CARE PROVISION DOMAIN
REQUIREMENTS ANALYSIS ARTIFACTS

5-MAR-07

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Introduction

Storyboards at the Patient Care Domain level summarize the scope that must be commonly understood in order to make the most of the domain and ultimately to achieve interoperability. Storyboards outlined in this document Care Provision Domain Requirements Analysis describe requirements illustrating implementations.

These Storyboards essentially represent business requirement scenarios that are used in various implementations globally. Furthermore the body of knowledge already in the Patient Care Domain is enriched by the alignment and harmonization of these requirements. The alignment may result in updating the HL7 artifacts and extending or revising the HL7 reference models to accommodate concepts from requirements that are either absent or inadequately expressed in Patient Care Domain Information Model.

In order not to lose the original realm specific requirements all Storyboards are presented, in their entirety, in this section. The Patient Care Committee wishes to encourage submitting of Storyboards and in turn will provide exposure to all Storyboards.

Spelling can be realm specific in this section to preserve the original works. Patient Care requests that clarity be provided for terminology that is realm specific e.g. definitions provided are added to the glossary.

Acknowledgements

The Patient Care Technical Committee would like to formally acknowledge the contribution of the considerable storyboard content in this ballot by Isobel Frean, doctoral student, Health Informatics Research Center, University of Wollongong, Australia. Storyboards relating to aged care have been developed and validated using the requirements and analysis methods of the HDF as part of an Australian Research Council funded project which has involved staff working in residential and community based aged care services with the following research partner organisations: Illawarra Retirement Trust, Southern Cross Services NSW & ACT and Our Lady of Consolation Aged Care Services. Additional support for the Community-Based Health storyboards was generously provided by Donald R. Kamens, MD.

Storyboards were provided by the Western Canada Chronic Disease Management Infostructure Initiative - Phase 2: Data Standards and HL7 Message Specifications, a Western Health Information Collaborative (WHIC) project. These storyboards describe relevant chronic disease management (CDM) clinical scenarios for selected chronic diseases, which are used to help explain the business environment, in this case the CDM clinical environment, and the requirements for messages to be communicated or exchanged within that environment. The process of storyboarding e.g. focused group discussions in western Canada (British Columbia, Alberta, Saskatchewan, and Manitoba), set the foundation for describing CDM HL7 messages and their content.

Storyboards were provided by the HL7 Pediatric Data Standards SIG. It describes the activities and/or scenarios pertaining to the processes relevant to communicating Immunization information between the clinician's electronic medical record (EMR)

system and the local immunization registry. Specific functions of the EMR related to supporting Immunization-related activities were derived from the HL7 ERHS Functional Model. The elements of the storyboard were derived from domain expert representation from the American Academy of Pediatrics (AAP), American Immunization Registry Association (AIRA), Certification Commission for Healthcare Information Technology (CCHIT), National Association of Children's Hospitals and Related Institution (NACHRI), and Child Health Corporation of America (CHCA).

Overview

Requirements

The definition of business and user community requirements is of critical importance.

The HDF Chapter 2 *Requirements Documentation Modeling, Analysis and Harmonization* provides detailed information of getting from the Healthcare Business Process (Domain Expertise) to a HL7 Specification. The Healthcare Business process is a description of a specific healthcare business problem (or processes) that require(s) the exchange of data/information.

Each HL7 Specification (or Specification component) must be traceable to a specific healthcare business process and requirements. This traceability relationship serves two important purposes:

- Validation of the Specification requirements domain experts unfamiliar with the design and implementation details of HL7 exchange artifacts (e.g. messages) to quickly determine whether a particular HL7 data/information artifact exist to support a given business-process-of-interest
- Facilitation of complete and accurate Specification design and construction relative to the defined requirements as outlined in the HDF chapter on Modeling, Analysis and Harmonization.

After several iterations, a comprehensive definition of the specific healthcare business process is developed with pictorial terms that a domain expert can understand, discuss, and refine. The Link between requirements (business process model) and the HL7 models is an Activity Diagram, which provides the context describing functional or interoperability requirements. Furthermore the techniques discussed in the HDF chapter for documenting the dynamic, responsibility-based interactions of a business process are easily translatable to system-to-system interactions, which in turn lead to the definition of application roles and receiver responsibilities. In addition, the dynamic behavior modeling techniques is used to make clear HL7 trigger events and state changes in relevant domain objects. Essentially storyboards provide a way of defining requirements as part of an iterative process.

Activity Diagram

Once the requirement has been appropriately scoped to a single process-of-interest, it is clarified and expanded into an Activity Diagram. This is a tool used for visualizing the activities and flow of a healthcare business process.

An Activity Diagram identifies a sequence of steps and the information that is transferred from one participating role to another. Sometimes called a “Swim-lane Diagram”, the pictures represent a dynamic description of the healthcare business processes driving the required data/information exchange.

Glossary

The focus is to clearly and unambiguously define the information to be able to achieve the objectives. Therefore Patient Care requests that clarity be provided for terminology that is realm specific e.g. definitions provided are added to the glossary.

Requirements Storyboard Summary

Storyboard	Purpose	Business Process of interest	Country	Author
Aged Care Transfer (Lite)	The purpose of this storyboard is to illustrate the communication flow between a person requesting access to nursing home services and a residential or community aged care service provider organisation.	Looking for nursing home placement	Australia	Isobel Frean University of Wollongong
Communicate a person's CDM data	The purpose of this storyboard is to demonstrate the communication of a person's CDM data. In the first scenario, we describe the exchange of the CDM data for an individual recently diagnosed with a specific chronic disease (e.g., Diabetes). The second scenario describes providing updates to the CDM data.	Communication of a person's CDM data	Canada	Western Health Information Collaborative (WHIC)
Ongoing CDM data exchange	This storyboard demonstrates the ongoing exchange of CDM data. In this scenario, we create and validate an individualized care plan for a person, and communicate the updated contents of the person's Chronic Disease Management (CDM) record to all providers who need to know the current plan for caring for this individual.	Ongoing exchange of chronic disease management data	Canada	Western Health Information Collaborative (WHIC)
Palliative Care Service Request	This storyboard demonstrates the communication flow associated with requests by an aged or community services provider for specialists clinical services.	Review pain management needs	Australia	Isobel Frean University of Wollongong
Pastoral Care – Domain	This storyboard illustrates the communication flow associated with provision of pastoral care services	Palliative care pastoral services	Australia	Isobel Frean University of

	involving paid and unpaid service providers.			Wollongong
Physician Requests Clinical Data on Patient	This storyboard demonstrates the flow of communication under the Care Record Query Topic and the Care Record Document Topic. A Care Record Summary document is the document type that would be returned by Dr Hormone.	Patient wants a second opinion	Australia	Isobel Frean University of Wollongong
Query Aged Care Assessment Record	This storyboard demonstrates querying a national aged care eligibility assessment forms database.	Eligibility assessment for subsidized service	Australia	Isobel Frean University of Wollongong
Referral Between Two Specialists	This storyboard demonstrates the communication between two specialists, cardiologist and electrophysiologist.	Referral from one specialists to another	Australia	Isobel Frean University of Wollongong
Request for Changes to Ongoing Services	This storyboard demonstrates the communication flow between a client/resident or their advocate requesting a change to an existing service.	Increase meal service	Australia	Isobel Frean University of Wollongong
Request Medication Chart Review	This storyboard demonstrates a request by a nurse of a Primary Care Physician (GP) to review a resident's medication chart.	Review of all medications	Australia	Isobel Frean University of Wollongong
Resident Transfer (Discharge Summary)	This storyboard demonstrates communication associated with the transfer of care of a resident/client by an aged care service provider to another care facility (hospital, hospice, rehabilitation unit).	Transfer from a nursing home to a hospital	Australia	Isobel Frean University of Wollongong
Respond to Personal Alarm in Community	This storyboard demonstrates the flow of communication associated with activation by a client living in the community of their personal alarm and responses by	Personal alarm supports community living	Australia	Isobel Frean University of Wollongong

	care providers (includes role of Call Centre).			
Retrieve a person's CDM data	Illustrate the events that occur when a person with a chronic condition presents for care to a new member of the Chronic Disease Management (CDM) Team. The new provider needs to be able to access and update the person's condition-specific CDM information.	New provider needs access and update information	Canada	Western Health Information Collaborative (WHIC)
Schedule Specialist Referral with Follow-up	This storyboard demonstrates the communication flow associated with both a referral for specialist clinical services and the logistic arrangements associated with achieving that referral.	Coordination and logistical of getting community patient to specialist	Australia	Isobel Frean University of Wollongong
Specialist to Primary Physician	This storyboard demonstrates the communication between a specialist and the referring primary physician.	Specialist sends report to primary care physician	Australia	Isobel Frean University of Wollongong
Surgical Specialist to Specialist	This storyboard demonstrates the communication between two specialists, the referred to electrophysiologist and the referring cardiologist specialist.	Specialist reports back to original specialists so monitoring post procedure occurs	Australia	Isobel Frean University of Wollongong
EMR and Immunization Registry Communication	Storyboard describes the activities and/or scenarios pertaining to the processes relevant to communicating Immunization information between the clinician's electronic medical record (EMR) system and the local immunization registry	EMR and Immunization Registry Communication	USA	HL7 PeDS SIG

Requirement Storyboards

Aged Care Transfer (Lite)

Purpose

The purpose of this storyboard is to illustrate the communication flow between a person requesting access to nuring home services and a residential or community aged care service provider organisation.

Precondition:

Peter Process, Discharge Planner at Good Health Hospital is looking for a nursing home placement for Mr Adam Everyman, 88 yrs in-patient, close to where his son lives. He sends requests to transfer Mr Everyman to five nursing home facilities, including Green Acres Retirement Home (GARH), where the Admissions Officer is Alice Admitter.

Activities:

Service Provision Transfer (Referral for service)

Acting on Mr Everyman's authorisation, Peter Process forwards a request for services, including a copy of Mr Everyman's eligibility assessment, to five nursing homes in closest proximity to where his son lives. [Interaction: Care Transfer Request]. He receives automatic acknowledgement from four of these nursing homes that his request has been received. Three weeks later, Peter Process receives advice from Alice Admitter, that Mr Everyman has been offered a nursing home place at GARH and that he is to be admitted the next day. [Interaction: Care Transfer Promise].

Service Provision Transfer Withdrawal

Having secured a place for Mr. Everyman at GARH, Peter Process, immediately notifies the three other nursing homes of his withdrawal of his Request for Service for Mr. Everyman. [Interaction: Abort Care Transfer Request].

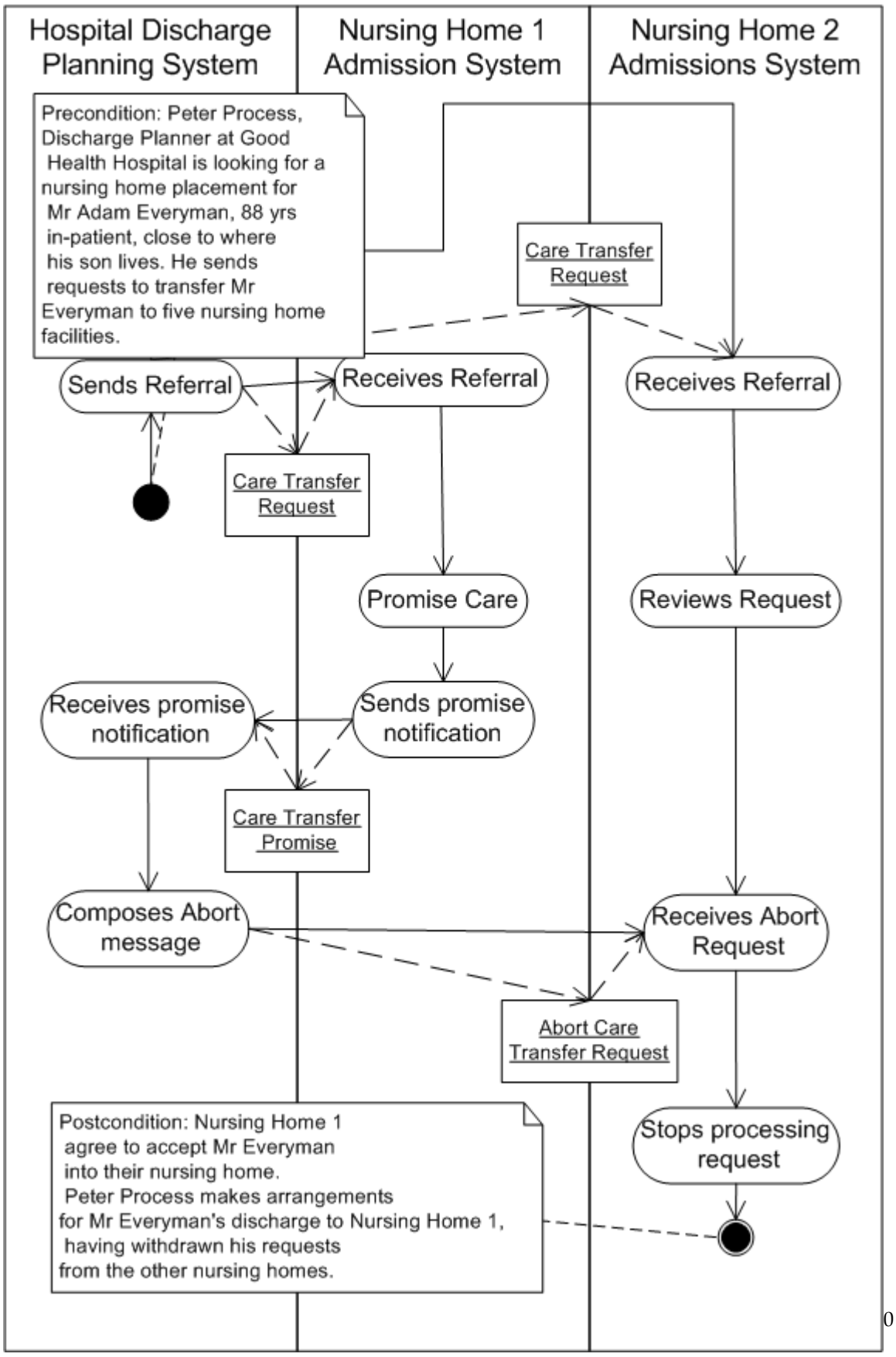
Postcondition:

Peter Process makes arrangements for Mr Everyman's discharge and transfer to GARH, having withdrawn his requests from the other nursing homes.

Updates Requirement Summary:

Having successfully found a place for Mr Everyman, Peter Process is able to focus on placement of other elderly inpatients. His information system gives him some information (via an audit trail) of how long respective nursing homes are taking to respond to requests for service. He uses this information to target his next requests.

Aged Care Transfer (Lite)



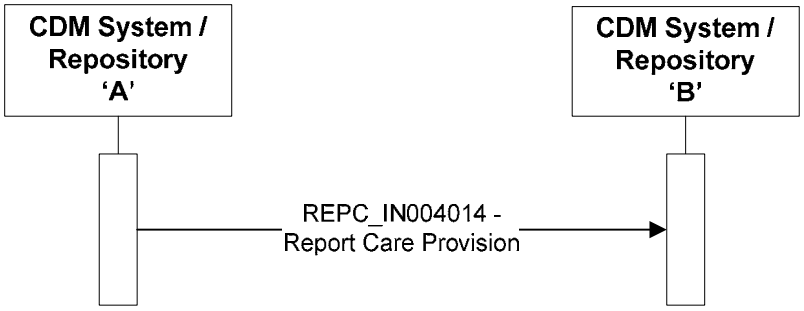
Communicate a person's CDM data

Purpose:

The purpose of this storyboard is to demonstrate the communication of a person's CDM data.

- In the first scenario, we describe the exchange of CDM data for an individual recently diagnosed with a specific chronic disease (e.g., Diabetes).
- The second scenario describes providing updates to the CDM data.

Diagram:



SCENARIO #1: Create new CDM record

Precondition:

Mrs. Everywoman exhibits new symptoms: an excessive thirst, lethargy, and difficulty concentrating. She makes an appointment with her General Physician to review her symptoms.

No CDM record currently exists in the CDM System for Mrs. Everywoman.

Activities:

Mrs. Everywoman sees Dr. Patricia Primary, General Physician. After an initial interview and review of symptoms, Dr. Primary orders laboratory and radiology tests.

After completing the tests, Mrs. Everywoman returns for another appointment with Dr. Primary. Dr. Primary assesses all findings and test results, and diagnoses Mrs. Everywoman with Type 2 diabetes.

Dr. Primary records the findings of the investigations and diagnosis in the CDM System, enrols Mrs. Everywoman in the Diabetes Management program, and recommends a referral to Dr. Specialize, a Diabetologist.

Post condition:

Lab results and assessments by Dr. Primary have been added to the individual's CDM record. A notification of Mrs. Everywoman's CDM record is communicated with other members of the CDM Team.

SCENARIO #2: Update the CDM record

Precondition:

Mrs. Everywoman meets with her General Physician, Dr. Patricia Primary for a follow up visit.

A CDM record currently exists in the CDM System for Mrs. Everywoman.

Activities:

Mrs. Everywoman sees Dr. Patricia Primary, General Physician. After a review of the current symptoms, Dr. Primary orders follow up laboratory and radiology tests.

Dr. Primary records the findings of the recent tests in the CDM System.

Post condition:

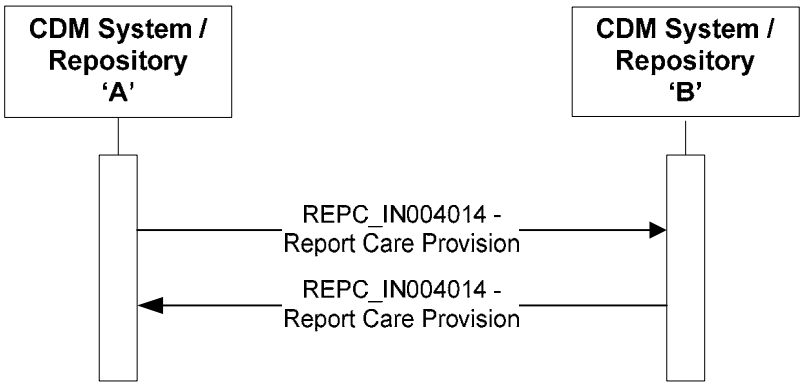
Recent results have been added to the individual's CDM record. Notification of the updated CDM record is sent to the other members of the CDM Team.

Ongoing CDM data exchange

Purpose:

This storyboard demonstrates the ongoing exchange of CDM data. In this scenario, we create and validate an individualized care plan for a person, and communicate the updated contents of the person's Chronic Disease Management (CDM) record to all providers who need to know the current plan for caring for this individual.

Diagram:



Precondition:

Mrs. Everywoman has been recently enrolled in the Diabetes Management Program and is continuing her enrolment in the Chronic Kidney Disease (CKD) Program. Data about Mrs. Everywoman and her latest chronic disease (diabetes) is now available in the CDM System.

Activities:

The members of the CDM Team, with full involvement of Mrs. Everywoman and her husband, review the available plans / templates / guidelines that apply to Mrs. Everywoman's diabetes and CKD status.

The team agrees on a plan that focuses on regular home monitoring of her condition, proper medication administration, and self management of hyperglycemic and hypoglycemic episodes.

The proposed Care Plan and Action Plan are entered into the CDM System and all members of the CDM Team are notified.

Dr. Kidney, her Nephrologist, is asked to review her new diabetes care plan and to confirm its appropriateness with her CKD program. Upon review, Dr. Kidney recommends that Mrs. Everywoman have an exercise stress test and also see an Exercise Therapist in order to start a carefully monitored exercise program.

All members of the CDM Team, including Dr. Kidney and Dr. Primary are notified of the updates to the CDM data.

Post condition:

A CDM Care Plan is created and is validated with Mrs. Everywoman and the CDM Team. Mrs. Everywoman's Nephrologist, Dr. Kidney and all other providers in her CDM Team are notified of the updated CDM data.

Palliative Care Service Request

Purpose

This storyboard demonstrates the communication flow associated with requests by an aged or community services provider for specialists clinical services.

Precondition:

Nancy Nightingale, Community Care Coordinator from the Home Health Care Clinic (HHCC) has reviewed the care plan for Mr Adam Everyman, a packaged care recipient with chronic emphysema. Mr Everyman and his daughter both feel he would benefit from a review of his current pain medication. Nancy Nightingale recommends a palliative care nurse consultant be invited to visit Mr Everyman and undertake a thorough assessment of his pain management needs. Mr Everyman and his daughter agree to this recommendation.

Activities:

Nancy Nightingale sends a request to Sophie Comfort, the Palliative Care Nurse Consultant based at the regional palliative care service, requesting a palliative care consultation for Mr Everyman [Interaction: Care Transfer Request Activate]. She sends a note to Dr Primary, who is on leave, to advise her of this action [Interaction: Notify Care Transfer Request]. Sophie Comfort sends a reply advising that she will see Mr Everyman on Thursday [Interaction: Care Transfer Promise].

Palliative care summary and ongoing care provision

Sophie Comfort completes a thorough assessment of Mr Everyman's pain needs and expectations and prepares a detailed care plan and medication regime for Mr Everyman. She attaches medication orders for the recommended drugs countersigned by the Director of the Palliative Care Unit, Dr Brian Relief [Interaction: Activate Care Provision]. A copy is sent to Mr Everyman's Primary Care Physician, Dr Primary, who is still on leave.

Three days later Sophie Comfort visits Mr Everyman to review his response to the new program. She provides a summary of her visit to Nancy Nightingale and a copy to Dr Primary [Interaction: Append Care Provision].

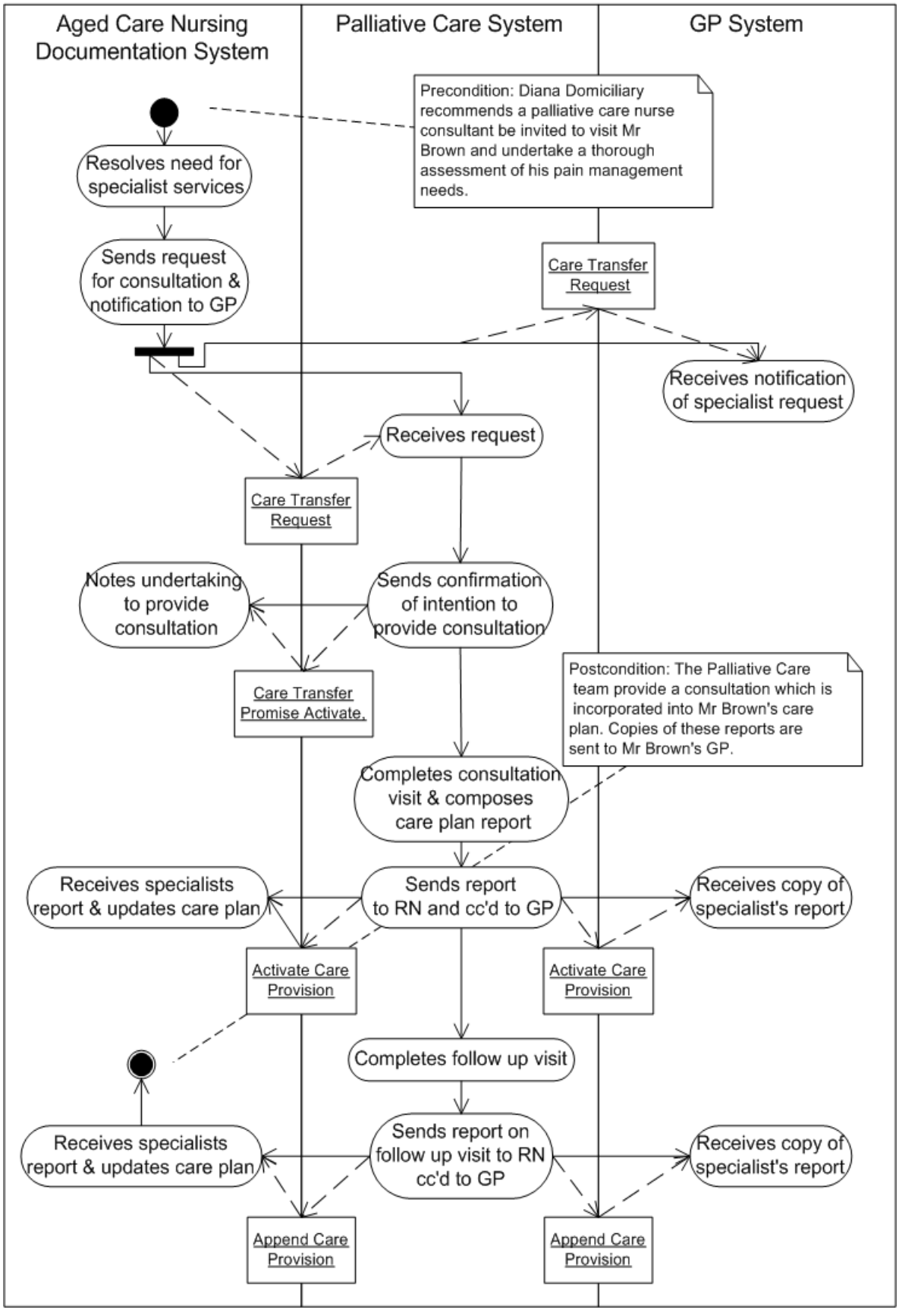
Postcondition:

Mr Everyman commences a new medication and exercise regime in accordance with the care plan prepared by Sophie Comfort. When Dr Primary returns from leave she notes the reports provided to her by Nancy Nightingale and the Palliative Care team. She makes a note to arrange a follow up visit to Mr Everyman.

Updates Requirement Summary:

The communicators of this storyboard, