

Health informatics— Electronic Healthcare record communication —

Part 4: Messages for the exchange of information

ICS 35.240.80

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National foreword

This Draft for Development is the English language version of ENV 13606-4:2000.

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It is being issued in the Draft for Development series of publications and is of a provisional nature due to the limited duration of the European Prestandard. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the European organization responsible for its conversion into a European Standard. A review of this publication will be initiated 2 years after its publication by the European organization so that a decision can be taken on its status at the end of its three-year life. The commencement of the review period will be notified by an announcement in *Update Standards*.

According to the replies received by the end of the review period, the responsible BSI Committee will decide whether to support the conversion into a European Standard, to extend the life of the prestandard or to withdraw it. Comments should be sent in writing to the Secretary of BSI Technical Committee IST/35, Medical informatics, at 389 Chiswick High Road, London W4 4AL, giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

Summary of pages

This document comprises a front cover, an inside front cover, the ENV title page, pages 2 to 188, an inside back cover and a back cover.

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English version

Health informatics - Electronic healthcare record communication - Part 4: Messages for the exchange of information

This European Prestandard (ENV) was approved by CEN on 29 July 1999 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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FOREWORD

This European Prestandard has been prepared by Technical Committee CEN/TC 251 "Health informatics", the secretariat of which is held by SIS.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This is Part 4 of a multipart standard on *Electronic Healthcare Record Communication*.

The multipart standard consists of the following parts:

- Part 1: Extended Architecture
- Part 2: Domain Term List
- Part 3: Distribution Rules
- Part 4: Messages for the Exchange of information

This Prestandard was drafted using the conventions of the ISO/IEC directive part 3.

All annexes of Part 4 are Informative.

INTRODUCTION

This European Prestandard provides a set of messages that enable the electronic transfer of healthcare record information between heterogeneous systems. These messages address the needs and capabilities of current healthcare record systems. They also take account of the more sophisticated requirements of future systems.

A combination of the following factors provide the motivation for this European Prestandard:

- Many hospitals, clinics and doctors now store the healthcare records of their patients in an electronic form.
Current electronic healthcare record systems are heterogeneous in nature. They store information in a variety of structures that differ in their levels of detail and sophistication. Some differences are idiosyncratic but others reflect variations in user requirements determined by organisational structures or clinical specialties.
- Timely availability of healthcare records is essential to the safe delivery of high quality healthcare.
Healthcare professionals need access to a patient's healthcare record to inform their decisions. If necessary information is not available, this leads to errors, delays or repetition of procedures. The end results of missing information include health risks, inconvenience for the patient and expense for the service provider.
- During their lifetime patients are cared for by more than one healthcare professional.
Patients may see a different healthcare profession when they move home, travel or require care out of the normal working hours of their usual physician. Patients may receive continuing care from a team of professionals or from a combination of specialists relevant.
- Timely availability of healthcare records requires communication between different healthcare professionals who care for the same patient.

Since the professionals involved will often have different electronic healthcare record systems, these communications usually involve paper reports or unstructured electronic exchanges. The relative inaccessibility of information received in these forms detracts from the quality, completeness and usability of the electronic healthcare record.

Implementation of the messages specified by this European Prestandard will:

- a) facilitate the transfer of electronic healthcare records or parts of these records;
- b) enable the communication of requests for transfer of electronic healthcare records;
- c) reduce the need for human intervention to manually duplicate entries in different healthcare record systems;
- d) minimise the time and effort required for the introduction of information interchange agreements that support the exchange of electronic healthcare record information;
- e) reduce the development effort required by suppliers to allow their systems to communicate with a wide range of other electronic healthcare record systems;
- f) reduce the cost of information interchange between clinical information systems.

When implementing information exchange based on this European Prestandard, data security services, including confidentiality provisions, will need to comply with the laws in force in the different CEN member countries. Other European Prestandards currently under development address technical issues relating to meeting this need.

This European Prestandard has been developed following the methods recommended in the CEN Report on "Medical Informatics - Methodology for the development of healthcare messages" (CR 12587:1996). However, in accord with the decisions of CEN TC251 WGI, a different modelling technique has been used. This is a subset of the Unified Modelling Language (UML) as documented in Annex A.

This European Prestandard specifies messages in a syntax independent form. Its requirements for conformance define the minimum acceptable content and structure for these messages. Compliant messages can be developed in a variety of implementation syntaxes and these syntax specific implementations may be the subject of future Standards.

This European Prestandard is directly relevant to suppliers of computer systems for use in hospitals, general practices, clinical departments and specialist clinics. Its provisions are also relevant to those planning, specifying, procuring or implementing information systems for use in departments, hospitals, general practices, clinical departments and specialist clinics.

1. Scope

This European Prestandard specifies messages that enable exchange of electronic healthcare record information between healthcare parties responsible for the provision of clinical care to an individual patient. These messages allow information from an electronic healthcare record held by one health professional to be sent to another health professional.

The messages specified by this European Prestandard can be used to convey:

- a complete copy of a patient's record as stored in one information system;
- parts of a patient's record that form a logically sound extract or summary of that record;
- parts of a patient's record used for updating a parallel record on another system.

The primary purpose of these messages is to support the provision of care to individual patients. The availability of consistent, continuing clinical care, when and where it is needed, requires appropriate and unambiguous communication between clinical professionals. The messages specified by this European Prestandard are designed to meet this requirement by enabling users of different clinical information systems to exchange electronic healthcare record information. Implementation of these messages will therefore assist the maintenance of timely and appropriate patient records.

This European Prestandard considers two distinct properties of electronic health record communication.

- a) Readability
 - Communication of information in a form that can be rendered human-readable by the receiving system. If the exchange of electronic healthcare record information is to support individual patient care, clinicians using the receiving system need to be able to read and understand the transferred information.
- b) Processability
 - Communication of information that can be incorporated into a record held by the receiving system in a way that enables it to be processed and retrieved as an integral part of that record. The benefits of electronic healthcare records include retrieval and processing for decision support, audit and research. If these benefits are to be fully realised, systems need to be able to process received information in ways that, while recognising the source of that information, are otherwise consistent with the processing of locally recorded information.

The European Prestandard specifies messages that permit exchange of electronic health record information with different levels of structure. The least structured level is sufficient to enable any receiving system to render the information in a human-readable form. The more structured levels enable information to be transferred in a manner that facilitates subsequent retrieval and processing.

The ability of communicating systems to achieve a particular level of interoperability by using these messages depends on:

- the compatibility of the structures in which the systems store patient records;
- the mappability of different forms of representation used by those systems (e.g. languages, terminologies and coding schemes);
- the level of trust between the communicating parties.

These factors will therefore determine how the messages specified by this European Prestandard are used.

This European Prestandard takes account of the following issues related to the confidentiality, source and status of the transferred information.

- *Distribution* – The messages include provisions for conveying and referencing distribution rules in the form specified in Part 3 of this European Prestandard. These distribution rules are intended to govern subsequent distribution of information. These rules may be applied to the entire message or to individual components within the message. This European Prestandard does not mandate a particular mechanism for the enforcement of distribution rules.
- *Attribution* – The messages support communication of attribution details regarding the originator and time of origin of information. Attribution information, including digital signatures, may be applied to the entire message or to individual components within the message. This European Prestandard does not mandate a particular mechanism for secure verification of digital attribution information. However, the algorithm specified in ENV12388 may be used for this purpose subject to the agreement of the communicating parties.

- *Integration* – The messages support the communication of information in a way that allows receiving systems to distinguish new information from information that they have already received.

Specific security requirements and the mechanisms to be used to meet these requirements are outside the scope of this European Prestandard. Implementers of the messages specified by this European Prestandard should ensure that the security mechanisms used satisfy national and international legislation, user requirements and ethical guidance.

The messages specified by this European Prestandard are general in nature. They meet the requirements for transferring electronic healthcare record information in a manner appropriate to a wide-variety of situations covering all clinical professions and specialties. However, to maximise the processability of communicated information for particular purposes, a specific profile of the messages specified in this European Prestandard may be required. A profile may restrict the degrees of freedom inherent in the general message and may specify additional types of data item that can be used within a communicating community.

The messages described in this European Prestandard are based on the architectural principles stated in Part 1 of this European Prestandard. This does not preclude the use of this message for communications between systems that do not conform to Part 1. The message applies the architectural principles in a way that facilitates clinically safe communication even between systems with widely different record structures. However, the faithfulness of communication of the structural richness of an electronic record will be greater in the case of systems that comply with or are closely aligned with all parts of this European Prestandard.

The messages specified by this European Prestandard are primarily aimed at conveying character-based information between systems. The messages also provide for references to binary objects, which may form part of an EHCR. However, the European Prestandard does not specify the format of such binary objects, nor does it specify the methods by which they shall be communicated or made available to a receiving system.

Communication of EHCR information is often associated with specific requests for intervention by or advice from the recipient of this information. The response from the recipient of EHCR information may similarly be accompanied by a specific report that they have undertaken (or have accepted responsibility for undertaking) a requested service. The messages specified in this European Prestandard are not designed for communication of these requests or reports, as these are standardised by previous European Prestandards¹. However, if such communications require the exchange of detailed EHCR information the messages or components defined in this European Prestandard may be used for that purpose. To facilitate this, the "EHCR extract" class specified in this European Prestandard may be used in place of the "Clinical Information" class in messages specified in previous European Prestandards for healthcare messages.

The messages specified by this European Prestandard are not designed for communication with intermittently connected devices such as patient data cards. However, due account has been taken of the relevant European Prestandard covering this domain (ENV12018).

These messages are not validated for the exchange of EHCR information for other purposes such as administration, resource allocation, research or quality monitoring.

¹ ENV1613 "Medical Informatics - Messages for exchange of laboratory information", ENV12538 "Medical Informatics - Messages for patient referral and discharge" and ENV 12539 "Medical Informatics - Request and report messages for diagnostic service departments".

2. Normative References

This European Prestandard incorporates by dated or undated references, provisions from other publications. These normative references are cited in the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments and revisions of any of these publications apply to this European Prestandard only when they are incorporated in it by amendment and revision. For undated references the latest edition of the publication referred to, applies.

ISO639:1988	Symbols for languages, geographical areas and authorities
ISO6523	Data interchange - Structure for the identification of organizations.
ISO2382-4:1987	Information processing - Vocabulary Part 4: Organisation of data
ISO5281:1977	Information interchange - Representation of human sexes
ISO/IEC 7826-1	Information technology – General structure for the interchange of code values – Part 1: Identification of coding schemes
ISO/IEC 7826-2	Information technology – General structure for the interchange of code values – Part 2: Registration of coding schemes
ISO8601: 1988	Data elements and interchange formats - Information interchange - Representation of dates and times
ENV 1613:1995	Medical informatics - Messages for exchange of laboratory information
ENV 1614:1995	Medical informatics - Structure for nomenclature, classification, and coding of properties in clinical laboratory sciences
ENV 12018:1997	Medical informatics - Identification, administrative and common clinical data structure for Intermittently Connected Devices used in healthcare (including machine readable cards)
ENV 12265	Medical informatics - Electronic healthcare record architecture
ENV 12381:1996	Medical informatics - Time standards for healthcare specific problems
ENV 12388:1996	Medical informatics - Algorithm for Digital Signature Services in Health Care
ENV 12435	Medical informatics - Expression of the results of measurements in health sciences
ENV 12537-1:1997	Medical informatics - Registration of information objects used for EDI in healthcare - Part 1: The Register
ENV 12537-2:1997	Medical informatics - Registration of information objects used for EDI in healthcare - Part 2: Procedures for the registration of information objects used for electronic data interchange (EDI) in healthcare
ENV 12538:1997	Medical informatics - Messages for patient referral and discharge
ENV 12539:1997	Medical informatics - Request and report messages for diagnostic service departments
CR 12587:1996	CEN Report: Medical informatics - Methodology for the development of healthcare messages
ENV 12612:1997	Medical informatics - Messages for the exchange of healthcare administrative information
ENV 13606-:2000	Electronic healthcare record communication – Extended architecture
ENV 13606-2:2000	Electronic healthcare record communication – Domain term list
ENV 13606-3:2000	Electronic healthcare record communication – Distribution rules
ENV 13607:2000	Health Informatics - Messages for The Exchange of Information on Medicine Prescriptions

3. Definitions

For the purpose of this European Prestandard, the following definitions apply:

3.1.

annotation identifier

a means to summarise the key contextual information pertaining to a component complex or a data item.

NOTE the annotations are added to the record component as a coded value. The *component annotation* measure within Part 2 provides a means to summarise in a standardised form the key contextual information pertaining to an elementary or compounded entry, primarily to assist in its safe interpretation. A secondary purpose is to facilitate the retrieval of relevant entries by computerised searches. See Part 2 for more details.

3.2.

attestation

a binding of the healthcare agent (with digital signature) to a unit of information content to confirm the acceptance of the content.

3.3.

clinical information

information about a patient, relevant to the health or treatment of that patient, that is recorded by or on behalf of a healthcare professional.

NOTE Clinical information about a patient may include information about the patient's environment or about related people where this is relevant.

3.4.

cluster

original component complex used to aggregate data items and/or other clusters to represent a compound concept.

EXAMPLES A blood pressure measurement consisting of systolic and diastolic pressure, a collection or closely related clinical findings, results of a battery of laboratory investigations, a treatment schedule consisting of several individually specified preparations or dosages.

3.5.

code meaning

element within a coded set.

EXAMPLE "Paris Charles-De-Gaulle" which is mapped on to the three-letter abbreviation "CDG" by the coding scheme for three-letter abbreviations of airport names.

3.6.

code value

result of applying a coding scheme to a code meaning.

EXAMPLE "CDG" as the representation of "Paris Charles-De-Gaulle" in the coding scheme for three-letter representations of airport names.

3.7.

coding scheme

collection of rules that maps the elements of one set on to the elements of a second set.

3.8.

communicating community

geographically or organisationally defined grouping of healthcare parties that agree to communicate, subject to an agreed set of constraints or guidelines.

3.9.

component name

attribute that is used to provide a title or label to an instance of an EHCR message component.

3.10.

component name category

attribute that provides a high level indication of the general nature of the content of a record component.

NOTE 1 These categories are assigned by or derived from the EHCR, depending upon the nature of the data or the process being carried out.

NOTE 2 See Part 2 for permissible values for different types of record component.

3.11.

composition

original component complex that contains a set of record components relating to one time and place of care delivery, a single session of recording or a single document included in the EHCR.

EXAMPLES Consultation note, operation note, discharge summary, vital signs chart, laboratory report.

3.12.

data item

single unit of data that in a certain context is considered indivisible.

NOTE 1 The content of data is dependent upon the structure and type of the identified data type.

NOTE 2 The context may mean that this component's content may represent for example either a single clinical statement (see Part 2) or a single complex type such as an X-ray report. Its granularity is determined by the context.

3.13.

digital signature

data appended to, or a cryptographic transformation of, a data unit that allows a recipient of a data unit to prove the source and integrity of the unit and protect against forgery e.g. by the recipient.

[ISO 7498-2]

3.14.

distribution rule

logical concept or rule intended to convey and govern distribution.

NOTE The form of representation of EHCR distribution rules is the subject of Part 3 of this Prestandard.

3.15.

distribution rule reference

attribute referencing a distribution rule.

3.16.

domain information model

DIM

conceptual model describing common concepts and their relationships for communication parties required to facilitate exchange of information between these parties within a specific domain of healthcare.

3.17.

electronic healthcare record

EHCR

healthcare record in computer readable form.

3.18.

electronic healthcare record architecture

a set of principles governing the logical structure and behaviour of electronic healthcare records that enables communication of the whole or part of a healthcare record.

3.19.

EHCR destination

communicating party that is the destination or intended of EHCR information that is requested, transferred or acknowledged in an EHCR message.

3.20.

EHCR extract

EHCR message component representing the entirety of a patient's electronic healthcare record or that part of the record contained within a particular instance of an EHCR message.

3.21.

EHCR source

communicating party that is the source or intended source of EHCR information that is requested, transferred or acknowledged in an EHCR message.

3.22.

EHCR message

generalisation applicable to all messages specified by this Prestandard for the purposes of requesting or providing EHCR information or for notifying another communicating party about this process.

3.23.

EHCR message component

part of an electronic healthcare record contained within an EHCR message in a form that renders it identifiable for the purposes of referencing and revision.

NOTE This European Prestandard specifies two types of EHCR message component. These are the "EHCR extract" and the "record component".

3.24.

EHCR message related agent

communicating party other than the source, intended source, destination or intended destination of EHCR information.

EXAMPLES Intermediary, forwarding agent, copy destination, trusted third party authenticating a request or provide EHCR message.

3.25.

EHCR notification message

message specified by this Prestandard for the purpose of conveying notifications about the sending, receipt, rejection or acceptance of a *request EHCR message* or *provide EHCR messages*.

