



5 **IHE Quality, Research and Public Health  
Technical Framework Supplement**

10 **Retrieve Process for Execution  
(RPE)**

15 **Trial Implementation**

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25 **Please verify you have the most recent version of this document. See [here](#) for Trial Implementation and Final Text versions and [here](#) for Public Comment versions.**

## Foreword

30 This is a supplement to the IHE Quality, Research and Public Health (QRPH) Technical Framework 0.1. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on September 9, 2016 for trial implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based  
35 on the results of testing. Following successful testing it will be incorporated into the Quality, Research and Public Health Technical Framework. Comments are invited and may be submitted at [http://www.ihe.net/QRPH Public Comments](http://www.ihe.net/QRPH_Public_Comments). This supplement describes changes to the existing technical framework documents.

“Boxed” instructions like the sample below indicate to the Volume Editor how to integrate the  
40 relevant section(s) into the relevant Technical Framework volume.

<i>Amend Section X.X by the following:</i>
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Where the amendment adds text, make the added text **bold underline**. Where the amendment removes text, make the removed text ~~**bold strikethrough**~~. When entire new sections are added, introduce with editor’s instructions to “add new text” or similar, which for readability are not  
45 bolded or underlined.

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

Information about the IHE QRPH domain can be found at: [http://www.ihe.net/IHE Domains](http://www.ihe.net/IHE_Domains).

Information about the organization of IHE Technical Frameworks and Supplements and the  
50 process used to create them can be found at: [http://www.ihe.net/IHE Process](http://www.ihe.net/IHE_Process) and <http://www.ihe.net/Profiles>.

The current version of the IHE QRPH Technical Framework can be found at:  
[http://www.ihe.net/Technical Frameworks](http://www.ihe.net/Technical_Frameworks).

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## CONTENTS

	Introduction.....	6
	Open Issues and Questions.....	6
60	Closed Issues.....	6
	<b>Volume 1 – Integration Profiles.....</b>	<b>7</b>
	1.n Copyright Permissions.....	7
	2.5 Dependencies of the RPE Integration Profile.....	7
	2.7 History of Annual Changes.....	7
65	X Retrieve Process for Execution (RPE) Profile.....	8
	X.1 RPE Actors/Transactions.....	8
	X.1.1 Actor Descriptions and Requirements.....	9
	X.1.1.1 Process Definition Manager.....	9
	X.1.1.2 Process State Manager.....	9
70	X.1.1.3 Process Activity Executor.....	10
	X.2 RPE Actor Options.....	11
	X.2.1 Retrieve Process Definitions Option.....	12
	X.2.2 Retrieve Activities Option.....	12
	X.2.3 Update Activity Option.....	12
75	X.3 Groupings.....	12
	X.4 RPE Process Flow.....	12
	X.4.1 Use Cases.....	12
	X.4.2 Process Flow.....	14
	X.5 RPE Security Considerations.....	16
80	X.5.1 Recommendations.....	17
	X.6 RPE Version mapping.....	18
	Appendix A: Actor Summary Definitions.....	19
	Appendix B: Transaction Summary Definitions.....	20
	Glossary.....	21
85	<b>Volume 2 - Transactions.....</b>	<b>22</b>
	3 IHE Transactions.....	22
	3.20 Retrieve Process Definitions [QRPH-20].....	22
	3.20.1 Scope.....	22
	3.20.2 Use Case Roles.....	22
90	3.20.3 Referenced Standards.....	23
	3.20.4 Interaction Diagram.....	23
	3.20.4.1 Retrieve Process Definitions Message.....	24
	3.20.4.1.1 Trigger Events.....	24
	3.20.4.1.2 Message Semantics.....	24
95	3.20.4.1.3 Expected Actions.....	25
	3.20.4.2 Retrieve Process Definitions Response Message.....	25
	3.20.4.2.1 Trigger Events.....	25
	3.20.4.2.2 Message Semantics.....	25

	3.20.4.2.3 Expected Actions .....	25
100	3.20.5 Security Considerations .....	25
	3.20.6 Protocol Requirements .....	26
	3.20.6.1 Sample SOAP Messages .....	26
	3.20.6.1.1 Sample Retrieve Process Definitions SOAP Request .....	27
	3.20.6.1.2 Sample Retrieve Process Definitions SOAP Response .....	27
105	3.25 Initiate Process [QRPH-25].....	28
	3.25.1 Scope .....	28
	3.25.2 Use Case Roles .....	28
	3.25.3 Referenced Standards .....	29
	3.25.4 Interaction Diagram.....	29
110	3.25.4.1 Initiate Process Message.....	29
	3.25.4.1.1 Trigger Events .....	29
	3.25.4.1.2 Message Semantics .....	30
	3.25.4.1.3 Expected Actions .....	30
	3.25.4.2 Initiate Process Response Message .....	30
115	3.25.4.2.1 Trigger Events .....	30
	3.25.4.2.2 Message Semantics .....	31
	3.25.4.2.3 Expected Actions .....	31
	3.25.5 Security Considerations .....	31
	3.25.6 Protocol Requirements .....	31
120	3.25.6.1 Sample SOAP Messages .....	32
	3.25.6.1.1 Sample Initiate Process SOAP Request.....	32
	3.25.6.1.2 Sample Initiate Process SOAP Response .....	33
	3.26 Retrieve Activities [QRPH-26].....	33
	3.26.1 Scope .....	33
125	3.26.2 Use Case Roles .....	33
	3.26.3 Referenced Standards .....	34
	3.26.4 Interaction Diagram.....	34
	3.26.4.1 Retrieve Activities Message .....	34
	3.26.4.1.1 Trigger Events .....	34
130	3.26.4.1.2 Message Semantics .....	34
	3.26.4.1.3 Expected Actions .....	34
	3.26.4.2 Retrieve Activities Response Message.....	35
	3.26.4.2.1 Trigger Events .....	35
	3.26.4.2.2 Message Semantics .....	35
135	3.26.4.2.3 Expected Actions .....	35
	3.26.5 Security Considerations .....	35
	3.26.6 Protocol Requirements .....	35
	3.26.6.1 Sample SOAP Messages .....	36
	3.26.6.1.1 Sample Retrieve Activities SOAP Request .....	37
140	3.26.6.1.2 Sample Retrieve Activities SOAP Response.....	37
	3.27 Update Activity [QRPH-27].....	37
	3.27.1 Scope .....	38

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	3.27.2 Use Case Roles .....	38
	3.27.3 Referenced Standards .....	38
145	3.27.4 Interaction Diagram.....	38
	3.27.4.1 Update Activity Message .....	39
	3.27.4.1.1 Trigger Events .....	39
	3.27.4.1.2 Message Semantics .....	39
	3.27.4.1.3 Expected Actions .....	39
150	3.27.4.2 Update Activity Response Message .....	40
	3.27.4.2.1 Trigger Events .....	40
	3.27.4.2.2 Message Semantics .....	40
	3.27.4.2.3 Expected Actions .....	40
	3.27.5 Security Considerations .....	40
155	3.27.6 Protocol Requirements .....	40
	3.27.6.1 Sample SOAP Messages .....	41
	3.27.6.1.1 Sample Update Activity SOAP Request.....	41
	3.27.6.1.2 Sample Update Activity SOAP Response .....	42
	3.28 Send Process State Alert [QRPH-28].....	42
160	3.28.1 Scope .....	42
	3.28.2 Use Case Roles .....	43
	3.28.3 Referenced Standards .....	43
	3.28.4 Interaction Diagram.....	43
	3.28.4.1 Send Process State Alert Message.....	44
165	3.28.4.1.1 Trigger Events .....	44
	3.28.4.1.2 Message Semantics .....	44
	3.28.4.1.3 Expected Actions .....	45
	3.28.4.2 Send Process State Alert Response Message .....	45
	3.28.4.2.1 Trigger Events .....	45
170	3.28.4.2.2 Message Semantics.....	45
	3.28.4.2.3 Expected Actions .....	45
	3.28.5 Security Considerations .....	45
	3.28.6 Protocol Requirements .....	45
	3.28.6.1 Sample SOAP Messages .....	46
175	3.28.6.1.1 Sample Send Process State Alert SOAP Request.....	47
	3.28.6.1.2 Sample Send Process State Alert SOAP Response .....	47

## Introduction

180 Retrieve Process for Execution (RPE) is a profile for *collaborative workflow* or *collaborative process management* involving three main actors:

1. the manager of process definitions
2. the manager of runtime processes
3. the performer of process activities

185 Note that the process definition contains specification for all activities to be performed. An activity defines a specific act, several of which define the entire process.

RPE started as Retrieve *Protocol* for Execution Profile, a proposed automated mechanism for an Electronic Health Record (EHR) to retrieve a complex set of clinical research instructions (a study protocol) from a research sponsor's Electronic Data Capture (EDC) system or research  
190 site's Clinical Trials Management System (CTMS) and to execute these instructions within the EHR. Interest has since grown to expand RPE to support processes from other domains involving collaborative workflows like quality, public health and patient care support. RPE now does this consistent with accepted IT standards for process management. In September of 2011, RPE underwent a substantial re-write that required current users of RPE to re-develop their  
195 implementations of the profile. The current version harmonizes the original Retrieve *Protocol* for Execution and the new Retrieve *Process* for Execution to lessen the burden on users of the profile to conform to the profile.

RPE defines the transport mechanism for process definitions, but does not provide the definitions per se. Additional profiles that define specific processes will complement RPE and bring the  
200 process automation capability to completion. One of these profiles is the Clinical Research Process Content (CRPC) Profile.

## Open Issues and Questions

No open issues at this time.

## Closed Issues

205 No closed issues at this time.

# Volume 1 – Integration Profiles

*Add the following to Section 1.1.5*

210

## **1.n Copyright Permissions**

*To be completed*

*Add the following to Section 2.5*

215

## **2.5 Dependencies of the RPE Integration Profile**

Retrieve Process for Execution (RPE) is not strictly dependent on any IHE profile but, for performance of activities, the ITI Retrieve Form for Data Capture (RFD) and QRPH Redaction Services (RSP) Profiles can be used very synergistically for form-based submission of appropriately-redacted EHR data.

220

*Add the following to Section 2.7*

## **2.7 History of Annual Changes**

225 *To be completed*

*Add Section X to the QRPH Technical Framework*

## X Retrieve Process for Execution (RPE) Profile

230 Retrieve Process for Execution (RPE) is a profile for *collaborative workflow* or *collaborative process management* involving three main actors:

1. the manager of process definitions
2. the manager of runtime processes
3. the performer of process activities

### X.1 RPE Actors/Transactions

235 Figure X.1-1 shows the actors directly involved in the Retrieve Process for Execution Profile and the relevant transactions between them. Other actors that may be indirectly involved due to their participation in other profiles are not necessarily shown.

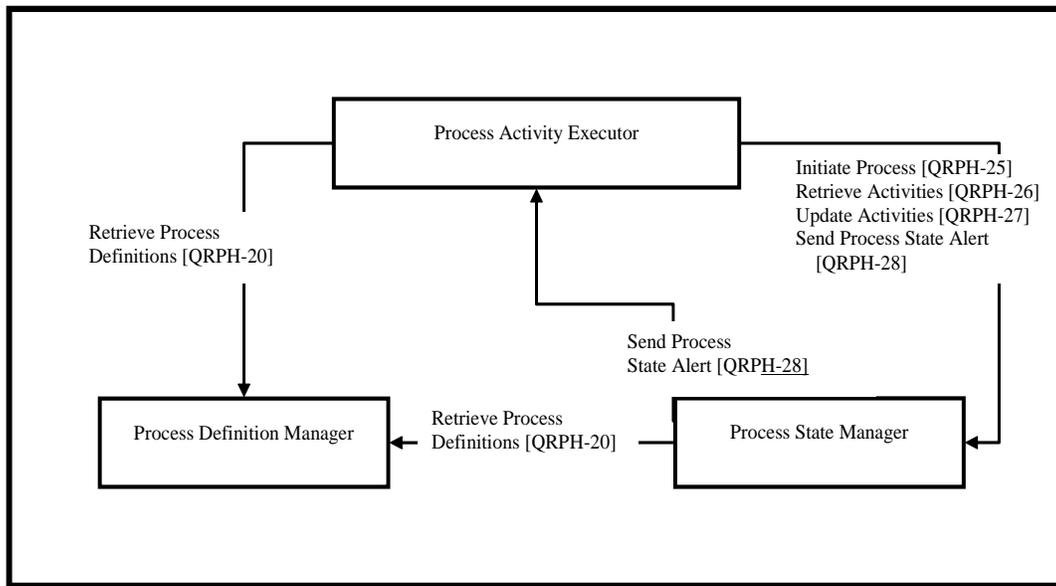


Figure X.1-1: RPE Actor Diagram

240

Table X.1-1 lists the transactions for each actor directly involved in the RPE Profile. In order to claim support of this integration profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” are optional. A complete list of options defined by this integration profile, which implementations may choose to support, is listed in Section X.2.

