

**Integrating the Healthcare Enterprise**



5

**IHE Patient Care Coordination  
Technical Framework Supplement**

10

**Cross Enterprise TeleHomeMonitoring  
Workflow Definition Profile  
(XTHM-WD)**

15

**Trial Implementation**

20

Date: August 16, 2012

Author: IHE PCC Technical Committee

25 Email: [pcc@ihe.net](mailto:pcc@ihe.net)

## Foreword

This is a supplement to the IHE Patient Care Coordination Technical Framework V8.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

- 30 This supplement is published for Trial Implementation on August 16, 2012 and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the Patient Care Coordination Technical Framework. Comments are invited and may be submitted at <http://www.ihe.net/pcc/pcccomments.cfm>.
- 35 This supplement describes changes to the existing technical framework documents and where indicated amends text by addition (**bold underline**) or removal (~~**bold strikethrough**~~), as well as addition of new sections introduced by editor’s instructions to “add new text” or similar, which for readability are not bolded or underlined.
- 40 “Boxed” instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume:

<i>Replace Section X.X by the following:</i>
--

General information about IHE can be found at: [www.ihe.net](http://www.ihe.net)

- 45 Information about the IHE Patient Care Coordination domain can be found at: <http://www.ihe.net/Domains/index.cfm>

Information about the structure of IHE Technical Frameworks and Supplements can be found at: <http://www.ihe.net/About/process.cfm> and <http://www.ihe.net/profiles/index.cfm>

- 50 The current version of the IHE Technical Framework can be found at: [http://www.ihe.net/Technical\\_Framework/index.cfm](http://www.ihe.net/Technical_Framework/index.cfm)

## **CONTENTS**

	<b>INTRODUCTION TO THIS SUPPLEMENT .....</b>	<b>4</b>
55	OPEN ISSUES AND QUESTIONS .....	4
	CLOSED ISSUES.....	4
	<b>VOLUME 1 – PROFILES .....</b>	<b>6</b>
	<b>X CROSS ENTERPRISE TELEHOMEMONITORING WORKFLOW DEFINITION (XTHM-WD) PROFILE .....</b>	<b>6</b>
60	X.1 PURPOSE AND SCOPE .....	6
	X.2 PROCESS FLOW .....	7
	X.3 WORKFLOW PARTICIPANTS AND PROCESS FLOW .....	12
	<i>X.3.1 Use Cases</i> .....	14
	<i>X.3.2 Options</i> .....	30
65	X.3.2.1 Consult Request task without Telemonitoring task as ancestor Option.....	30
	X.3.2.2 Clinical Input Option.....	31
	X.4 WORKFLOW DEFINITION ACTORS AND OPTIONS .....	32
	<i>X.4.1 Workflow Definition Actors</i> .....	32
	<i>X.4.2 Workflow Options</i> .....	32
70	<i>X.4.3 Workflow Definition Profile Grouping with other Profiles</i> .....	33
	X.5 SECURITY CONSIDERATIONS.....	35
	<b>VOLUME 2 – CONTENT MODULES .....</b>	<b>36</b>
	Y.1 XTHM WORKFLOW DEFINITION - XDW WORKFLOW DOCUMENT – COMMON ATTRIBUTES .....	36
	Y.2 XDW CONTENT MODULES .....	37
75	Y.3 TASKS SPECIFICATIONS.....	38
	<i>Y.3.1 Task: Requested</i> .....	41
	<i>Y.3.2 Task: Approved</i> .....	42
	<i>Y.3.3 Task : Telemonitoring</i> .....	43
	<i>Y.3.4 Task: Consult Request</i> .....	44
80	<i>Y.3.5 Task: Analysis and Request Visit</i> .....	45
	<i>Y.3.6 Task: Visit Result</i> .....	46
	<i>Y.3.7 Task: Analysis and Change Protocol</i> .....	46
	<i>Y.3.8 Task: New Protocol Activation</i> .....	47
	<i>Y.3.9 Task: Analysis and clinical actions</i> .....	48
85	<i>Y.3.10 Task: Analysis and no actions</i> .....	49
	Y.4 INPUT AND OUTPUT DOCUMENTS .....	50
	<b>APPENDIX A- COMPLETE EXAMPLE OF TELEMONITORING WORKFLOW DOCUMENT .....</b>	<b>50</b>
	<b>APPENDIX B: TECHNICAL DEVELOPMENT OF WD RELATED TO THE TELEMONITORING PROCESS.....</b>	<b>61</b>
90	B.1 MANAGEMENT OF ALARM SITUATION WITH A REQUEST OF A VISIT .....	62
	B.2 MANAGEMENT OF ALARM SITUATION WITH A CHANGE OF THE PROTOCOL.....	63
	B.3 MANAGEMENT OF ALARM SITUATION WITH CLINICAL ACTIONS .....	64
	B.4 MANAGEMENT OF ALARM SITUATION WITH NO ACTIONS .....	65

## 95 Introduction to this Supplement

This supplement is written according to the specific template defined for Workflow Definition profiles. The structure of this document differs from a PCC Content Profile. In particular the XTHM-WD Profile establishes a common set of rules to share between participants involved in a telemonitoring workflow.

100 The telemonitoring process, and workflow related to it, are applicable to many different sharing infrastructures. In this profile we present a specific XDS based use-case.

Volume 1 is related to the introduction of the profile with the description of the telemonitoring process flow with the references to the tasks, to the produced documents and to the Workflow Participants involved in the process. This volume reports also the use case of the telemonitoring analyzing in details each possible step of the process.

105 Volume 2 aims to explain how to use XDW Workflow Document (See ITI Technical Framework and Supplements) to track and manage this workflow: in particular the detail features of each step of the workflow, and rules to follow to go through these steps are analyzed.

110 At the end of the supplement (Appendix A) is presented a complete example of a Workflow Document produced during a telemonitoring workflow; diagrams to provide a depiction of the technical development of the Workflow Document related to the telemonitoring are reported in Appendix B.

## Open Issues and Questions

115 None

## Closed Issues

- 120 • *(Reviewers should evaluate how to manage the task “Telemonitoring” in status FAILED. In general, the cardinality of this task is 1..n but in the case where the status is FAILED, it should be required to be 2..n. After a “Telemonitoring” task is put in status FAILED (i.e., there are problems with sending data) there must be another “Telemonitoring” task with status COMPLETED (the measurement is repeated after the failure). Is there a need to specify this situation in the document? If yes, how can we describe it? (see table X.2-1 of Volume 2))* Answer: in case of failing of the Telemonitoring task it is not required to repeat the action traced but it is suggested to solve the problems in sending data adding new task Events.
- 125 • *(Reviewers should evaluate the need to define options within the Workflow Definition to facilitate implementation of the workflow definition profile. Should there be options on the (1) support of specific workflow tasks/status, (2) reference content document profiles, (3) remaining options from XDW? These would be formalized and placed in Section X.4 Option of Volume 1. The requirements for support of options related to the XDW Profile may not be properly placed in Section X.4 and should be moved to Volume 2.)* Answer: The workflow
- 130

Definition profile defines a section Options where are described alternative paths, or alternative rules for the evolution of the process.

- 135
- *(Reviewers should evaluate the proposed table in Section 6.5 that describes the documents created during the workflow process, their requirements, their nature and their related PCC(or other) document content profiles that define them and, in case that these are not present, the note that the PCC may/should define them in the future. How specific should a workflow definition profile be in terms of referenced documents conformance requirements?)*
- 140
- The Workflow Definition profile defines only “documents labels” to define the role of an attachment of the profile.
- *(In many parts of this document we present XML examples to better understand how the Workflow Document can track information related to the process. This structure will be affected by CPs proposed to the ITI domain (CP-643, CP-637). So these XML parts may change sections X.2.1.1, X.2.2.1, X.2.3.1 and Appendix A)* Small xml parts are removed from
- 145
- text, we left only the appendix A to show a complete example of Workflow Document.

150

## Volume 1 – Profiles

### **X Cross Enterprise TeleHomeMonitoring Workflow Definition (XTHM-WD) Profile**

155 This profile focuses on the definition of a standardized and shared document structure for the proper management of the clinical process involving chronic patients followed by telemonitoring services. Although this profile has the word “home” in its title, the telemonitoring process considered in this profile allows the patient to be monitored not only from his home but from the place in which he is resident.

160 The main goal is to allow every participant involved in the process (e.g., specialist, general practitioner, telemonitoring centre’s staff) to manage and share the complete clinical history of the patient, from the monitored data to the events occurring during the process (e.g., visits, changes of therapy). To achieve this, this profile is based on the ITI Cross-enterprise Document Workflow (XDW) Profile that provides a structure to build cross-enterprise workflows, where each event and the related status and documents are tracked and shared between all individuals  
165 involved. The XTHM-WD Profile follows the technical specifications contained in the XDW Profile to define the rules needed to create and manage a cross-enterprise workflow related to a telemonitoring process.

#### **X.1 Purpose and Scope**

170 The workflow related to the management of patients with chronic diseases (e.g., heart failure, COPD, diabetes) followed by a telemonitoring service is a cross-enterprise workflow since many different individuals from different enterprises can be involved: specialists and physicians, working in hospitals, rural areas or urban areas, general practitioners (GP), and general caregivers, as well as the telemonitoring centre’s staff.

175 For the correct management of these patients, each of these individuals, managing his part of the telemonitoring workflow, should have also the possibility to share and manage the patient’s complete clinical history. However, at the moment there are no technical specifications allowing this to be done in a standardized manner.

180 This profile provides guidelines to define this kind of cross-enterprise workflow using the XDW profile, allowing every participant involved in a patient's care to share the complete telemonitoring workflow, including all related documents produced for each event occurring during the process (data sending, request for a visit, change of therapy), and the related workflow status.

This proposal focuses on the Cross Enterprise TeleHomeMonitoring Workflow Definition in support of telemonitoring workflow document and status management.

185 The key elements are:

- managing telemonitoring cross-enterprise workflow, tracking all events and related documents;
- managing workflow specific status with relationship to one or more documents;
- tracking status of all events in telemonitoring process (in progress, completed, etc.).

190

With the increase in the elderly population and the consequent increase in the prevalence of patients with chronic diseases (as diabetes, chronic heart failure and COPD), the introduction of a telemonitoring service for these patients, with good workflow management, as defined in this profile, would entail a considerable advantage in terms of quality of life for patients and cost savings.

195

To demonstrate the scale of the problem, an analysis has been performed on some European data about the most relevant chronic diseases: now COPD affects approximately 44 million people; heart failure affects about 15 million people. The introduction of a telemonitoring service for these patients, with good workflow management, as defined in this profile, would entail a considerable advantage in terms of quality of life for patients and cost savings.

200

## **X.2 Process Flow**

This section is focused on the description of the general telemonitoring process flow, which can be described with the following steps:

205

A. The Telemonitoring process starts when a GP or a general caregiver requests the activation of a telemonitoring service for his patient to a telemonitoring service provider. In this initial phase of the process the GP defines the telemonitoring protocol for the patient and produces a telemonitoring Workflow Document with a “Requested” task as the first entry.

B. The service provider now evaluates and approves the physician's request and activates the service; the workflow document is updated with a new “Approved Request” task.

210

C. The patient starts to collect the required clinical parameters at his home or place of residence. The data collected is transmitted to the service provider that manages the data, making them available to any clinicians involved in the process. The Workflow Document is updated with a “Telemonitoring” task.

215

D. If the data sent by the patient goes outside the threshold levels defined in the protocol, the service provider alerts the referring physician and updates the Workflow Document with a “Consult Request” task.

E. The physician analyses the patient's data and decides if the patient needs to change their therapy, to have a specialist visit, or if there is no need to perform any action. The Workflow Document is updated with a task that depends on the decision taken by the clinician:

220

E1. “Analysis and Request Visit”;

E2. “Analysis and Change Protocol”;

E3. “Analysis and Clinical Actions”;

E4. “Analysis and No Actions”.

F. Depending on the resulting task from step E, two options can result:

225 F1. If the decision is to schedule a visit, an eReferral process is activated. When the eReferral workflow ends the clinician that performed the referral updates the Workflow Document with the task “Visit Result”.

230 F2. If the result includes a need to change the protocol, the service provider receives the protocol from the clinician and activates it, updating the Workflow Document with the task “New Protocol Activation”.

The patient now continues with the telemonitoring service.

The workflow ends and is set to “Closed” when the patient doesn’t need to be monitored any more by the telemonitoring service. Each task can lead to the closing of the Workflow Document and this can be tracked by including a closure document in the outputs of the current task.

235 These steps can be tracked in nine different tasks throughout the workflow:

1. Requested: tracks step A, performed by the patient’s clinician;
2. Approved Request: tracks step B, performed by the telemonitoring service provider;
3. Telemonitoring: tracks step C, performed by the telemonitoring service provider;
4. Consult Request: tracks step D, performed by the telemonitoring service provider;
- 240 5. Analysis and Request Visit: tracks step E1, performed by the patient’s clinician;
6. Visit Result: tracks step F1, performed by the patient’s clinician;
7. Analysis and Change Protocol: tracks step E2, performed by the patient’s clinician;
8. New Protocol Activation: tracks step F2, performed by the telemonitoring service provider;
9. Analysis and Clinical Actions: tracks step E3, performed by the patient’s clinician;
- 245 10. Analysis and No Actions: tracks step E4, performed by the patient’s clinician.

Figure X.2-1 below shows the schematic modality of all tasks related to the process and the relationship between these.

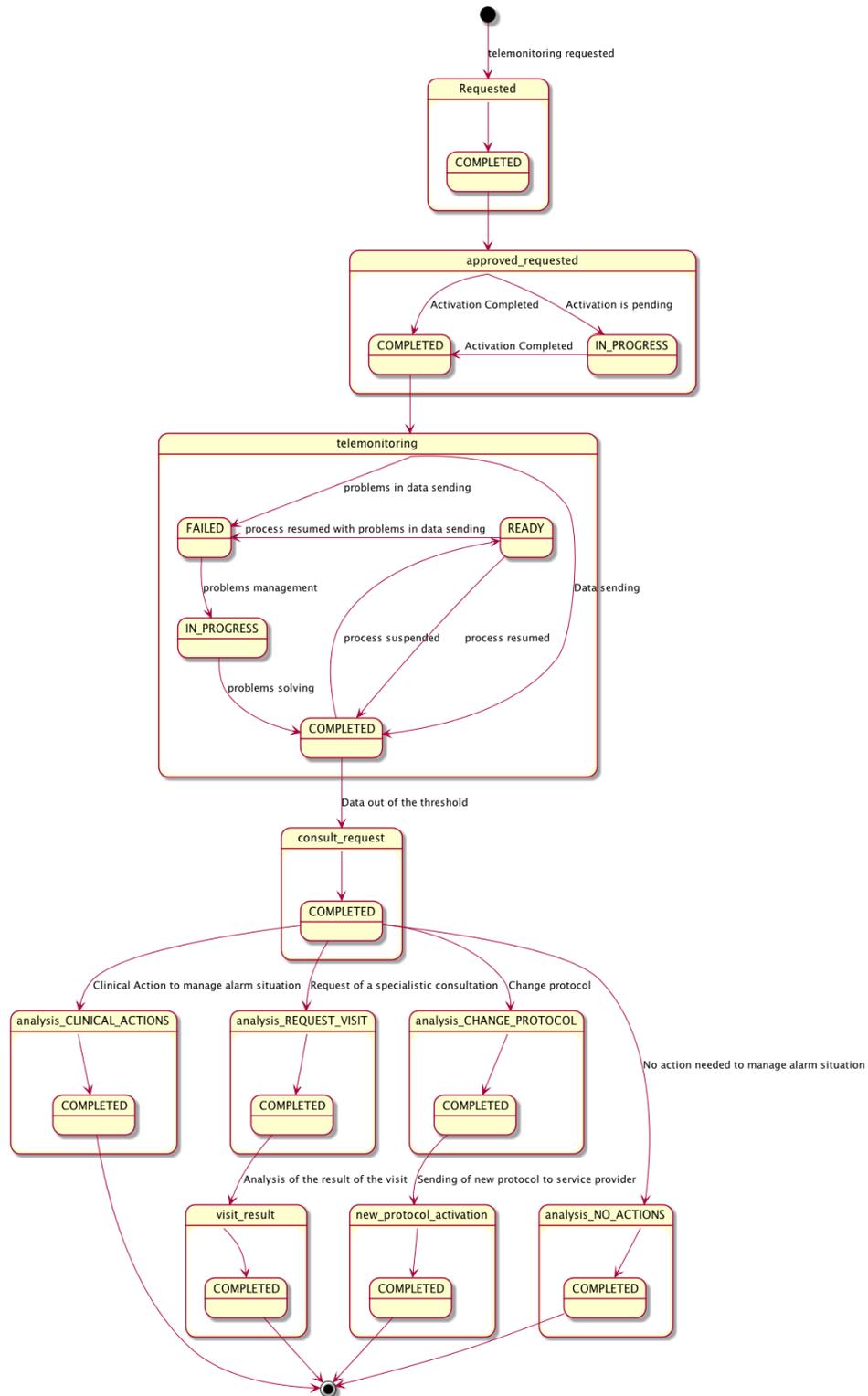
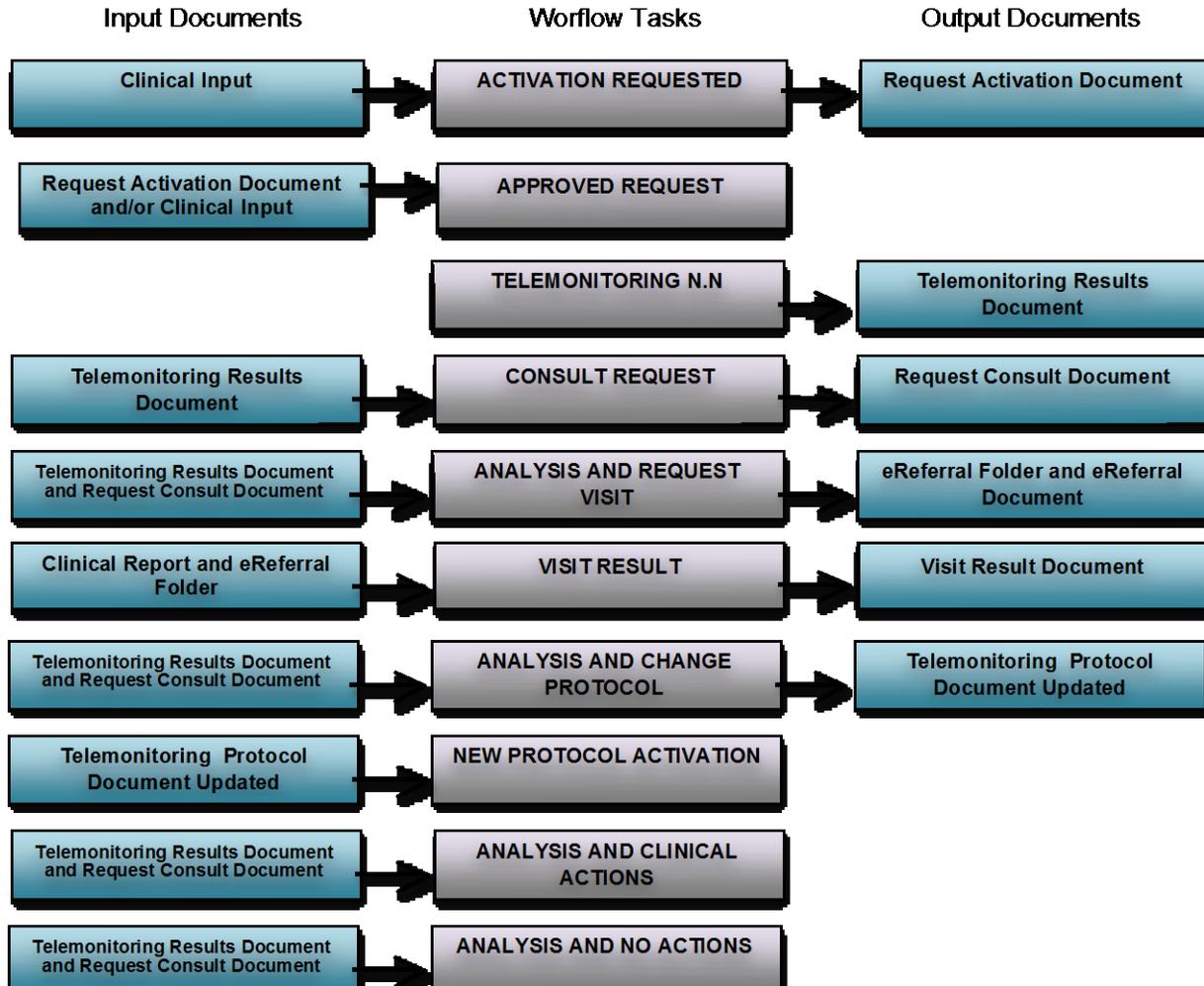


Figure X.2-1: Workflow Definition sample process flow

A telemonitoring process produces many documents and each of these documents is referenced in related tasks of the Workflow Document. Figure X.2-2 and Table X.2-1, outlines the documents needed as input and output for each task.



255

Figure X.2-2: Input and Output Documents of each task

260

265

**Table X.2-1: Input and Output Documents of each task/status pair**

Task Type	Task Status	Input Docs	Option	Output Docs	Option
Requested	COMPLETED	Clinical Input	O * These may change if Workflow Options are selected	Request Activation Document	R
Approved	IN_PROGRESS	Request Activation Document	R	N/A	-
		Clinical Input	O * These may change if Workflow Options are selected		
	COMPLETED	Request Activation Document	R	N/A	-
		Clinical Input	O * These may change if Workflow Options are selected		
Telemonitoring	COMPLETED	N/A	-	Telemonitoring Results Document	R
	FAILED	N/A	-	Telemonitoring Results Document	R
	IN_PROGRESS	Telemonitoring Results Document	O	N/A	-
	READY	N/A	-	N/A	-
Consult Request	COMPLETED	Telemonitoring Results Document	R * These may change if Workflow Options are selected	Request Consult Document	R
Analysis and Request Visit	COMPLETED	Telemonitoring Results Document	R * These may change if Workflow Options are selected	eReferral Workflow Document	R

Task Type	Task Status	Input Docs	Option	Output Docs	Option
		Request Consult Document	R	eReferral Document	R
Visit Result	COMPLETED	Clinical Report of the visit	R	Visit Result Document	R
		eReferral Workflow Document	R		
Analysis and Change Protocol	COMPLETED	Telemonitoring Results Document	R * These may change if Workflow Options are selected	Telemonitoring Protocol Updated	R
		Request Consult Document	R		
New Protocol Activation	COMPLETED	Telemonitoring Protocol Document Updated	R	N/A	-
Analysis and Clinical Actions	COMPLETED	Telemonitoring Results Document	R * These may change if Workflow Options are selected	N/A	-
		Request Consult Document	R		
Analysis and no actions	COMPLETED	Telemonitoring Results Document	R * These may change if Workflow Options are selected	N/A	-
		Request Consult Document	R		

### X.3 Workflow Participants and Process Flow

In this section we present the Workflow Participants involved in the telemonitoring process and, using the figure X.3-1, we describe in detail process transactions and interactions between them.

270

A Workflow Participant is an abstraction of system along with users involved in the telemonitoring process. They can be identified, based on their roles in the process, as one of three specific participants. Each of these workflow participants has specific rights and duties in

the process. They drive the process from one step to another, performing determinate actions on the workflow:

275 **Care Manager** is the participant that performs the following actions and related tasks:

- Activating the telemonitoring service – task APPROVED;
- Creating the Telemonitoring Results Document for each set of data sent – task TELEMONITORING;
- Creating the Request Consult Document in the case of alarm situations – task REQUEST CONSULT;
- Activating new telemonitoring protocol when requested form the General Clinician Manager – Task NEW PROTOCOL ACTIVATION;

280

**General Clinician Manager** is the participant that performs the following actions and related tasks:

- 285
- Creating the Workflow Document for the telemonitoring of his patient;
  - Creating the Request Activation Document – task REQUESTED;

**Consult Manager** is the participant that performs the following actions and related tasks:

- Analyzing any alarm situations and deciding how to manage them – tasks ANALYSIS AND REQUEST VISIT, ANALYSIS AND CHANGE PROTOCOL, ANALYSIS AND CLINICAL ACTIONS and ANALYSIS AND NO ACTIONS;
  - If a specialist visit is needed, producing an eReferral Document and creating the related eReferral Workflow Document – task ANALYSIS AND REQUEST VISIT;
  - After receive the Clinical Report of the visit by the specialist as the end of the eReferral process, checking the visit’s outcomes and confirming the telemonitoring protocol – task VISIT RESULT;
  - If a change of protocol is decided, updating the Telemonitoring Protocol Document – task ANALYSIS AND CHANGE PROTOCOL;
  - If clinical actions are decided (e.g. change therapy) – task ANALYSIS AND CLINICAL ACTIONS;
  - If no action is decided – task ANALYSIS AND NO ACTIONS.
- 290
- 295
- 300

Table X.3-1 describes these Workflow Participants.

**Table X.3-1: Workflow Participants**

Workflow Participants	Description
Care Manager	<i>Participant responsible for the management of the telemonitored data sent by the patient from his home and of the alarm situations incurring when data go outside of the thresholds</i>
General Clinician Manager	<i>Participant responsible for the request of activation of the telemonitoring process and producing the telemonitoring Workflow Document</i>

Workflow Participants	Description
Consult Manager	<i>Participant responsible for the management of the clinical care process of the patient from the activation of the telemonitoring service with the clinical management of alarm situations reported by the Care Manager</i>

305 The figure below describes the relationship between each Workflow Participants and the tasks of the telemonitoring process.

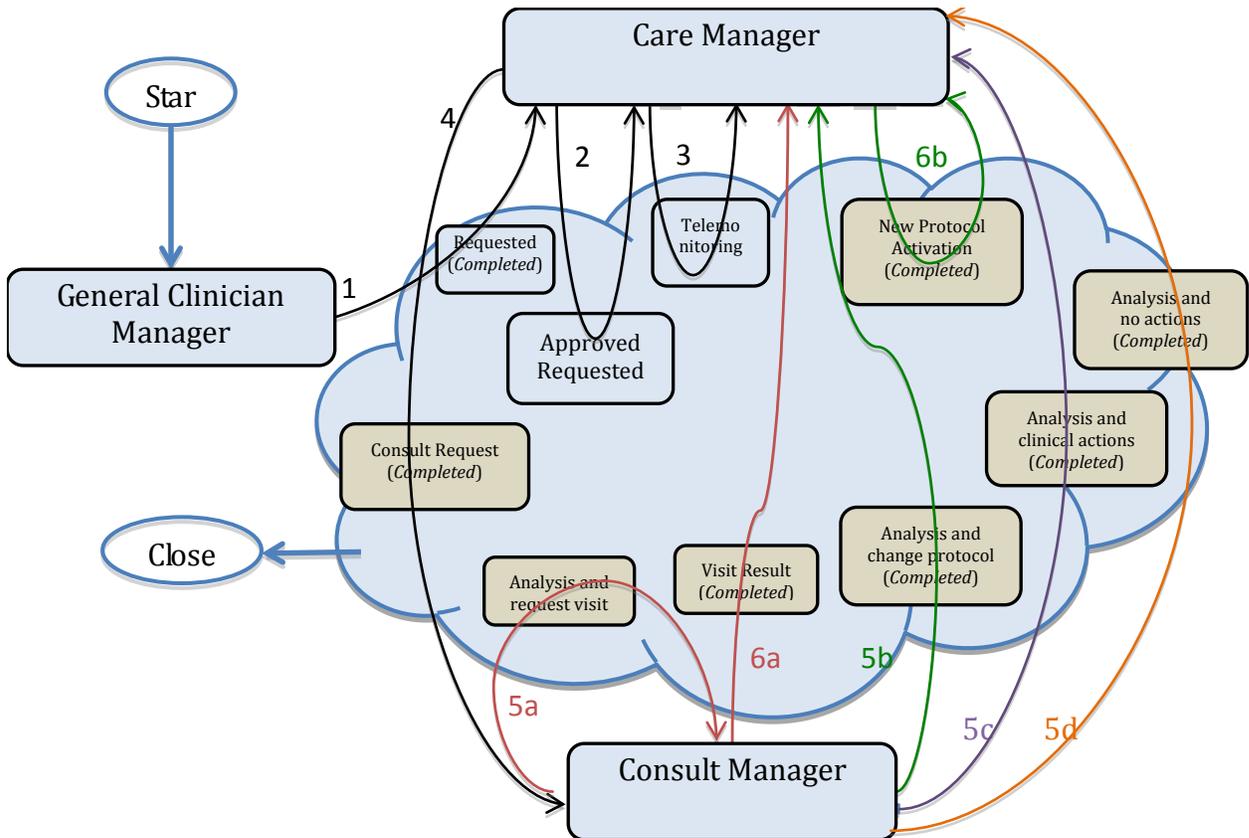


Figure X.3-1: Process transaction between Workflow Participants

310 **X.3.1 Use Cases**

Dr. Rossi, a general practitioner, visits his patient, Mr. Jones, who has chronic heart failure. He decides to include Mr. Jones in a telemonitoring program which monitors the heart rate of the patient, and his O2-saturation. He activates this service by filling in a formal request to the service provider, stating the clinical parameters that have to be monitored (pulse-oximetry and heart rate), the frequency of the patient’s measurements, the threshold values to detect alarm situations, and his contact information to inform the service provider that he is the primary

315

physician who will follow the patient in the service.

At the telemonitoring centre, Mr. Bonning receives the request and approves it: at this point, Mr. Bonning starts scheduling the installation of the devices at the patient's home.

320 After the devices are installed and tested, Mr. Jones starts the devices and is being monitored. The measurements and the related data are transmitted to the telemonitoring centre.

325 A week later, the heart rate measuring device sends an alarm to the telemonitoring centre, indicating a possible atrial fibrillation. Dr. Rossi receives a message from the Telehome monitoring centre; after an analysis of the patient's data, Dr. Rossi decides to refer Mr. Jones to his cardiologist. After receiving the results of the visit to the cardiologist, Dr. Rossi evaluates that his patient can continue with the scheduled telemonitoring program.

