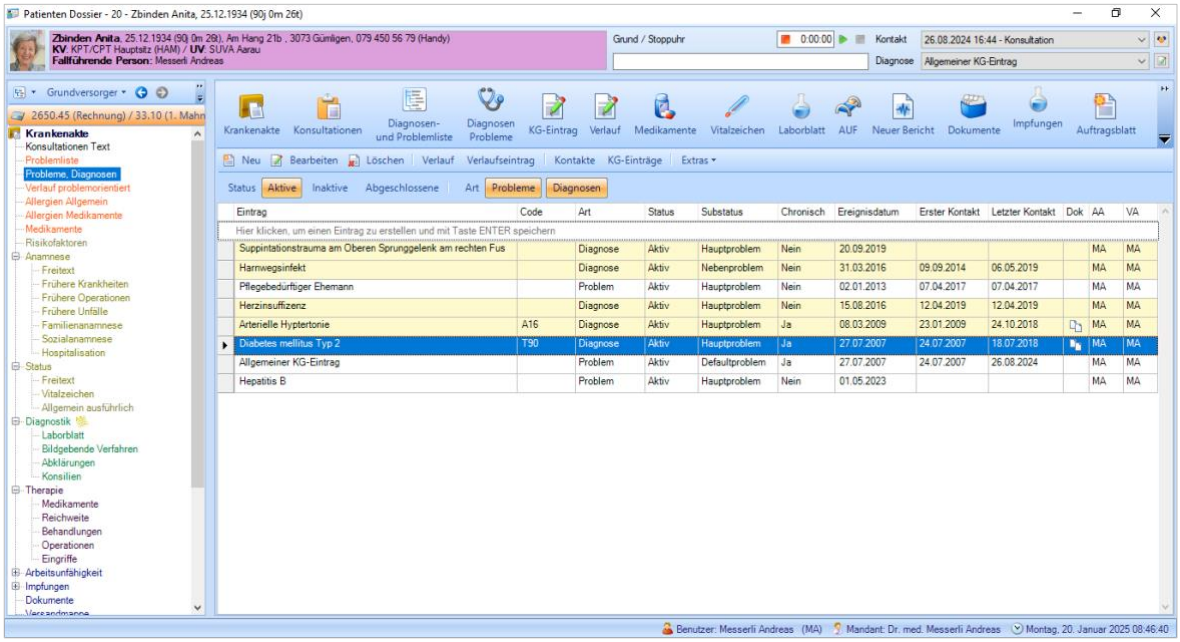

Figure 13- Episode list with filter (status = active, inactive, completed / problem, diagnosis)

[9] https://www.mytriamed.ch/triamed/DE/Produkt/Hauptmerkmale.aspx
[10] https://www.swisscom.ch/de/business/enterprise/angebot/health/solutions/triamed.html

According to the episode-oriented methodology, the health problem is linked to a contact and an episode and has various attributes. The attending physician and the responsible physician are stored together with the validation date. Various documents can be directly linked to the health problem. Coding is possible using different classifications.