245

**Table X.1-1: RPE Actors and Transactions**

Actors	Transactions	Optionality	Reference
Process Definition	Retrieve Process Definitions [QRPH-20]	R	QRPH TF-2: 3.20
Process State Manager	Retrieve Process Definitions [QRPH-20]	O	QRPH TF-2: 3.20
	Initiate Process [QRPH-25]	R	QRPH TF-2: 3.25
	Retrieve Activities [QRPH-26]	O	QRPH TF-2: 3.26
	Update Activity [QRPH-27]	O	QRPH TF-2: 3.27
	Send Process State Alert [QRPH-28]	R	QRPH TF-2: 3.28
Process Activity Executor	Retrieve Process Definitions [QRPH-20]	R	QRPH TF-2: 3.20
	Initiate Process [QRPH-25]	R	QRPH TF-2: 3.25
	Retrieve Activities [QRPH-26]	O	QRPH TF-2: 3.26
	Update Activity [QRPH-27]	O	QRPH TF-2: 3.27
	Send Process State Alert [QRPH-28]	R	QRPH TF-2: 3.28

## X.1.1 Actor Descriptions and Requirements

### X.1.1.1 Process Definition Manager

250 The Process Definition Manager manages access to a repository of process definitions, allowing for search and retrieval.

An example would be a research sponsor providing access to the clinical research protocols it has developed. Another would be a provider of evidence-based clinical practice guidelines.

### X.1.1.2 Process State Manager

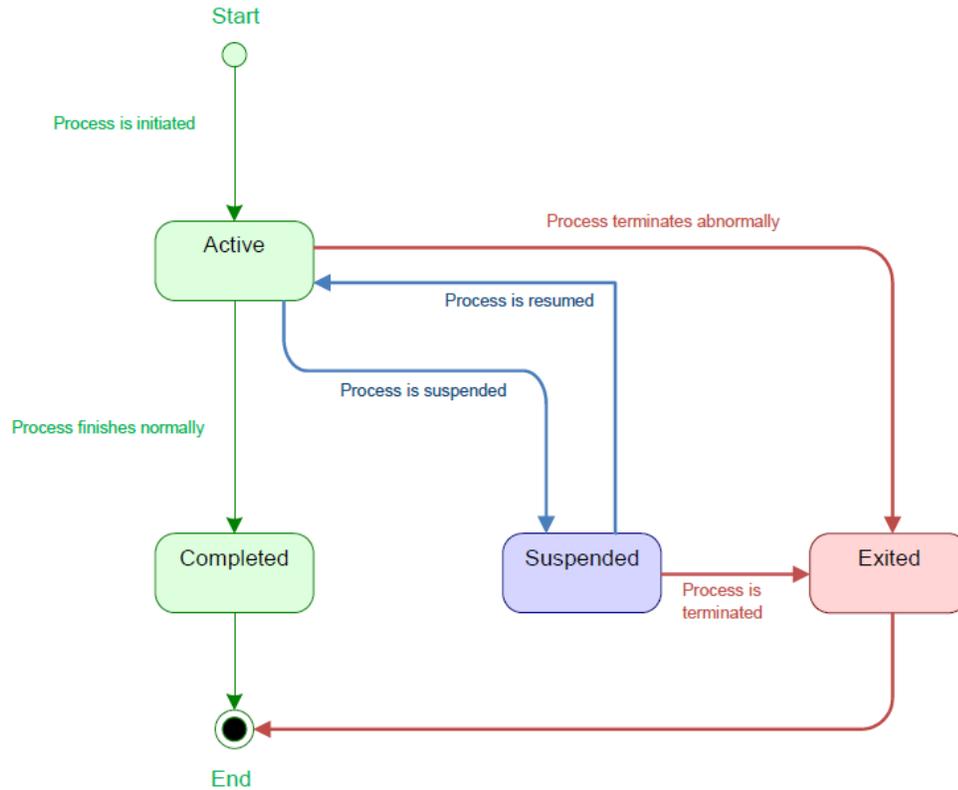
255 The Process State Manager manages the initiation and state of runtime process instances. The Process State Manager typically also supports the initiation and lifecycle management of task activities associated with a process while providing the ability for task performers to retrieve and update activities.

260 An example would be a research sponsor conducting clinical trials in conjunction with its EHR participants. Another would be an EHR performing clinical care in accordance with executable guideline-based processes.

The states of a process from the perspective of RPE actors<sup>1</sup> are indicated below:

---

<sup>1</sup> A BPMN 2.0 process and its activities may undergo more complex state transitions as per the BPMN 2.0 specification, Section 13.2.2, but these are the ones of interest to the Process Activity Executor. (Note the “Exited” state is any non-normal end state reached by a process or activity.)



265 All state transitions above are managed by the Process State Manager which can then use the Send Process State Alert transaction to notify the Process Activity Executor.

### X.1.1.3 Process Activity Executor

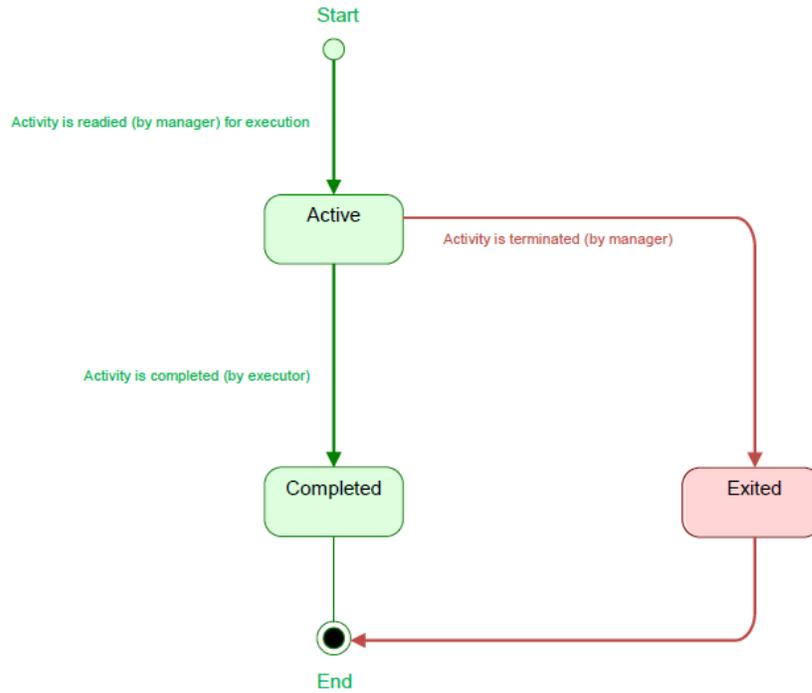
270 The Process Activity Executor performs activities as prescribed by a running process being managed by a Process State Manager. The Process Activity Executor retrieves current activity or task lists, works its list, updating the Process State Manager on activity state until completion. This cycle is repeated until all process activities have been worked and the process itself completes.

275 An example would be an EHR performing activities as part of a clinical trial being managed by a research sponsor. Another example would be an EHR performing guideline-based care process activities.

The states of an activity from the perspective of RPE actors<sup>2</sup> are indicated below:

---

<sup>2</sup> A BPMN 2.0 activity may undergo more complex state transitions as per the BPMN 2.0 specification, Section 13.2.2, but these ones are of interest to the Process Activity Executor. (Note the “Exited” state is any non-normal end state reached by an activity.)



280 The Process State Manager is responsible for transitioning the activity into the “Active” state and possibly forcing it into a non-normal end state, i.e., “Exited” and using the Send Process State Alert transaction to notify the Process Activity Executor.

The Process Activity Executor is responsible for marking the activity “Completed” and using the Update Activity transaction to update the Process State Manager with this change as well as any associated output data.

285 **X.2 RPE Actor Options**

Options that may be selected for each actor in this profile, if any, are listed in the Table X.2-1.

**Table X.2-1: RPE Actor Options**

Actor	Options	Reference
Process State Manager	Retrieve Process Definitions	Section X.2.1
Process State Manager	Retrieve Activities	Section X.2.2
Process State Manager	Update Activity	Section X.2.3
Process Activity Executor	Retrieve Activities	Section X.2.2

Actor	Options	Reference
Process Activity Executor	Update Activity	Section X.2.3

290 The optional transactions extend the capabilities of the participating actor. Each actor can participate in any or all appropriate optional transactions.

### **X.2.1 Retrieve Process Definitions Option**

The Retrieve Process Definitions Option allows a Process State Manager to retrieve the process definition. A Process State Manager that supports the Retrieve Process Definitions Option shall support the [QRPH-20] transaction.

### **X.2.2 Retrieve Activities Option**

The Retrieve Activities Option allows a Process State Manager or a Process Activity Executor to retrieve the current set of activities it needs to execute as part of processes it is a participant in and managed by the given Process State Manager. A Process State Manager or Process Activity Executor that supports the Retrieve Activities Option shall support the [QRPH-26] transaction.

### **X.2.3 Update Activity Option**

300 Update Activity allows a Process Activity Executor to provide an update on activity's state or data to a Process State Manager for a process it is a participant in. A Process Activity Executor that supports the Update Activity Option shall support the [QRPH-27] transaction.

## **X.3 Groupings**

305 No groupings specified.

## **X.4 RPE Process Flow**

### **X.4.1 Use Cases**

310 The clinical research use case below describes the before and after effects of implementing the Retrieve Process for Execution (RPE) Profile for an investigational new drug clinical trial scenario.

- Scenario

315 The setting for the clinical trial use case is a physicians' practice where patient care is delivered side-by-side with clinical research. The site, Fictitious Medical Group, is a multi-site physician practice, employing over 100 physicians in a variety of specialties. The Fictitious CEO encourages the physicians to participate as site investigators for pharmaceutical-sponsored clinical trials.

#### **Before RPE**

##### Preconditions

- 320
1. A Clinical Research Protocol is defined by a clinical trials expert at Sponsor, a biopharma research company.
  2. Fictitious provides support for clinical research activities in the form of a Research Department of twelve dedicated study coordinators, mostly RNs, along with clerical and data-entry support personnel.
  - 325 3. Fictitious Medical Group uses an Electronic Health Record (EHR) and a number of sponsor-provided Electronic Data Capture (EDC) systems for documenting clinical trial activities.

### **Clinical Research Site's Involvement:**

330 Fictitious involvement in a clinical study begins when the Research Department receives a request for proposal (RFP) from Sponsor. A Study Coordinator, Patricia Zone, RN, evaluates the RFP for business viability and clinical appropriateness, provides the requested documentation back to the sponsor, and agrees to participate. After being approved as a site for the Sponsor #1234 trial, the Fictitious Medical Group provides the required regulatory documentation to the sponsor.

335 Following trial set up, Patricia contacts Corey Jones, a patient at Fictitious, about participating in the trial and Corey agrees to participate as a subject. A number of tasks deal with this individual patient:

1. Obtain proper consent and other documentation from study candidate Corey Jones.
2. Register Corey in the EHR as a candidate in trial #1234, using the EHR's patient index.
3. Register Corey as a candidate in the EDC system.
- 340 4. Schedules Corey's study screening visits using the EHR scheduling module, and flag the visits as pertaining to the trial #1234.
5. Examine screening results to confirm continued enrollment in the trial.
6. After screening, Patricia obtains and schedules the next set of study activities corresponding to the path (arm) of the Sponsor #1234 trial.

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#### Post conditions

1. Fictitious Medical Group uses an EHR and the EDC system to document the Sponsor #1234 trial activities.

#### **After RPE**

350

#### Preconditions

1. A Clinical Research Protocol is defined by the clinical trials expert at Sponsor using a study design tool.

2. The resulting study design definition document is stored and made available for access by a Process Definition Manager (implemented by an EDC or other system).
- 355 3. A Process State Manager (implemented by an EDC or other system) is available to deploy, run and manage the execution of the clinical trial process.
4. The Fictitious EHR (or other system) can implement the Process Activity Executor role.

Clinical Research Site's Involvement:

Initial:

- 360 1. The Process Activity Executor uses the Retrieve Process Definitions transaction to obtain a list of protocols from the Process Definition Manager.

Screening:

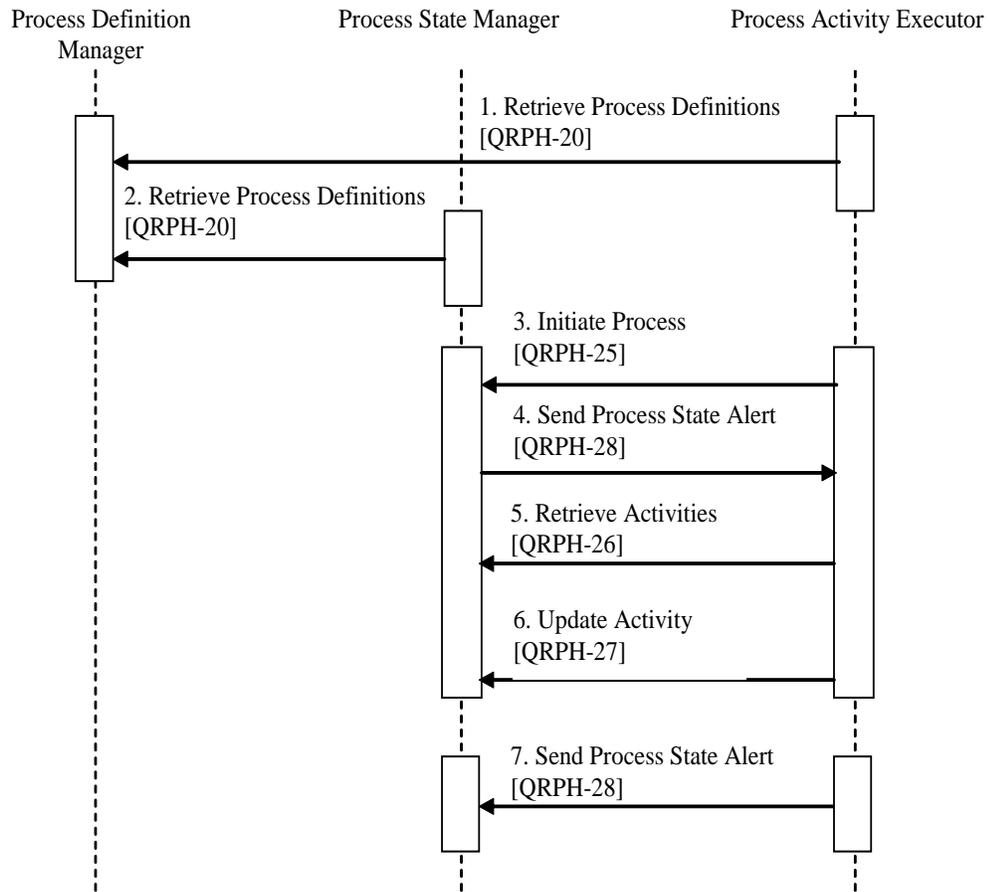
1. Process Activity Executor uses the Initiate Process transaction to notify the Process State Manager that the site wishes to enter a patient into the study.
- 365 2. Process Activity Executor uses the Retrieve Activities transaction to obtain from the Process State Manager the set of screening activities.
3. Process Activity Executor uses the Update Activity transaction to send the Process State Manager the screening results. (Note: if activities have associated RFD forms then Update Activity may be replaced by RFD form retrieval and submission.)
- 370 4. Process State Manager uses the Send Process State Alert transaction to notify the Process Activity Executor that the patient passed screening and has been enrolled in the trial.

Treatment:

1. Process Activity Executor uses the Retrieve Activities transaction again to obtain from the Process State Manager the next set of study activities for this patient.
- 375 2. Process Activity Executor uses the Update Activity transaction to send the Process State Manager updates of activities as they are performed. (Note: if activities have associated RFD forms then Update Activity may be replaced by RFD form retrieval and submission.)
3. Process Activity Executor can, at any time, use the Send Process State Alert transaction to notify the Process State Manager that the patient has withdrawn from the trial.
- 380 4. Process State Manager can at any time use the Send Process State Alert transaction to notify the Process Activity Executor that the trial has been placed on hold.

#### **X.4.2 Process Flow**

The basic process flow for RPE is shown below:



385

**Figure X.4.2-1: Basic Process Flow in RPE Profile**

390

1. The Process Activity Executor retrieves process definitions of potential interest from the Process Definition Manager.

2. The Process State Manager may have previously retrieved the same process definition(s) from the same or different Process Definition Manager.

395

3. The Process Activity Executor requests process initiation by the Process State Manager forwarding a given process definition identifier as well as other required data, e.g., a patient identifier, demographics or eligibility criteria.

4. The Process State Manager notifies the Process Activity Executor that the process is actively proceeding or otherwise, e.g., after initial screening of patient data.

5. The Process Activity Executor retrieves the current activity it has to perform.

400

6. After completion of an activity, the Process Activity Executor sends the Process State Manager the updated activity state and output data.

7. The Process Activity Executor can always notify the Process State Manager of unscheduled events that may affect the process state, e.g., patient withdrawal from a clinical trial.

## X.5 RPE Security Considerations

405 The risk analysis for RPE enumerates assets, threats, and mitigations. The complete risk data is stored and available from IHE<sup>3</sup>.

410 The purpose of this risk assessment is to notify vendors of some of the risks that they are advised to consider when implementing RPE actors. For general IHE risks and threats, please see ITI TF-1: Appendix L. The vendor is also advised that many risks cannot be mitigated by the IHE profile and instead responsibility for mitigation is transferred to the vendor, and occasionally to the affinity domains, individual enterprises and implementers. In these instances, IHE fulfills its responsibility to notify affected parties through the use of the following sections.

**Table X.5-1: Risk Issues**

Risk Scenario	Type of Impact	Probability
S1: Patient is misidentified during process initiation, activity retrieval initiation or update. Demographic or identification information is intermixed with that of another patient.	Loss of Data Integrity resulting in potentially incorrect diagnosis, treatment and/or data analysis, possibly resulting in loss of life or quality of life for the patient and/or errant analysis in the context of research, public health or quality processes.	M
S2: A malicious attacker may attempt to compromise the system to obtain wrongful access to patient identity, clinical, financial or insurance data.	Loss of Privacy, Legal Liability / Compensation, Loss / Decrease of Funding, Loss of Public Trust or Reputation for Patient, Provider, Agency, Institution or Organization, Accountable Employee Loses Job	M
S3: Accidental release of personal health information (PHI) protected by consent agreements, regulation or law.	Loss of Privacy, Legal Liability / Compensation, Loss / Decrease of Funding, Loss of Public Trust or Reputation for Patient, Provider, Agency, Institution or Organization, Accountable Employee Loses Job	M
S4: Activity results data with negative indications may be prematurely exposed to patient prior to direct communication.	Decreased Effectiveness of Provider, Agency, Institution or Organization in the conduct of its processes.	M
S5: Identify of certain profile actors needs to be kept secret during conduct of a process, e.g., a double-blind study.	Decreased Effectiveness of Provider, Agency, Institution or Organization in the conduct of its processes.	M

<sup>3</sup> The full risk analysis data may be found at:  
[ftp://ftp.ihe.net/Quality/2010\\_2011\\_YR\\_4/QRPH% 20Technical% 20Committee/Maintenance% 20work/RPE/RPE Risk Analysis 2010-05-21.xls](ftp://ftp.ihe.net/Quality/2010_2011_YR_4/QRPH%20Technical%20Committee/Maintenance%20work/RPE/RPE%20Risk%20Analysis%202010-05-21.xls)

Risk Scenario	Type of Impact	Probability
S6: In the event of inappropriate disclosure or other incident, auditing and investigation time becomes prohibitively long.	Increased Cost and Decreased Effectiveness of Provider, Agency, Institution or Organization in the conduct of its processes.	M

415

### X.5.1 Recommendations

The high impact risks include:

- mismatch between patient and patient data
- malicious system attack
- 420 • inappropriate or premature disclosure of personal health information
- patient and organization identity protection

For risk mitigation, the following profiles from the ITI Technical Framework are referred:

- Audit Trail and Node Authentication (ATNA)
- Basic Patient Privacy Consents (BPPC)
- 425 • Cross-Enterprise User Assertion (XUA)
- Consistent Time (CT)
- Enterprise User Authentication (EUA)
- Document Digital Signature (DSG)

This profile includes the mitigations:

430 **M1:** Ensure additional demographics are available to verify patient identity (e.g., address, other identifiers)

**M2:** Identify actors, ensure secure login and access control to protected data, e.g., using XUA and grouping with EUA for protected applications.

**M3:** Use secured communication for any patient data e.g., as per ATNA.

435 **M4:** Audit access to PHI, e.g., as per ATNA.

**M5:** Obtain patient consent to release protected data, e.g., using BPPC and DSG.

**M6:** Use pseudonymized identifiers for organizations in transactions as supported by RPE.

These mitigations are transferred to vendors and clients:

**T1:** Verify demographics other than patient name, birth date and gender.

440 **T2:** Providers evaluate and review activity data before submission to ensure data is entered correctly for the correct patient. Providers are cautioned not to use RPE for unmediated treatment

or diagnosis, i.e., a doctor must always intervene prior to treatment or diagnosis to ensure that errors that may occur in submission are checked by a human prior to engaging in any treatment or diagnosis of a patient.

445 **T3:** Secure internal networks from unauthorized access.

**T4:** Ensure strong password use for applications with access to PHI.

**T5:** Employ a restrictive RBAC scheme for applications providing access to PHI.

**T6:** Obtain patient consents and ensure patient data requiring increased protection is clearly identified.

450 **T7:** Workflow processes should be designed to ensure provider to patient communication occurs prior to sharing results with negative implications.

**T8:** Assign pseudonymized identifiers in processes when it is required to shield real identities.

**T9:** Actors are advised to consider the usability of their logging and audit repository implementation.

455 **X.6 RPE Version mapping**

The following tables specify mappings from the original Retrieve *Protocol* for Execution to the new Retrieve *Process* for Execution to assist implementers in translating their original RPE actors, transactions, and parameters to the new actors, transactions, and parameters.

460

**Table X.6-1: Actor Mapping**

<b>Retrieve <i>Protocol</i> for Execution Actor</b>	<b>Retrieve <i>Process</i> for Execution Actor</b>
ProtocolDefManager	Process Definition Manager
ProtocolExecutor	Process Activity Executor
ProtocolStateManager	Process State Manager

**Table X.6-2: Transaction Mapping**

<b>Retrieve <i>Protocol</i> for Execution Transaction</b>	<b>Retrieve <i>Process</i> for Execution Transaction</b>
RetrieveProtocolDef – Retired [QRPH-10]	Retrieve Process Definitions [QRPH-20]
EnterPatientRequest – Retired [QRPH-11]	Initiate Process [QRPH-25]
PatientScreeningVisitsScheduled – Retired [QRPH-12]	UpdateActivity [QRPH-27]
RecordPatientScreeningVisit – Retired [QRPH-13]	UpdateActivity [QRPH-27]
EnrollPatientRequest – Retired [QRPH-14]	Send Process State Alert [QRPH-28]

Retrieve <i>Protocol</i> for Execution Transaction	Retrieve <i>Process</i> for Execution Transaction
PatientStudyVisitsScheduled – Retired [QRPH-15]	UpdateActivity [QRPH-27]
RecordPatientStudyVisit – Retired [QRPH-16]	UpdateActivity [QRPH-27]
AmendProtocolDef – Retired [QRPH-17]	Publish Process Definitions [QRPH-22]
AlertProtocolState – Retired [QRPH-18]	Send Process State Alert [QRPH-28]

**Table X.6-3: Parameter Mapping**

Retrieve <i>Protocol</i> for Execution Parameter	Retrieve <i>Process</i> for Execution Parameter
query	processDefinitionIdentifier
ProtocolDefs	processDefinition
contentType	processDefinitionLanguage
study/id	processDefinitionIdentifier
subjectID	processIdentifier
schedule	activity
visit	activity

465

## Appendix A: Actor Summary Definitions

**Process Definition Manager** – A system that manages access to a repository of process definitions allowing for search and retrieval. An example would be a research sponsor providing access to the clinical research protocols it has developed. Another would be a provider of evidence-based clinical practice guidelines.

470

**Process State Manager** – A system that manages the initiation and state of runtime process instances. The Process State Manager typically also supports the initiation and lifecycle management of task activities associated with a process while providing the ability for task performers to retrieve and update activities. An example would be a research sponsor conducting clinical trials in conjunction with its EHR participants. Another would be an EHR performing clinical care in accord with executable guideline-based processes.

475

**Process Activity Executor** – A system that performs activities as prescribed by a running process being managed by a Process State Manager. The Process Activity Executor retrieves current activity or task lists, works its list, updating the Process State Manager on activity state until completion. This cycle is repeated until all process activities have been worked and the process itself completes. An example would be an EHR performing activities as part of a clinical trial being managed by a research sponsor. Another would be an EHR performing guideline-based care process activities.

480

## Appendix B: Transaction Summary Definitions

- 485 **Retrieve Process Definitions [QRPH-20]** – enables access to one or more process definitions specified by an identifier or other query criteria. This transaction is implemented by the Process Definition Manager and used by both the Process State Manager – to deploy processes it wishes to manage – and the Process Activity Executor – to examine processes it may be interested in becoming an activity participant.
- 490 **Initiate Process [QRPH-25]** – enables a Process Activity Executor to initiate a new process to be managed by a Process State Manager, e.g., an EHR entering a new patient candidate in a clinical trial being managed by a research sponsor.
- Retrieve Activities [QRPH-26]** – enables a Process Activity Executor to retrieve the current set of activities it needs to execute as part of a process managed by a Process State Manager.
- 495 **Update Activity [QRPH-27]** – allows a Process Activity Executor to provide an update on activity's state or data to a Process State Manager for a process it is a participant in.
- Send Process State Alert [QRPH-28]** – provides the Process State Manager and Process Activity Executor the ability to notify each other of unscheduled events that affect the state of the process, e.g., an EHR patient withdrawing from a clinical trial or, a study being placed on hold.
- 500

## Glossary

*Add the following terms to the Glossary:*

**Process Definition** – A designed flow of activities involving one or more role-based activity performers, implemented in XML and deployable to a runtime process consumer.

505 **Process** – A specific instance of a process definition running in a process consumer.

**Activity Definition** – A designed task which is deployable to a runtime activity processor, typically as part of a process definition.

**Activity** – A specific instance of an activity definition created in, and available from, an activity processor.

510

## Volume 2 - Transactions

### 3 IHE Transactions

*Add Sections 3.20, 3.25, 3.26, 3.27, and 3.28*

#### 515 3.20 Retrieve Process Definitions [QRPH-20]

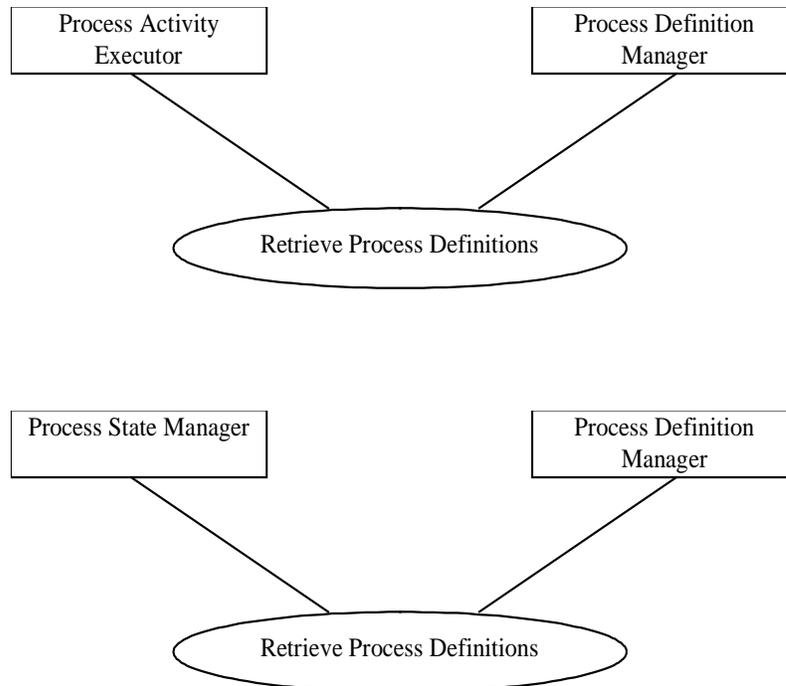
This section corresponds to transaction QRPH-20 of the IHE QRPH Transaction Framework. QRPH-20 is used by the Process Definition Manager and Process Activity Executor Actors.

##### 3.20.1 Scope

520 This transaction involves a Process Activity Executor or Process State Manager requesting one or more process definitions from a Process Definition Manager. The Process Activity Executor or Process State Manager has one or more process definition identifiers obtained by means outside the scope of this profile.

The Process Definition Manager returns either a list of matching process definitions or an error response.

##### 525 3.20.2 Use Case Roles



530

**Actor:** Process Activity Executor

**Role:** A system that knows how to execute activities that are part of a process.

535 **Actor:** Process State Manager

**Role:** A system that manages the runtime state of a process.

**Actor:** Process Definition Manager

**Role:** A system that provides a set of process definitions upon request.

### 3.20.3 Referenced Standards

540 Implementers of this transaction shall comply with all requirements described in:

- ITI TF-2x: Appendix V Web Services for IHE Transactions
- Extensible Markup Language (XML) 1.0 (Second Edition). W3C Recommendation 6 October 2000. <http://www.w3.org/TR/REC-xml>

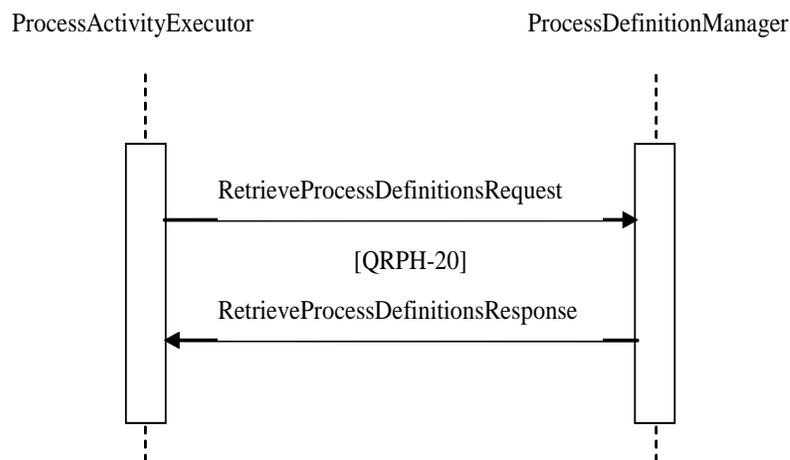
Implementers of this transaction shall comply with *one of the following* reference standards:

- 545
- OMG Business Process Model and Notation (BPMN) Version 2.0  
[\[http://www.omg.org/spec/BPMN/2.0/\]](http://www.omg.org/spec/BPMN/2.0/)

**OR**

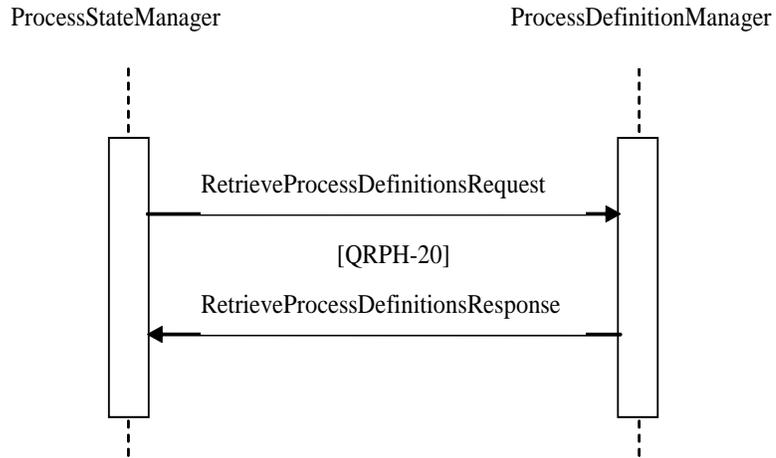
- 550
- HL7<sup>®4</sup> Study Design  
[\[http://www.hl7.org/v3ballot/html/domains/uvrt/uvrt\\_StudyDesign.htm\]](http://www.hl7.org/v3ballot/html/domains/uvrt/uvrt_StudyDesign.htm) **AND** HL7 Study Participation  
[\[http://www.hl7.org/v3ballot/html/domains/uvrt/uvrt\\_StudyParticipation.htm\]](http://www.hl7.org/v3ballot/html/domains/uvrt/uvrt_StudyParticipation.htm)

### 3.20.4 Interaction Diagram



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<sup>4</sup> HL7 is the registered trademark of Health Level Seven International.



555

### 3.20.4.1 Retrieve Process Definitions Message

#### 3.20.4.1.1 Trigger Events

The Process Activity Executor or Process State Manager, based on human decision or the application of a rule for automatic operation, wants to obtain from the Process Definition Manager one or more process definitions matching a set of previously supplied identifiers.

560

#### 3.20.4.1.2 Message Semantics

The following parameters are specified for the body of this transaction.

565

**Table 3.20.4.1.2-1: Retrieve Process Definitions Request Parameters**

Parameter Name	REQ	Description	Value
processDefinitionIdentifier (list)	R	An identifier (or list of identifiers) for the process definition(s) to be retrieved.	HL7 element of type InstanceIdentifier.
maxOccurs	O	If specified, the number of process definitions returned MUST NOT exceed this limit.	An XML element of simple type int.
startIndex	O	The startIndex can be used to perform multiple identical queries and iterate over result sets where the maxOccurs size exceeds the query limit.	An XML element of simple type int.

Section 3.20.6 describes the Web Services protocol requirements and the format of the message in full detail.

**3.20.4.1.3 Expected Actions**

570 Upon receipt of the Retrieve Process Definitions Message, the Process Definition Manager shall parse the request and return the requested process definitions in the Retrieve Process Definitions Response message.

575 The successful response shall be one or more well-formed XML documents matching the supplied identifiers.

Otherwise SOAP faults shall be generated accordingly.

**3.20.4.2 Retrieve Process Definitions Response Message**

**3.20.4.2.1 Trigger Events**

580 The delivery of a set of process definitions is triggered by a Process Definition Manager Actor in response to a Retrieve Process Definitions message.

**3.20.4.2.2 Message Semantics**

A matching list of one or more process definitions is returned. The format of each process definition is a well-formed XML document.

585

**Table 3.20.4.1.2-2: Retrieve Process Definitions Response Parameter**

Parameter Name	Option ality	Description	Value
processDefinition	R	One process definition per process definition identifier requested.	A complex XML element of type specified per optional processDefinitionLanguage attribute
processDefinitionLanguage	R	XML attribute	Options: <a href="http://www.omg.org/spec/BPMN/2.0/">http://www.omg.org/spec/BPMN/2.0/</a> (BPMN) PORT_RM100002UV (HL7 Study Design)

**3.20.4.2.3 Expected Actions**

590 The Process Activity Executor shall consume the set of process definitions. If a SOAP fault is received then this fault should be handled based on the business rules of the system.

**3.20.5 Security Considerations**

See QRPH TF-1:X.5.

### 3.20.6 Protocol Requirements

595 The Retrieve Process Definitions Request and Response shall be transmitted using Synchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V Web Services for IHE Transactions.

**Table 3.20.6-1: WSDL Namespace Definitions**

ihe	urn:ihe:qrph:rpe:2009
soap12	<a href="http://schemas.xmlsoap.org/wsdl/soap12/">http://schemas.xmlsoap.org/wsdl/soap12/</a>
wsaw	<a href="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing</a>
xsd	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>

600 These are the requirements for the Retrieve Process Definitions transaction presented in the order in which they would appear in the WSDL definition:

- The following types shall be imported (xsd:import) in the /definitions/types section:
- namespace="urn:ihe:qrph:rpe:2009", schema="RPE.xsd"
- The /definitions/message/part/@element attribute of the Retrieve Process Definitions Request message shall be defined as: "ihe:RetrieveProcessDefinitionsRequest"
- The /definitions/message/part/@element attribute of the Retrieve Process Definitions Response message shall be defined as: "ihe:RetrieveProcessDefinitionsResponse"
- The /definitions/portType/operation/input/@wsaw:Action attribute for the Retrieve Process Definitions Request message shall be defined as "urn:ihe:qrph:2009:RetrieveProcessDefinitions"
- The /definitions/portType/operation/output/@wsaw:Action attribute for the Retrieve Process Definitions response message shall be defined as: "urn:ihe:qrph:2009:RetrieveProcessDefinitionsResponse"
- The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as "urn:ihe:qrph:2009:RetrieveProcessDefinitions"

615 These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.20.6.1 Sample SOAP Messages.

#### 3.20.6.1 Sample SOAP Messages

620 The samples in the following two sections show a typical request and corresponding response as contained in a SOAP Body. *Note: the SOAP Header should be populated according to the IHE ITI TF-2x: Appendix V: Web Services for IHE Transactions.*

A full WSDL for the Process Definition Manager Actor is found on the IHE FTP site at:  
[ftp://ftp.ihe.net/Quality/2011\\_2012\\_YR\\_5/QRPH\\_Technical\\_Committee/Profiles\\_in\\_Progress/RPE/metadata](ftp://ftp.ihe.net/Quality/2011_2012_YR_5/QRPH_Technical_Committee/Profiles_in_Progress/RPE/metadata)

625

### 3.20.6.1.1 Sample Retrieve Process Definitions SOAP Request

*Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

630

```
<soap:Body>
  <rpe:RetrieveProcessDefinitionsRequest xmlns:rpe="urn:ihe:qrph:rpe:2009">
    <rpe:processDefinitionIdentifier root="1.2.3.4" extension="1006" />
  </rpe:RetrieveProcessDefinitionsRequest>
</soap:Body>
```

635

### 3.20.6.1.2 Sample Retrieve Process Definitions SOAP Response

*Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

640

```
<soap:Body>
  <rpe:RetrieveProcessDefinitionsResponse xmlns:rpe="urn:ihe:qrph:rpe:2009">
    <rpe:processDefinition processDefinitionLanguage="http://www.omg.org/spec/BPMN/2.0/">
      <definitions targetNamespace="http://www.examples.org"
        xmlns:tns="http://www.examples.org" xmlns="http://www.omg.org/spec/BPMN/20100524/MODEL"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:schemaLocation="http://www.omg.org/spec/BPMN/20100524/MODEL BPMN-20100501/BPMN20.xsd"
        xmlns:di="http://www.omg.org/spec/DD/20100524/DI"
        xmlns:bpmndi="http://www.omg.org/spec/BPMN/20100524/DI"
        xmlns:dc="http://www.omg.org/spec/DD/20100524/DC" xmlns:hl7="urn:hl7-org:v3"
        xmlns:rpe="urn:ihe:qrph:rpe:2009" id="_1312929184333">
        <!-- Import schemas and define RPE and HL7 element items for reference by process
        data object variables -->
        <import importType="http://www.w3.org/2001/XMLSchema" location="RPE.xsd"
          namespace="urn:ihe:qrph:rpe:2009" />
        <import importType="http://www.w3.org/2001/XMLSchema" location="HL7-
          SD/StudyDesign.xsd" namespace="urn:hl7-org:v3" />
        <itemDefinition id="InitiateProcessRequestItem"
          structureRef="rpe:InitiateProcessRequest"></itemDefinition>
        <itemDefinition id="RequestContextItem"
          structureRef="rpe:requestContext"></itemDefinition>
        <itemDefinition id="PatientDataItem"
          structureRef="rpe:patientData"></itemDefinition>
        <itemDefinition id="EligibilityCriterionItem"
          structureRef="hl7:eligibilityCriterion"></itemDefinition>
        <itemDefinition id="ObservationItem"
          structureRef="hl7:observation"></itemDefinition>
        <itemDefinition id="SubstanceAdministrationItem"
          structureRef="hl7:substanceAdministration"></itemDefinition>

        <message id="InitiateProcessRequest" itemRef="tns:InitiateProcessRequestItem"
          name="Initiate Process Request" />

        <process isExecutable="false" id="_6" name="IHE RPE Study Design" >
          <documentation id="Title">IHE RPE Study Design</documentation>
          <documentation id="Description">A simple single arm example consisting of
          Screen, Treatment and Followup epochs with 3 activities total:
          a screening visit, a treatment visit and a followup visit 6 months
```

650

655

660

665

670

675

680

```

        later.</documentation>
        <ioSpecification>
            <dataInput isCollection="true" name="Eligibility Criteria"
685 id="EligibilityCriteria" itemSubjectRef="tns:EligibilityCriterionItem"/>
            <dataInput name="Request Context" id="RequestContext"
            itemSubjectRef="tns:RequestContextItem"/>
            <dataInput name="Patient Data" id="PatientData"
            itemSubjectRef="tns:PatientDataItem"/>
690 <dataInput name="Substance Administration" id="SubstanceAdministration"
            itemSubjectRef="tns:SubstanceAdministrationItem"/>
            <dataOutput isCollection="true" name="Screening Observations"
            id="ScreeningObservations" itemSubjectRef="tns:ObservationItem"/>
            <dataOutput isCollection="true" name="Treatment Observations"
695 id="TreatmentObservations" itemSubjectRef="tns:ObservationItem"/>
            <dataOutput isCollection="true" name="Follow-up Observations"
            id="FollowUpObservations" itemSubjectRef="tns:ObservationItem"/>
            ...
        </definitions>
    </rpe:processDefinition>
700 </rpe:RetrieveProcessDefinitionsResponse>
</soap:Body>

<soap:Body>
705 <rpe:RetrieveProcessDefinitionsResponse xmlns:rpe="urn:ihe:qrph:rpe:2009">
    <rpe:processDefinition processDefinitionLanguage="PORT_RM10002UV">
        <plannedStudy xmlns:h17="urn:h17-org:v3">
            ...
710 </plannedStudy>
    </rpe:processDefinition>
</rpe:RetrieveProcessDefinitionsResponse>
</soap:Body>

```

### 3.25 Initiate Process [QRPH-25]

715 This section corresponds to transaction QRPH-25 of the IHE QRPH Transaction Framework. QRPH-25 is used by the Process State Manager and Process Activity Executor Actors.

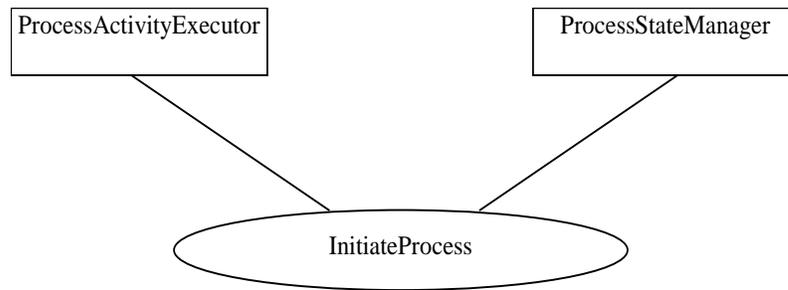
#### 3.25.1 Scope

This transaction involves a Process Activity Executor requesting the initiation of a process with a Process State Manager.

720 In its request the Process Activity Executor supplies an initial context, including:

- an identifier for the process definition of interest
- an organizational identifier
- a patient identifier
- an endpoint reference for callback notifications (alerts)
- 725 • other optional patient data (such as demographics)

#### 3.25.2 Use Case Roles



730 **Actor:** Process Activity Executor

**Role:** A system that knows how to execute activities that are part of a process.

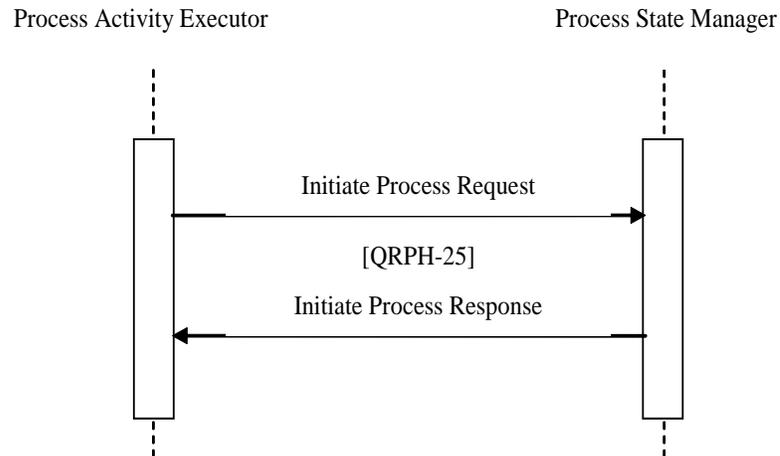
**Actor:** Process State Manager

**Role:** A system that manages the runtime state of a process.

735 **3.25.3 Referenced Standards**

See Section 3.20.3.

**3.25.4 Interaction Diagram**



740 **3.25.4.1 Initiate Process Message**

**3.25.4.1.1 Trigger Events**

The Process Activity Executor, based on human decision or the application of a rule for automatic operation, wants to initiate a process with a Process State Manager.

### 3.25.4.1.2 Message Semantics

745 The following parameters are specified for the body of this transaction.

**Table 3.25.4.1.2-1: Initiate Process Request Parameters**

Parameter Name	Optionality	Description	Value
patient	R	Basic demographics for the patient.	Simple patient definition, of type rpe:PatientType.
candidateID	R	List of patient identities.	HL7 element of type InstanceIdentifier. HL7 patient name type
name	O	Patient name	HL7 address type
address	O	Patient address	HL7 datetime type
dob	O	Patient date of birth	
processDefinitionIdentifier	R	Identifier for the process definition to be initiated.	HL7 element of type InstanceIdentifier.
processState	R	Initial state of the process	An XML element of type enumerated string.
organizationIdentifier	O	Identifier for the involved organization.	HL7 element of type InstanceIdentifier.
requestorReference	O	The Process Activity Executor callback endpoint for the Process State Manager to use in sending alerts.	WS Addressing EndpointReferenceType
patientData	O	Patient data, e.g., a CRD-conforming CCD.	An XML element of complex type specified per patientDataLanguage attribute with default value (CCD): <a href="http://xreg2.nist.gov:8080/hitsp/Validation/schema/cdar2c32/infrastructure/cda/C32_CDA.xsd">http://xreg2.nist.gov:8080/hitsp/Validation/schema/cdar2c32/infrastructure/cda/C32_CDA.xsd</a>

750 Section 3.25.6 describes the Web Services protocol requirements and the format of the message in full detail.

### 3.25.4.1.3 Expected Actions

The Process State Manager parses the Initiate Process request and, if well-formed, initiates an instance of the given process and acknowledges the request with a returned process context to be used in subsequent transactions.

755

Otherwise SOAP faults shall be generated accordingly.

### 3.25.4.2 Initiate Process Response Message

#### 3.25.4.2.1 Trigger Events

760 The message is triggered by a Process State Manager receiving an Initiate Process request from a Process Activity Executor and after successful initiation of the process.

### 3.25.4.2.2 Message Semantics

The following output parameters are the body of the response.

**Table 3.25.4.2.2-1: Initiate Process Response Parameters**

Parameter Name	Optionality	Description	Value
processIdentifier	R	Identifier for process instance	HL7 element of type InstanceIdentifier.
processState	R	Initial state of the process	An XML element of type enumerated string.
assignedOrganizationIdentifier	O	Assigned identifier for organization.	HL7 element of type InstanceIdentifier.
patient	O	Provided if additional identifiers are assigned to the patient.	Simple patient definition, of type rpe:PatientType.

765

### 3.25.4.2.3 Expected Actions

The Process Activity Executor shall consume the response code based on the business rules of the system. If a SOAP fault is received then this fault should also be handled based on the business rules of the system.

### 770 3.25.5 Security Considerations

See QRPH TF-1:X.5.

### 3.25.6 Protocol Requirements

The Initiate Process request and response shall be transmitted using Synchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V Web Services for IHE Transactions.

775

**Table 3.25.6-1: WSDL Namespace Definitions**

ihe	urn:ihe:qrph:rpe:2009
soap12	<a href="http://schemas.xmlsoap.org/wsdl/soap12/">http://schemas.xmlsoap.org/wsdl/soap12/</a>
wsaw	<a href="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing</a>
xsd	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>

780 These are the requirements for the Initiate Process transaction presented in the order in which they would appear in the WSDL definition:

- The following types shall be imported (xsd:import) in the /definitions/types section:
- namespace="urn:ihe:qrph:rpe:2009", schema="RPE.xsd"

- The /definitions/message/part/@element attribute of the Initiate Process Request message shall be defined as: “ihe:InitiateProcessRequest”
- 785 • The /definitions/message/part/@element attribute of the Initiate Process Response message shall be defined as: “ihe:InitiateProcessResponse”
- The /definitions/portType/operation/input/@wsaw:Action attribute for the Initiate Process request message shall be defined as “urn:ihe:qrph:2009:InitiateProcess”
- 790 • The /definitions/portType/operation/output/@wsaw:Action attribute for the Initiate Process response message shall be defined as: “urn:ihe:qrph:2009:InitiateProcessResponse”
- The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as “urn:ihe:qrph:2009:InitiateProcess”

795 These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in the Section 3.25.6.1 Sample SOAP Messages.

### 3.25.6.1 Sample SOAP Messages

800 The samples in the following two sections show a typical request and corresponding response as contained in a SOAP Body. Note: the SOAP Header should be populated according to the IHE ITI TF-2x: Appendix V: Web Services for IHE Transactions and in accord with Section 3.25.5 Security Considerations.

A full WSDL for the Process State Manager Actor is found on the IHE FTP site at: [ftp://ftp.ihe.net/Quality/2011\\_2012\\_YR\\_5/QRPH\\_Technical\\_Committee/Profiles\\_in\\_Progress/RPE/metadata](ftp://ftp.ihe.net/Quality/2011_2012_YR_5/QRPH_Technical_Committee/Profiles_in_Progress/RPE/metadata)

#### 805 3.25.6.1.1 Sample Initiate Process SOAP Request

*Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

```
810 <soap:Body>
    <rpe:InitiateProcessRequest xmlns:rpe="urn:ihe:qrph:rpe:2009" xmlns:hl7="urn:hl7-org:v3"
      xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/03/addressing">
      <rpe:patient>
815         <rpe:candidateID root="" extension="" />
         <rpe:name>
            <hl7:given>John</hl7:given>
            <hl7:family>Smith</hl7:family>
         </rpe:name>
820         <rpe:address />
         <rpe:dob value="19990101" />
      </rpe:patient>
      <rpe:processDefinitionIdentifier root="1.2.3.4" extension="1006" />
      <rpe:processState>INTERESTED</rpe:processState>
825      <rpe:organizationIdentifier root="1.2.3.5" extension="CIS_CE_CB" />
      <rpe:requestorReference>
         <wsa:Address>http://example.com/fabrikam/acct</wsa:Address>
      </rpe:requestorReference>
```

```
</rpe:InitiateProcessRequest>  
</soap:Body>
```

### 830 3.25.6.1.2 Sample Initiate Process SOAP Response

*Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

```
835 <soap:Body>  
    <rpe:InitiateProcessResponse xmlns:rpe="urn:ihe:qrph:rpe:2009">  
        <rpe:processIdentifier root="1.2.3.5" extension="1006-1" />  
        <rpe:processState>INTERESTED</rpe:processState>  
    </rpe:InitiateProcessResponse>  
840 </soap:Body>
```

## 3.26 Retrieve Activities [QRPH-26]

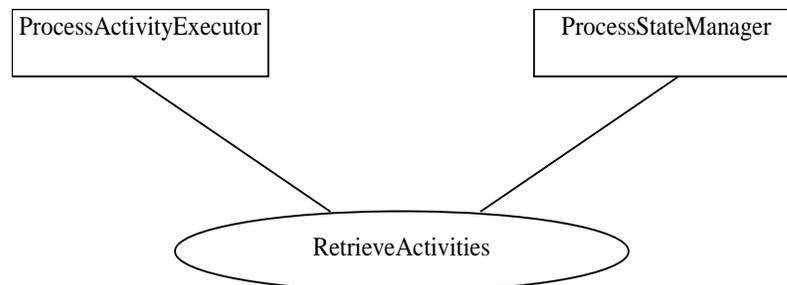
This section corresponds to transaction QRPH-26 of the IHE QRPH Transaction Framework. QRPH-26 is used by the Process State Manager and Process Activity Executor Actors.

### 845 3.26.1 Scope

The Retrieve Activities transaction enables a Process Activity Executor to retrieve the current set of activities it needs to execute as part of processes in which it is a participant and which are managed by the given Process State Manager.

850 In its request, the Process Activity Executor supplies the current process context, per Table 3.25.4.2.2-1.

### 3.26.2 Use Case Roles



855 **Actor:** Process Activity Executor

**Role:** A system that knows how to execute activities that are part of a process.

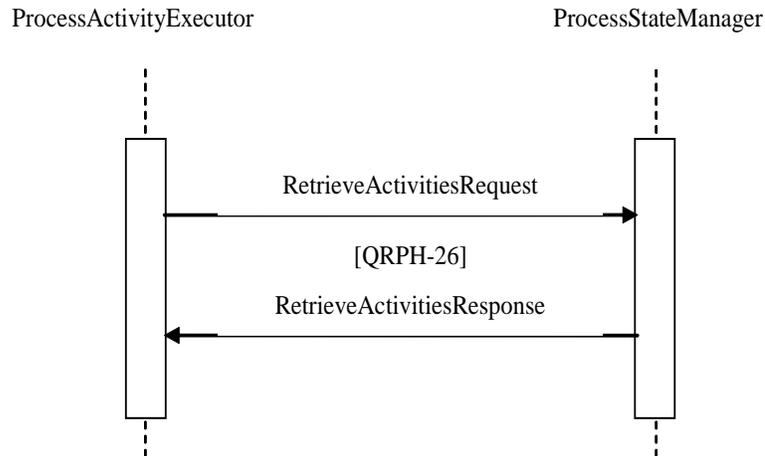
**Actor:** Process State Manager

**Role:** A system that manages the runtime state of a process.

### 3.26.3 Referenced Standards

860 See Section 3.20.3.

### 3.26.4 Interaction Diagram



#### 3.26.4.1 Retrieve Activities Message

##### 865 3.26.4.1.1 Trigger Events

The Process Activity Executor, based upon human decision or application of a rule for automatic operation, wants to retrieve the current set of process activities it needs to perform from a Process State Manager.

##### 3.26.4.1.2 Message Semantics

870 The current process context (see Table 3.25.4.2.2-1) is the sole input.

Section 3.26.6 describes the Web Services protocol requirements and the format of the message in full detail.

##### 3.26.4.1.3 Expected Actions

875 The Process State Manager parses the Retrieve Activities Request message and, if well-formed, returns the current set of activities for the given organization and patient. If no activities are outstanding an empty response is returned.

Otherwise SOAP faults shall be generated accordingly.

### 3.26.4.2 Retrieve Activities Response Message

#### 880 3.26.4.2.1 Trigger Events

The message is triggered by a Process State Manager in response to a Retrieve Activities Request from a Process Activity Executor.

#### 3.26.4.2.2 Message Semantics

885 A list of zero or more process activities is returned. The format of each activity is a well-formed XML document of the type supported by the process of which they are part.

**Table 3.26.4.2.2-1: Retrieve Activities Response Parameters**

Parameter Name	Optionality	Description	Value
activity	R	Current process activity	A complex XML element representing an activity within a process as specified per the activityLanguage attribute
activityLanguage	R	XML attribute	Options: <a href="http://www.omg.org/spec/BPMN/2.0.2/PDF/">http://www.omg.org/spec/BPMN/2.0.2/PDF/</a> (BPMN) PORT_RM100002UV (HL7 Study Design)
processIdentifier	R	Identifier for process instance	HL7 element of type InstanceIdentifier.
processState	R	Initial state of the process	An XML element of type enumerated string.
assignedOrganizationIdentifier	O	Assigned identifier for organization.	HL7 element of type InstanceIdentifier.
patient	O	Provided if additional identifiers are assigned to the patient.	Simple patient definition, of type rpe:PatientType.

#### 3.26.4.2.3 Expected Actions

890 The Process Activity Executor shall consume the list of activities based on the business rules of the system. If a SOAP fault is received then this fault should also be handled based on the business rules of the system.

### 3.26.5 Security Considerations

See QRPH TF-1:X.5.

### 3.26.6 Protocol Requirements

895 The Retrieve Activities Request and Response messages shall be transmitted using Synchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V Web Services for IHE Transactions.

**Table 3.26.6-1: WSDL Namespace Definitions**

ihe	urn:ihe:qrph:rpe:2009
soap12	<a href="http://schemas.xmlsoap.org/wsdl/soap12/">http://schemas.xmlsoap.org/wsdl/soap12/</a>
wsaw	<a href="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing</a>
xsd	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>

900

These are the requirements for the Retrieve Activities transaction presented in the order in which they would appear in the WSDL definition:

- The following types shall be imported (xsd:import) in the /definitions/types section:
- namespace="urn:ihe:qrph:rpe:2009", schema="RPE.xsd"
- 905 • The /definitions/message/part/@element attribute of the Retrieve Activities request message shall be defined as: "ihe:RetrieveActivitiesRequest"
- The /definitions/message/part/@element attribute of the Retrieve Activities response message shall be defined as: "ihe:RetrieveActivitiesResponse"
- The /definitions/portType/operation/input/@wsaw:Action attribute for the Retrieve Activities request message shall be defined as "urn:ihe:qrph:2009:RetrieveActivities"
- 910 • The /definitions/portType/operation/output/@wsaw:Action attribute for the Retrieve Activities response message shall be defined as: "urn:ihe:qrph:2009:RetrieveActivitiesResponse"
- The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as "urn:ihe:qrph:2009:RetrieveActivities"
- 915

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.26.6.1 Sample SOAP Messages.

### 3.26.6.1 Sample SOAP Messages

920 The samples in the following two sections show a typical request and corresponding response as contained in a SOAP Body. *Note: the SOAP Header should be populated according to the IHE Appendix V: Web Services for IHE Transactions and in accord with Section 3.26.5 Security Considerations.*

A full WSDL for the Process State Manager Actor is found on the IHE FTP site at:  
 925 [ftp://ftp.ihe.net/Quality/2011\\_2012\\_YR\\_5/QRPH\\_Technical\\_Committee/Profiles\\_in\\_Progress/RPE/metadata](ftp://ftp.ihe.net/Quality/2011_2012_YR_5/QRPH_Technical_Committee/Profiles_in_Progress/RPE/metadata)

### 3.26.6.1.1 Sample Retrieve Activities SOAP Request

*Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

```

930 <soap:Body>
    <rpe:RetrieveActivitiesRequest xmlns:rpe="urn:ihe:qrph:rpe:2009">
      <rpe:patient>
935         <rpe:candidateID root="" extension="" />
          <rpe:name>
            <hl7:given>John</hl7:given>
            <hl7:family>Smith</hl7:family>
          </rpe:name>
          <rpe:address />
940         <rpe:dob value="19990101" />
      </rpe:patient>
      <rpe:processIdentifier root="1.2.3.5" extension="1006-1" />
      <rpe:processDefinitionIdentifier root="1.2.3.4" extension="1006" />
945      <rpe:processState>SCREENING</rpe:processState>
      <rpe:assignedOrganizationIdentifier root="1.2.3.5" extension="CIS_CE_CB" />
    </rpe:RetrieveActivitiesRequest>
  </soap:Body>

```

### 3.26.6.1.2 Sample Retrieve Activities SOAP Response

*Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

```

955 <soap:Body>
    <rpe:RetrieveActivitiesResponse xmlns:rpe="urn:ihe:qrph:rpe:2009">
      <rpe:activity activityLanguage="http://www.omg.org/spec/BPMN/2.0/">
        <userTask xmlns="http://www.omg.org/spec/BPMN/20100524/MODEL"
960           implementation="##unspecified" name="Screening Activity" id="ScreeningActivity"/>
      </rpe:activity>
    </rpe:RetrieveActivitiesResponse>
  </soap:Body>

  <soap:Body>
965    <rpe:RetrieveActivitiesResponse xmlns:rpe="urn:ihe:qrph:rpe:2009" xmlns:hl7="urn:hl7-org:v3">
      <rpe:activity activityLanguage="PORT_RM100001UV">
        <hl7:study>
          <hl7:instantiation>
970             <hl7:plannedStudy>
              ...
            </hl7:plannedStudy>
          </hl7:instantiation>
        </hl7:study>
      </rpe:activity>
975    </rpe:RetrieveActivitiesResponse>
  </soap:Body>

```

## 3.27 Update Activity [QRPH-27]

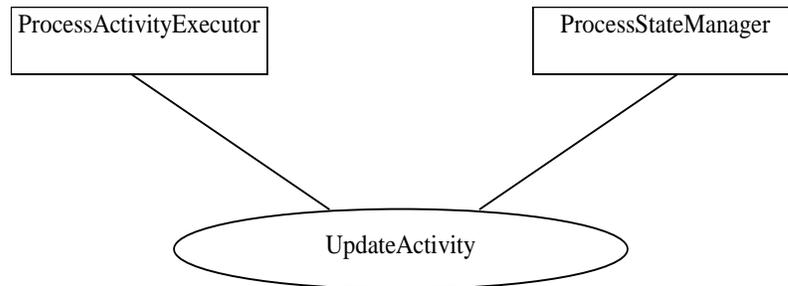
980 This section corresponds to transaction QRPH-27 of the IHE QRPH Transaction Framework. QRPH-27 is used by the Process State Manager and Process Activity Executor Actors.

### 3.27.1 Scope

Update Activity allows a Process Activity Executor to provide an update on an activity's state or data to a Process State Manager for a process in which it is a participant.

985 In its request, the Process Activity Executor supplies the current process context, per Table 3.25.4.2.2-1, and the updated activity.

### 3.27.2 Use Case Roles



**Actor:** Process Activity Executor

990 **Role:** A system that knows how to execute activities that are part of a process.

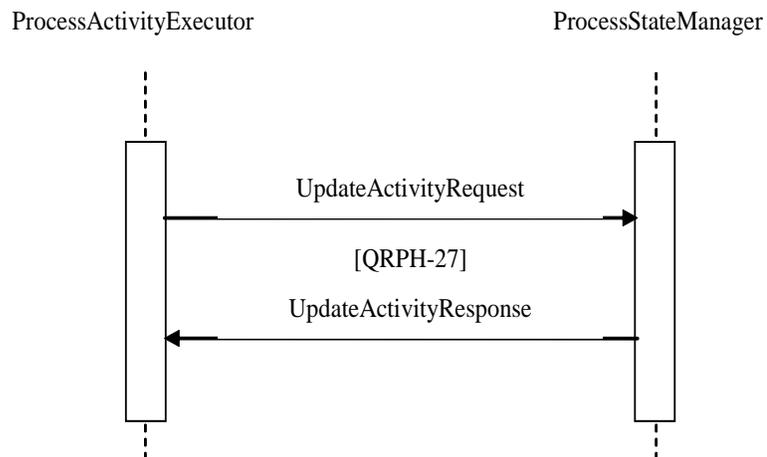
**Actor:** Process State Manager

**Role:** A system that manages the runtime state of a process.

### 3.27.3 Referenced Standards

See Section 3.20.3.

### 995 3.27.4 Interaction Diagram



### 3.27.4.1 Update Activity Message

#### 3.27.4.1.1 Trigger Events

1000 The Process Activity Executor, based upon human decision or application of a rule for automatic operation, wants to update the Process State Manager with the current state or data associated with an activity it is performing.

#### 3.27.4.1.2 Message Semantics

The following parameters are specified for the body of this transaction.

1005

**Table 3.27.4.1.2-1: Update Activity Request Parameters**

Parameter Name	Optionality	Description	Value
activity	R	One or more process activities.	A complex XML element representing an activity within a process as specified per the activityLanguage attribute
activityLanguage	R	XML attribute	Options: <a href="http://www.omg.org/spec/BPMN/2.0.2/PDF/">http://www.omg.org/spec/BPMN/2.0.2/PDF/</a> (BPMN) PORT_RM100002UV (HL7 StudyDesign)
processIdentifier	R	Identifier for process instance	HL7 element of type InstanceIdentifier.
processState	R	State of the process	An XML element of type enumerated string.
assignedOrganizationIdentifier	O	Assigned identifier for organization.	HL7 element of type InstanceIdentifier.
patient	O	Provided if additional identifiers are assigned to the patient.	Simple patient definition, of type rpe:PatientType.

Section 3.27.6 describes the Web Services protocol requirements and the format of the message in full detail.

#### 1010 3.27.4.1.3 Expected Actions

The Process State Manager parses the Update Activity request and if well-formed, updates the given activity for the state and/or data supplied.

1015 If the activity is updated as a result of this transaction the Process State Manager acknowledges the request with a response code of “ACTIVITY\_UPDATED”.

Otherwise SOAP faults shall be generated accordingly.

### 3.27.4.2 Update Activity Response Message

#### 3.27.4.2.1 Trigger Events

1020 The message is triggered by a Process State Manager receiving an Update Activity request from a Process Activity Executor.

#### 3.27.4.2.2 Message Semantics

A responseCode XML element of type string is returned which confirms successful update of the activity with a value of “ACTIVITY\_UPDATED”.

#### 1025 3.27.4.2.3 Expected Actions

The Process Activity Executor shall consume the response code based on the business rules of the system. If a SOAP fault is received then this fault should also be handled based on the business rules of the system.

### 3.27.5 Security Considerations

1030 See Section QRPH TF-1:X.5

### 3.27.6 Protocol Requirements

The Update Activity request and response shall be transmitted using Synchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V Web Services for IHE Transactions.

1035

**Table 3.27.6-1: WSDL Namespace Definitions**

ihe	urn:ihe:qrph:rpe:2009
soap12	<a href="http://schemas.xmlsoap.org/wsdl/soap12/">http://schemas.xmlsoap.org/wsdl/soap12/</a>
wsaw	<a href="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing</a>
xsd	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>

These are the requirements for the Update Activity transaction presented in the order in which they would appear in the WSDL definition:

- 1040
- The following types shall be imported (xds:import) in the /definitions/types section:
  - namespace=’urn:ihe:qrph:rpe:2009’, schema=’RPE.xsd’
  - The /definitions/message/part/@element attribute of the Update Activity request message shall be defined as: “ihe:UpdateActivityRequest”
  - The /definitions/message/part/@element attribute of the Update Activity response message shall be defined as: “ihe:UpdateActivityResponse”
- 1045

- The /definitions/portType/operation/input/@wsaw:Action attribute for the Update Activity request message shall be defined as “urn:ihe:qrph:2009:UpdateActivity”
- The /definitions/portType/operation/output/@wsaw:Action attribute for the Update Activity response message shall be defined as:  
1050 “urn:ihe:qrph:2009:UpdateActivityResponse”
- The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as “urn:ihe:qrph:2009:UpdateActivity”

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in the Section 3.27.6.1 Sample SOAP Messages.  
1055

### 3.27.6.1 Sample SOAP Messages

The samples in the following two sections show a typical request and corresponding response as contained in a SOAP Body. *Note the SOAP Header should be populated according to the IHE Appendix V: Web Services for IHE Transactions and in accord with Section 3.27.5 Security Considerations.*  
1060

A full WSDL for the Process State Manager Actor is found on the IHE FTP site at: [ftp://ftp.ihe.net/Quality/2011\\_2012\\_YR\\_5/QRPH Technical Committee/Profiles in Progress/RPE/metadata](ftp://ftp.ihe.net/Quality/2011_2012_YR_5/QRPH_Technical_Committee/Profiles_in_Progress/RPE/metadata).

#### 3.27.6.1.1 Sample Update Activity SOAP Request

1065 *Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

```

1070 <soap:Body>
    <rpe:UpdateActivityRequest xmlns:rpe="urn:ihe:qrph:rpe:2009">
        <rpe:patient>
            <rpe:candidateID root="" extension="" />
            <rpe:name>
                <hl7:given>John</hl7:given>
                <hl7:family>Smith</hl7:family>
            </rpe:name>
            <rpe:address />
            <rpe:dob value="19990101" />
        </rpe:patient>
        <rpe:processIdentifier root="1.2.3.5" extension="1006-1" />
        <rpe:processDefinitionIdentifier root="1.2.3.4" extension="1006" />
        <rpe:processState>SCREENING</rpe:processState>
        <rpe:assignedOrganizationIdentifier root="1.2.3.5" extension="CIS_CE_CB" />
        <rpe:activity activityLanguage="http://www.omg.org/spec/BPMN/2.0/">
            <userTask xmlns="http://www.omg.org/spec/BPMN/20100524/MODEL"
                implementation="##unspecified" name="Screening Activity" id="ScreeningActivity">
                <dataOutputAssociation id="ScreeningObservations_DataOutput">
                    <targetRef>ScreeningObservations</targetRef>
                    <assignment>
                        <from><![CDATA[
1085                 <hl7:observation xmlns:hl7="urn:hl7-org:v3" classCode="OBS"
                    moodCode="CRT">
                            <id root="1.2.5.2.3.4" extension="DBP" />
                            <code code="8462-4" codeSystem="2.16.840.1.113883.6.1"
                    codeSystemName="LOINC" displayName="BP Diastolic">
1090

```

```

1095         <originalText>Diastolic Blood Pressure</originalText>
           </code>
           <statusCode code="active" />
           <value xsi:type="PQ" value="120" unit="mmHg" />
1100       </hl7:observation>
     ]]>
   </from>
   <to>ScreeningObservations</to>
 </assignment>
</dataOutputAssociation>
</userTask>
</rpe:activity>
</rpe:UpdateActivityRequest>
</soap:Body>
1110 <soap:Body>
   <rpe:UpdateActivityRequest xmlns:rpe="urn:ihe:qrph:rpe:2009" xmlns:hl7="urn:hl7-org:v3">
     <rpe:patient>
       <rpe:candidateID root="" extension="" />
       <rpe:name>
1115         <hl7:given>John</hl7:given>
         <hl7:family>Smith</hl7:family>
       </rpe:name>
       <rpe:address />
       <rpe:dob value="19990101" />
1120     </rpe:patient>
     <rpe:processIdentifier root="1.2.3.5" extension="1006-1" />
     <rpe:processDefinitionIdentifier root="1.2.3.4" extension="1006" />
     <rpe:processState>SCREENING</rpe:processState>
     <rpe:assignedOrganizationIdentifier root="1.2.3.5" extension="CIS_CE_CB" />
1125     <rpe:activity activityLanguage="PORT_RM100001UV">
       <hl7:study>
         <hl7:instantiation>
           <hl7:plannedStudy>
1130             ...
           </hl7:plannedStudy>
         </hl7:instantiation>
       </hl7:study>
     </rpe:activity>
   </rpe:UpdateActivityRequest >
1135 </soap:Body>

```

### 3.27.6.1.2 Sample Update Activity SOAP Response

*Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

```

1140 <soap:Body>
   <rpe:UpdateActivityRequestResponse xmlns:rpe="urn:ihe:qrph:rpe:2009">
     <rpe:responseCode>ACTIVITY_UPDATED</rpe:responseCode>
1145   </rpe:UpdateActivityRequestResponse>
</soap:Body>

```

## 3.28 Send Process State Alert [QRPH-28]

This section corresponds to transaction QRPH-28 of the IHE QRPH Transaction Framework. QRPH-28 is used by the Process State Manager and Process Activity Executor Actors.

### 3.28.1 Scope

1150 This transaction involves either:

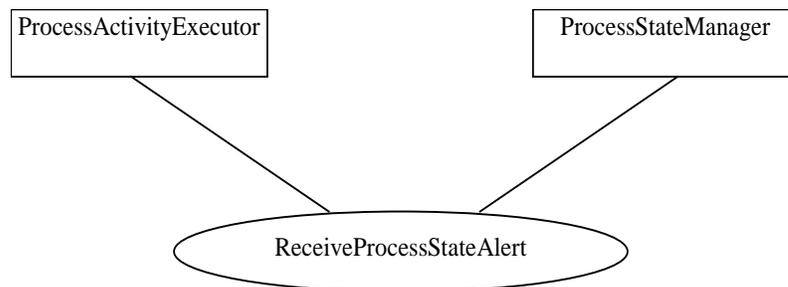
- a Process Activity Executor alerting a Process State Manager of a change that affects the state of a process it initiated,

**OR**

- a Process State Manager alerting a Process Activity Executor of a change associated with a process it initiated with the Process State Manager, in which case the alert contains.

In either case, the request passed by the actor supplies the current process context as per Table 3.25.4.2.2-1 and a process state value.

### 3.28.2 Use Case Roles



1160

**Actor:** Process Activity Executor

**Role:** A system that knows how to execute activities that are part of a process.

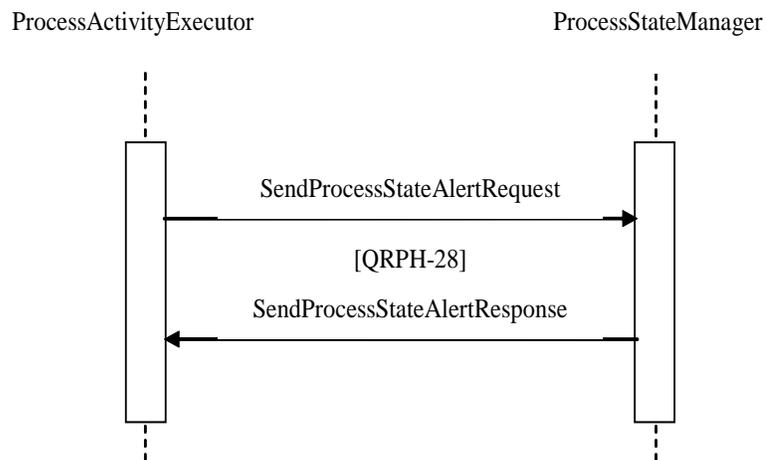
**Actor:** Process State Manager

**Role:** A system that manages the runtime state of a process.

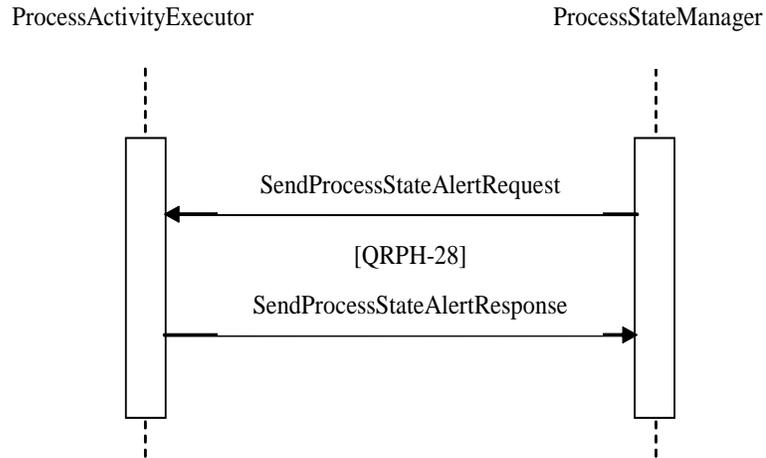
### 1165 3.28.3 Referenced Standards

See Section 3.20.3.

### 3.28.4 Interaction Diagram



**OR**



1170

### 3.28.4.1 Send Process State Alert Message

#### 3.28.4.1.1 Trigger Events

Either:

- 1175 • the Process Activity Executor, based upon human decision or application of a rule for automatic operation, wants to alert the Process State Manager of a change that affects a process it initiated

**OR**

- 1180 • the Process State Manager, based upon human decision or application of a rule for automatic operation, wants to alert the Process Activity Executor of a change associated with a process it initiated with the Process State Manager.

#### 3.28.4.1.2 Message Semantics

The following parameters are specified for the body of this transaction.

1185 **Table 3.28.4.1.2-1: Send Process State Alert Request Parameters**

Parameter Name	Optionality	Description	Value
patient	O	Basic demographics for the patient.	Simple patient definition, of type rpe:PatientType.
processDefinitionIdentifier	R	Identifier for the process definition to be initiated.	HL7 element of type InstanceIdentifier.
processIdentifier	R	Identifier for process instance	HL7 element of type InstanceIdentifier.

processState	R	The process state change being alerted.	An XML element of type enumerated string.
assignedOrganizationIdentifier	O	Assigned identifier for organization.	HL7 element of type InstanceIdentifier.

Section 3.28.6 describes the Web Services protocol requirements and the format of the message in full detail.

### 3.28.4.1.3 Expected Actions

1190 The Process Activity Executor or Process State Manager parses the Send Process State Alert request and if well-formed acknowledges the request with a response code of “ALERT\_RECEIVED”.

Otherwise SOAP faults shall be generated accordingly:

- If request is not well-formed, a SOAP fault shall be generated and shall include:
  - faultcode: Client
  - 1195 • faultstring: Invalid Request
  - and may provide further information in the details element

### 3.28.4.2 Send Process State Alert Response Message

#### 3.28.4.2.1 Trigger Events

1200 The message is triggered by a Process Activity Executor or Process State Manager receiving a well-formed Send Process State Alert request.

#### 3.28.4.2.2 Message Semantics

A responseCode XML element of type string is returned to confirm receipt of the alert with a value of “ALERT\_RECEIVED”.

#### 3.28.4.2.3 Expected Actions

1205 The Process Activity Executor or Process State Manager shall consume the response code based on the business rules of the system. If a SOAP fault is received then this fault should also be handled based on the business rules of the system.

### 3.28.5 Security Considerations

See QRPH TF-1:X.5.

### 1210 3.28.6 Protocol Requirements

The Send Process State Alert request and response shall be transmitted using Synchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V Web Services for IHE Transactions.

1215

**Table 3.28.6-1: WSDL Namespace Definitions**

ihe	urn:ihe:qrph:rpe:2009
soap12	<a href="http://schemas.xmlsoap.org/wsdl/soap12/">http://schemas.xmlsoap.org/wsdl/soap12/</a>
wsaw	<a href="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing</a>
xsd	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>

These are the requirements for the Send Process State Alert transaction presented in the order in which they would appear in the WSDL definition:

- The following types shall be imported (xds:import) in the /definitions/types section:
  - 1220 • namespace="urn:ihe:qrph:rpe:2009", schema="RPE.xsd"
- The /definitions/message/part/@element attribute of the Send Process State Alert request message shall be defined as: "ihe:SendProcessStateAlertRequest"
- The /definitions/message/part/@element attribute of the Send Process State Alert response message shall be defined as: "ihe:SendProcessStateAlertResponse"
- 1225 • The /definitions/portType/operation/input/@wsaw:Action attribute for the Send Process State Alert request message shall be defined as "urn:ihe:qrph:2009:SendProcessStateAlert"
- The /definitions/portType/operation/output/@wsaw:Action attribute for the Send Process State Alert response message shall be defined as:
  - 1230 "urn:ihe:qrph:2009:SendProcessStateAlertResponse"
- The /definitions/binding/operation/soap12:operation/@soapAction attribute shall be defined as "urn:ihe:qrph:2009:SendProcessStateAlert"

1235 These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in the Section 3.28.6.1 Sample SOAP Messages.

### 3.28.6.1 Sample SOAP Messages

1240 The samples in the following two sections show a typical request and corresponding response as contained in a SOAP Body. *Note the SOAP Header should be populated according to the IHE Appendix V: Web Services for IHE Transactions and in accord with Section 3.28.5 Security Considerations.*

A full WSDL for the Process State Manager Actor is found on the IHE FTP site at: [ftp://ftp.ihe.net/Quality/2011\\_2012\\_YR\\_5/QRPH Technical Committee/Profiles in Progress/RPE/metadata](ftp://ftp.ihe.net/Quality/2011_2012_YR_5/QRPH_Technical_Committee/Profiles_in_Progress/RPE/metadata).

### 3.28.6.1.1 Sample Send Process State Alert SOAP Request

1245 *Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

Process State Manager to Process Activity Executor (notification of patient enrollment):

```
1250 <soap:Body>
      <rpe:SendProcessStateAlertRequest xmlns:rpe="urn:ihe:qrph:rpe:2009">
        <rpe:patient>
          <rpe:candidateID root="" extension="" />
          <rpe:name>
            <hl7:given>John</hl7:given>
            <hl7:family>Smith</hl7:family>
          </rpe:name>
          <rpe:address />
          <rpe:dob value="19990101" />
1255 </rpe:patient>
          <rpe:processIdentifier root="1.2.3.5" extension="1006-1" />
          <rpe:processDefinitionIdentifier root="1.2.3.4" extension="1006" />
          <rpe:processState>ENROLLED</rpe:processState>
          <rpe:assignedOrganizationIdentifier root="1.2.3.5" extension="CIS_CE_CB" />
1260 </rpe:SendProcessStateAlertRequest>
      </soap:Body>
```

### 3.28.6.1.2 Sample Send Process State Alert SOAP Response

1270 *Note to the editor: please keep the following format for the sample text – courier new, 8pt, no spacing before and after the paragraph, tab stops every 1/8 of an inch for the first inch.*

```
1275 <soap:Body>
      <rpe:SendProcessStateAlertResponse xmlns:rpe="urn:ihe:qrph:rpe:2009">
        <rpe:responseCode>ALERT_RECEIVED</rpe:responseCode>
      </rpe:SendProcessStateAlertResponse>
    </soap:Body>
```