The use case presented in this section, related to the definition of a telemonitoring process workflow, is composed of two parts.

330 The first one is about the creation of the Workflow Document (WD), which tracks all the events occurring during the telemonitoring process of a patient, and how it is updated with the daily transmission of the patient's clinical data (from step A to C1).

335 The second part of this use case follows the workflow that occurs when the data sent by the patient goes outside of the thresholds set in the protocol, causing the occurrence of an alarm situation for the patient (from step C2 to step F).

The workflow related to this use case is a multi-step process:

A. The GP requests the telemonitoring service for his chronic patient;

B. The telemonitoring service provider evaluates and accepts the activation request and activates the service for the patient;

340 C. The patient performs his measurements according to the protocol and transmits them to the telemonitoring service provider. At this point there are two possibilities:

C1. The patient's measurements are normal and telemonitoring continues;

C2. The patient's measurements are outside the thresholds defined;

345 D. The telemonitoring service provider detects an alarm situation for the patient and requests a physician's consultation;

E. The GP analyses the alarm situation. At this point there are three possibilities:

E1. The GP analyses the alarm situation and decides to request a specialist visit for his patient;

350 E2. The GP analyses the alarm situation and decides to change the telemonitoring protocol of his patient, in particular the therapy or the monitoring timing or the alarm thresholds;

E3. The GP analyses the alarm situation and decides to perform clinical actions to solve the situation, e.g. change the therapy;

E4. The GP analyses the alarm situation and decides to perform no actions.

355 F. The alarm situation is resolved. At this point there are three possibilities depending on the path chosen at step E:

F1. The GP checks the results of the visit and confirms the new telemonitoring protocol;

F2. The telemonitoring service provider activates the new telemonitoring protocol.

360 Each step is now described both from a clinical and a technical point of view.

We present below the detailed chronological sequence of steps.

#### **A. The GP requests the telemonitoring service for his chronic patient**

365 In this task, the GP determines that his patient with chronic heart failure needs to be followed by a telemonitoring service allowing him to be monitored remotely as he performs daily measurements of his clinical parameters. The GP requests a service activation to the telemonitoring service provider, creating a document for the formal request (Request Activation Document) including the customized telemonitoring protocol (clinical parameters to collect, frequency of data transmission, threshold values to detect alarm situations, information about the 370 referencing physician and the patient’s therapy) and referencing the reports and results that can be used to evaluate the possibility of a follow up at home.

The GP’s software, or some system acting as a General Clinician Manager, produces the Request Activation Document and one Workflow Document to track the clinical workflow of the patient being followed by the telemonitoring service. As shown in column A of Figure X.3.1-2, at this 375 time the Workflow Document has only one task (“Activation Requested”) characterized by:

- a status of “Completed”;
- references to Clinical Input as inputs of the task;
- reference to the Request Activation Document as the output of the task.

380 In order to share the documents produced during the task, the system acting as the General Clinician Manager submits the Request Activation Document and the Workflow Document to an XDS Document Repository.

#### **B. The telemonitoring service provider evaluates and accepts the activation request and activates the service for the patient**

385 In order to evaluate the activation request from the GP, the telemonitoring service provider queries for and retrieves the Request Activation Document and the associated Workflow Document using a system which acts as a Care Manager.

390 If the telemonitoring service provider approves the activation request, as shown in column B of Figure X.3.1-2, it updates the Workflow Document with a new version in which a new task “Approved Request” has been added to the content of the previous version. The task “Approved Request” is characterized by:

- a status “Completed”;
- the references to the Request Activation Document produced by the GP and Clinical Input as inputs of the task.

395 The telemonitoring service provider's system, as a Care Manager, provides the updated version of Workflow Document to the XDS Document Repository/Registry, replacing the previous version.

400 At this step, there is the possibility for a system of subscription and notification, through the use of the Document Metadata Subscription (DSUB) profile or the Notification of Document Availability (NAV) profile, to notify the GP that performed the request that the patient has been activated.

405 **C1. The patient performs his measurements according to the protocol and transmits them to the telemonitoring service provider. The patient’s measurements are normal and telemonitoring continues**

The patient is activated with the telemonitoring service. He collects his clinical parameters at home and sends these data to the telemonitoring service provider. The telemonitoring service provider evaluates the data received and includes them in the Telemonitoring Results Document referenced in the Workflow Document.

410 To accomplish this, the telemonitoring service provider, using a system that acts as a Care Manager, queries and retrieves the Workflow Document and creates the Telemonitoring Results Document.

415 At this step of the workflow, as shown in column C1 of Figure X.3.1-2, the Workflow Document is updated with a new version in which a new task “Telemonitoring n.1” is added to the content of the previous version of the Workflow Document. The task “Telemonitoring n.1” is characterized by:

- a status “Completed”;
- a reference to the Telemonitoring Results Document as output of the task.

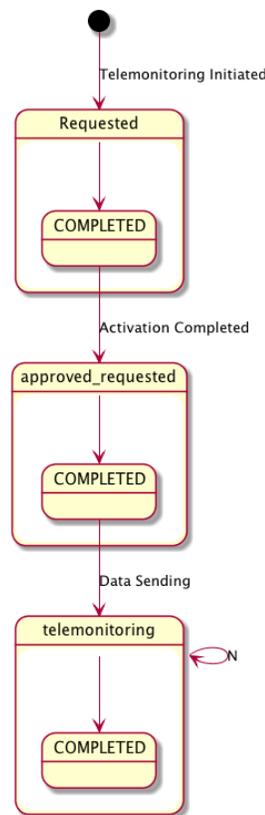
420 The telemonitoring service provider’s software, as a Care Manager, provides the updated version of Workflow Document to the Document Repository, replacing the previous version.

At any time the GP may review the Workflow Document and the new documents produced related to this workflow. This is accomplished through a query and retrieve by the GP’s software of the active Workflow Document from the XDS Document Registry and the XDS Document Repository.

425 This process is repeated for every data transmission so the Workflow Document is continuously updated and tracks all events and their respective status along with the associated documents, allowing all physicians treating the patient to share and manage the complete workflow of the telemonitoring process any time they need.

430 Each time the patient performs a measurement this task is created, and there would be the possibility for a system of subscription and notification, through the use of the Document Metadata Subscription (DSUB) profile or the Notification of Document Availability (NAV) profile, to communicate the creation of the task and the related Telemonitoring Results Document to the GP, so that they can access the workflow and view the patient’s data.

Figure X.3.1-1 describes the process flow reporting the related tasks from step A to C1.



435

**Figure X.3.1-1: Workflow Definition sample process flow**

440 To demonstrate how the Workflow Document is populated during the process, Figure X.3.1-2 shows the evolution of the Workflow Document during this telemonitoring workflow from step A to step C1. Each one of the steps is depicted in a column.

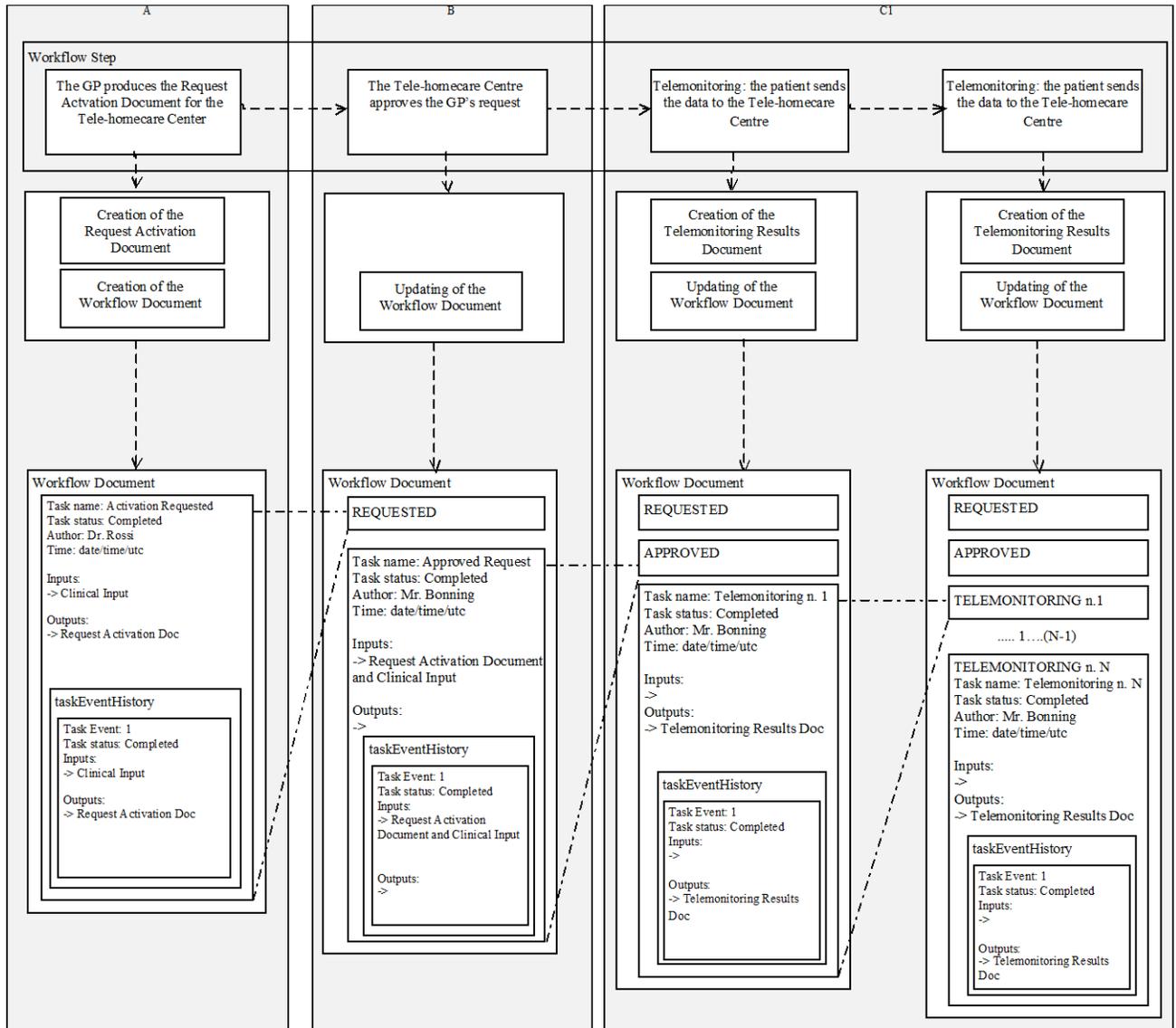


Figure X.3.1-2: Management of the Workflow Document from step A to step C1

445 **C2. The patient performs his measurements according to the protocol and transmits them to the telemonitoring service provider. The patient’s measurements are outside the thresholds defined;**

The patient collects his clinical parameters at home and sends these data to the telemonitoring service provider. The telemonitoring service provider evaluates the data received and includes them in the Telemonitoring Results Document referenced in the Workflow Document.

450

To accomplish this, the telemonitoring service provider uses a system that acts as Care Manager to query and retrieve the Workflow Document and creates the Telemonitoring Results

Document.

455 At this step of the workflow, the Workflow Document is updated with a new version in which a new task “Telemonitoring n. n+1” is added to the content of the previous version of the Workflow Document. The task “Telemonitoring n. n+1” is characterized by:

- a status “Completed”;
- the reference to the Telemonitoring Results Document as output of the task.

460 The telemonitoring service provider’s system, as a Care Manager, provides the updated version of Workflow Document to the Document Repository, replacing the previous version.

#### **D. The telemonitoring service provider detects the alarm situation for the patient and requires a physician’s consultation**

465 If the data sent by the patient are outside of the normal range defined by the GP in the telemonitoring protocol, the telemonitoring service provider has to manage an alarm situation for the patient.

470 The telemonitoring service provider needs to alert the referring physician so, using a system that acts as a Care Manager, it creates a Request Consult Document including a request for the physician to evaluate this alarm situation. At the same time the telemonitoring service provider queries and retrieves the Workflow Document.

At this step of the workflow, the Workflow Document is updated with a new version in which a new task, “Consult Request,” is added to the content of the previous version. The task “Consult Request” is characterized by:

- a status “Completed”;
- 475 • a reference to the Telemonitoring Results Document as input of the task;
- a reference to the Request Consult Document as output of the task.

The telemonitoring service provider’s software, as a Care Manager, provides the updated version of Workflow Document to the Document Repository, replacing the previous version.

480 Each time the telemonitoring service provider detects an alarm situation, there is a possibility for a system of subscription and notification through the use of the Document Metadata Subscription (DSUB) profile or the Notification of Document Availability (NAV) profile, to communicate the presence of an alarm to the GP.

#### **E. The GP analyses the alarm situation**

485 The physician analyses the alarm situation for the patient by accessing the Workflow Document, using a system that acts as a Consult Manager, to query and retrieve it together with the Telemonitoring Results Document and the Request Consult Document.

Depending on how the GP decides to manage the alarm situation, there are three possible options

at this point.

490 For each of the following cases, when the GP solves the alarm situation, there is a possibility for a system of subscription and notification between tasks, through the use of the Document Metadata Subscription (DSUB) profile or the Notification of Document Availability (NAV) profile, to notify the telemonitoring service provider that the alarm condition has been resolved.

495 **Case 1**

**E1. The GP analyses the alarm situation and decides to request a specialist visit for his patient;**

If the GP decides that the patient needs to have a specialist visit, he refers the patient to a specialist, creating an eReferral Document and the related eReferral Workflow Document to  
500 track the specific events related to the visit, using a system that acts as a Consult Manager.

The Workflow Document is updated with a new task, “Analysis and Request Visit,” which is characterized by:

- a task status “Completed”;
- references to the Telemonitoring Results Document and the Request Consult Document as  
505 inputs of the task;
- references to the eReferral Document and the link to the eReferral Workflow Document as outputs.

The GP’s system, as a Consult Manager, provides an updated version of the Workflow Document to the Document Repository, replacing the previous version.

510 At this time this Workflow will be on standby until the eReferral process is concluded. When the eReferral Workflow Document generated in this task is completed and the report produced by the specialist is returned to the GP, he can decide how to proceed.

For a description of the management of the eReferral Workflow Document, refer to the Cross-enterprise Basic eReferral Workflow Definition Profile (XBeR-WD Profile).

515

**F1. The alarm situation is resolved. The GP checks the results of the visit and confirm the telemonitoring protocol.**

The physician checks the results of the referral, consulting the Clinical Report referenced in the eReferral Workflow Document. At this time, the Workflow Document related to the  
520 telemonitoring process is reactivated by the GP, using a system that acts as a Consult Manager, to notify the telemonitoring service provider that the telemonitoring of the patient can proceed.

The GP creates a Visit Result Document including a description of the visits outcomes and a confirmation that the telemonitoring protocol can continue. This document is included in the Workflow Document as a reference.

525 The Workflow Document is updated with a new task, “Visit Result,” characterized by:

- a task status “Completed”;
- references to the Clinical Report of the visit from the referral and a link to the eReferral Workflow Document as inputs of the task;
- a reference to the Visit Result Document as output of the task.

530 The GP’s system, as a Consult Manager, provides the updated version of Workflow Document to the Document Repository, replacing the previous version.

The telemonitoring service provider can then review the Workflow Document and the new documents produced related to this workflow. This is accomplished through a query and retrieve of the active Workflow Document by the telemonitoring service provider’s system from the XDS  
535 Document Registry and the XDS Document Repository.

Figure X.3.1-3 describes this process flow and related tasks from step A to F1.

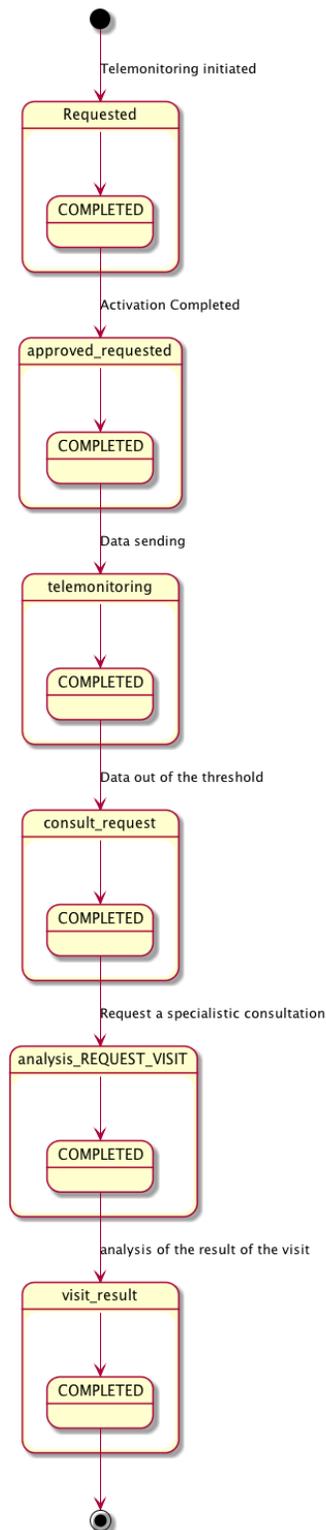
For further technical details see Appendix B.

540

545

550

555



**Figure X.3.1-3: Workflow Definition sample process flow**

*Case 2*

560 **E2. The GP analyses the alarm situation and decides to change the telemonitoring protocol of his patient, in particular the therapy or the monitoring timing or the alarm thresholds.**

If the GP decides to change the telemonitoring protocol, including therapy type, telemonitoring timing or alarm thresholds:

- the GP’s system, as a Consult Manager, produces a Telemonitoring Protocol Document, updated with the new telemonitoring protocol;
- 565 • the GP’s system updates the Workflow Document.

This step is characterized by the creation of another task, “Analysis and Change Protocol,” related to the telemonitoring protocol change.

In the Workflow Document, the “Analysis and Change Protocol” task is characterized by:

- a task status “Completed”;
- 570 • references to the Telemonitoring Results Document and the Request Consult Document as inputs of the task;
- a reference to the Telemonitoring Protocol Document Updated as output of the task.

The GP’s system, as a Consult Manager, provides the updated version of Workflow Document to the Document Repository, replacing the previous version.

575

**F2. The alarm situation is resolved. The telemonitoring service provider activates the new telemonitoring protocol.**

580 After the GP publishes the new telemonitoring protocol and notifies the telemonitoring service provider, the new telemonitoring protocol for the patient must be activated. The telemonitoring service provider retrieves the updated Telemonitoring Protocol Document and the associated Workflow Document accessing them using a system that acts as a Care Manager.

Once the telemonitoring service provider activates the new telemonitoring protocol it updates the Workflow Document with a new version in which the task “New Protocol Activation” is updated with the new information. The task “New Protocol Activation” is characterized by:

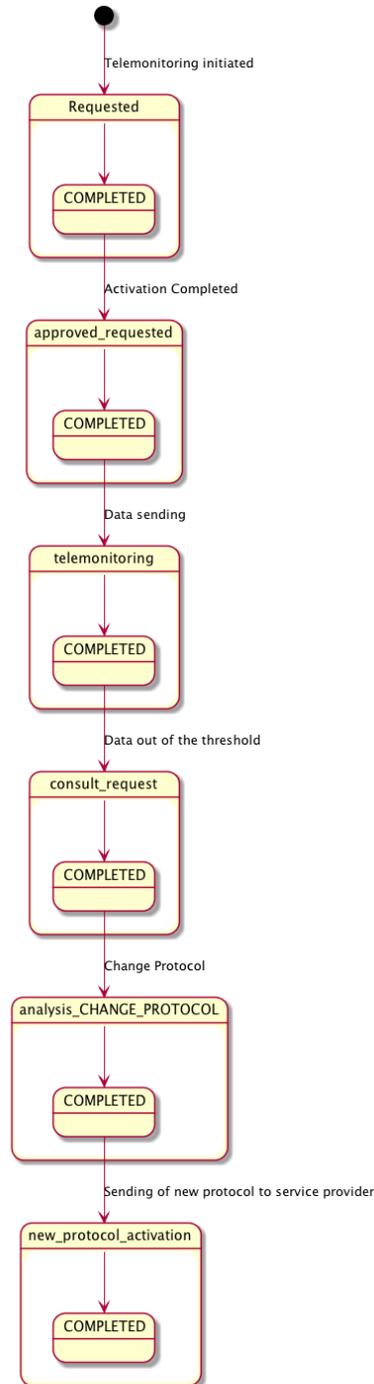
- 585 • a status “Completed”;
- the reference to the updated Telemonitoring Protocol Document produced by the GP as input of the task.

590 The telemonitoring service provider’s system, as a Care Manager, provides the updated version of Workflow Document to the XDS Document Repository/Registry, replacing the previous version.

Other clinicians involved in the care of the patient, e.g. the specialist that visits the patient, can access the Workflow Document to view his complete clinical history in relation to the telemonitoring process.

Figure X.3.1-4 describes the process flow and related tasks from step A to F2.

595 For further technical details see Appendix B.



**Figure X.3.1-4: Workflow Definition sample process flow**

*Case 3*

**E3. The GP analyses the alarm situation and decides to perform clinical actions.**

600 If the GP decides that the alarm situation requires clinical actions, that include e.g. a change of the patient’s therapy, he updates the Workflow document with a new task, “Analysis and Clinical Actions”.

In the Workflow Document, the task “Analysis and Clinical Actions” is characterized by:

- a task status “Completed”;
- 605 • references to the Telemonitoring Results Document and the Request Consult Document as inputs of the task.

The GP’s system, as a Consult Manager, provides the updated version of Workflow Document to the Document Repository, replacing the previous version.

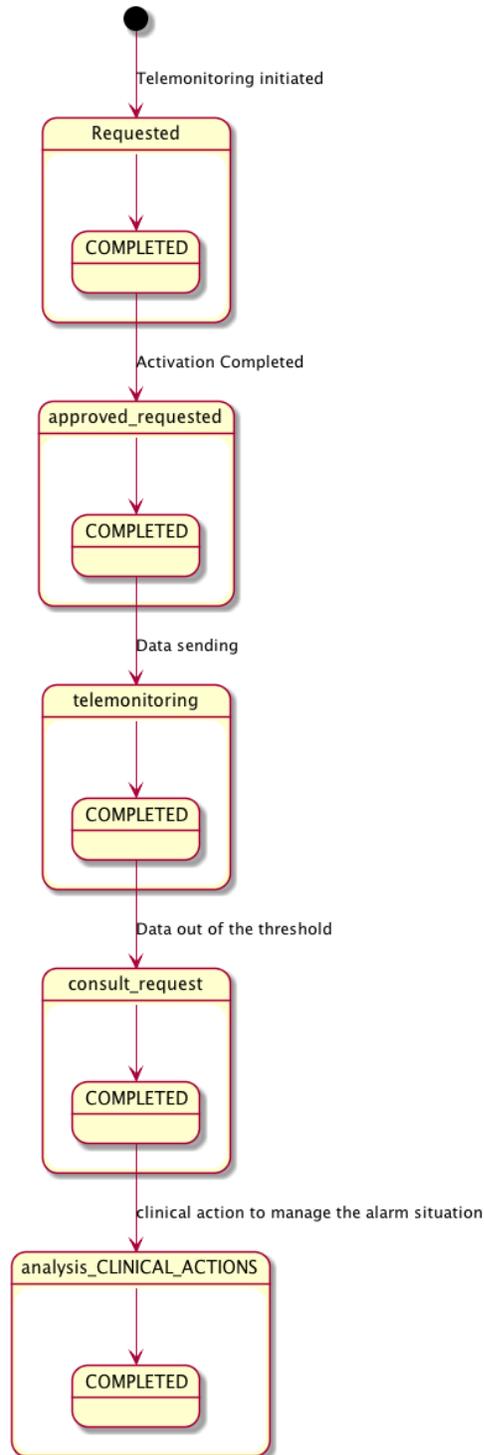
Figure X.3.1-5 describes the process flow and related tasks from step A to E3.

610 For further technical details see Appendix B.

615

620

625



**Figure X.3.1-5: Workflow Definition sample process flow**

*Case 4*

630 **E4. The GP analyses the alarm situation and decides to perform no actions.**

If the GP decides that the alarm situation requires no action, he updates the Workflow document with a new task, “Analysis and No Actions”.

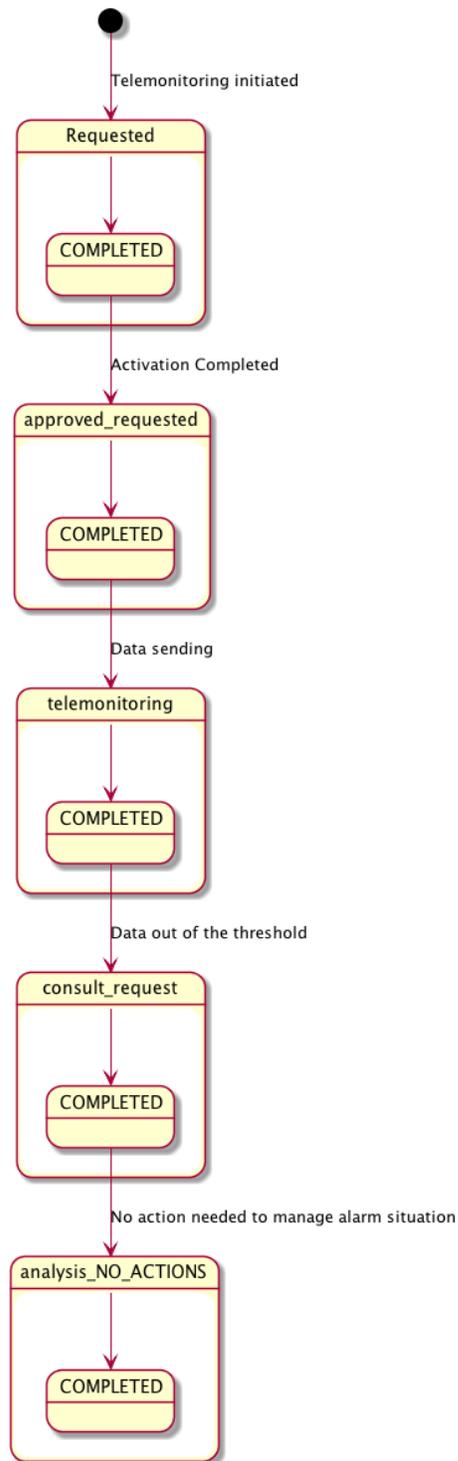
In the Workflow Document, the task “Analysis and No Actions” is characterized by:

- a task status “Completed”;
- 635 • references to the Telemonitoring Results Document and the Request Consult Document as inputs of the task.

The GP’s system, as a Consult Manager, provides the updated version of Workflow Document to the Document Repository, replacing the previous version.

Figure X.3.1-6 describes the process flow and related tasks from step A to E4.

640 For further technical details see Appendix B.



**Figure X.3.1-6: Workflow Definition sample process flow**

645 The workflow ends when the patient doesn't need to be monitored any more by the telemonitoring service.

It would also be possible for a system of subscription and notification to communicate the progress between the different steps through the use of the Document Metadata Subscription (DSUB) profile or the Notification of Document Availability (NAV) profile.

### **X.3.2 Options**

650 In this section we describe which variations from the normal process are allowed. It is mandatory for implementers to explicitly define which workflow options, if any, are addressed by their products (See section 4).

Options that may be selected for this Profile are listed below along with the Workflow Participants to which they apply.

655 This Workflow Definition Profile is intended to be combined with other IHE Profiles. These other profiles may have their specific options. These are not addressed in this section, which focuses only on the Options identified for this Workflow Definition Profile.

#### **X.3.2.1 Consult Request task without Telemonitoring task as ancestor Option**

660

The process can develop without the requirement to have the Telemonitoring task with data out of threshold as ancestor of the task Consult Request. This allows this profile to be implemented in many other real use-cases. If the “Consult Request task without Telemonitoring task as ancestor option” is chosen, rules to manage the process shall change.

665

If this workflow definition option is implemented, e.g., if the Care Manager is a single system that collects and manages data, when collected data are out of threshold, the Care Manager creates directly the Consult Request task with the Request Consult Document including the alarm information together with the clinical parameters of interest; this, without creating previously the Telemonitoring task that is not needed because it should include a document with the same information.

670

These rule changes are addressed in the Task Specification section Y.3:

- Task “Consul Request”:
  - Task dependencies:
    - 675       ▪ Ancestors: Approved, Telemonitoring of a previous data collection without alarms, Visit Result, New protocol activation, Analysis and clinical actions, Analysis and no actions.
  - Input:

- None
- 680 • Task “Analysis and Request Visit”:
  - Input
    - Request Consult Document (Required)
- Task “Analysis and Change Protocol”:
  - Input
  - 685 ▪ Request Consult Document (Required)
- Task “Analysis and Clinical Actions”:
  - Input
  - Request Consult Document (Required)
- Task “Analysis and No Actions”:
  - 690 ○ Input
  - Request Consult Document (Required)

### **X.3.2.2 Clinical Input Option**

695 If this option is selected it is required that a Clinical Input is referenced as input of the tasks Requested and Approved.

## X.4 Workflow Definition Actors and Options

700 Workflow Participants introduced in Section X.3 are expected to be supported by Workflow Definition Actors that represents abstractions of IT systems. Compliance to this workflow definition profile and its options are based on selecting the implementation of one or more of these Workflow Definition Actors.

### X.4.1 Workflow Definition Actors

705 Table X.4.1-1 specifies the mapping of Workflow Participants to Workflow Definition Actors.

**Table X.4.1-1: XTHM-WD Workflow Participants grouping with Workflow Definition Actors**

Workflow Participant	Workflow Definition Actor
Care Manager	Care Manager Actor
General Clinician Manager	General Clinician Manager Actor
Consult Manager	Consult Manager Actor

### X.4.2 Workflow Options

710 Options that may be selected for this Profile are listed below along with the Workflow Definition Actors to which they apply. Although this Workflow Definition Profile is intended to be combined with other IHE Profiles, the specific options of these other Profiles are not addressed in this section, which focuses only on the Options identified for this Workflow Definition Profile.