3.26.

EHCR source

communicating party that is the source or intended source of EHCR information that is requested, transferred or acknowledged in an EHCR message.

3.27.

EHCR system

system for recording, retrieving and manipulating information in electronic healthcare records.

3.28.

folder

original component complex used to group record components collected and/or recorded during several contacts with a patient.

NOTE A folder may include information collected and recorded at different times and by different people.

3.29.

general message description

GMD

subset of a domain information model prescribing the information content and semantic structure of a message used to meet one or more identified information interchange requirements.

NOTE General message descriptions are independent of the syntax used for constructing an actual message. They provide statement of the information interchange requirements in a form that can be implemented using different syntaxes.

3.30.

headed section

original component complex representing a sub-division within a composition, the contents of which have a common theme or are derived through the same healthcare process.

3.31.

healthcare agent

healthcare person, healthcare organisation, healthcare device or healthcare software component that performs a role in a healthcare activity.

3.32.

healthcare agent function

reference to a healthcare agent that identifies them *only* in terms of their function in relation to another healthcare agent and not by an individual name or identifier.

NOTE The healthcare agent function allows a record component or message to refer to healthcare agents who are not individually identified at the time of recording.

EXAMPLE To send a message to the “duty doctor” in an emergency department, to indicate the contact details for a specialist’s secretary, to distinguish between the parts of a pre-operative assessment applicable to the “anaesthetist”.

3.33.

healthcare agent in context

one or more healthcare agents related together in a specified manner for the purposes of performing a particular role in a healthcare activity.

3.34.

healthcare agent in context reference

reference which uniquely identifies a healthcare agent in context.

NOTE: Use of a healthcare agent in context reference depends on the existence of shared information describing the healthcare agent in context to which it refers.

3.35.

healthcare agent role

role played by a healthcare agent (or by a healthcare agent in context) in a healthcare activity.

EXAMPLES Originator or author of a record entry, requester of a service, provider of a service, sender of a message, recipient of a message, person signing a message or record entry.

3.36.

healthcare agent relationship

relationship between two healthcare agents.

NOTE 1 A healthcare agent relationship may apply for a specified period of time.

EXAMPLE 1 Employee / employer

NOTE 2 A healthcare agent relationship may be specific to a particular healthcare agent role.

EXAMPLE 2 On behalf of / responsible for.

3.37.

healthcare device

device or equipment involved in the direct or indirect provision of healthcare services to an individual or to a population.

EXAMPLE ECG machine, auto-analyser, syringe pump.

3.38.
healthcare organisation

organisation involved in the direct or indirect provision of healthcare services to an individual or to a population.

NOTE Groupings or subdivisions of an organisation, such as departments or sub-departments, may also be considered as organisations where there is need to identify them.

3.39.
healthcare party

organisation or person involved in the direct or indirect provision of healthcare services to an individual or to a population.

3.40.
healthcare person

person involved in the direct or indirect provision of healthcare services to an individual or to a population.

NOTE A carer or the patient may be a healthcare person. This enables the role of the patient in providing his/her own care to be recorded.

EXAMPLE Primary care physician, dentist, nurse, social worker, pharmacist, medical secretary.

3.41.
healthcare record

repository of information regarding the health of a subject of care.

3.42.
healthcare service

service provided with the intention of directly or indirectly improving the health of the person or populations to whom it is provided.

3.43.
healthcare software

software component involved in the direct or indirect provision of healthcare services to an individual or to a population.

EXAMPLE: EHCR system, decision support software, viewing tools.

3.44.
implementable message specification
IMS

specification of a general message description in a particular message syntax.

3.45.
interchange format

specification of a message type according to a given message syntax, covering the identification of the message type components, their arrangement, representation and interrelationships.

3.46.
International Coding Scheme Identifier
ICSI

unique permanent identifier of a coding scheme as specified by ISO 7826-1.
[ISO7826]

3.47.
link set item

record component that provides a means of associating two or more other instances of EHCR message component, and specifying the relationship between them.

NOTE The link set item is used to convey a collection of one or more link items (defined in accordance with Part 1 of this Prestandard) for which both the link source component and relationship are identical.

3.48.
message profile

specification derived from an implementable message specification by selecting its optional elements, appropriate to the specific business requirements of the communicating parties.

3.49.
message syntax

system of rules and definitions specifying the basic component types of messages, their interrelationships and their arrangement.

3.50.
message type

identified, named and structured set of functionally related information which fulfils a specific business purpose.

3.51.
multiplicity

expression of the number of instances of one class that may be part of or associated with another class.

NOTE The term cardinality has been used in earlier related European Prestandards. However, following the decision to use UML as the modelling notation the term multiplicity is more appropriate. In UML "cardinality" refers to the actual number of members of a set of relations. The term "multiplicity" is used to refer to the "allowable cardinalities" and this is the sense in which this concept is represented in this Prestandard.

3.52.
organisation

unique framework of authority within which a person or persons act, or are designated to act towards some purpose.

NOTE Groupings or subdivisions of an organisation may also be considered as organisations where there is need to identify them for information interchange.

[ISO 6523-1984]

3.53.
original component complex
OCC

record component representing an aggregation of other record components that is determined by the time and situation in which they were originally added to the EHCR.

3.54.
original information context

topological placement and position of data in the EHCR as entered by an authoring healthcare agent, be that person, software or device.

3.55.
provide EHCR message

message specified by this Prestandard for the purpose of conveying EHCR information between two healthcare agents.

3.56.
record component
component

part of an electronic healthcare record that is identifiable for the purposes of referencing and revision.

3.57.
request EHCR message

message specified by this Prestandard for the purpose of conveying a request for EHCR information between two healthcare agents.

3.58.

selected component complex

SCC

record component representing an aggregation of other record components that is *not* determined by the time or situation in which they were originally added to the EHCR.

NOTE Selected component complexes are used to provide alternative views or groupings of records. They can represent the record as viewed at a particular time or they can represent groupings of clinically or logically associated record components.

3.59. Abbreviations

The following abbreviations are used for the terms defined in this European Prestandard.

DIM	Domain Information Model
DTD	Document Type Definition
EHCR	Electronic Healthcare Record
GMD	General Message Description
GP	General Practitioner
HGMD	Hierarchical General Message Description
ICSI	International Coding Scheme Identifier
IMS	Implementable Message Specification
MIG	Message Implementation Guide
OCC	Original Component Complex
SCC	Selected Component Complex
UML	Unified Modelling Language
XML	Extensible Markup Language

4. Communication roles

4.1. General

This clause defines the communication roles applicable to the exchange of electronic healthcare record in a manner that is compliant with this European Prestandard. It establishes the relationships between the communication roles and the General Message Descriptions (GMDs), as well as the relationships between the messages defined by the GMDs.

4.2. Communication roles for different messages

The following messages are defined in this European Prestandard:

- *request EHCR message*;
- *provide EHCR message*;
- *EHCR notification message*.

For each of these messages there are two primary communication roles:

- The message originator role (the sender)
- The message destination role (the intended recipient)

During a series of exchanges relating to a single EHCR transfer, the same healthcare party may be both a sender and recipient of messages. For example, the originator of a request will be the recipient of a response to that request. Rather than considering the role in respect of a particular message, this European Prestandard refers to healthcare parties according to the roles played in a sequence of messages related to one EHCR transfer. These roles are:

- The *EHCR source* – the current holder of EHCR information that is requested, transferred or acknowledged.
- The *EHCR destination* – the requester or recipient of the EHCR.

The same healthcare party may act as an *EHCR source* and an *EHCR destination* in respect of different messages. For example, the *EHCR destination* for one *provide EHCR message* may be the *EHCR source* for another *provide EHCR message*.

Other healthcare parties may play secondary roles in the communication of the EHCR. Examples of these roles include:

- Acting as a clearinghouse or forwarding agent.
- Validating the source of the EHCR message.
- Confirming the right of the *EHCR destination* to receive the EHCR for a patient.

Healthcare parties undertaking these roles are referred to in this European Prestandard as *EHCR message related agents*. The involvement of *EHCR message related agents* depends on the procedures agreed for exchanging EHCR messages within a communicating community. This European Prestandard enables but does not require the involvement of *EHCR message related agents* and it does not specify the details of the roles an *EHCR message related agent* may play.

Table 1 notes the communication roles that different parties may play in relation to the messages described in this Prestandard. Figure 1 provides a graphical representation of this information. The following notes apply to Figure 1 and outline the different types of *EHCR notification message* that each party may send or receive. The decision on which, if any, of these notifications should be used is dependent on the business process in a communicating community and is not subject to any normative provisions in this Prestandard.

NOTE 1 An *EHCR source* may notify an *EHCR destination* of acceptance or rejection of a *request EHCR message*.

NOTE 2 An *EHCR destination* may notify an *EHCR source* of acceptance or rejection of a *provide EHCR message*.

NOTE 3 Either an *EHCR destination* or *EHCR source* may notify a third party (an *EHCR message related agent*) when they send, receive, accept or reject of a message.

NOTE 4 An *EHCR message related agent* may forward a notification from an *EHCR destination* or *EHCR source* to another communicating party.

Table 1. Associations between Communicating parties, communicating party roles and messages

Communicating party (actor no.)	Originating role	Destination role	Messages	To actor no.	From actor no.
1. Healthcare party acting as EHCR source	X		<i>provide EHCR message</i> <i>EHCR notification message</i>	2,3	
		X	<i>request EHCR message</i> <i>EHCR notification message</i>		2,3
2. Healthcare party acting as EHCR destination	X		<i>request EHCR message</i> <i>EHCR notification message</i>	1,3	
		X	<i>provide EHCR message</i> <i>EHCR notification message</i>		1,3
3. Healthcare party acting as EHCR related agent (e.g. clearing house or forwarding agent)	X		<i>provide EHCR message</i> <i>EHCR notification message</i>	2	
	X		<i>request EHCR message</i> <i>EHCR notification message</i>	1	
		X	<i>provide EHCR message</i> <i>EHCR notification message</i>		1
		X	<i>request EHCR message</i> <i>EHCR notification message</i>		2

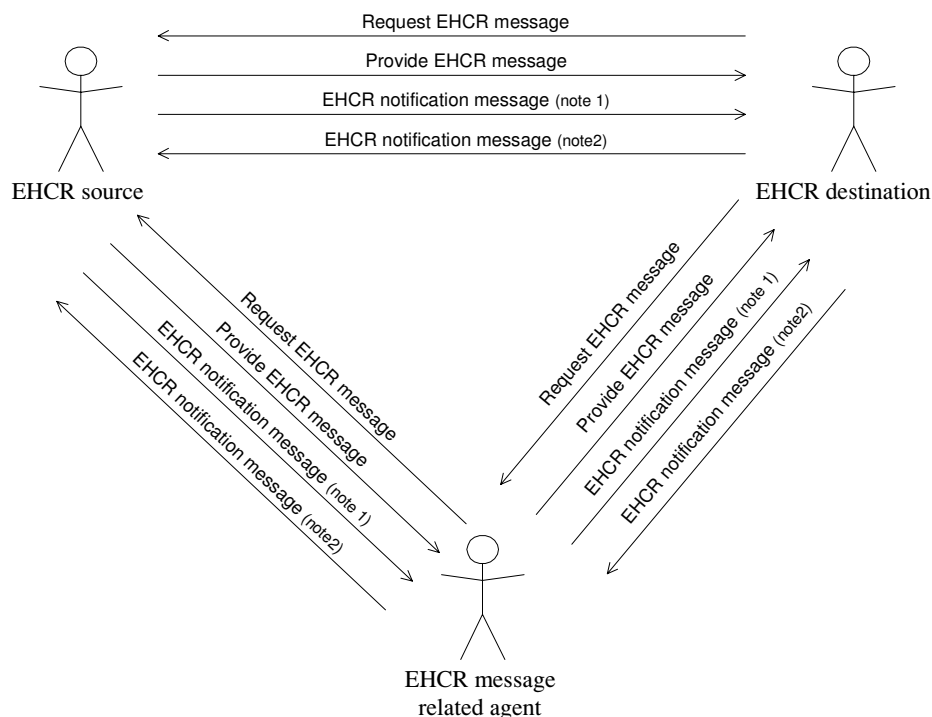


Figure 1. Illustration of EHCR message communications and communication role

5. Communication Requirements and Scenarios

5.1. Introduction

This clause outlines the communication requirements supported by use of the messages specified in this European Prestandard.

The requirements are identified as part of several general scenarios outlined in this clause. However, these scenarios do not form an exhaustive list of circumstances in which these messages are applicable.

The clause outlines each scenario in a general manner followed by illustrative examples and a summary of the main communication requirements arising from the scenario. Each communication requirement is related to an instance of a specific message. The messages referred to are specified by this European Prestandard or have already been adopted as part of previously published European Prestandards.

Each scenario involves the transfer of EHCR related information in one or more directions between two or more healthcare parties. Figure 2 shows the general sequence of use of the messages. However, some scenarios use only one or two of the messages shown in this figure. Also, as noted in Clause 4, the communicating parties may have different roles at different stages in a communication scenario. For this reason many of the illustrations in this clause refer to the communicating parties as Party A and Party B rather than using the role name.

The diagrams in this section follow the general notation of Unified Modelling Language sequence diagrams. Time is represented by the vertical axis. The parties are represented by a dotted lifeline. While a party has a role in relations to the patient the lifeline is overlaid by a hollow rectangle. Lines between the parties indicate the flow of messages.

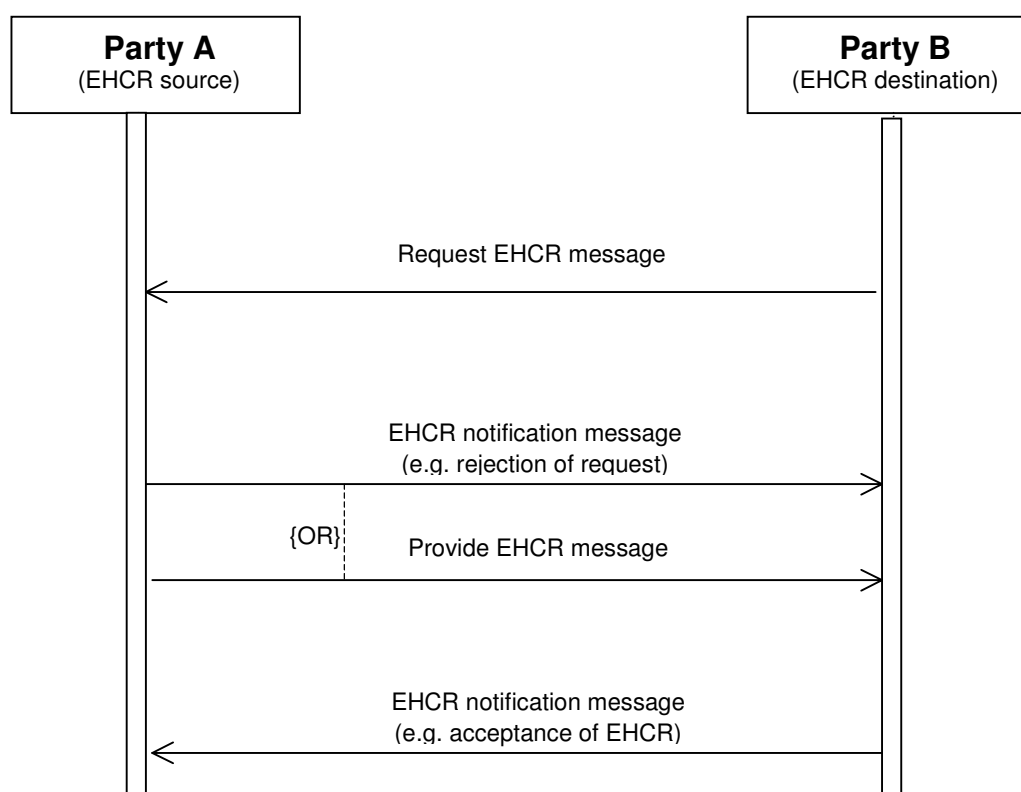


Figure 2. General sequence of messages

5.2. Transfer initiated by an EHCR source

5.2.1. Scenario outline

Party A becomes aware that a patient will in future seek the healthcare services previously provided by **Party A** from **Party B**.

- **Party A** hands over their clinical responsibility for the patient to **Party B**.
- **Party A** does not expect to have continuing clinical responsibility for the care of the patient.
- **Party B** assumes a continuing responsibility for the care of the patient.

EXAMPLES

- A patient informs their GP that they are moving to another area. The GP hands over care of a patient to a colleague in the area to which the patient is moving.
- A specialist is retiring or leaving a clinic and makes arrangements for the future care of his patients.
- A patient chooses to change the healthcare professional that they consult for a particular service. The patient informs their current provider that they wish care to be transferred. The current provider transfers the EHCR to the new provider.

5.2.2. Communication requirements and use of messages

Party A provides **Party B** with complete or summarised EHCR information about the patient and indicates that they wish **Party B** to take over responsibility for the patient.

- **Party A** (an *EHCR source*) sends a *provide EHCR message* to **Party B** (an *EHCR destination*).

Party B may respond to the by informing **Party A** that they have received the information provided and have either accepted or rejected responsibility for the care of the patient.

- **Party B** (an *EHCR destination*) sends an *EHCR notification message* to **Party A** (an *EHCR source*).

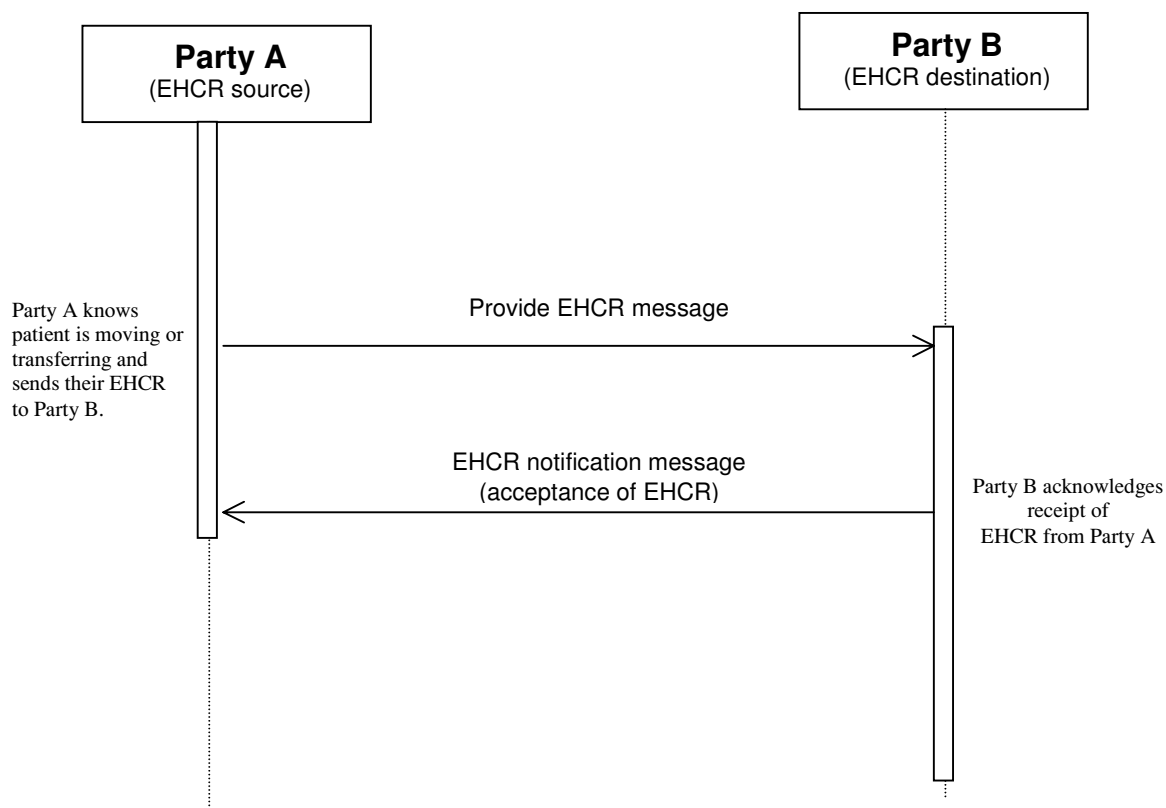


Figure 3. Patient transfer initiated by an EHCR source

5.3. Transfer of care initiated by an EHCR destination

5.3.1. Scenario outline

A patient, currently cared for by **Party A**, requests **Party B** to provide a continuing healthcare service.

- **Party B** takes over clinical responsibility for the patient from **Party A**.
- **Party A** does not have continuing clinical responsibility for the care of the patient.
- **Party B** assumes a continuing responsibility for the care of the patient.

EXAMPLES

- A patient consults or registers with a new GP after moving to another area.
- A patient chooses to change the specialist or clinic that they attend.

5.3.2. Communication requirements and use of messages

Party B requests **Party A** to provide a complete or summarised EHCR for the patient.

- **Party B** (an *EHCR destination*) sends a *request EHCR message* to **Party A** (an *EHCR source*).

Party A may accept or reject the request for the EHCR.

If the request is accepted, **Party A** provides **Party B** with complete or summarised EHCR information about the patient.

- **Party A** (an *EHCR source*) sends a *provide EHCR message* to **Party B** (an *EHCR destination*).

If the request is rejected, **Party A** informs **Party B** of this decision.

- **Party A** (an *EHCR source*) sends an *EHCR notification message* to **Party B** (an *EHCR destination*).

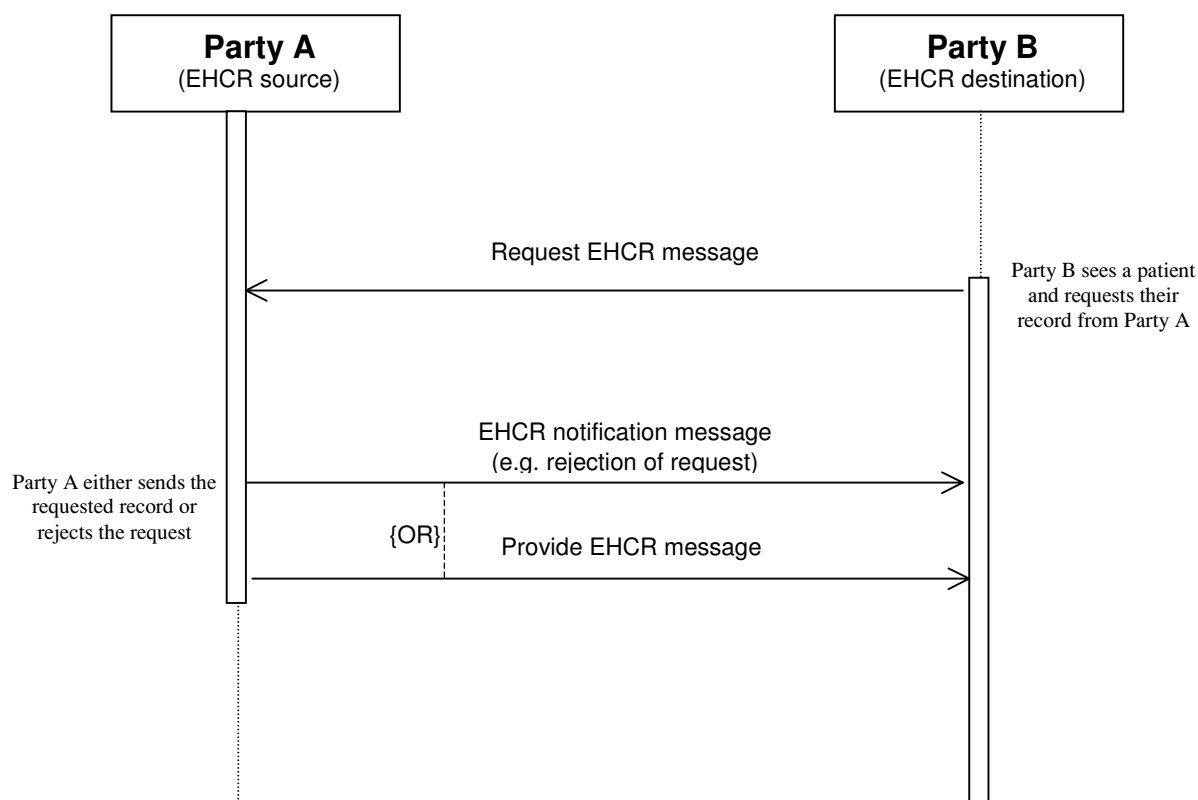


Figure 4. Transfer of care initiated by an EHCR destination

5.4. Provision of a temporary service without a request from the EHCR source

5.4.1. Scenario outline

A patient, usually cared for by **Party A**, requests **Party B** to provide a service of limited duration.

- **Party B** performs the service for the patient.
- **Party A** resumes clinical responsibility for the care of the patient.
- **Party B** does not expect to play a further role in the future care of the patient.

EXAMPLES

- A patient attends an Accident Emergency department at a hospital.
- A patient self-refers to a particular specialist.
- A patient requires healthcare services while out of their home area.
- A patient requires urgent healthcare services out of the normal office hours of their doctor.
- A patient consults another GP (in countries where patients may see more than one GP).

5.4.2. Communication requirements and use of messages

Party B may decide that they need EHCR information from **Party A** in order to perform the service. In this case, **Party B** requests **Party A** to provide a complete or summarised EHCR for the patient.

- **Party B** (an *EHCR destination*) sends a *request EHCR message* to **Party A** (an *EHCR source*).

Party A may accept or reject the request for the EHCR.

If the request is accepted, **Party A** provides **Party B** with complete or summarised EHCR information about the patient.

- **Party A** (an *EHCR source*) sends a *provide EHCR message* to **Party B** (an *EHCR destination*).

If the request is rejected, **Party A** informs **Party B** of this decision.

- **Party A** (an *EHCR source*) sends an *EHCR notification message* to **Party B** (an *EHCR destination*).

When the service has been performed **Party B** may send the EHCR information recorded while performing the service to **Party A**. The communication roles of the parties are now reversed.

- **Party B** (an *EHCR source*) sends a *provide EHCR message* to **Party A** (an *EHCR destination*).

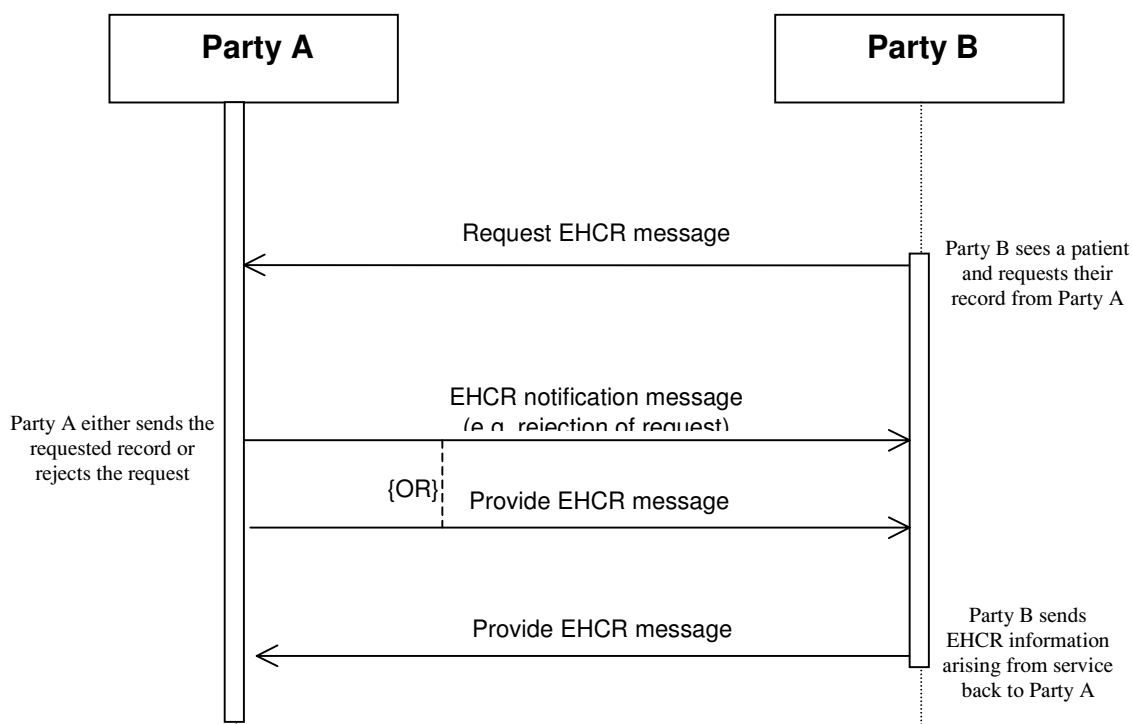


Figure 5. Service provision without a request

5.5. Provision of a temporary service following a request from the EHCR source

5.5.1. Scenario outline

A patient, usually cared for by **Party A**, receives a service of limited duration from **Party B** at the request of **Party A**.

- **Party A** requests the service from **Party B**.
- **Party B** performs the service for the patient.
- **Party A** resumes or retains clinical responsibility for the care of the patient.
- **Party B** does not expect to play a further role in the future care of the patient.

EXAMPLES

- A GP refers a patient to a specialist.
- A specialist involves a therapist in a particular aspect of a patient's care.

5.5.2. Communication requirements and use of messages

Party A requests **Party B** to provide a service and may provide a copy or summary of the EHCR as part of this request. This may be done using the *specialist service request message* specified by ENV 12538 or using the *provide EHCR message*.

- **Party A** (an *EHCR source*) sends a *provide EHCR message* to **Party B** (an *EHCR destination*).

When the service has been performed **Party B** may send the EHCR information recorded while performing the service to **Party A**. This may be done using the *specialist service report message* specified by ENV 12538 or using the *provide EHCR message*. If the *provide EHCR message* is used, the communication roles are reversed.

- **Party B** (an *EHCR source*) sends a *provide EHCR message* to **Party A** (an *EHCR destination*).

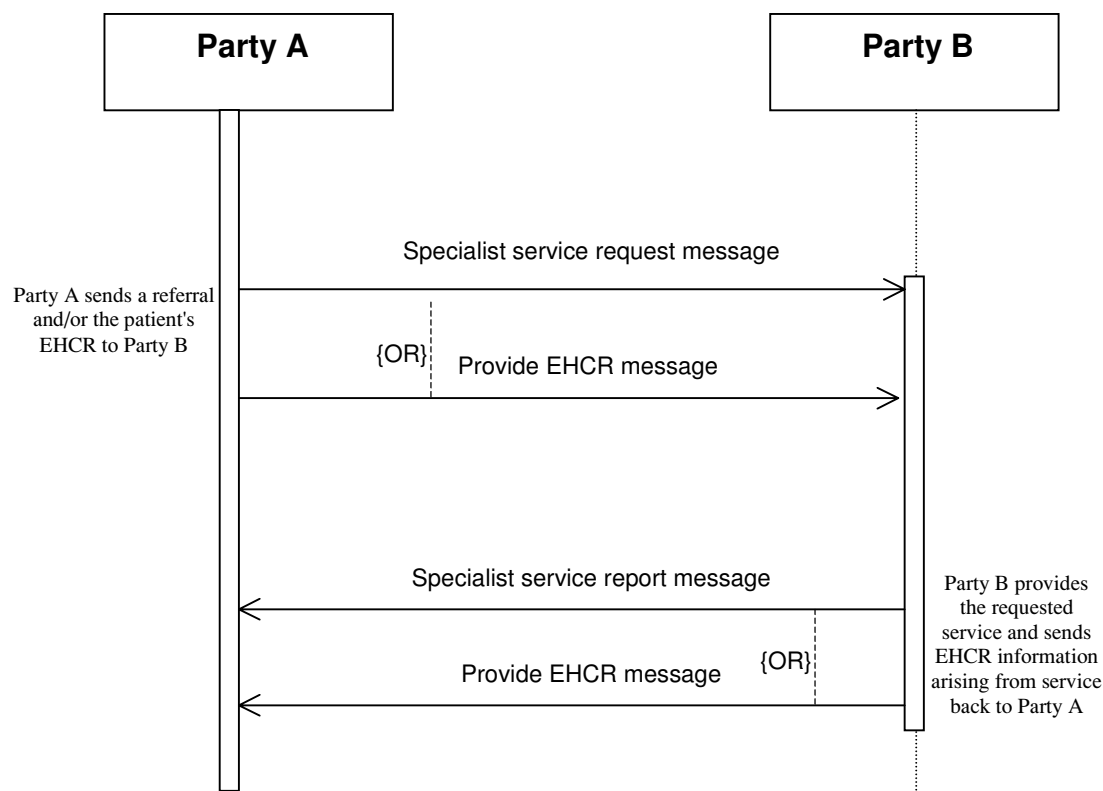


Figure 6. Service provision following a request

5.6. Provision of continuing care by two or more parties

5.6.1. Scenario outline

- **Party A** is providing care to a patient and requests **Party B** to become involved in providing for a particular aspect of that patient's care.
- **Party A**'s general responsibility for the care of the patient continues. However, a specific part of that responsibility is shared with **Party B** while a series of services are provided.
- **Party B** usually sees the patient two or more times while providing the requested service.
- During the period during which **Party B** is sharing responsibility, **Party A** may also see the patient one or more times.

EXAMPLES

- GP and diabetic specialist providing care to a diabetic patient.
- GP and Midwife and/or Obstetrician providing antenatal care.

5.6.2. Communication requirements and use of messages

Party A requests **Party B** to provide a service and may provide a copy or summary of the EHCR as part of this request. This may be done using the *specialist service request message* specified by ENV 12538 or using the *provide EHCR message*.

- **Party A** (an *EHCR source*) sends a *provide EHCR message* to **Party B** (an *EHCR destination*).

After the initial contact with the patient, **Party B** may send the EHCR information recorded during that contact to **Party A**.

- **Party B** (an *EHCR source*) sends a *provide EHCR message* to **Party A** (an *EHCR destination*).

After each subsequent consultation, or other interaction with the EHCR, **Party A** sends an update of the EHCR information recorded during that contact to **Party B**.

- **Party A** (an *EHCR source*) sends a *provide EHCR message* to **Party B** (an *EHCR destination*).

After each subsequent consultation, or other interaction with the EHCR, **Party B** sends an update of the EHCR information recorded during that contact to **Party A**.

- **Party B** (an *EHCR source*) sends a *provide EHCR message* to **Party A** (an *EHCR destination*).

An alternative to the unsolicited transfers of updates described here is for the update to be explicitly requested.

If an update is required by **Party A**.

- **Party A** (an *EHCR destination*) sends a *request EHCR message* to **Party B** (an *EHCR source*).
- **Party B** (an *EHCR source*) responds by sending a *provide EHCR message* to **Party A** (an *EHCR destination*).

If an update is required by **Party B**.

- **Party B** (an *EHCR destination*) sends a *request EHCR message* to **Party A** (an *EHCR source*).
- **Party A** (an *EHCR source*) responds by sending a *provide EHCR message* to **Party B** (an *EHCR destination*).

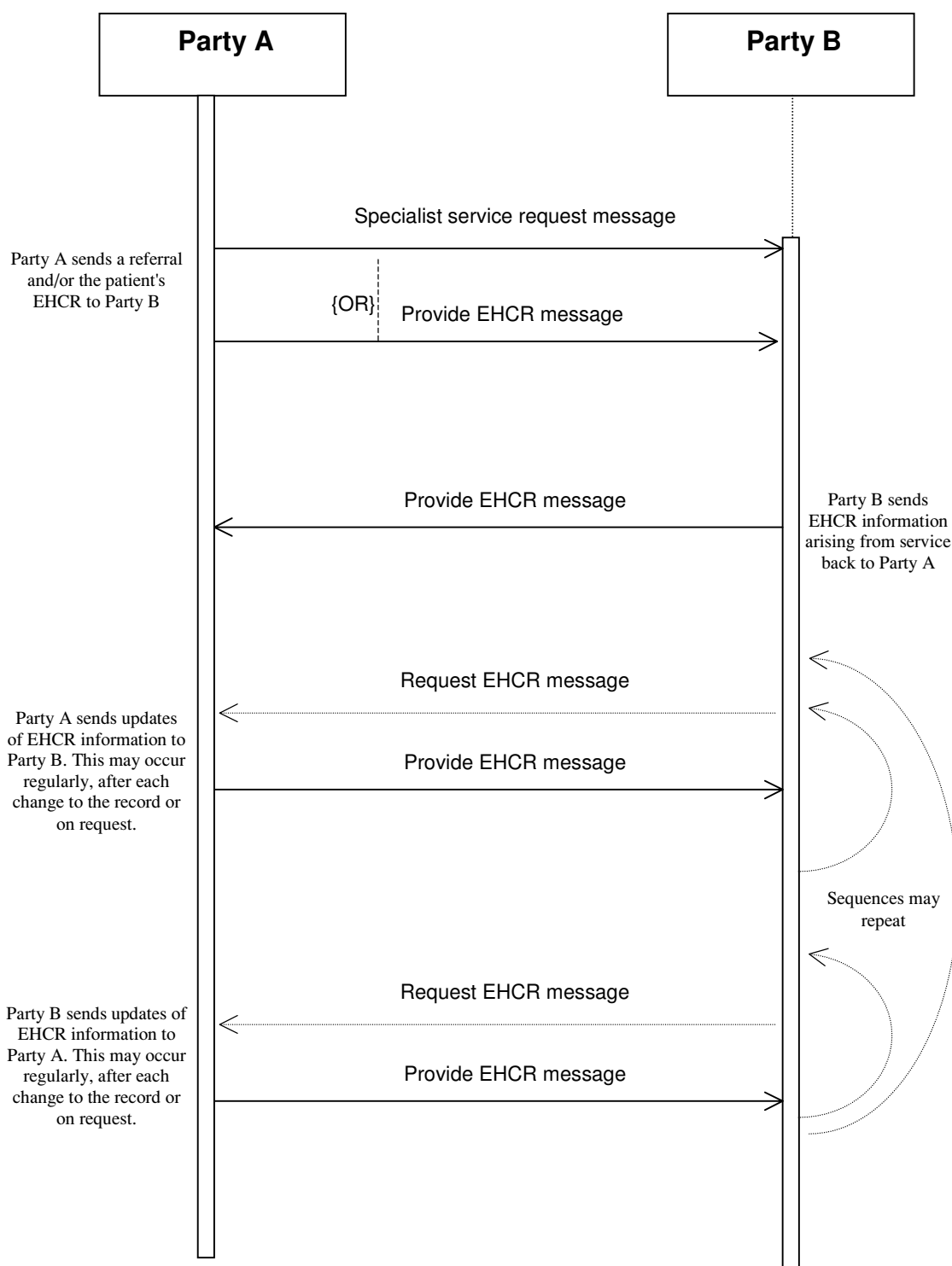


Figure 7. Continuing care by two parties

5.7. Scenarios involving a third party

5.7.1. Description

Some scenarios may involve a third party (**Party C**). **Party C** may act as a clearing-house where parties are not sure to whom they should send requests (see 5.7.2) or EHCR information (see 5.7.3). **Party C** may also act as a Trusted Third Party either confirming that a requester is authorised to receive EHCR information (see 5.7.5) or authenticating the source of the EHCR information (see 5.7.6).

5.7.2. Indirect communication initiated by the recipient

Case

- **Party B** wishes to receive EHCR information but does not know who holds this information

Action

- **Party B** sends the *request EHCR message* to **Party C**.
- **Party C** establishes the location of a party who holds relevant EHCR information.
- **Party C** forwards the *request EHCR message* to **Party A**.
- **Party A** responds by sending a *provide EHCR message* or an *EHCR notification message* either directly to **Party B** or to **Party C** as an intermediary.
- If **Party C** is used as an intermediary then the message received from **Party A** is forwarded by **Party C** to **Party B**.

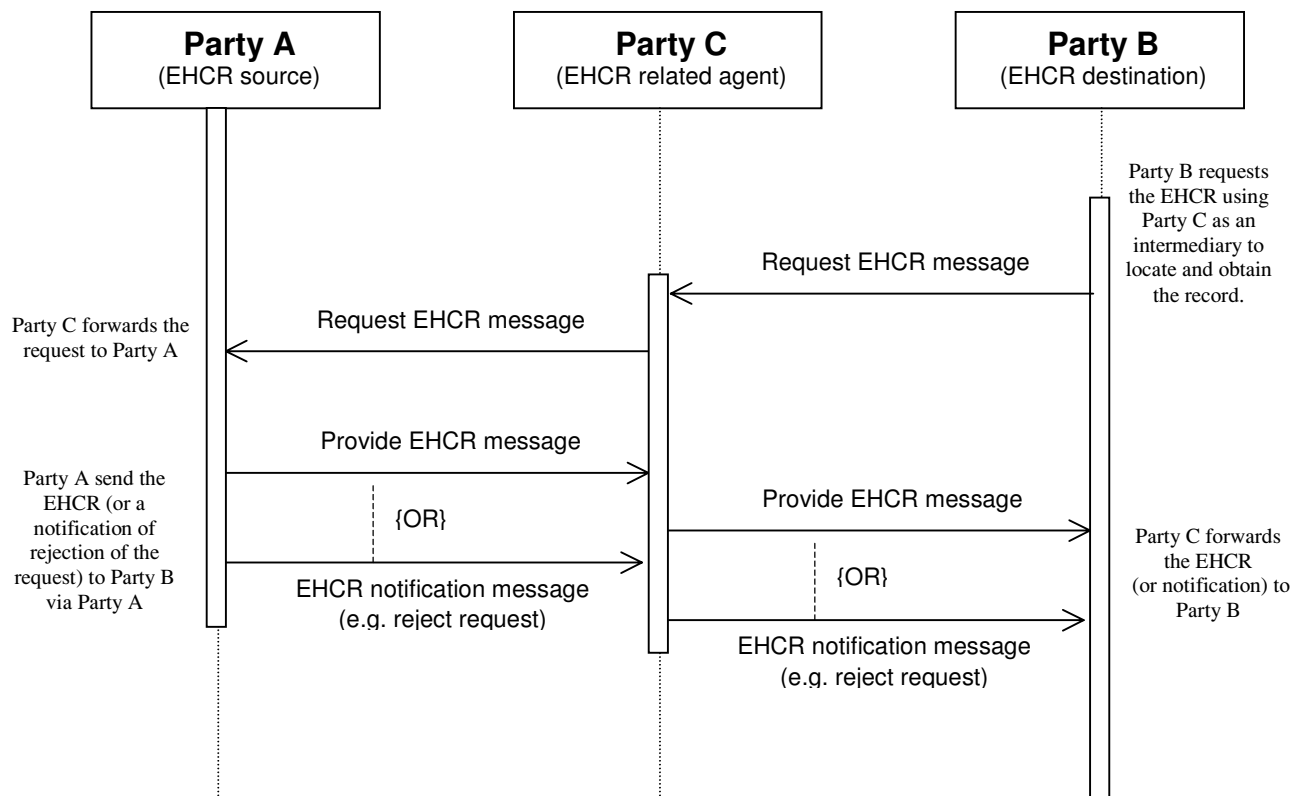


Figure 8. Indirect communication initiated by the recipient

5.7.3. Indirect communication initiated by the sender

Case

- **Party A** is aware that another party will require EHCR information but is not aware of the identity of that party.
- **Party C** acts as a clearing-house.

Action

- **Party A** sends a *provide EHCR message* to **Party C**.
- **Party C** retains the record acting as a clearing-house.
- **Party B** sends a *request EHCR message* to **Party C**.
- **Party C** checks whether the relevant *provide EHCR message* has been received and also checks that **Party B** is authorised to receive this message.
- **Party C** either forwards the *provide EHCR message* to **Party B** or generates and sends an appropriate *EHCR notification message* to **Party B**

The second part of this scenario is superficially similar to the more general request scenario (see 5.3). However, there are two important differences in requirements. The first is that the *provide EHCR message* must identify its origin (**Party A**) as well as the intermediary. The second is that the intermediary may need to be aware of the distribution rules applied at the point of origin in order to determine whether **Party B** is authorised to receive the *provide EHCR message*. The messages specified allow this information to be conveyed but the security mechanisms for enforcing these provisions are outside the scope of this European Prestandard.

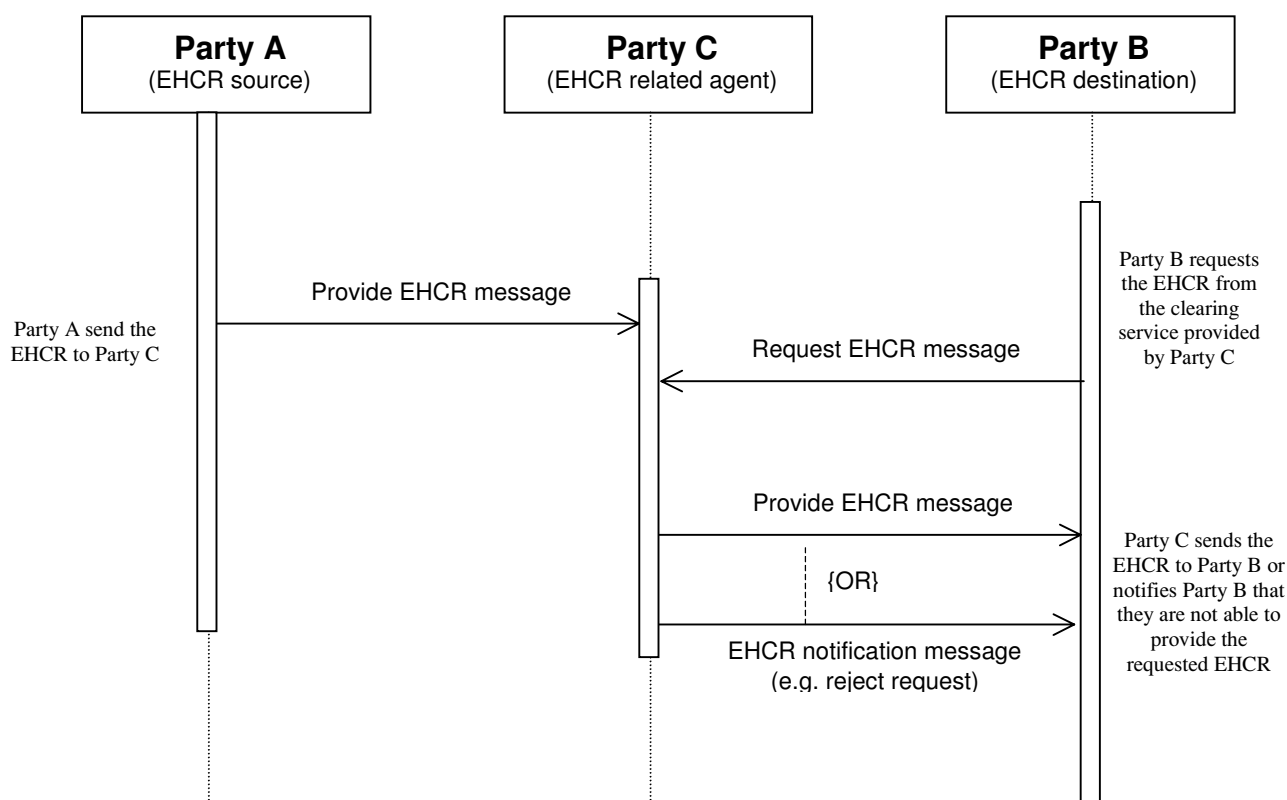


Figure 9. Indirect communication initiated by the sender

5.7.4. Indirect communication initiated by the third party

Case

- **Party C**, acting as a medical dispatch centre, wishes to receive information from an identified **Party A** in order to select and request a service from an appropriate **Party B**.

EXAMPLES

- A patient at home has a cardiac infarction and needs immediate intensive care. A communication between the family doctor and the emergency medical dispatch centre is established by telephone. The medical dispatch centre informs the intensive care unit of the regional university hospital. The medical dispatch centre requests the relevant patient records and forwards them to the hospital.
- An injured tourist asks an emergency medical assistance provider for repatriation. The assistance provider obtains the records from the treating clinicians in the country where the patient was injured and forwards this information to an appropriate hospital or clinician in the tourist's home country.

Action

- **Party C** sends a *request EHCR message* to **Party A**.
- **Party A** sends a *provide EHCR message* to **Party C**
- (optionally **Party C** sends a *specialist service request message* (referral) to **Party B**)
- (optionally **Party B** sends a *request EHCR message* to **Party C**)
- **Party C** sends a *provide EHCR message* to **Party B**.

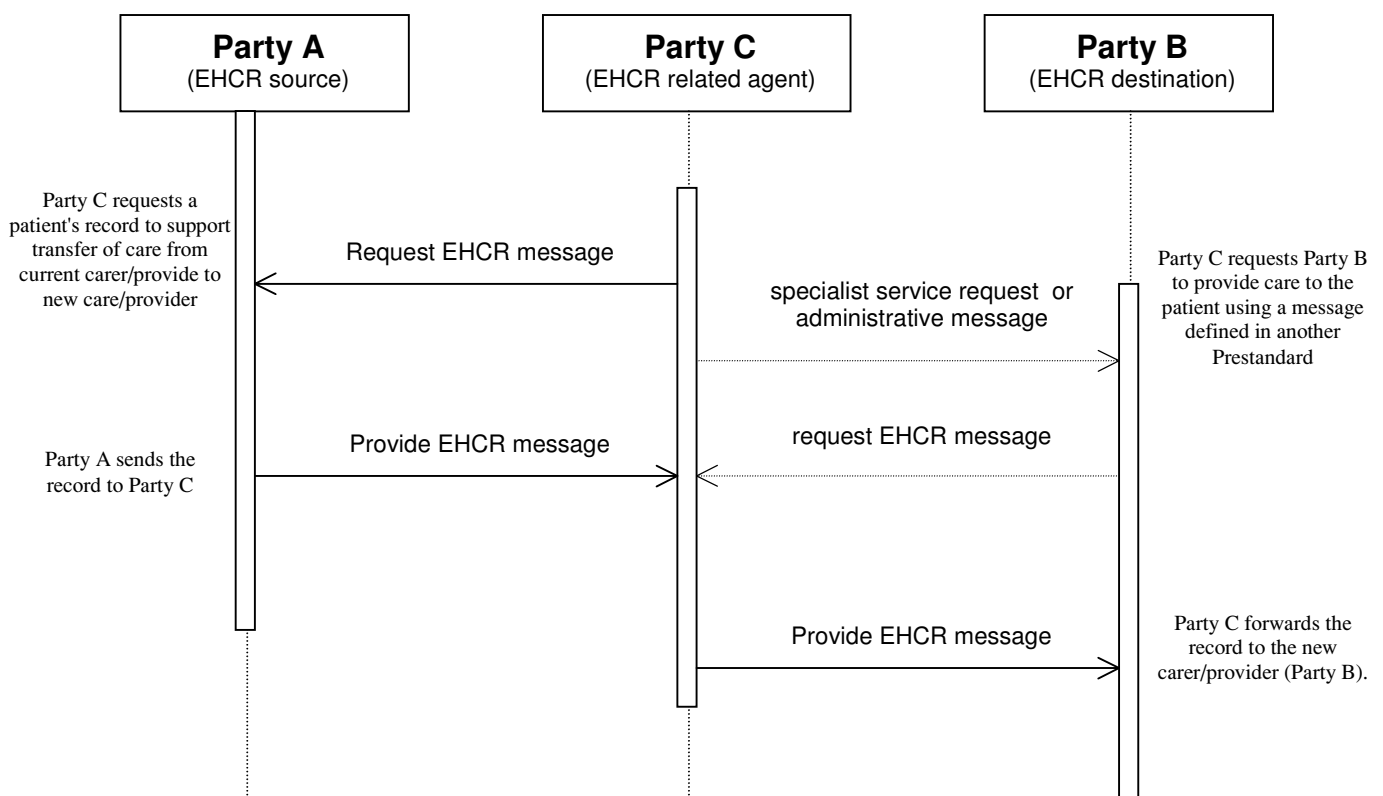


Figure 10. Indirect communication initiated by the third party

5.7.5. Confirming the entitlement of a requester to EHCR Information

If the *request EHCR message* is used between two parties with an existing relationship of trust, it may be sufficient for the request message to confirm its source and authenticity (for example using a digital signature). However, in the case of transfers within a wider community, the holder of the EHCR (**Party A**) may need to check the status of the requester (**Party B**) before responding to a request. This check may be done using various mechanisms that are outside the scope of this European Prestandard. However, some of the possible mechanisms impose additional requirements on the message.

- The *request EHCR message* may need to convey a reference to a third party (**Party C**) recognised by **Party A** as being authorised to vouch for the status of **Party B**.
- The *request EHCR message* may need to convey information that allows it to be routed via a third party (**Party C**) responsible for logging and checking the validity of requests before forwarding valid requests to **Party A**.
- The *request EHCR message* may need to convey a password or key provided by the patient to **Party B**, which is recognised by **Party A** as indicating authorisation by that patient for the EHCR to be provided.
- The *provide EHCR message* may need to be capable of being sent without recognisable identification information. This "unidentified" EHCR may then be recombined with the appropriate identification information provided by a recognised third party who is able to provide a link between the information in this message and the appropriate patient.

5.7.6. Authenticity of origin of EHCR Information

If the *provide EHCR message* is used between two parties with an existing relationship of trust it may be sufficient for the message to confirm its source and authenticity (for example using a digital signature). However, in the case of transfers within a wider community, the recipient (**Party B**) may need to check the status of the sender (**Party A**) before accepting the validity of the EHCR information provided. This check may be done using various mechanisms that are outside the scope of this European Prestandard. However, some of the possible mechanisms impose additional requirements on the message.

- The *provide EHCR message* may need to convey a reference to a third party (**Party C**) recognised by **Party B** as being authorised to vouch for the status of **Party A**.
- The *provide EHCR message* may need to convey information that allows it to be routed via a third party (**Party C**). **Party C** only forwards the message if it recognises the status of **Party A**.

5.7.7. Sending EHCR information to multiple destinations

If it is appropriate to send a copy of the same information to several destinations, separate instances of the *provide EHCR message* should be used. Only one *EHCR destination* may be specified in an instance of the message. However, if appropriate, the same EHCR information can be included in another message sent to another *EHCR destination*. The other recipients of the same EHCR information can be identified in the message as *EHCR message related agents* with the role copy destination.

NOTE The requirement to use separate messages for each *EHCR destination* is intended to ensure that ethical and legal responsibility for each communicative act is explicit in the message. Therefore, each EHCR message is specifically identified and is sent by a single identified *EHCR source*, to a single identified *EHCR destination*.

6. Requirements and General Message Descriptions

6.1. Conformance requirements

6.1.1. This clause specifies the normative minimum acceptable content and structure requirements for messages that comply with this European Prestandard.

6.1.2. Messages that comply with this European Prestandard shall support the structure and relationships illustrated by the GMD diagrams and textual descriptions in this clause. The requirements in this clause incorporate by reference the relevant class descriptions in Clause 7.

6.1.3. In respect of each class referred to in the clause 6, compliant messages shall support the detailed content of the class as described in Clause 7.

6.1.4. A reference to a class description implies a requirement to fully support the listed attributes of that class, including those that are further decomposed by reference to further class and subclass descriptions in Clause 7.

6.1.5. Messages that comply with this European Prestandard need not support relationships shown in the domain information model diagrams in Clause 7, except to the extent that these are either:

- Explicitly specified in this clause; or
- Listed in Clause 7 as a component or attribute of a class explicitly specified in this clause.

6.1.6. Where text description in this clause include phrases such as "*the... message shall contain an optional instance of...*", practical implementation of messages that comply with this European Prestandard shall include appropriate provision for the specified information. However, this European Prestandard does not require the user of such a message to send an instance of these classes in each instance of the message.

NOTE 1 This phrase is used to make clear that in these cases the optionality specified in the model applies to population of instances of the message with data. It is mandatory for the message to be capable of carrying these classes.

NOTE 2 In practice, the use of some of these optional attributes may be constrained by rules agreed with communicating communities while others may depend on a variety of factors including availability of relevant information, capabilities of communicating applications and the needs or preferences of users.

6.1.7. Where text description in clause 6 include phrases such as "*the... message shall contain one mandatory instance of...*", practical implementation of messages that comply with this European Prestandard shall include appropriate provision for the specified information. This European Prestandard requires that the message shall oblige the sender of such a message to send an instance of the referred classes in each instance of the message.

NOTE This phrase is used to make clear that in these instances it is not only mandatory for the message to be able to carry the specified class; it is also mandatory for the class to be populated with appropriate data in each instance of the message.

6.2. General Message Descriptions

6.2.1. The diagrammatic representation of the GMDs shows the hierarchical decomposition of each message into its main classes. The depth of the hierarchy shown in the diagrams has been limited to highlight the main points. Wherever a branch of the hierarchy is shown in an expanded form all its direct descendants are included. Thus some of the boxes in these diagrams represent attributes rather than classes.

6.2.2. In some of the GMD diagrams, the generalisation of a class is shown by text within the box representing the specialised class, rather than by explicitly listing the generalised content of the class. The Domain Information Model in Clause 7 contains a fully expanded listing of the components of each class, including the attributes inherited from generalised classes.

6.3. Requirements common to all EHCR messages

6.3.1. The *EHCR message* (7.4.1) is an abstract generalisation of the three messages specified in this Prestandard. It is used to refer to those elements of the messages that are common to a wide range of patient related healthcare messages.

6.3.2. Any implementation of the *provide EHCR message* (7.4.3), *request EHCR message* (7.4.2) or *EHCR notification message* (7.4.4) shall comply with all the requirements for the *EHCR message* as stated in this subclause. These requirements are summarised in the GMD diagram (Figure 11). A more detailed description of the *EHCR message* class and its constituent attributes is provided in the Domain Information Model (7.4.1)

6.3.3. An *EHCR message* shall contain one mandatory instance of each of the following attributes (see 7.4.1):

- *identification of message by originator*
- *issue date and time of message*
- *urgency of message*
- *message receipt acknowledgement request*.

6.3.4. An *EHCR message* shall contain one mandatory instance of each of the following classes.

- *EHCR source* (7.3.2)
- *EHCR destination* (7.3.3)
- *patient matching information* (7.4.6).

6.3.5. An *EHCR message* shall contain optional instances of each of the following attributes (see 7.4.1):

- *comment on message*
- *language*.

6.3.6. An *EHCR message* shall contain optional instances of each of the following classes:

- *EHCR message related agent* (7.3.4)
- *healthcare agents directory* (7.10.19)
- *message reference* (7.4.5).

6.3.7. In accordance with the descriptions in Clause 7, the *EHCR source*, *EHCR destination* and any *EHCR message related agents* are identified using a *healthcare agent in context reference* (7.10.12). These references, and those for other *healthcare agents* identified in the message, may either refer to entries in a common shared directory or may refer to entries in the *healthcare agents directory* (7.10.19) class contained in the message. An individual instance of the message shall contain appropriate *healthcare agents directory* entries for any *healthcare agent*, or *healthcare agent in context*, referred to in the message, unless the reference refers to an existing entry for this agent in a directory readily accessible to both communicating parties.

6.3.8. The mandatory instance of *patient matching information* (7.4.6) shall contain sufficient information to identify the patient who is the subject of the message. The message shall include instances of the following attributes, one or more of which should be mandatory in any instance of the message.

- *patient identifiers*
- *person name*
- *date of birth*.

6.3.9. The requirement to include a *patient identifier*, *person name* or *date of birth* may be met by use of an alias or encrypted identifier where this is required to comply with data protection legislation. In this case, the communicating community shall specify a mechanism that enables an authorised communicating party to match a message to a patient.

6.3.10. The mandatory instance of *patient matching information* (7.4.6) should also contain optional instances of the following attributes. These may be included in individual instances of the message where this information may assist accurate matching:

- *alternative person name*
- *person administrative sex*
- *person addresses*.

6.3.11. Communicating communities should specify which combinations of the attributes listed in 6.3.8 and 6.3.10 are acceptable to enable safe automated or manually assisted matching of a message to a patient.

6.3.12. If the *EHCR message* is a response to another message, a *message reference* (7.4.5) should be included in the message and, if included, this shall uniquely identify the relevant message.

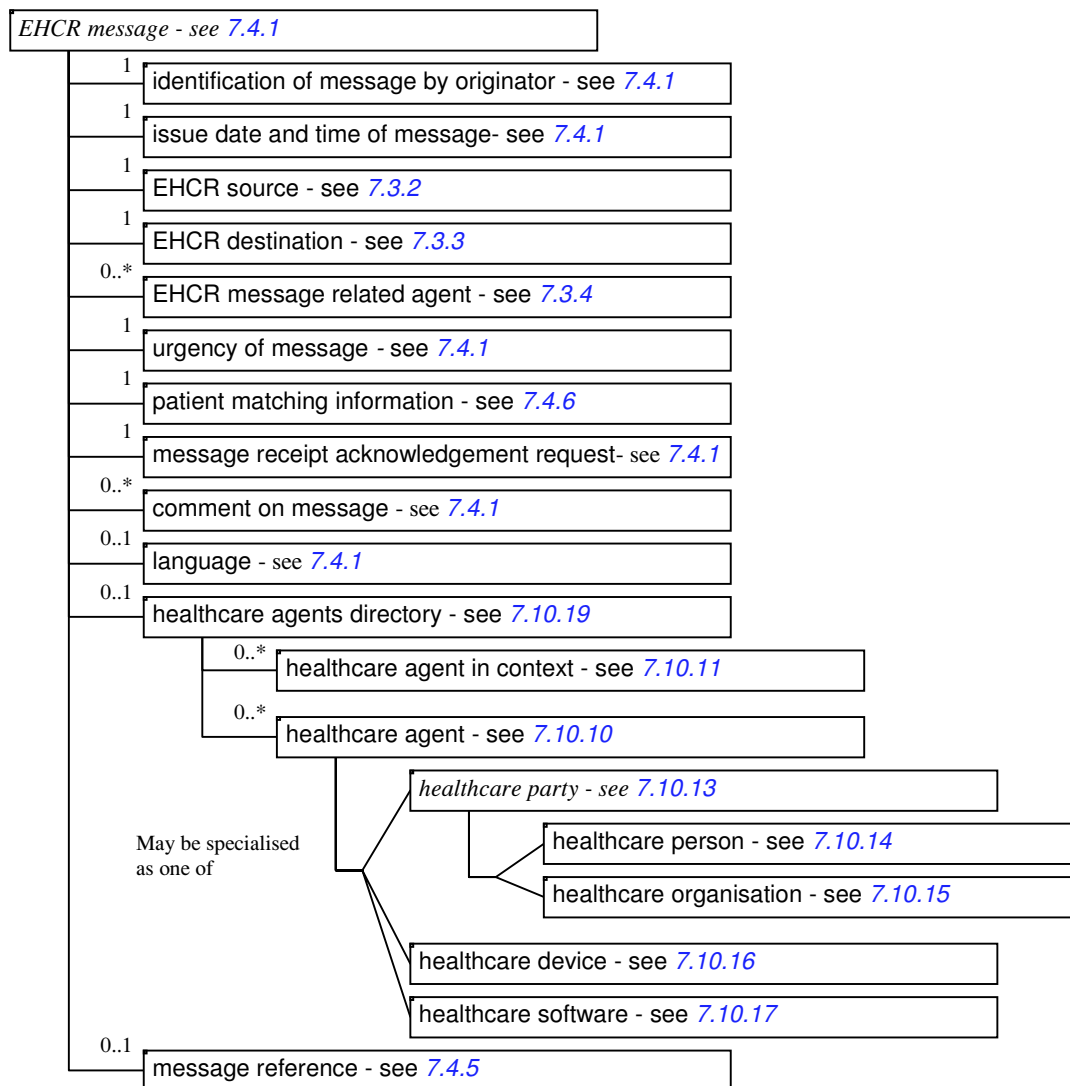


Figure 11. GMD for the common structures applicable to all EHCR Messages

6.4. Specification of EHCR message information

6.4.1. The *specification of EHCR information* is used to indicate the nature of the information that an *EHCR message* requests, contains or refers to. The requirements for including this class vary and are stated in the clauses relevant to each message. However, when *specification of EHCR information* is included in a message, the requirements for its composition are not dependent on the nature of the message.

6.4.2. Any implementation of the *provide EHCR message* (7.4.3), *request EHCR message* (7.4.2) or *EHCR notification message* (7.4.4) shall conform with all the requirements stated in this subclause. These requirements apply to the class *specification of EHCR information*, when it is included in any of the three messages specified in this Prestandard. These requirements are summarised in the GMD diagram (Figure 12). A more detailed description of *specification of EHCR information* class and its constituent attributes is provided in the Domain Information Model (7.4.7).

6.4.3. The *specification of EHCR information* shall contain one mandatory instance of the attribute *EHCR scope*. This shall indicate whether the EHCR information represents:

- the complete EHCR for a patient as held by the *EHCR source*;
- a selected subset from the EHCR;
- an update of changes during a specified period.

6.4.4. The *specification of EHCR information* shall contain one instance of the attribute *EHCR subset description* (see 7.4.7). This attribute shall be mandatory in any instance of the message in which the *EHCR scope* indicates that the information is a selected subset of the record.

6.4.5. The *specification of EHCR information* shall contain one instance of the attribute *EHCR update period* (see 7.4.7). This attribute shall be mandatory in any instance of the message in which the *EHCR scope* indicates that the information is an update of changes to the record.

6.4.6. The *specification of EHCR information* shall contain one instance of the attribute *EHCR update period* (see 7.4.7). This attribute shall be mandatory in any instance of the message in which the *EHCR scope* indicates that the information is an update of changes to the record.

6.4.7. The *specification of EHCR information* shall contain one optional instance of each of the following attributes (see 7.4.7):

- *communicating community identifier*
- *enterprise identifier*
- *EHCR language*.

6.4.8. If the attribute *communicating community identifier* is present in an instance of a message, it shall identify the *communicating community* which defined the implementation guidelines followed by this message. According to the nature of those guidelines, it may also determine the expected nature of a response to the message and/or the use of *community defined data items* within the message.

6.4.9. If the attribute *enterprise identifier* is present in an instance of a message, it shall identify the enterprise environment of the sending system. This may determine the inclusion of, or capability to interpret, enterprise specific *community defined data items*.

6.4.10. If the attribute *EHCR language* is present in an instance of a message, it shall identify the predominant language in which EHCR information is represented or, in the case of a *request EHCR message*, the language in which the *EHCR destination* would prefer to receive this information.

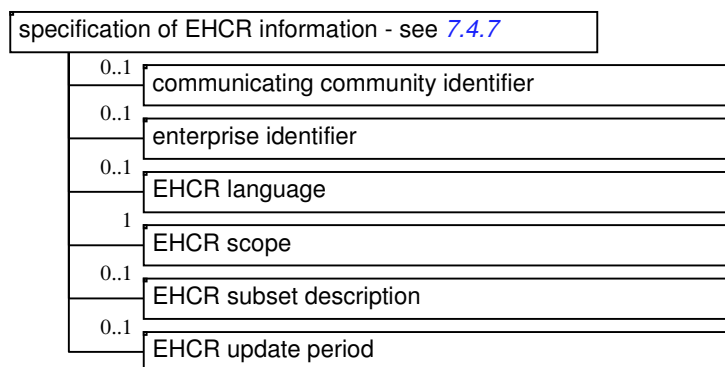


Figure 12. GMD for Specification of EHCR Information applicable to all EHCR messages

6.5. Provide EHCR Message

6.5.1. The *provide EHCR message* is used to communicate all or part of a single patient's EHCR:

- In response to:
 - a *request EHCR message*;
 - a request conveyed by other means (i.e. a verbal or written request).
- Without a specific preceding request:
 - as part of the regular sharing of information between healthcare parties caring for the same patient;
 - when the EHCR source is aware of a likely future requirement for another healthcare party to have access to a particular patient record;
 - as part of the process of transferring a patient to the care of another healthcare party.

6.5.2. The requirements applicable to the *provide EHCR message* are stated in this subclause and summarised in the GMD diagram (Figure 13). A more detailed description of the *provide EHCR message* is included in the Domain Information Model (7.4.3).

6.5.3. The *provide EHCR message* shall comply with the general requirements for *EHCR messages* stated in 6.3.

6.5.4. The *provide EHCR message* shall include one mandatory instance of *specification of EHCR information* which shall comply with the requirements stated in 6.4. This shall indicate the scope of the EHCR information in the message. It may also indicate the predominant language and communicating community or enterprise constraints or extensions applied to that information.

6.5.5. The *provide EHCR message* should include one optional instance of *distribution rule directory* (7.9.1) which, if present, shall contain one or more instances of *distribution rules* (7.9.3). The rules included in the directory shall comply with the detailed requirements specified in Part 3 of this Prestandard. The *EHCR extract* or any of its constituent *record components* may refer to one or more of these rules using the *distribution rule reference* (7.9.2) attribute. Access to *record components* that refer to *distribution rules* shall be governed by those rules as specified in Part 3.

6.5.6. The *provide EHCR message* shall include one mandatory instance of *EHCR extract*. This shall contain the EHCR information indicated by the *specification of EHCR information* and shall be structured as specified in 6.6.

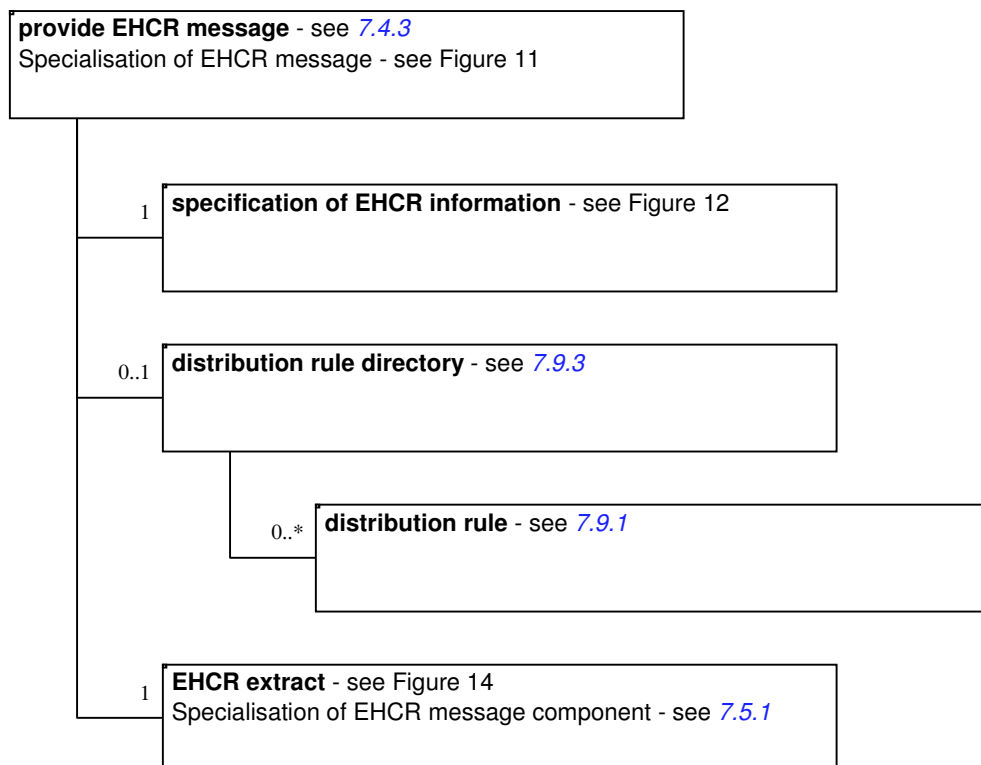


Figure 13. GMD Provide EHCR Message

6.6. EHCR Extract

6.6.1. The *EHCR extract* represents the entirety of the EHCR information within the message. Thus it acts as the root of a hierarchical structure including all the other record components that convey the structure and content of the EHCR. If the message contains the complete EHCR, the *EHCR extract* is equivalent to the *EHCR Root Architectural Component* specified in Part 1 of this Prestandard. However, this is not the case if the message contains a selected subset or an update of EHCR information.

6.6.2. The requirements applicable to the *EHCR extract* are stated in this subclause and summarised in the GMD diagram (Figure 14). A more detailed description of the *EHCR extract* class is included in the Domain Information Model (7.5.1).

6.6.3. The *EHCR extract* is a specialisation of the abstract class *EHCR message component*. Therefore, the *EHCR extract* shall include instances of the attributes of *EHCR message component* as specified in 7.8.1 and these attributes shall be populated in accordance with the specification of usage included in the full description of the *EHCR extract* in 7.5.1.

6.6.4. The *EHCR extract* shall include one or more members and each of these members shall be an instance of one of the following specialisations of the abstract class *record component*:

- *original component complexes* (7.5.3) of the following types:
 - *folder* (7.5.4)
 - *composition* (7.5.5)
- *selected component complex* (7.5.8)
- *empty record component* (7.5.9)
- *link set item* (7.7.1)
- *text data item* (7.6.2).

6.6.5. Implementation of the *provide EHCR message* in an Implementable Message Specification shall not restrict the maximum number of members that an *EHCR extract* may have.

6.7. Original component complexes

6.7.1. General requirements

6.7.1.1. *Original component complexes* are used to structure the record in accordance with the time and situation in which information was recorded in the EHCR.

6.7.1.2. Within the message all *record components* that are not members of the *EHCR extract* shall be members of one, and only one, *original component complex*. A *record component* that is a member of the *EHCR extract* shall not also be a member of an *original component complex*.

6.7.1.3. All the *record components* that are members of the same *original component complex* shall have arisen in a common original information context based on the time and situation in which they were recorded. *Original component complexes* shall not be used to represent logical or clinical relationships between *record components* that arose in different original information contexts.

6.7.1.4. The *original component complex* is a specialisation of the abstract class *record component*. Therefore, the *original component complex* shall include instances of the attributes of *record component* as specified in 7.5.2. These attributes shall be populated in accordance with the specification of usage included in the full description of the *original component complex* in 7.5.3.

6.7.1.5. Each instance of *original component complex* shall include one or more members and each of these members shall be an instance of one of the concrete specialisations of the abstract class *record component*.

6.7.1.6. Each member of an *original component complex* may play one of three *component roles* in the representation of the information content of that part of the EHCR. By default a member provides **structured** content. However, in each *original component complex* there may be one optional instance of a *record component* that provides a parallel **narrative** text representation of the same part of the record. They may also be one optional instance of a *record component* that provides a parallel **enterprise** specific representation of the same part of the record. These roles are indicated by the value of the *component role* attribute (7.5.2).

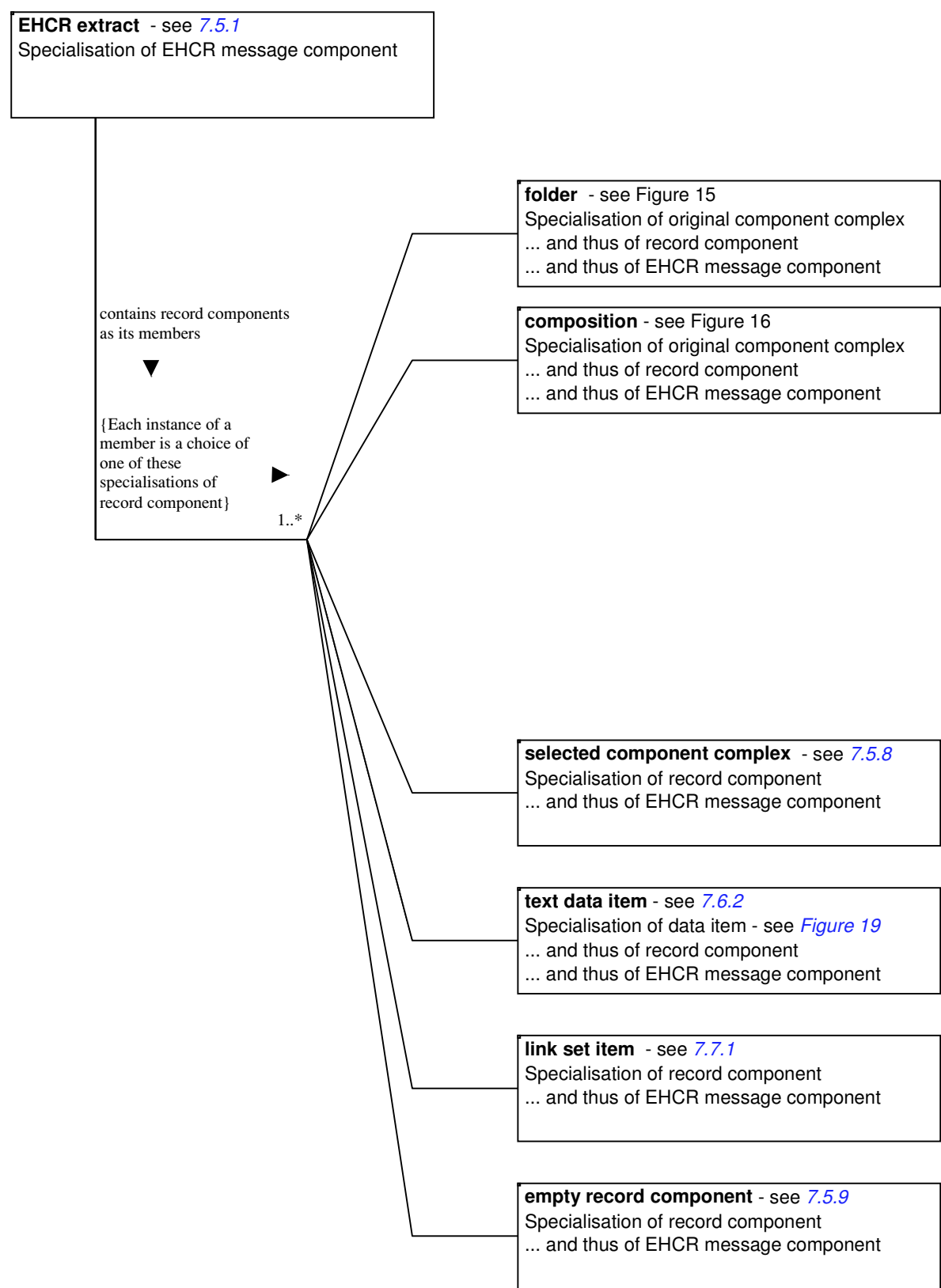


Figure 14. GMD EHCR Extract Component Hierarchy

6.7.1.7. Implementation of the *provide EHCR message* in an Implementable Message Specification shall not restrict the maximum number of members that an *original component complex* may have.

6.7.1.8. Four specialised types of *original component complex* are described in this Prestandard. These are *folder* (7.5.4), *composition* (7.5.5), *headed section* (7.5.6) and *cluster* (7.5.7). All *original component complexes* have the same general structure but differ in respect of:

- coarseness of granularity of their shared original information context;
- permissible values for certain attributes;
- propagation of attribute values to their members;
- specialisations of record components that are permitted to be their contain members.

The following subclauses describe and illustrate these points for each specialisation of *original component complex*.

6.7.2. Folders

6.7.2.1. A *folder* is used to group *record components* collected and/or recorded during several contacts with a patient. A *folder* may include information collected and recorded at different times and by different people.

EXAMPLES Nursing notes, Primary care notes, Specialist departmental record.

6.7.2.2. All implementations of the *provide EHCR message* should be capable of supporting *folders*. However, users of the message need not include instances of *folder* in a message.

6.7.2.3. If *folders* are implemented and used in the message, they shall comply with the requirements which are stated in this subclause and summarised in the GMD diagram (Figure 15). A more detailed description of the *folder* class is included in the Domain Information Model (7.5.4).

6.7.2.4. A *folder* is a specialisation of the abstract class *original component complex*. Therefore, the *EHCR extract* shall comply with the requirements specified for all types of *original component complex* in 6.7 and shall fully support the specialised constraints specified for *folder* type *original component complexes* in 7.5.4.

6.7.2.5. A *folder* shall include one or more members and each of these members shall be an instance of one of the following specialisations of the abstract class *record component*:

- *original component complexes* (7.5.3) of the types:
 - *folder* (7.5.4)
 - *composition* (7.5.5)
- *selected component complex* (7.5.8)
- *empty record component* (7.5.9)
- *link set item* (7.7.1)
- *text data item* (7.6.2)

6.7.2.6. A *folder* may include other folders among its members. A communicating community may specify limitations to the level of nesting of folders as part of the implementation guidelines for the *provide EHCR message*.

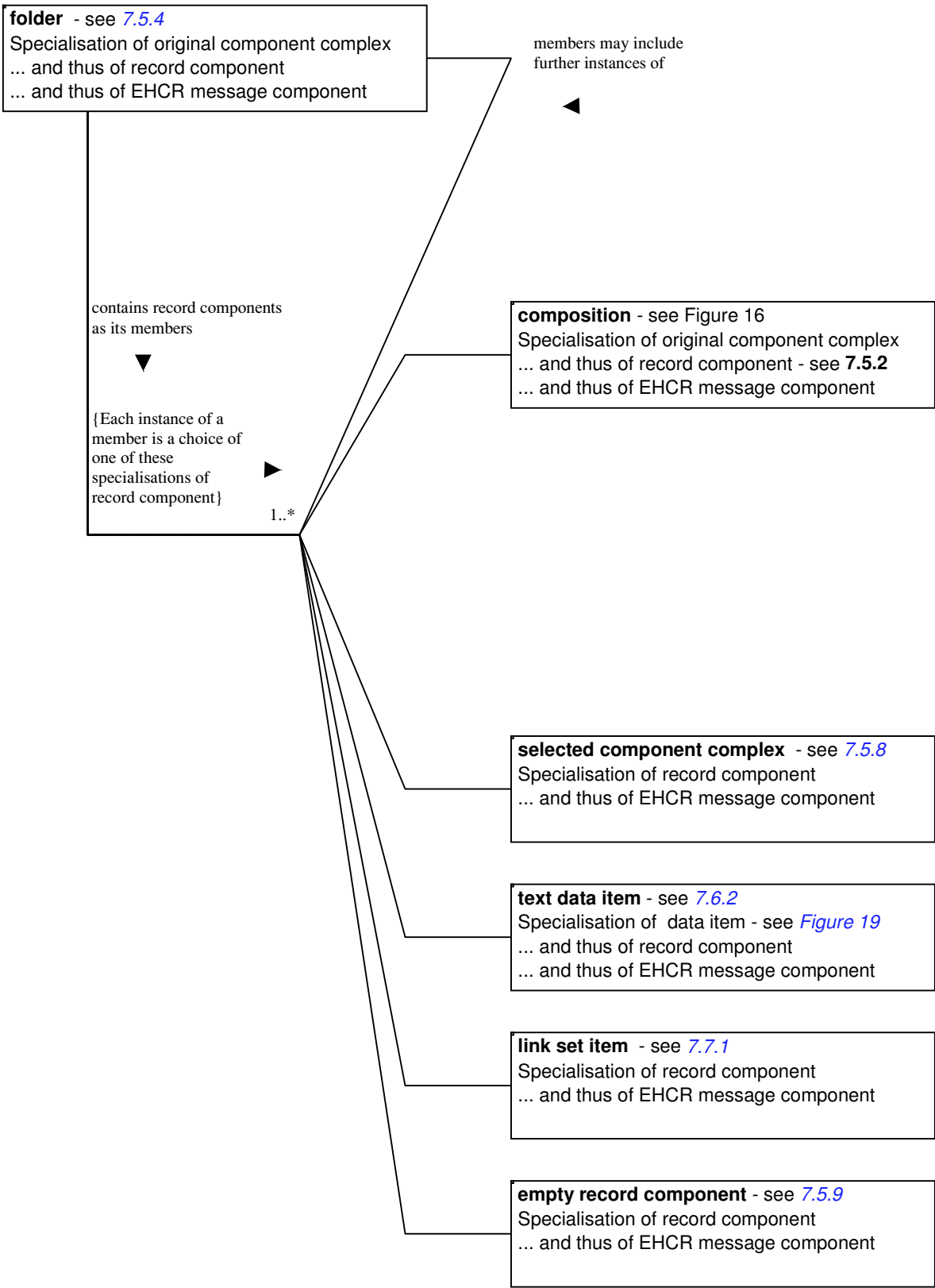


Figure 15. GMD Folder - Original Component Complex

6.7.3. Compositions

6.7.3.1. A *composition* is used to group *record components* collected during a single contact with a patient and/or a single interaction between the *originating healthcare agent* and the EHCR system.

EXAMPLES Notes of a consultation, an investigation report, a referral letter.

6.7.3.2. All implementations of the *provide EHCR message* shall support *compositions*. Each instance of the message should include at least one *composition*. However, an instance of the message that only conveys a narrative text summary of the EHCR need not contain a *composition*.

6.7.3.3. *Compositions* shall comply with the requirements which are stated in this subclause and summarised in the GMD diagram (Figure 16). A more detailed description of the *composition* class is included in the Domain Information Model (7.5.5).

6.7.3.4. A *composition* is a specialisation of the abstract class *original component complex*. Therefore, the *EHCR extract* shall comply with the requirements specified for all types of *original component complex* in 6.7 and shall fully support the specialised constraints specified for *composition* type *original component complexes* in 7.5.5.

6.7.3.5. Every instance of a *composition* shall include a value for the *component name category* attribute. This shall be one of the "Categories for Composition OCC types", listed in Table A.1 of Part 2 of this Prestandard. These values are required to communicate information about the general nature of the composition. An optional additional more detailed title may be provided using the *component name structure* (7.8.4).

6.7.3.6. Every instance of a *composition* shall include a value for the attributes *originating date and time* and *originating healthcare agent*.

6.7.3.7. A *composition* shall include one or more members and each of these members shall be an instance of one of the following specialisations of the abstract class *record component*:

- *original component complexes* (7.5.3) of the types:
 - *headed section* (7.5.6)
 - *cluster* (7.5.7)
- *selected component complex* (7.5.8)
- *empty record component* (7.5.9)
- *link set item* (7.7.1)
- *data item* (7.6.1) of any of the types specified in (6.8)

6.7.3.8. A *composition* shall not include *folders* or other *compositions* as members.

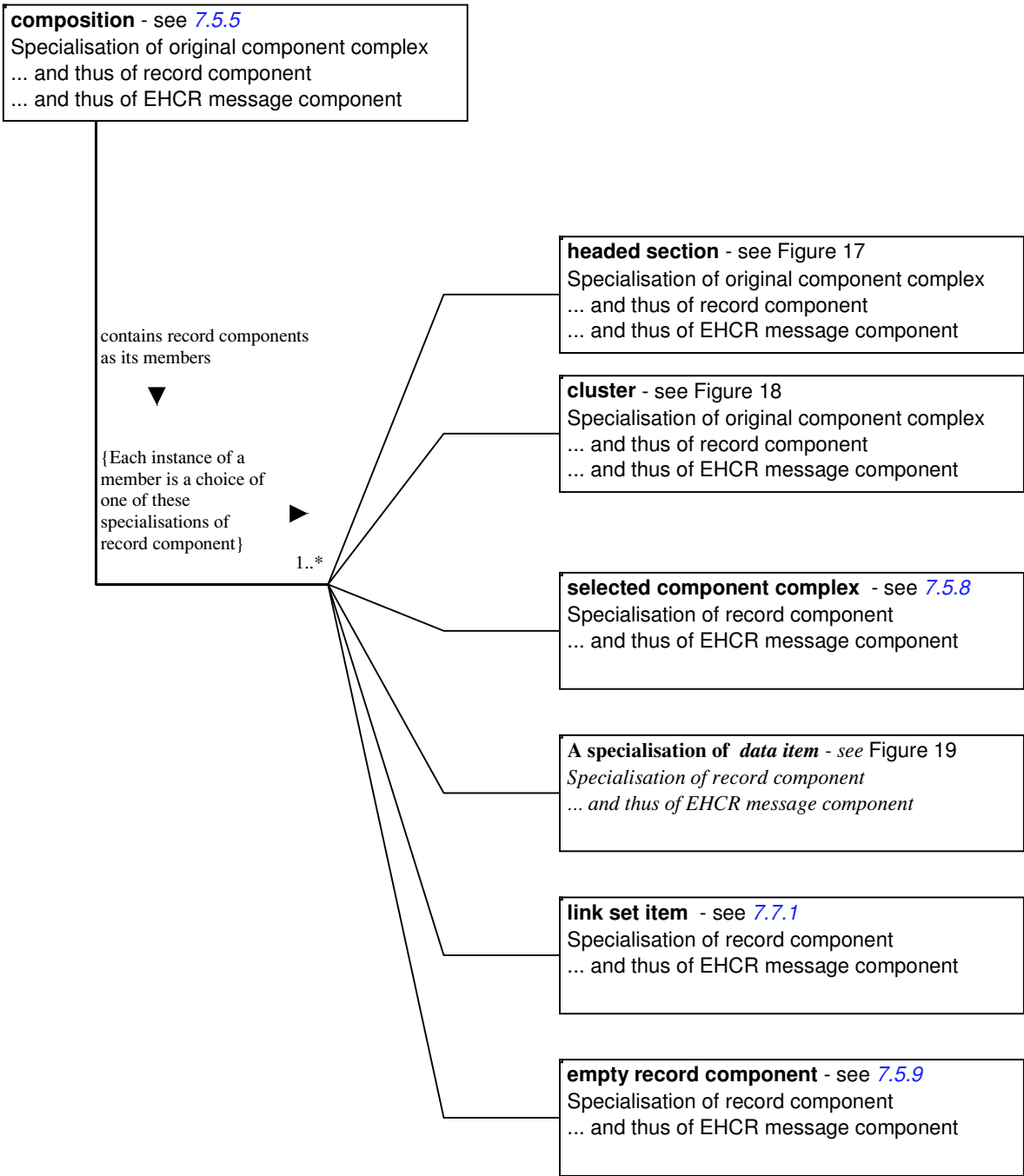


Figure 16. GMD Composition - Original Component Complex

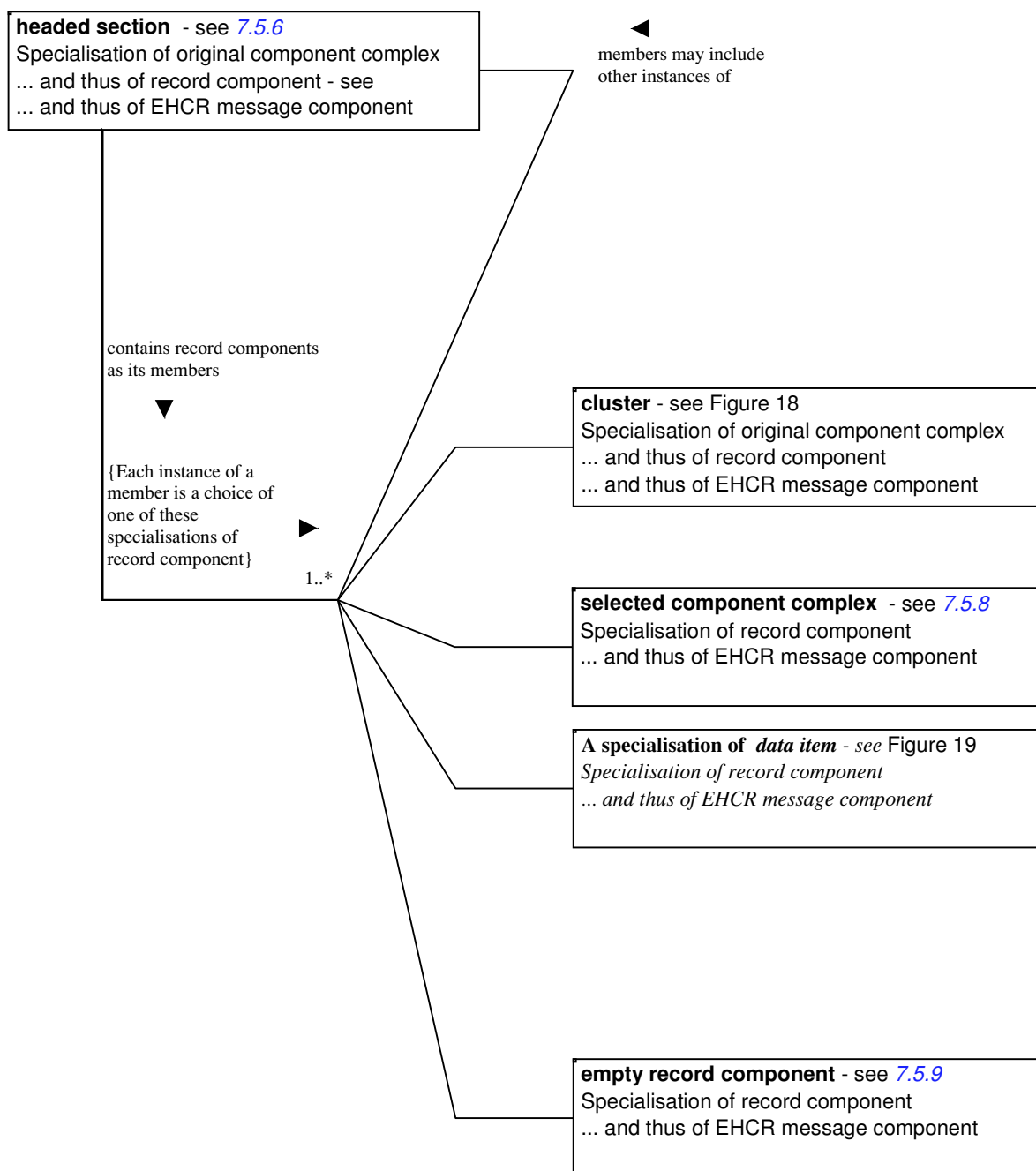


Figure 17. GMD Headed Section - Original Component Complex

6.7.4. Headed sections

6.7.4.1. A *headed section* is used to group *record components* that are part of a *composition* under an appropriate heading. A *headed section* shall not be used to group *record components* that arise from more than one contact with a patient.

EXAMPLES Clinical history, examination, treatment.

6.7.4.2. All implementations of the *provide EHCR message* should be capable of supporting *headed sections*. However, users of the message need not include instances of *headed section* in a message.

6.7.4.3. If *headed sections* are implemented and used in the message, they shall comply with the requirements which are stated in this subclause and summarised in the GMD diagram (Figure 17). A more detailed description of the *headed section* class is included in the Domain Information Model (7.5.6).

6.7.4.4. A *headed section* is a specialisation of the abstract class *original component complex*. Therefore, the *EHCR extract* shall comply with the requirements specified for all types of *original component complex* in 6.7 and shall fully support the specialised constraints specified for *headed section* type *original component complexes* in 7.5.6.

6.7.4.5. Every instance of a *headed section* shall include a value for the *component name category* attribute. This shall be one of the "Categories for Headed Section OCC types", listed in Table A.2 of Part 2 of this Prestandard. These values are required to communicate information about the general nature of the headed section. An optional additional more detailed heading may be provided using the *component name structure* (7.8.4).

6.7.4.6. A *headed section* shall include one or more members and each of these members shall be an instance of one of the following specialisations of the abstract class *record component*:

- *original component complexes* (7.5.3) of the types:
 - *headed section* (7.5.6)
 - *cluster* (7.5.7)
- *selected component complex* (7.5.8)
- *empty record component* (7.5.9)
- *data item* (7.6.1) of any of the types specified in (6.8)

6.7.4.7. A *headed section* may include other *headed sections* among its members. A communicating community may specify limitations to the level of nesting of *headed sections* as part of the implementation guidelines for the *provide EHCR message*.

6.7.5. Clusters

6.7.5.1. A *cluster* is used where it is necessary or desirable to group *data item* into logically or clinical associated collections within a *composition* or *headed section*. A *cluster* shall not be used to group *record components* that arise from more than one contact with a patient or that have been recorded under different *headed sections*.

EXAMPLES Blood pressure measurement (including systolic and diastolic as separate data items, the results of a "battery" of investigations).

6.7.5.2. All implementations of the *provide EHCR message* should be capable of supporting *clusters*. Instances of a message should include clusters if the *EHCR source* systems contains an indication of a fundamental relationship between several observations or actions recorded during the same contact with the patient.

6.7.5.3. If *clusters* are implemented and used in the message, they shall comply with the requirements stated in this subclause and summarised in the GMD diagram (Figure 18). A more detailed description of the *cluster* class is included in the Domain Information Model (7.5.7).

6.7.5.4. A *cluster* is a specialisation of the abstract class *original component complex*. Therefore, the *EHCR extract* shall comply with the requirements specified for all types of *original component complex* in 6.7 and shall fully support the specialised constraints specified for *cluster* type *original component complexes* in 7.5.7.

6.7.5.5. The nature of the information within a *cluster* should be represented by one or more code values applied to the *component name structure* (7.8.4). The codes used for this purpose shall be taken from a coding scheme or controlled terminology agreed for use within the communicating community and identified in the message.

6.7.5.6. Any other coded or structured information that alters the meaning of the entire *cluster* should be represented by inclusion of one or more instances of the *annotation identifier* attribute, which shall contain an appropriate value from the list in Table B.1 in Part 2 of this Prestandard.

6.7.5.7. A *cluster* shall include one or more members and each of these members shall be an instance of one of the following specialisations of the abstract class *record component*:

- *original component complexes* (7.5.3) of the type *cluster* (7.5.7)
- *empty record component* (7.5.9)
- *data item* (7.6.1) of any of the types specified in (6.8)

6.7.5.8. A *cluster* may include other *clusters* among its members and this Prestandard does not specify a limit to the levels of nesting. A communicating community may specify limitations to the level of nesting of *clusters* as part of the implementation guidelines for the *provide EHCR message*.

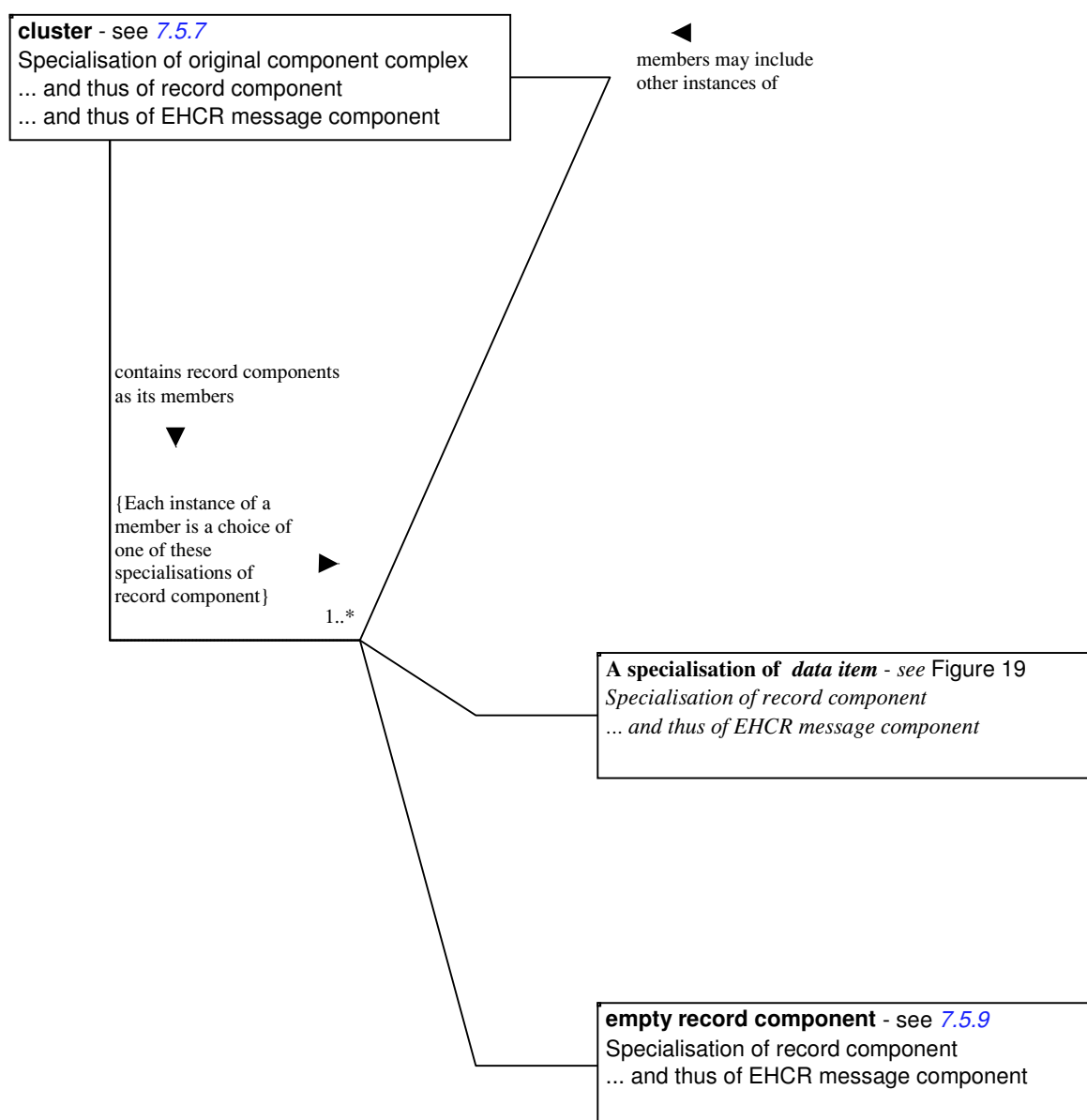


Figure 18. GMD Cluster - Original Component Complex

6.8. Data items

6.8.1. Concrete specialisations of the abstract class *data item* represent individual items of EHCR information that cannot be subdivided without losing all or part of their meaning.

6.8.2. The specialisations of *data item* are illustrated by Figure 19. A more detailed description of the *data item* class is included in the Domain Information Model (7.6.1).

6.8.3. A *data item* is a specialisation of the class *record component*. Therefore, each instance of *data item* shall include instances of the attributes of *record component* as specified in 7.5.2. These attributes shall be populated in accordance with the specification of usage included in the full description of each specialisation of *data item* in 7.6.

6.8.4. All implementations of the messages specified by this European Prestandard shall fully support the structure of the following mandatory specialisations of *data item* (7.6.1) as specified in the referenced clauses of the Domain Information Model:

- | | |
|---|--|
| — address data item (7.6.13) | — event data item (7.6.6) |
| — external data reference data item (7.6.7) | — language data item (7.6.15) |
| — medication data item (7.6.5) | — patient related party data item (7.6.9) |
| — person identifier data item (7.6.11) | — person name data item (7.6.12) |
| — physical entity reference data item (7.6.8) | — quantifiable observation data item (7.6.4) |
| — structured coded data item (7.6.3) | — telecom data item (7.6.14) |
| — text data item (7.6.2) | |

6.8.5. The nature of main information within a *data item* should be represented by one or more code values applied to the *component name structure* (7.8.4). The codes used for this purpose shall be taken from a coding scheme or controlled terminology agreed for use within the communicating community and identified in the message. More detailed specific requirements regarding the use of the *component name* are included in the description of the individual specialisation of *data item*. The *component name structure* is mandatory for most specialisations of *data item* but is optional or not applicable for others, such as the *text data item*.

EXAMPLES Coded representations of a diagnosis, a procedure, a drug identification or a property measured or observed.

6.8.6. Demographic and healthcare administrative information contained in the EHCR should be conveyed using the appropriate *data items*. The attributes for names, identifiers, address, sex, date of birth in *patient matching information* should only be used for information intended to be used to match a message to a patient.

NOTE The rationale for treating *patient matching information* separately for formal communication of demographic information is as follows. The *patient matching information* is part of the message but outside the formally defined EHCR. This allows a separation between data required to support the management of the message and information contained within the record. Information within the EHCR is conveyed as *record components* that are identifiable, attributable, subject to distribution rules and capable of supporting revision. *Patient matching information* is not subject to these constraints, it should be the minimum information required for a match and it may be effective even if it is out-of-date. For example, if a patient has moved home recently, their previous address may be more useful than their current address for matching a message to an existing record.

6.8.7. Information about characteristics of a patient such as sex, marital status and occupation should be conveyed in instances of *structured coded data item*.

6.8.8. The date of birth and/or date of death should be conveyed in instances of the *event data item*.

6.8.9. Any other coded or structured information that alters the meaning of the *data item* shall be represented by inclusion of one or more instances of the *annotation identifier* attribute, which shall contain an appropriate value from the list in Table B.1 in Part 2 of this Prestandard.

6.8.10. Those involved in implementing the messages specified by this European Prestandard may specify additional *community defined data items* (7.6.16) for use within a communicating community. These additional types of *data item* (7.6.1) should be defined using the sub-classes and data types specified in this European Prestandard. To facilitate future extension of communicating communities the specification of *community defined data items* should follow a documentary form similar to that used in this European Prestandard.

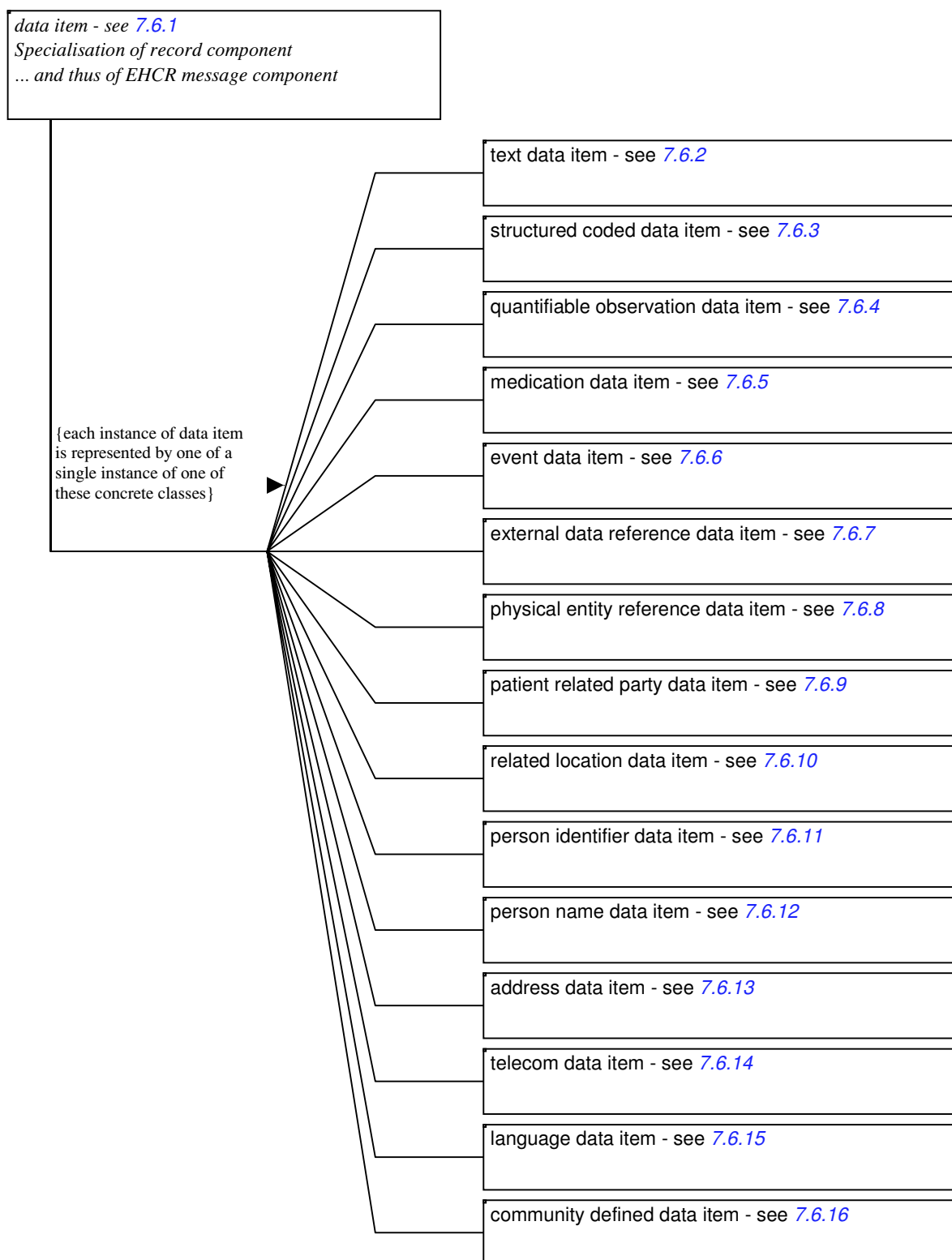


Figure 19. GMD Data Item

6.9. Link set items

6.9.1. A *link set item* is used to indicate relationships between *record components* other than those relationships that are determined by the original information context.

6.9.2. All implementations of the *provide EHCR message* shall enable the communication of *link set items* that comply with the requirements specified in this clause. An individual instance of the message need not include any *link set items*. However, *link set items* are the only way to convey explicit associations between *record components* other than those derived from the original information context. Therefore, *link set items* should be used wherever necessary for this purpose. Communicating communities may specify additional constraints in respect of the use of *link set items*.

6.9.3. A *link set item* is a specialisation of the class *record component*. Therefore, each instance of *link set item* (7.7.1) shall include instances of the attributes of *record component* as specified in 7.5.2. These attributes shall be populated in accordance with the specification of usage included in the full description of the *link set item* in 7.7.1.

6.9.4. Every instance of a *link set item* shall include a value for the *component name category* attribute. This shall be one of the "Categorisation of Link Item Names" listed in Table C.1 of Part 2 of this Prestandard. These values are required to communicate information about the general nature of the relationship between the linked components. An optional additional more detailed indication of the nature of a link may be provided using the *component name structure* (7.8.4).

6.9.5. The *link set item* shall also include a single mandatory instance of the *source component* (7.7.2) and one or more instances of the *target component* (7.7.3) attribute.

6.10. Selected component complexes

6.10.1. A *selected component complex* is used to aggregate *record components* in a manner not determined by the time and situation in which they were originally added to the EHCR. *Selected component complexes* can be used in the message to communicate various alternate views of the EHCR.

EXAMPLES Problem lists, views of information associated a particular topic or problem, summaries of based on reference to information in various parts of the record, representation of the record as it appeared at a particular time in the past, dynamic views generated by applying selection criteria to the record.

6.10.2. All implementations of the *provide EHCR message* shall enable the communication of *selected component complexes*. However, the requirements for this are equivalent to those for conveying a *data item* because, in the message, members of a *selected component complex* are associated with the complex using *link set items*. An individual instance of the message need not include any *selected component complexes*.

6.10.3. A *selected component complex* is a specialisation of the class *record component*. Therefore, each instance of *selected component complex* shall include instances of the attributes of *record component* as specified in 7.5.2. These attributes shall be populated in accordance with the specification of usage included in the full description of the *selected component complex* in 7.5.8.

6.10.4. The *component name structure* (7.8.4) should be used to denote the title of the view of the EHCR provided by the *selected component complex*. This may be mapped to a high-level *component name category*. In this case the value of the *component name category* shall be one of the values specified in Tables A.1 and A.2 of Part 2 of this European Prestandard.

6.10.5. The *selected component complex* may contain an additional optional attribute, the *component selection criteria*, for communicating the criteria used to generate a dynamic view. However, the nature of these criteria is not specified by this Prestandard. Therefore if this attribute is implemented, its contents shall be specified and agreed by the communicating community.

6.11. Empty record component

6.11.1. An *empty record component* is used to communicate the deletion of existing *record component*.

6.11.2. Any implementations of the *provide EHCR message* should enable the communication of *empty record component*. However, this component need not be supported if the message is not being used for updating.

6.11.3. An *empty record component* is a specialisation of the class *record component* (7.5.2). However the attributes required for this specialisation form a restricted set, which is specified in the Domain Information Model (7.5.9).

6.12. Adding comments to items

Comments on the information content of any *record component* may be included in the record in the form of *text data items* associated with the component to which they relate in one of the following ways:

- By an explicit link represented by *link set item* (7.7.1)
- By proximity within the same *original component complex*.
 - This second method is only applicable if the comment originates at the same time as the component on which the comment is made.

6.13. Request EHCR Message

6.13.1. The *request EHCR message* is used to request all or part of the EHCR for a single specified patient.

6.13.2. The requirements applicable to the *request EHCR message* are stated in this subclause and summarised in the GMD diagram (Figure 20). A more detailed description of the *request EHCR message* is included in the Domain Information Model (7.4.2).

6.13.3. The *request EHCR message* shall comply with the general requirements for *EHCR messages* stated in 6.3.

6.13.4. The *request EHCR message* shall include one mandatory instance of *specification of EHCR information*, which shall comply with the requirements stated in 6.4. This shall indicate the scope of the EHCR information requested by the *EHCR destination* (7.3.3). It may also indicate the language in which the EHCR information is requested and any communicating community or enterprise constraints that apply to the requester.

6.13.5. The *request EHCR message* shall include one mandatory instance of the coded or string attribute *reason for request*.

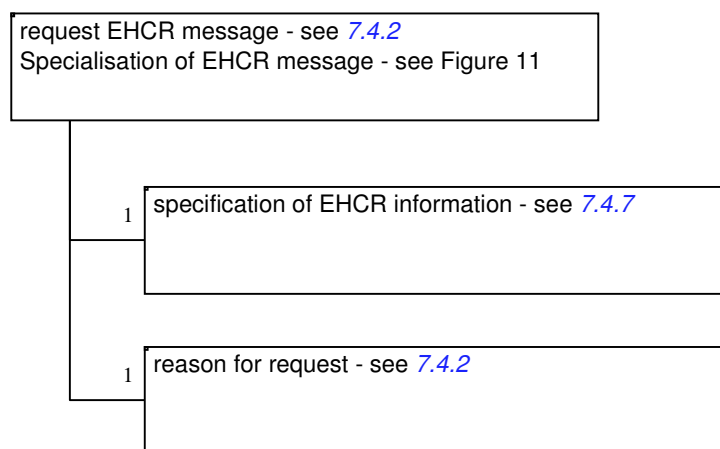


Figure 20. GMD Request EHCR Message

6.14. EHCR notification message

6.14.1. The *EHCR notification message* is used to enable the communicating parties to notify one another about the progress of EHCR communication. It may also be used to notify third parties about the transfer of EHCR information in a communicating community that requires this.

6.14.2. The requirements applicable to the *EHCR notification message* are stated in this subclause and summarised in the GMD diagram (Figure 21). A more detailed description of the *EHCR notification message* is included in the Domain Information Model (7.4.4).

6.14.3. The *EHCR notification message* shall comply with the general requirements for *EHCR messages* stated in 6.3.

6.14.4. The *EHCR notification message* shall include one optional instance of *specification of EHCR information*, which shall comply with the requirements, stated in 6.4. This may be used to indicate the scope of the EHCR information conveyed or requested by the message that is the subject of this notification.

6.14.5. The *EHCR notification message* shall include one mandatory instance of the enumerated attribute *EHCR message notification type* and this shall be used to indicate the type of notification (see 7.4.4).

6.14.6. The *EHCR notification message* shall include one mandatory instance of the coded or string attribute *EHCR notification comment* and this shall be used to convey a comment relevant to the notification.

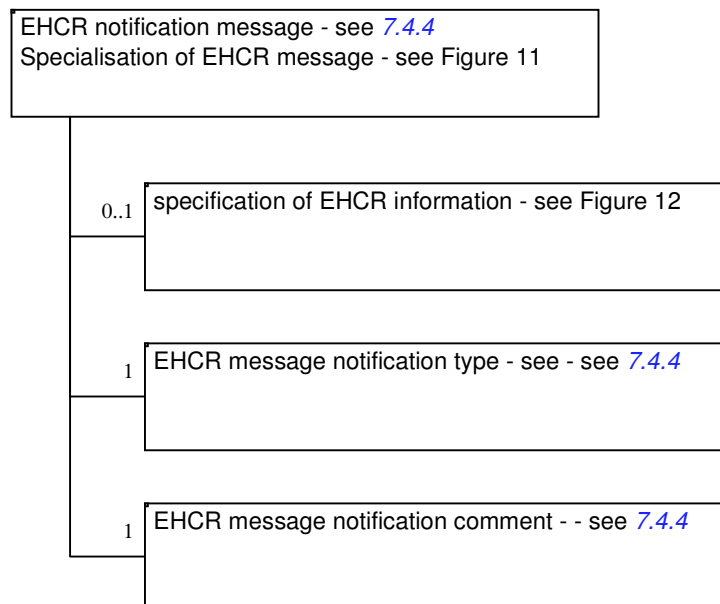


Figure 21. GMD EHCR Notification Message