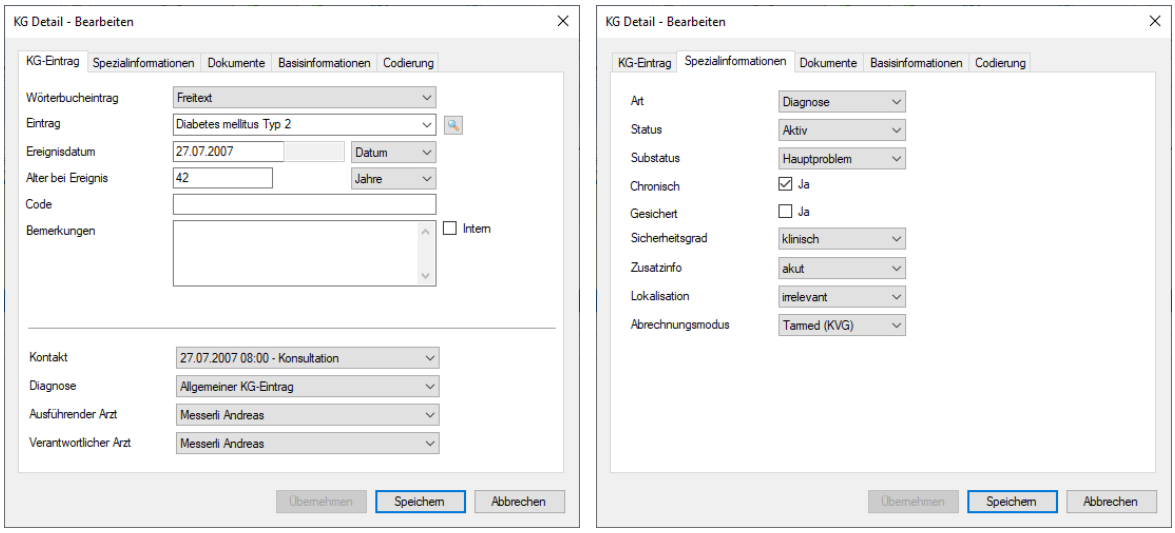

Figure 14- Health problem with varioust attributes

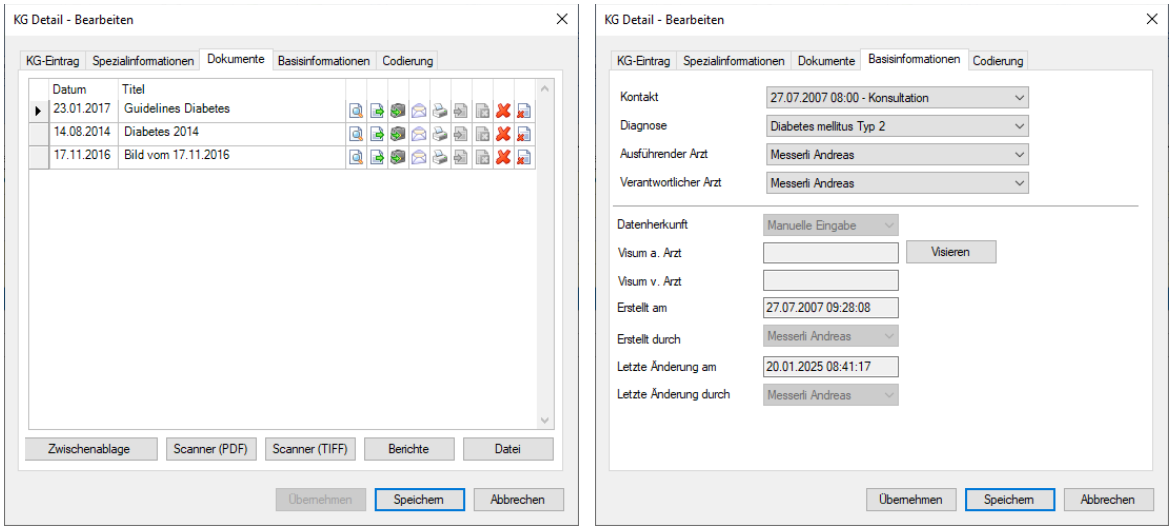

Figure 15- Health problem - links to documents and basic information

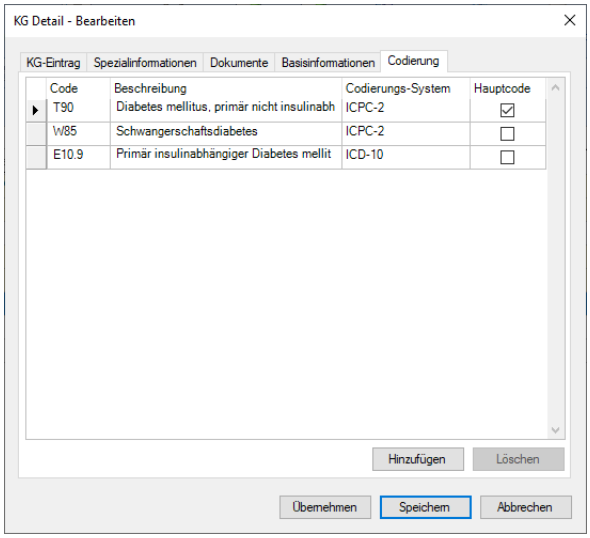

Figure 16- Health problem - Coding with different coding systems

In the edit view of the diagnosis and problem list, all health problems, a selection of the user-selected medical record items, and a context-sensitive diagnosis and problem list are listed on the right. These items can be dragged and dropped into the tree structure on the left and sorted. In the diagnosis and problem list, a branch or group can be moved within the tree structure. If necessary, a node can be entered as free text.

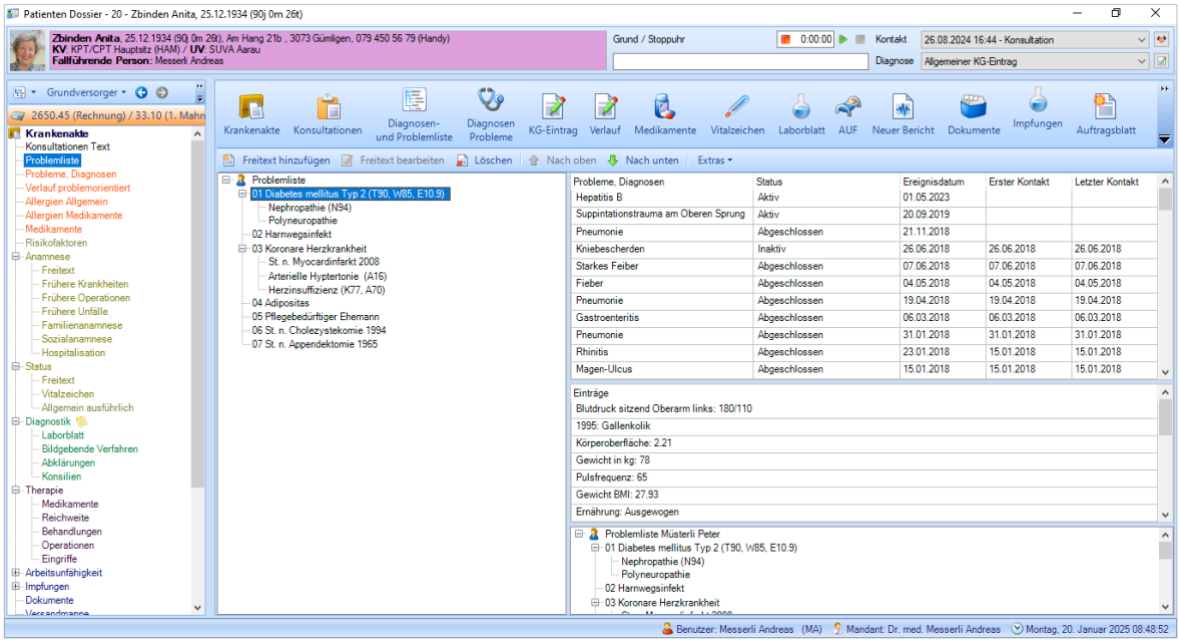

Figure 17- Editing the diagnosis and problem list

The health problems can be displayed on the medical dashboard as a linear diagnosis list, a linear problem list, a past history list, and a hierarchical diagnosis and problem list. Two linear lists have the filter set to Active.

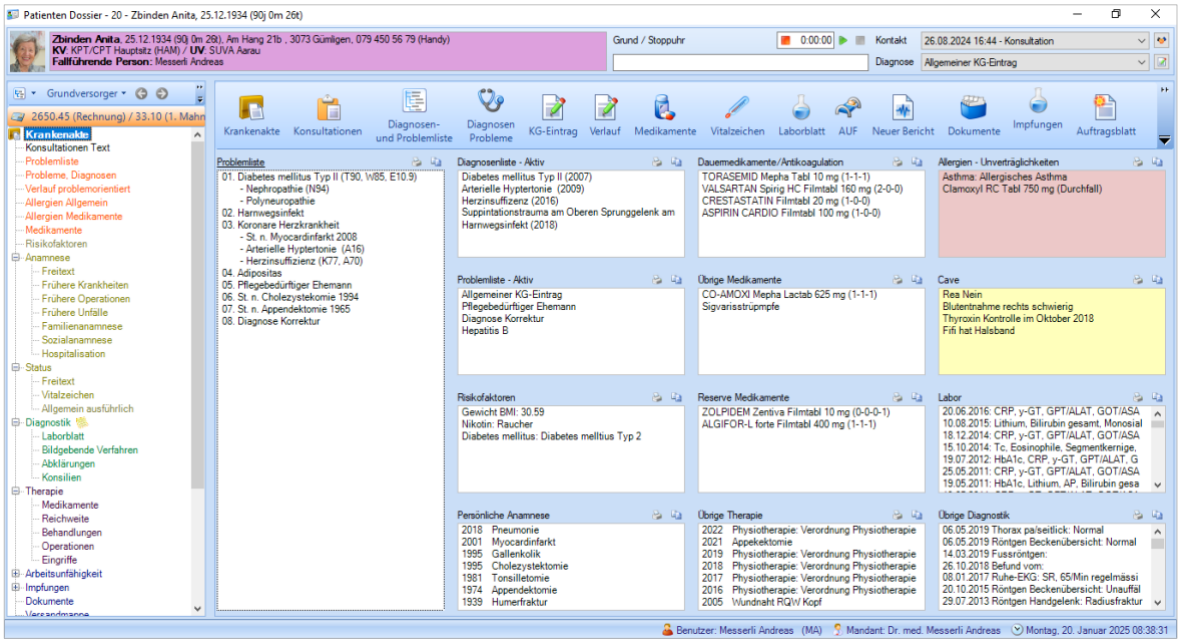

Figure 18- The Dashboard with a set of linear lists and the diagnosis and problem list

5 Directories

5.1 List of illustrations

5.2 List of tables

6 Glossary and list of abbreviations

6.1 Glossary

Term	Abbr.	Explanations	Source, standard
Diagnosis		Medical diagnoses are the classification of pathological processes into scientific terms	
Electronic Health Record	EHR	A systematic collection of electronically stored patient and population health data in a digital format. This data can be shared across healthcare organizations, facilitating seamless communication and continuity of care.	https://en.wikipedia.org/wiki/Electronic_health_record
Electronic Medical Record	EMR	An outpatient or inpatient electronic medical record that captures, stores, and manages a patient's health information in the primary system.	
Episode of Care	EoC	One or more contacts with one or more healthcare providers for the treatment of a health problem	

Healthcare professional	HCP	Professional recognized in Switzerland under federal or cantonal law who performs or prescribes treatment in the healthcare sector or dispenses therapeutic agents or other products in connection with treatment	https://www.e-health-suisse.ch/glossar
Medical record	MR	Complete medical documentation of a patient	
Service provider		Person in a company or organization who provides medical services for the treatment of patients, e.g. physician	
Nomenclature		A nomenclature (Latin: nomenclatura) is a set of guidelines for naming objects in a particular subject area. The totality of names in a subject area forms a terminology (e.g., SNOMED, LOINC)	
Ontology		An ontology is the most comprehensive structure that not only contains terms and classifications, but also defines the relationships between terms and their properties based on the underlying terminologies	
Organization		Healthcare institution that provides medical services	
Personal Health Record	PHR	Personal Health Records are electronic applications that allow patients to manage their health information in a private, secure, and confidential environment	https://www.healthit.gov/faq/what-personal-health-record
Problem		A problem is a patient health issue that requires either diagnostic or therapeutic intervention	

6.2 Abbreviations

Abbreviation	**Explanations**
EoC	Episode of Care
EHR	Electronic Health Record
EMR	Electronic Medical Record
HCP	Healthcare Professional
MR	Medical record
PHR	Personal Health Record
POMR	Problem Orientated Medical Record
SOAP	Subjective - Objective - Assessment - Plan