715 Table X.4.2-1 specifies the options that are available, if any for each selected Workflow Definition Actors.

**Table X.4.2-1 XTHM Profile Workflow Definition Actors and Options**

XTHM-WD Workflow Definition Actor	option	Volume & Section
Care Manager Actor	<i>Consult Request task without Telemonitoring task as ancestor Option</i>	PCC TF-1: X.3.2.1
	<i>Clinical Input Option</i>	PCC TF-1: X.3.2.2
General Clinician Manager Actor	<i>Clinical Input Option</i>	PCC TF-1: X.3.2.2

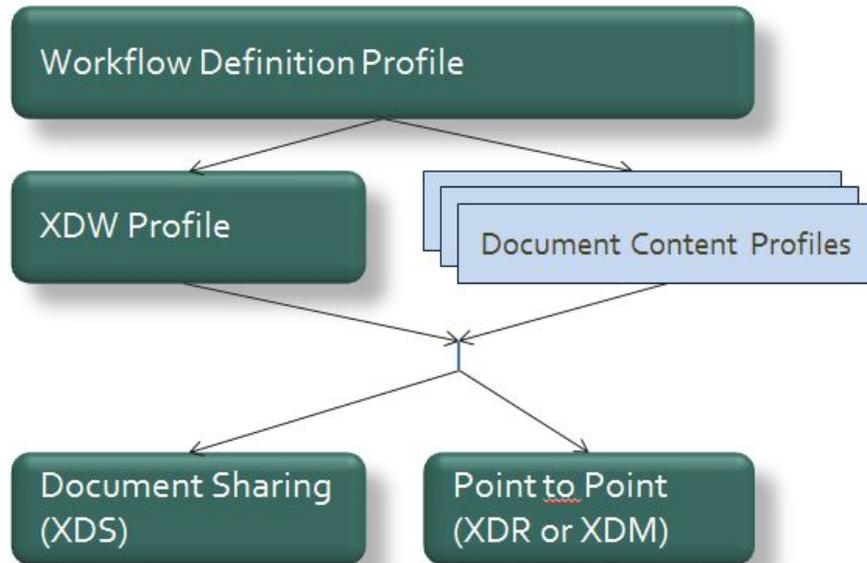
<b>XTHM-WD Workflow Definition Actor</b>	<b>option</b>	<b>Volume &amp; Section</b>
Consult Manager Actor	<i>Consult Request task without Telemonitoring task as ancestor Option</i>	PCC TF-1: X.3.2.1

### X.4.3 Workflow Definition Profile Grouping with other Profiles

720 This Workflow Definition Profile is intended to be combined with other IHE Profiles. The profiles that are candidates for such combinations and the associated rules are specified in this Section.

Figure X.4.3-1 presents an overview for the major classes of IHE Profiles that shall or may be grouped:

- 725 • The Workflow Definition Profile SHALL be grouped with the XDW Profile.
- 730 • The Workflow Definition Profile SHOULD be grouped with one or more Document Content Profiles matched to the input and output reference “Document Labels” in the Workflow Definition Profile (Defined in Vol.2). The Workflow Definition Profile provides only “Document Labels” for these input and output reference documents and not the actual specifications. This selection of the actual document content specification (IHE Content profiles or others), need to be made by the environment that deploys the Workflow Definition Profile.
- 735 • The Workflow Definition Profile, the XDW Profile and the selected Document Content Profiles shall be grouped as decided by the deployment environment, with the suitable Integration Profile supporting a document transport service such as XDS for Document Sharing, XDR/XDM for point-to-point directed transport, or other functionally equivalent profiles.
- Consult Manager Actor of the XTHM-WD Profile SHALL be grouped with Referral Requester Actor of XBeR-WD Profile.



740

**Figure X.4.3-1 Grouping of profiles**

745 The grouping of XDW actors with each of the XTHM-WD Workflow Definition Actors is specified in Table X.4.3-1. These XDW Actors support the creation, consumption and update of the XDW workflow document which is the shared data structure which is tracking the evolution of the workflow. This allows the XTHM-WD Workflow Definition Actors, at any point in the workflow to access the most current status of the workflow and share the tasks performed with all other Workflow Definition Actors.

750 Note: See IHE ITI TF-1: Section 30.3 (XDW Supplement) for other groupings that are needed for the XDW Actors to permit sharing of a Workflow Document with IHE XDS, XDR or XDM Profiles.

**Table X.4.3-1: XTHM-WD Workflow Definition Actors grouping with XDW Actors**

Workflow Definition Actor	Shall be grouped with XDW Actors
Care Manager Actor	XDW Content Consumer XDW Content Updater
General Clinician Manager Actor	XDW Content Creator XDW Content Consumer
Consult Manager Actor	XDW Content Consumer XDW Content Updater

755

## **X.5 Security Considerations**

For this section please refer to the section ITI TF-1: 30.5.

## Volume 2 – Content Modules

### 760 Y.1 XTHM Workflow Definition - XDW Workflow Document – Common Attributes

This workflow definition profile is assigned a specific OID that shall be used to assign an identifier to the workflowDefinitionReference element of a Workflow Document that tracks a telemonitoring process.

765

**Table Y.1-1: XTHM-WD Workflow – Workflow Definition Reference**

type of Workflow	Workflow Definition Reference
Telemonitoring workflow	1.3.6.1.4.1.19376.1.5.3.1.5.2

The XTHM-WD Workflow Definition does not introduce new metadata and all the metadata elements used are the common XDS document metadata specified in ITI TF-3:4.1.5 and in ITI TF-3:5.4.6. In this section only the use of some specific metadata for use of XDW in the XTHM-WD context is specified.

770

**Table Y.1-2: XTHM-WD Workflow – XDS Metadata Attribute**

XDS Metadata Attribute	Definition
typeCode	For the Workflow Document which tracks the XTHM-WD process the code for the typeCode shall be: This code will be assigned by LOINC
classCode	For the Workflow Document which tracks the XTHM-WD process the code for the classCode is defined by the XDW profile. See XDW Supplement Section 5.4.6.1
eventCodeList	<p><b>Rule 1:</b> An XTHM-WD workflow shall be created with code OPEN and shall remain in this status until it is set to CLOSE.</p> <p><b>Rule 2:</b> An XTHM-WD workflow should be set to CLOSE when there is the need to end the telemonitoring workflow for any reason. In this case the current last task of the workflow has to be set in status COMPLETED. Each task of the process can lead to the closing of the workflow.</p> <p><b>Rule 3:</b> An XTHM-WD workflow that was set to CLOSE can be reopened and set to OPEN if the patient has a need to use the telemonitoring service again.</p>

XDS Metadata Attribute	Definition
	See IHE ITI TF-3: 5.4.5.7 for a general description of this attribute.
serviceStartTime	Is the time at which work began on the first task for this workflow.
serviceStopTime	Is the time at which the status of the overall Workflow is changed from OPEN to CLOSED. It shall be empty when the workflow is still in OPEN state.

## Y.2 XDW Content Modules

775 The main instrument of the Cross-enterprise TeleHomeMonitoring Workflow Definition Profile is the Workflow Document defined in the XDW Profile. This document does not include clinical information about the patient directly. It shall only contain information necessary for organizing and defining work tasks. All clinical information regarding any task shall be provided through separate documents that are referenced from the associated input or output documents.

780 Detailed knowledge of the Cross-enterprise Document Workflow (XDW) profile is indispensable in understanding the following sections. For more detailed, refer to ITI TF-3: 5.4.

### Y.3 Tasks Specifications

Workflow Description Overview:

785

**Table Y.3-1: Workflow Description Overview**

Task Type	Requirement For task initiation	Task Statuses *valid when task initiated	Task Property	Input Docs	Option	Output Docs	Option
Requested	At XDW doc creation	COMPLETED*	Cardinality: 1..1 Removable: no	Clinical Input	O * These may change if Workflow Options are selected	Request Activation Document	R
Approved	When Requested completed	IN_PROGRESS* COMPLETED*	Cardinality: 1..1 Removable: no	Request Activation Document	R	N/A	
				Clinical Input	O * These may change if Workflow Options are selected		
Telemonitoring	For the first time in the WD: when Approved completed	READY COMPLETED* FAILED* IN PROGRESS	Cardinality: 1..n Removable: no	N/A		Telemonitoring Results Document	R
Consult Request	If Telemonitoring with data out of the threshold	COMPLETED*	Cardinality: 1..n Removable: no	Telemonitoring Results Document	R * These may change if Workflow Options are selected	Request Consult Document	R
Analysis and Request Visit	When Consult Request Completed	COMPLETED*	Cardinality: 1..n Removable: no	Telemonitoring Results Document	R * These may change if Workflow Options are selected	eReferral Workflow Document	R

IHE PCC Technical Framework Supplement – Cross Enterprise TeleHomeMonitoring Workflow Definition Profile (XTHM-WD)

Task Type	Requirement For task initiation	Task Statuses *valid when task initiated	Task Property	Input Docs	Option	Output Docs	Option
				Request Consult Document	R	eReferral Document	R
Visit Result	When Request Visit Completed	COMPLETED*	Cardinality: 1..n Removable: no	Clinical Report of the Visit	R	Visit Result Document	R
				eReferral Workflow Document	R		
Analysis and Change Protocol	When Consult Request Completed	COMPLETED*	Cardinality: 1..n Removable: no	Telemonitoring Results Document	R * These may change if Workflow Options are selected	Telemonitoring Protocol Updated	R
				Request Consult Document	R		
New Protocol Activation	When Analysis and Change Protocol completed	COMPLETED*	Cardinality: 1..n Removable: no	Telemonitoring Protocol Document Updated	R	N/A	-
Analysis and Clinical Actions	When Consult Request Completed	COMPLETED*	Cardinality: 1..n Removable: no	Telemonitoring Results Document	R * These may change if Workflow Options are selected	N/A	-
				Request Consult Document	R		
Analysis and no actions	When Consult Request Completed	COMPLETED*	Cardinality: 1..n Removable: no	Telemonitoring Results Document	R * These may change if Workflow Options are selected	N/A	-

Task Type	Requirement For task initiation	Task Statuses *valid when task initiated	Task Property	Input Docs	Option	Output Docs	Option
				Request Consult Document	R		

In this section we define rules and constraints for the creation and update of the XDW Workflow Document related to the telemonitoring process.

790 The set of rules defined here is necessary to manage transitions between tasks. For each task the following are defined:

- Task attributes: ID, name, type description;
- The sequence of the tasks: the previous and the next task;
- Which Workflow Participant is allowed to create each task and to change the status;

795

- The task event;
- The input and output documents.

### Y.3.1 Task: Requested

Task attributes	Rules for the task “Requested”						
Task id	Unique id of the instance of the task						
Task type	<b>Requested</b>						
Task name	Activation Requested						
Task description	Request the activation of the telemonitoring service activation for a patient.						
Task dependencies	Ancestors: None Successors: Approved						
Status allowed	<b>COMPLETED</b>						
Status transactions (*)	None, task is created completed. <table border="1" data-bbox="704 846 1279 926"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create
Initial Status	Final Status	eventType					
none	COMPLETED	create					
Input	<ul style="list-style-type: none"> <li>• Optional                             <ul style="list-style-type: none"> <li>○ Clinical input (all relevant documents useful to evaluate the possibility for follow up of the patient at home, e.g., clinical or laboratory reports)</li> <li>* These may change if Workflow Options are selected</li> </ul> </li> </ul>						
Output	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Request Activation Document</li> </ul> </li> </ul>						
Owner	General Clinician Manager						
owner changes	No						
<taskEvent>	Only one						
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No						
Task duplication	May the task appear more than once in the Workflow Definition: No						

800 (\*) The element eventType stores the type of event that produces the change in the task status. In the “Status transactions” we want to associate the specific type of event to the status transaction produced. For further details on eventType element see XDW profile.

805 **Y.3.2 Task: Approved**

Task attributes	Rules for the task “Approved”												
Task id	Unique id of the instance of the task												
Task type	<b>Approved</b>												
Task name	Approved Request												
Task description	Approval of the request for activation for the telemonitoring service.												
Task dependencies	Ancestors: Requested Successors: Telemonitoring												
Status allowed	<b>IN_PROGRESS</b> : if the enrollment of the patient is pending and needs more information or time to be completed  <b>COMPLETED</b> : if the enrollment is completed												
Status transactions	None, if the task is created in completed state. If the task is created with status IN_PROGRESS, the status shall be changed to COMPLETED when the approving process is completed <table border="1" data-bbox="706 934 1279 1094"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>IN_PROGRESS</td> <td>create</td> </tr> <tr> <td>IN_PROGRESS</td> <td>COMPLETED</td> <td>complete</td> </tr> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	IN_PROGRESS	create	IN_PROGRESS	COMPLETED	complete	none	COMPLETED	create
Initial Status	Final Status	eventType											
none	IN_PROGRESS	create											
IN_PROGRESS	COMPLETED	complete											
none	COMPLETED	create											
Input	<ul style="list-style-type: none"> <li>• Required <ul style="list-style-type: none"> <li>○ Request activation Document</li> </ul> </li> <li>• Optional <ul style="list-style-type: none"> <li>○ Clinical Input</li> </ul> </li> </ul> <p>* These may change if Workflow Options are selected</p>												
Output	None												
Owner	Care Manager (Approver of the request activation)												
owner changes	No												
<taskEvent>	Only one (completed): if the approving process is completed Two in the other cases												
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No												
Task duplication	May the task appear more than once in the Workflow Definition: No												

### Y.3.3 Task : Telemonitoring

Task attributes	Rules for the task “Telemonitoring”																								
Task id	Unique id of the instance of the task																								
Task type	<b>Telemonitoring</b>																								
Task name	Telemonitoring <N>																								
Task description	Sending of data to the service provider																								
Task dependencies	Ancestors: Approved, Telemonitoring, Visit Result, New Protocol Activation, Analysis and no actions and Analysis and clinical actions Successors: Telemonitoring, Consult Request																								
Status allowed	<b>READY</b> : if the process is suspended for a period <b>or</b> <b>COMPLETED</b> <b>or</b> <b>FAILED</b> : in case of problems in sending data. <b>or</b> <b>IN PROGRESS</b> : to manage the problems after a status FAILED (not required)																								
Status transactions	<p>None if the task created with status COMPLETED or FAILED. If there is the need to suspend the telemonitoring for a patient, the last task available with status COMPLETED moves to the status READY. When the process is resumed, the status shall be changed into COMPLETED, or into FAILED if there are problems in sending data when the process is resumed. In case of failing of the Telemonitoring task it is not required to repeat the action traced but it is suggested to solve the problems, occurred in sending data, adding new task Events:</p> <ul style="list-style-type: none"> <li>- when the Care Manager takes in charge the problem there is the transaction from status FAILED to status IN_PROGRESS;</li> <li>- when the errors are corrected, there is the transaction from status IN_PROGRESS to status COMPLETED.</li> </ul> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> <tr> <td>COMPLETED</td> <td>READY</td> <td>suspend</td> </tr> <tr> <td>READY</td> <td>COMPLETED</td> <td>resume</td> </tr> <tr> <td>READY</td> <td>FAILED</td> <td>fail</td> </tr> <tr> <td>none</td> <td>FAILED</td> <td>fail</td> </tr> <tr> <td>FAILED</td> <td>IN_PROGRESS</td> <td>resume</td> </tr> <tr> <td>IN_PROGRESS</td> <td>COMPLETED</td> <td>complete</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create	COMPLETED	READY	suspend	READY	COMPLETED	resume	READY	FAILED	fail	none	FAILED	fail	FAILED	IN_PROGRESS	resume	IN_PROGRESS	COMPLETED	complete
Initial Status	Final Status	eventType																							
none	COMPLETED	create																							
COMPLETED	READY	suspend																							
READY	COMPLETED	resume																							
READY	FAILED	fail																							
none	FAILED	fail																							
FAILED	IN_PROGRESS	resume																							
IN_PROGRESS	COMPLETED	complete																							
Input	<ul style="list-style-type: none"> <li>• Optional: <ul style="list-style-type: none"> <li>○ Telemonitoring Results Document: if the status is IN_PROGRESS</li> </ul> </li> </ul>																								

Task attributes	Rules for the task “Telemonitoring”
Output	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Telemonitoring Results Document</li> </ul> </li> </ul>
Owner	Care Manager
owner changes	No
<taskEvent>	Not specified
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No
Task duplication	May the task appear more than once in the Workflow Definition: Yes

810 **Y.3.4 Task: Consult Request**

Task attributes	Rules for the task “Consult Request”						
Task id	Unique id of the instance of the task						
Task type	<b>Consult Request</b>						
Task name	Consult Request <N>						
Task description	Generation of an alarm because data are outside of the thresholds						
Task dependencies	Ancestors: Telemonitoring with data out of the threshold * These may change if Workflow Options are selected Successors: Analysis and Request visit, Analysis and Change Protocol, Analysis and No Actions, Analysis and Clinical Actions						
Status allowed	<b>COMPLETED</b>						
Status transactions	None, task is created with status completed. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create
Initial Status	Final Status	eventType					
none	COMPLETED	create					
Input	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Telemonitoring Results Document</li> </ul> </li> <li>* These may change if Workflow Options are selected</li> </ul>						
Output	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Request Consult Document</li> </ul> </li> </ul>						
Owner	Care Manager						
owner changes	No						
<taskEvent>	Only one						

Task attributes	Rules for the task “Consult Request”
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No
Task duplication	May the task appear more than once in the Workflow Definition: Yes

### Y.3.5 Task: Analysis and Request Visit

Task attributes	Rules for the task “Analysis and Request Visit”						
Task id	Unique id of the instance of the task						
Task type	<b>Analysis and Request Visit</b>						
Task name	Analysis and Request Visit <N>						
Task description	Analysis of the Telemonitoring Results Document and request of a specialist consultation						
Task dependencies	Ancestors: Consult Request Successors: Visit Result						
Status allowed	<b>COMPLETED</b>						
Status transactions	None, task is created with status completed. <table border="1" data-bbox="706 1066 1279 1150"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create
Initial Status	Final Status	eventType					
none	COMPLETED	create					
Input	<ul style="list-style-type: none"> <li>• Required <ul style="list-style-type: none"> <li>○ Telemonitoring Results Document * These may change if Workflow Options are selected</li> <li>○ Request Consult Document</li> </ul> </li> </ul>						
Output	<ul style="list-style-type: none"> <li>• Required <ul style="list-style-type: none"> <li>○ eReferral Workflow Document</li> <li>○ eReferral document</li> </ul> </li> </ul>						
Owner	Consult Manager						
owner changes	No						
<taskEvent>	Only one						
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No						
Task duplication	May the task appear more than once in the Workflow Definition: Yes						

### Y.3.6 Task: Visit Result

Task attributes	Rules for the task “Visit Result”						
Task id	Unique id of the instance of the task						
Task type	<b>Visit Result</b>						
Task name	Visit Result <N>						
Task description	Analysis of the Results of the requested eReferral process						
Task dependencies	Ancestors: Analysis and Request Visit Successors: Any task to collect or manage telemonitored data or alarms						
Status allowed	<b>COMPLETED</b>						
Status transactions	None, task is created with status completed. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create
Initial Status	Final Status	eventType					
none	COMPLETED	create					
Input	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Clinical Report of the visit</li> <li>○ eReferral Workflow Document</li> </ul> </li> </ul>						
Output	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Visit Result Document</li> </ul> </li> </ul>						
Owner	Consult Manager						
owner changes	No						
<taskEvent>	Only one						
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No						
Task duplication	May the task appear more than once in the Workflow Definition: Yes						

### Y.3.7 Task: Analysis and Change Protocol

Task attributes	Rules for the task “Analysis and Change Protocol”
Task id	Unique id of the instance of the task
Task type	<b>Analysis and Change Protocol</b>
Task name	Analysis and Change Protocol <N>
Task description	Analysis of the alarm situation and change of the telemonitoring protocol

<b>Task attributes</b>	<b>Rules for the task “Analysis and Change Protocol”</b>						
Task dependencies	Ancestors: Consult Request Successors: New Protocol Activation						
Status allowed	<b>COMPLETED</b>						
Status transactions	None, task is created with status completed. <table border="1"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create
Initial Status	Final Status	eventType					
none	COMPLETED	create					
Input	<ul style="list-style-type: none"> <li>• Required <ul style="list-style-type: none"> <li>○ Telemonitoring Results Document * These may change if Workflow Options are selected</li> <li>○ Request Consult Document</li> </ul> </li> </ul>						
Output	<ul style="list-style-type: none"> <li>• Required <ul style="list-style-type: none"> <li>○ Telemonitoring Protocol Updated</li> </ul> </li> </ul>						
Owner	Consult Manager						
owner changes	No						
<taskEvent>	Only one						
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No						
Task duplication	May the task appear more than once in the Workflow Definition: Yes						

815 **Y.3.8 Task: New Protocol Activation**

<b>Task attributes</b>	<b>Rules for the task “New Protocol Activation”</b>						
Task id	Unique id of the instance of the task						
Task type	<b>New Protocol Activation</b>						
Task name	New Protocol Activation <N>						
Task description	Analysis of the Telemonitoring Protocol Updated and new protocol activation						
Task dependencies	Ancestors: New Protocol Activation Successors: Any task to collect or manage telemonitored data or alarms						
Status allowed	<b>COMPLETED</b>						
Status transactions	None, task is created in status completed. <table border="1"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Initial Status	Final Status	eventType			
Initial Status	Final Status	eventType					

Task attributes	Rules for the task “New Protocol Activation”			
	<table border="1"> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </table>	none	COMPLETED	create
none	COMPLETED	create		
Input	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Telemonitoring Protocol Document Updated</li> </ul> </li> </ul>			
Output	None			
Owner	Care Manager			
owner changes	No			
<taskEvent>	Only one			
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No			
Task duplication	May the task appear more than once in the Workflow Definition: Yes			

### Y.3.9 Task: Analysis and clinical actions

Task attributes	Rules for the task “Analysis clinical actions”						
Task id	Unique id of the instance of the task						
Task type	Analysis and clinical actions						
Task name	Analysis and clinical actions <N>						
Task description	Analysis of the alarm situation and clinical actions						
Task dependencies	Ancestors: Consult Request Successors: Any task to collect or manage telemonitored data or alarms						
Status allowed	<b>COMPLETED</b>						
Status transactions	None, task is created in status completed. <table border="1"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create
Initial Status	Final Status	eventType					
none	COMPLETED	create					
Input	<ul style="list-style-type: none"> <li>• Required                             <ul style="list-style-type: none"> <li>○ Telemonitoring Results Document</li> <li>* These may change if Workflow Options are selected</li> <li>○ Request Consult Document</li> </ul> </li> </ul>						
Output	None						
Owner	Consult Manager						
owner changes	No						

Task attributes	Rules for the task “Analysis clinical actions”
<taskEvent>	Only one
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No
Task duplication	May the task appear more than once in the Workflow Definition: Yes

### Y.3.10 Task: Analysis and no actions

Task attributes	Rules for the task “Analysis and no actions”						
Task id	Unique id of the instance of the task						
Task type	Analysis and no actions						
Task name	Analysis and no actions <N>						
Task description	Analysis of the alarm situationn and no actions are necessary						
Task dependencies	Ancestors: Consult Request Successors: Any task to collect or manage telemonitored data or alarms						
Status allowed	<b>COMPLETED</b>						
Status transactions	None, task is created in status completed. <table border="1" data-bbox="706 1123 1279 1207"> <thead> <tr> <th>Initial Status</th> <th>Final Status</th> <th>eventType</th> </tr> </thead> <tbody> <tr> <td>none</td> <td>COMPLETED</td> <td>create</td> </tr> </tbody> </table>	Initial Status	Final Status	eventType	none	COMPLETED	create
Initial Status	Final Status	eventType					
none	COMPLETED	create					
Input	<ul style="list-style-type: none"> <li>• Required <ul style="list-style-type: none"> <li>○ Telemonitoring Results Document * These may change if Workflow Options are selected</li> <li>○ Request Consult Document</li> </ul> </li> </ul>						
Output	None						
Owner	Consult Manager						
owner changes	No						
<taskEvent>	Only one						
Task Removal allowed	May workflow participants remove a task when updating a XDW Workflow Document): No						
Task duplication	May the task appear more than once in the Workflow Definition: Yes						

## Y.4 Input and output documents

820 The WS-HumanTask element that permit to store the reference of an object in input or output sections is described in IHE ITI TF-3:5.4.3.

In table Y.4-1 we define the kind of document involved in the telemonitoring process. For each type of document this table defines the Documents Labels of the document. This Label describes the function or the role that the document performs in the course of the process or during the execution of a task, and defines the type of information conveyed and expected by the owner of the tasks.

825

**Table Y.4-1: Documents involved in the telemonitoring process**

Document Label	Example of Content Profile
<b>Clinical Input</b>	XDS-SD PPOC XD-LAB ECDR CIRC DRPT APSR
<b>Request Activation Document</b>	XDS-SD
<b>Telemonitoring Results Document</b>	PHMR XDS-SD
<b>Request Consult Document</b>	XDS-SD
<b>eReferral</b>	XDS-SD
<b>Clinical Report of the Visit</b>	XDS-SD EDR PPOC XD-LAB ECDR CIRC DRPT APSR
<b>Visit Result Document</b>	XDS-SD
<b>Telemonitoring Protocol Updated</b>	XDS-SD

## 830 Appendix A- Complete example of Telemonitoring Workflow Document

In this Appendix we provide a complete example of a Workflow Document related to the telemonitoring process from the request for service activation and creation of the Workflow

835 Document (WD), through the uploading of daily transmissions of clinical patient data, to the management of an alarm situation with no actions and then with a request of a visit.

```
<?xml version="1.0" encoding="UTF-8"?>
<ns3:XDW.WorkflowDocument
  xmlns:ns1="urn:hl7-org:v3"
  xmlns:ns2="http://docs.oasis-open.org/ns/bpel4people/ws-humantask/types/200803"
  xmlns:ns3="urn:ihe:iti:2011:xdw"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ihe:iti:2011:xdw file:C: XDW-2011-09-13.xsd">
  <ns3:id root="1.2.3.4.5"/>
  <ns3:effectiveTime value="20120430131000"/>
  <ns3:confidentialityCode code="1.24.3.3.3"/>
  <ns3:patient>
    <ns3:id root="1.3.6.1.4.1.21367.13.20.1000" extension="33333"
      assigningAuthorityName="IHERED"/>
  </ns3:patient>
  <ns3:author>
    <ns3:assignedPerson>
      <ns1:name>
        <ns1:family>Smith</ns1:family>
        <ns1:prefix>Mr.</ns1:prefix>
      </ns1:name>
    </ns3:assignedPerson>
  </ns3:author>
  <ns3:workflowInstanceID>urn:oid:1.2.3.4</ns3:workflowInstanceID>
  <ns3:workflowDocumentSequenceNumber>6</ns3:workflowDocumentSequenceNumber>
  <ns3:workflowStatus>OPEN</ns3:workflowStatus>
  <ns3:workflowStatusHistory>
    <ns3:documentEvent>
      <ns3:eventTime>2006-05-04T18:13:51.0Z</ns2:eventTime>
      <ns3:eventType>create</ns2:eventType>
      <ns3:taskEventIdentifier>urn:oid:1.1</ns2:taskEventIdentifier>
      <ns3:author>Mr. Rossi</ns2:author >
      <ns3:previousStatus></ns2:previousStatus>
      <ns3:actualStatus>OPEN</ns2:actualStatus>
    </ns3:documentEvent>
  </ns3:workflowStatusHistory>
</ns3:XDW.WorkflowDocument>
```

## IHE PCC Technical Framework Supplement – Cross Enterprise TeleHomeMonitoring Workflow Definition Profile (XTHM-WD)

---

```
<ns3:workflowDefinitionReference>urn:oid:1.2.3.4.5.6.7.8.9</ns3:workflowDefinitionReference>
  <ns3:TaskList>
    <ns3:XDWTask>
      <ns3:taskData>
        <ns2:taskDetails>
          <ns2:id>urn:oid:1.1.1.1.1</ns2:id>
          <ns2:taskType>Requested</ns2:taskType>
          <ns2:name>Activation Requested</ns2:name>
          <ns2:status>COMPLETED</ns2:status>
          <ns2:createdTime>2012-04-15T08:40:00.0Z</ns2:createdTime>
          <ns2:lastModifiedTime>2012-04-15T08:40:00.0Z</ns2:lastModifiedTime>
          <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
          <ns2:actualOwner>Mr. Rossi</ns2:actualOwner>
          <ns2:createdBy>Mr. Rossi</ns2:createdBy>
        </ns2:taskDetails>
        <ns2:description>Request for activation of a telehealth
service</ns2:description>
        <ns2:input>
          <ns2:part name="Laboratory Report">
            <reference uid="urn:oid:1.2.3.4.1" home="urn:oid:1.2.3"/>
          </ns2:part>
        </ns2:input>
        <ns2:output>
          <ns2:part name="Request Activation Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
          </ns2:part>
        </ns2:output>
      </ns3:taskData>
      <ns3:taskEventHistory>
        <ns3:taskEvent>
          <ns3:id>1</ns3:id>
          <ns3:eventTime>2012-04-15T08:40:00.0Z</ns3:eventTime>
          <ns3:identifier>urn:oid:1.1</ns3:identifier>
          <ns3:eventType>create</ns3:eventType>
          <ns3:status>COMPLETED</ns3:status>
        </ns3:taskEvent>
      </ns3:taskEventHistory>
    </ns3:XDWTask>
  </ns3:TaskList>
</ns3:XDWTask>
```

```
<ns3:taskData>
  <ns2:taskDetails>
    <ns2:id>urn:oid:1.1.1.1.1</ns2:id>
    <ns2:taskType>Approved</ns2:taskType>
    <ns2:name>Approved Request</ns2:name>
    <ns2:status>COMPLETED</ns2:status>
    <ns2:createdTime>2012-04-17T10:00:00.0Z</ns2:createdTime>
    <ns2:lastModifiedTime>2012-04-17T10:00:00.0Z</ns2:lastModifiedTime>
    <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
    <ns2:actualOwner>Mr. Smith</ns2:actualOwner>
    <ns2:createdBy>Mr. Smith</ns2:createdBy>
  </ns2:taskDetails>
  <ns2:description>Request for activation of a telehealth
service</ns2:description>
  <ns2:input>
    <ns2:part name="Request Activation Document">
      <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
    </ns2:part>
  </ns2:input>
</ns3:taskData>
<ns3:taskEventHistory>
  <ns3:taskEvent>
    <ns3:id>1</ns3:id>
    <ns3:eventTime>2012-04-17T10:00:00.0Z</ns3:eventTime>
    <ns3:identifier>urn:oid:1.2</ns3:identifier>
    <ns3:eventType>create</ns3:eventType>
    <ns3:status>COMPLETED</ns3:status>
  </ns3:taskEvent>
</ns3:taskEventHistory>
</ns3:XDWTask>
<ns3:XDWTask>
  <ns3:taskData>
    <ns2:taskDetails>
      <ns2:id>urn:oid:1.2.3.4.3</ns2:id>
      <ns2:taskType>Telemonitoring</ns2:taskType>
      <ns2:name>Telemonitoring 1</ns2:name>
      <ns2:status>COMPLETED</ns2:status>
      <ns2:createdTime>2012-04-20T13:01:50.0Z</ns2:createdTime>
      <ns2:lastModifiedTime>2012-04-20T13:01:50.0Z</ns2:lastModifiedTime>
      <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
```

```
        <ns2:actualOwner>Mr. Smith</ns2:actualOwner>
        <ns2:createdBy>Mr. Smith</ns2:createdBy>
    </ns2:taskDetails>
    <ns2:description>Sending of data to the service provider</ns2:description>
    <ns2:output>
        <ns2:part name="Telemonitoring Results Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:output>
</ns3:taskData>
<ns3:taskEventHistory>
    <ns3:taskEvent>
        <ns3:id>1</ns3:id>
        <ns3:eventTime>2012-04-20T13:01:50.0Z</ns3:eventTime>
        <ns3:identifier>urn:oid:1.3</ns3:identifier>
        <ns3:eventType>create</ns3:eventType>
        <ns3:status>COMPLETED</ns3:status>
    </ns3:taskEvent>
</ns3:taskEventHistory>
</ns3:XDWTask>
<ns3:XDWTask>
    <ns3:taskData>
        <ns2:taskDetails>
            <ns2:id>urn:oid:1.2.3.4.4</ns2:id>
            <ns2:taskType>Telemonitoring</ns2:taskType>
            <ns2:name>Telemonitoring 2</ns2:name>
            <ns2:status>COMPLETED</ns2:status>
            <ns2:createdTime>2012-04-25T13:11:00.0Z</ns2:createdTime>
            <ns2:lastModifiedTime>2012-04-25T13:11:00.0Z </ns2:lastModifiedTime>
            <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
            <ns2:actualOwner>Mr. Smith</ns2:actualOwner>
            <ns2:createdBy>Mr. Smith</ns2:createdBy>
        </ns2:taskDetails>
        <ns2:description>Sending of data to the service provider</ns2:description>
        <ns2:output>
            <ns2:part name=" Telemonitoring Results Document">
                <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
            </ns2:part>
        </ns2:output>
    </ns3:taskData>
</ns3:XDWTask>
```

```
</ns3:taskData>
<ns3:taskEventHistory>
  <ns3:taskEvent>
    <ns3:id>1</ns3:id>
    <ns3:eventTime>2012-04-25T13:11:00.0Z</ns3:eventTime>
    <ns3:identifier>urn:oid:1.4</ns3:identifier>
    <ns3:eventType>create</ns3:eventType>
    <ns3:status>COMPLETED</ns3:status>
  </ns3:taskEvent>
</ns3:taskEventHistory>
</ns3:XDWTask>
<ns3:XDWTask>
  <ns3:taskData>
    <ns2:taskDetails>
      <ns2:id>urn:oid:1.2.3.4.5</ns2:id>
      <ns2:taskType>Consult Request</ns2:taskType>
      <ns2:name>Consult Request</ns2:name>
      <ns2:status>COMPLETED</ns2:status>
      <ns2:createdTime>2012-04-25T14:01:30.0Z</ns2:createdTime>
      <ns2:lastModifiedTime>2012-04-25T14:01:30.0Z</ns2:lastModifiedTime>
      <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
      <ns2:actualOwner>Mr. Smith</ns2:actualOwner>
      <ns2:createdBy>Mr. Smith</ns2:createdBy>
    </ns2:taskDetails>
    <ns2:description>Generation of an alarm because data are out of the threshold
  </ns2:description>
  <ns2:input>
    <ns2:part name="Telemonitoring Results Document">
      <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
    </ns2:part>
  </ns2:input>
  <ns2:output>
    <ns2:part name="Request Consult Document">
      <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
    </ns2:part>
  </ns2:output>
</ns3:taskData>
<ns3:taskEventHistory>
  <ns3:taskEvent>
    <ns3:id>1</ns3:id>
```

```
        <ns3:eventTime>2012-04-25T14:01:30.0Z </ns3:eventTime>
        <ns3:identifier>urn:oid:1.5</ns3:identifier>
        <ns3:eventType>create</ns3:eventType>
        <ns3:status>COMPLETED</ns3:status>
    </ns3:taskEvent>
</ns3:taskEventHistory>
<ns3:XDWTask>
<ns3:XDWTask>
    <ns3:taskData>
        <ns2:taskDetails>
            <ns2:id>urn:oid:1.2.3.4.6</ns2:id>
            <ns2:taskType>Analysis and no Actions</ns2:taskType>
            <ns2:name> Analysis and no Actions</ns2:name>
            <ns2:status>COMPLETED</ns2:status>
            <ns2:createdTime>2012-04-27T17:56:07.0Z</ns2:createdTime>
            <ns2:lastModifiedTime>2012-04-27T17:56:07.0Z</ns2:lastModifiedTime>
            <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
            <ns2:actualOwner>Mr. Rossi</ns2:actualOwner>
            <ns2:createdBy>Mr. Rossi</ns2:createdBy>
        </ns2:taskDetails>
        <ns2:description>Analysis of the Telemonitoring Results Document and no
actions are necessary</ns2:description>
        <ns2:input>
            <ns2:part name="Telemonitoring Results Document">
                <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
            </ns2:part>
            <ns2:part name="Request Consult Document">
                <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
            </ns2:part>
        </ns2:input>
    </ns3:taskData>
<ns3:taskEventHistory>
    <ns3:taskEvent>
        <ns3:id>1</ns3:id>
        <ns3:eventTime>2012-04-27T17:56:07.0Z</ns3:eventTime>
        <ns3:identifier>urn:oid:1.6</ns3:identifier>
        <ns3:eventType>create</ns3:eventType>
        <ns3:status>COMPLETED</ns3:status>
    </ns3:taskEvent>
</ns3:taskEventHistory>
```

```
</ns3:XDWTask>

<ns3:XDWTask>
  <ns3:taskData>
    <ns2:taskDetails>
      <ns2:id>urn:oid:1.2.3.4.7</ns2:id>
      <ns2:taskType>Telemonitoring</ns2:taskType>
      <ns2:name>Telemonitoring 3</ns2:name>
      <ns2:status>COMPLETED</ns2:status>
      <ns2:createdTime>2012-04-30T13:10:00.0Z</ns2:createdTime>
      <ns2:lastModifiedTime>2012-04-30T13:10:00.0Z</ns2:lastModifiedTime>
      <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
      <ns2:actualOwner>Mr. Smith</ns2:actualOwner>
      <ns2:createdBy>Mr. Smith</ns2:createdBy>
    </ns2:taskDetails>
    <ns2:description>Sending of data to the service provider</ns2:description>
    <ns2:output>
      <ns2:part name="Telemonitoring Results Document">
        <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
      </ns2:part>
    </ns2:output>
  </ns3:taskData>
  <ns3:taskEventHistory>
    <ns3:taskEvent>
      <ns3:id>1</ns3:id>
      <ns3:eventTime>2012-04-30T13:10:00.0Z</ns3:eventTime>
      <ns3:identifier>urn:oid:1.7</ns3:identifier>
      <ns3:eventType>create</ns3:eventType>
      <ns3:status>COMPLETED</ns3:status>
    </ns3:taskEvent>
  </ns3:taskEventHistory>
</ns3:XDWTask>

<ns3:XDWTask>
  <ns3:taskData>
    <ns2:taskDetails>
      <ns2:id>urn:oid:1.2.3.4.8</ns2:id>
      <ns2:taskType>Consult Request</ns2:taskType>
      <ns2:name>Consult Request</ns2:name>
```

```
        <ns2:status>COMPLETED</ns2:status>
        <ns2:createdTime>2012-04-30T11:00:00.0Z</ns2:createdTime>
        <ns2:lastModifiedTime>2012-04-30T11:00:00.0Z</ns2:lastModifiedTime>
        <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
        <ns2:actualOwner>Mr. Smith</ns2:actualOwner>
        <ns2:createdBy>Mr. Smith</ns2:createdBy>
    </ns2:taskDetails>
    <ns2:description>Generation of an alarm because data are out of the threshold
</ns2:description>
    <ns2:input>
        <ns2:part name="Telemonitoring Results Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:input>
    <ns2:output>
        <ns2:part name="Request Consult Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:output>
</ns3:taskData>
<ns3:taskEventHistory>
    <ns3:taskEvent>
        <ns3:id>1</ns3:id>
        <ns3:eventTime>2012-04-30T11:00:00.0Z</ns3:eventTime>
        <ns3:identifier>urn:oid:1.8</ns3:identifier>
        <ns3:eventType>create</ns3:eventType>
        <ns3:status>COMPLETED</ns3:status>
    </ns3:taskEvent>
</ns3:taskEventHistory>
<ns3:XDWTask>

<ns3:XDWTask>
    <ns3:taskData>
        <ns2:taskDetails>
            <ns2:id>urn:oid:1.2.3.4.9</ns2:id>
            <ns2:taskType>Analysis and Request Visit</ns2:taskType>
            <ns2:name>Analysis and Request Visit</ns2:name>
            <ns2:status>COMPLETED</ns2:status>
            <ns2:createdTime>2012-05-3T08:30:00.0Z</ns2:createdTime>
```

```
        <ns2:lastModifiedTime>2012-05-3T08:30:00.0Z</ns2:lastModifiedTime>
        <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
        <ns2:actualOwner>Mr. Rossi</ns2:actualOwner>
        <ns2:createdBy>Mr. Rossi</ns2:createdBy>
    </ns2:taskDetails>
    <ns2:description>Analysis of the Telemonitoring Results Document and request
of a specialist consultation</ns2:description>
    <ns2:input>
        <ns2:part name="Telemonitoring Results Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
        <ns2:part name="Request Consult Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:input>
    <ns2:output>
        <ns2:part name="eReferral Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
        <ns2:part name="XDSFolder.uniqueId">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:output>
</ns3:taskData>
<ns3:taskEventHistory>
    <ns3:taskEvent>
        <ns3:id>1</ns3:id>
        <ns3:eventTime>2012-05-3T08:30:00.0Z</ns3:eventTime>
        <ns3:identifier>urn:oid:1.9</ns3:identifier>
        <ns3:eventType>create</ns3:eventType>
        <ns3:status>COMPLETED</ns3:status>
    </ns3:taskEvent>
</ns3:taskEventHistory>
</ns3:XDWTask>
<ns3:XDWTask>
    <ns3:taskData>
        <ns2:taskDetails>
            <ns2:id>urn:oid:1.2.3.4.10</ns2:id>
            <ns2:taskType>Visit Result</ns2:taskType>
            <ns2:name>Visit Result</ns2:name>
```

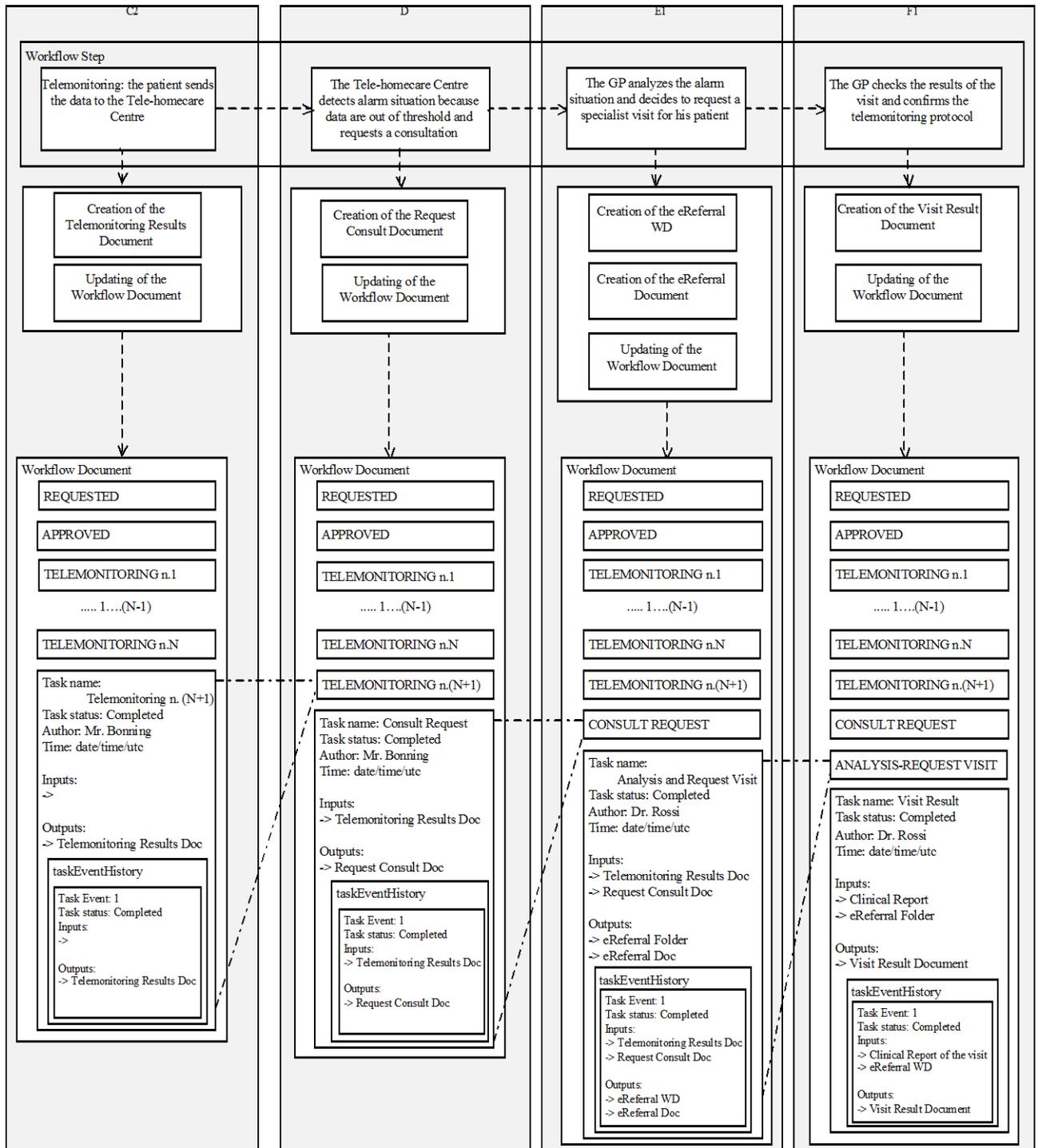
```
        <ns2:status>COMPLETED</ns2:status>
        <ns2:createdTime>2012-05-7T08:30:00.0Z</ns2:createdTime>
        <ns2:lastModifiedTime>2012-05-7T08:30:00.0Z</ns2:lastModifiedTime>
        <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
        <ns2:actualOwner>Mr. Rossi</ns2:actualOwner>
        <ns2:createdBy>Mr. Rossi</ns2:createdBy>
    </ns2:taskDetails>
    <ns2:description>Analysis of the Results of the eReferral process requested
</ns2:description>
    <ns2:input>
        <ns2:part name="Clinical Report">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
        <ns2:part name="XDSFolder.uniqueId">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:input>
    <ns2:output>
        <ns2:part name="Visit Result Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:output>
</ns3:taskData>
<ns3:taskEventHistory>
    <ns3:taskEvent>
        <ns3:id>1</ns3:id>
        <ns3:eventTime>2012-05-7T08:30:00.0Z</ns3:eventTime>
        <ns3:identifier>urn:oid:1.10</ns3:identifier>
        <ns3:eventType>create</ns3:eventType>
        <ns3:status>COMPLETED</ns3:status>
    </ns3:taskEvent>
</ns3:taskEventHistory>
</ns3:XDWTask>
<ns3:XDWTask>
    <ns3:taskData>
        <ns2:taskDetails>
            <ns2:id>urn:oid:1.2.3.4.11</ns2:id>
            <ns2:taskType>Telemonitoring</ns2:taskType>
            <ns2:name>Telemonitoring 4</ns2:name>
            <ns2:status>FAILED</ns2:status>
```

```
        <ns2:createdTime>2012-05-8T09:36:00.0Z</ns2:createdTime>
        <ns2:lastModifiedTime>2012-05-8T09:36:00.0Z</ns2:lastModifiedTime>
        <ns2:renderingMethodExists>>false</ns2:renderingMethodExists>
        <ns2:actualOwner>Mr. Smith</ns2:actualOwner>
        <ns2:createdBy>Mr. Smith</ns2:createdBy>
    </ns2:taskDetails>
    <ns2:description>Sending of data to the service provider</ns2:description>
    <ns2:output>
        <ns2:part name="Telemonitoring Results Document">
            <reference uid="urn:oid:1.2.3.4.2" home="urn:oid:1.2.3"/>
        </ns2:part>
    </ns2:output>
</ns3:taskData>
<ns3:taskEventHistory>
    <ns3:taskEvent>
        <ns3:id>1</ns3:id>
        <ns3:eventTime>2012-05-8T09:36:00.0Z</ns3:eventTime>
        <ns3:identifier>urn:oid:1.11</ns3:identifier>
        <ns3:eventType>fail</ns3:eventType>
        <ns3:status>FAILED</ns3:status>
    </ns3:taskEvent>
</ns3:taskEventHistory>
</ns3:XDWTask>
</ns3:TaskList>
</ns3:XDW.WorkflowDocument>
```

## Appendix B: Technical development of WD related to the telemonitoring process

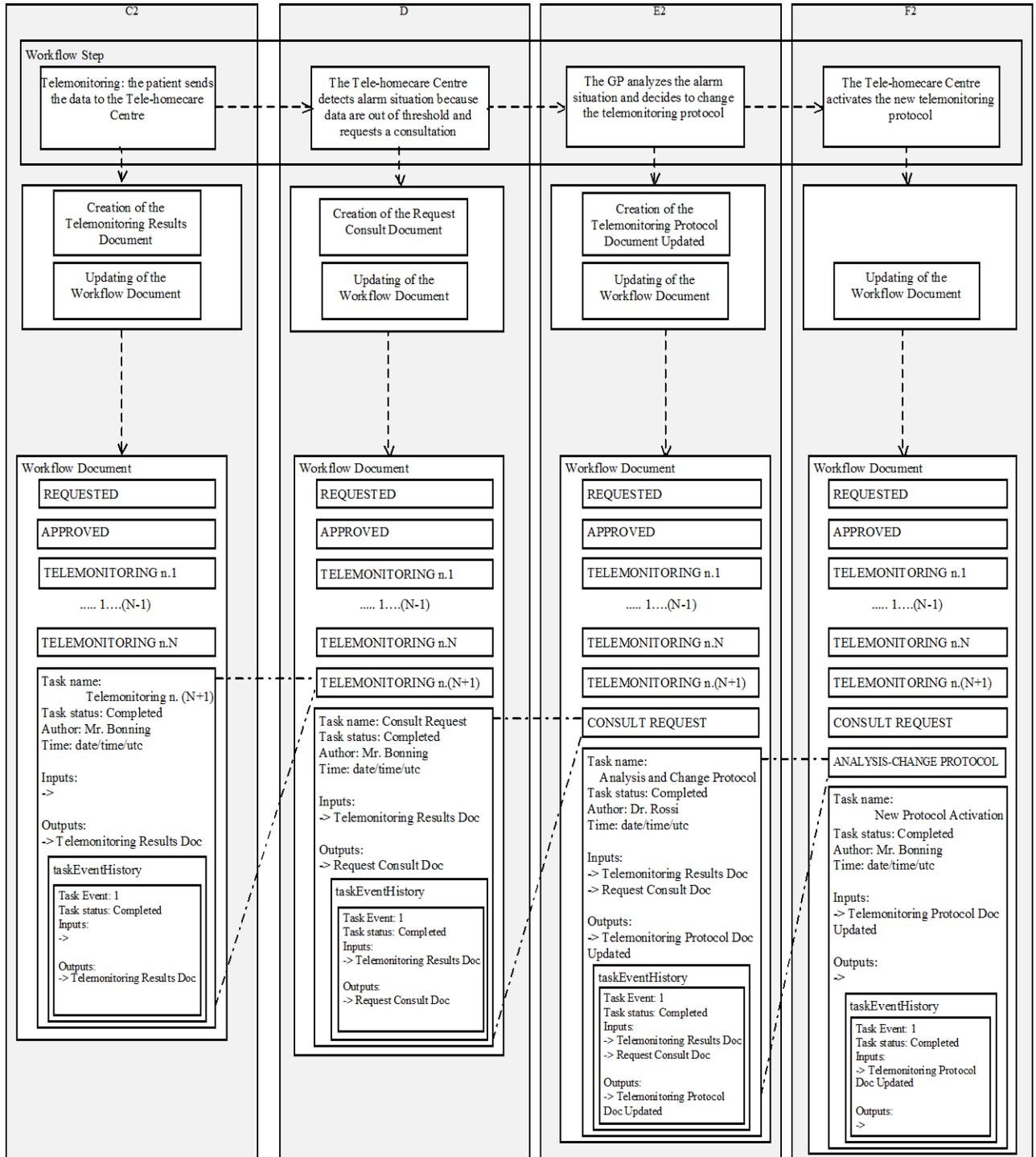
840 In this Appendix we present more technical information related to the use-case scenario described in Volume 1 of this profile.

**B.1 Management of alarm situation with a request of a visit**



**Figure B.1-1: Management of the Workflow Document: request of a visit**

**B.2 Management of alarm situation with a change of the protocol**



**Figure B.2-1: Management of the Workflow Document: change protocol**

### B.3 Management of alarm situation with clinical actions

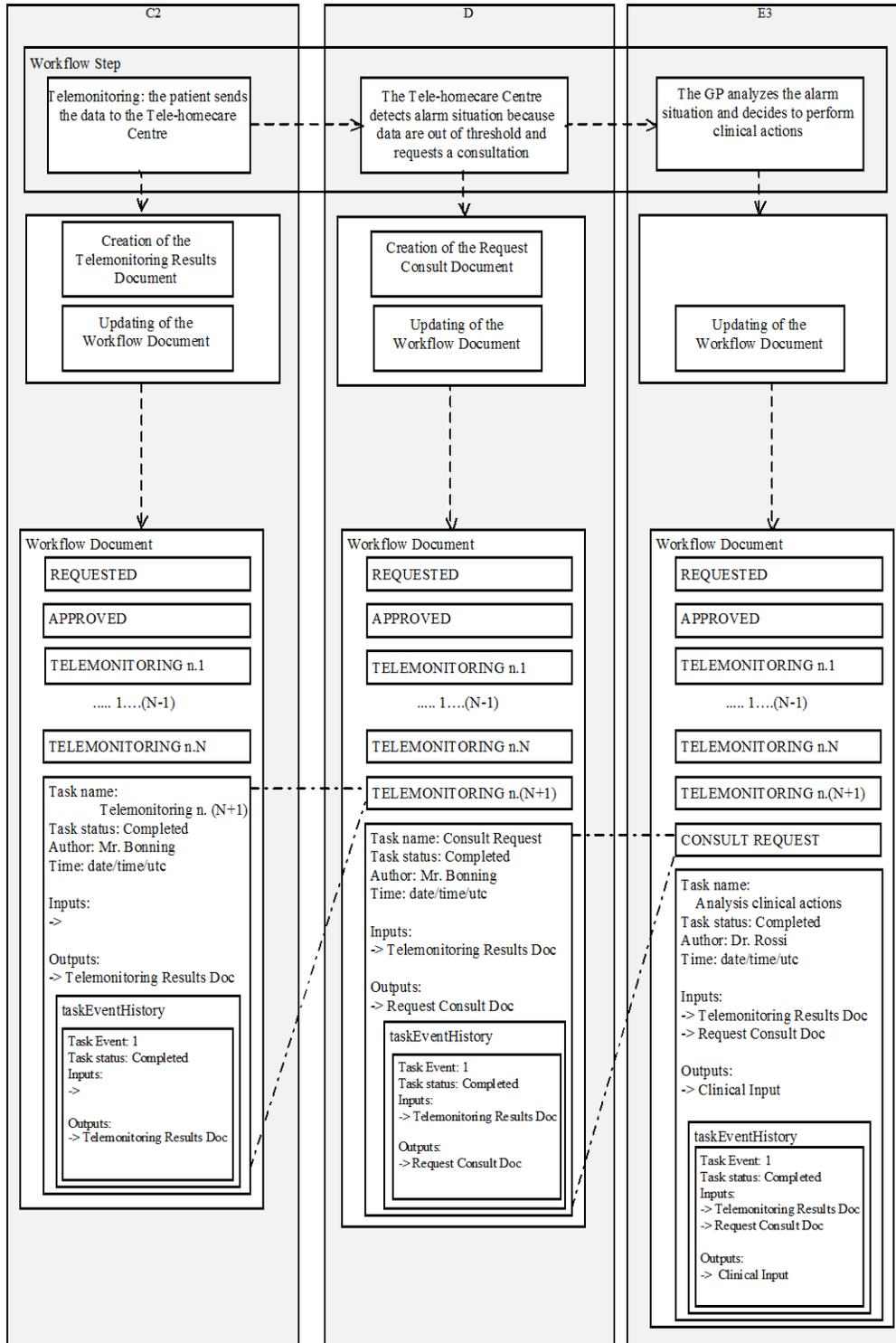


Figure B.3-1: Management of the Workflow Document: clinical actions

### B.4 Management of alarm situation with no actions

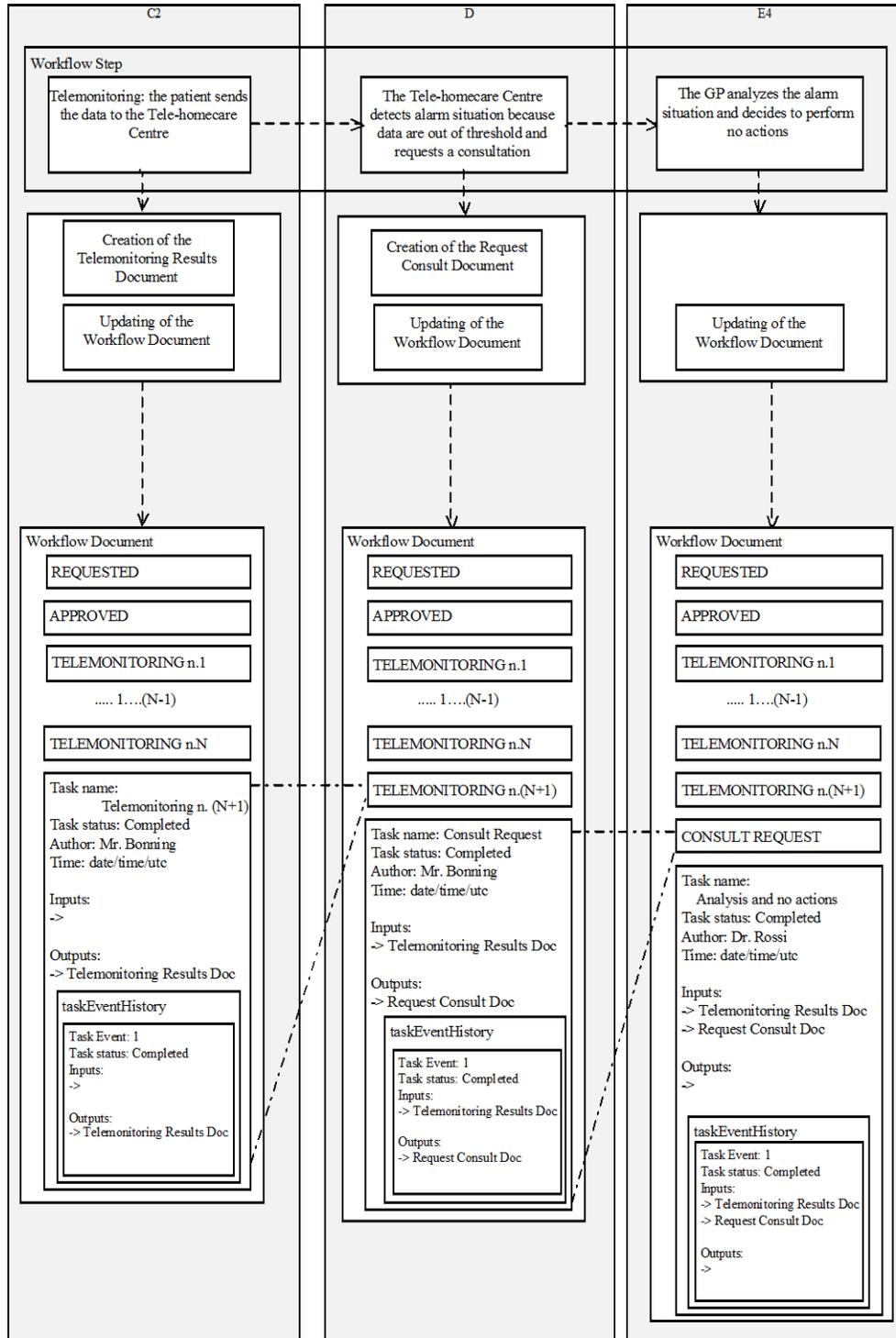


Figure B.4-1: Management of the Workflow Document: no actions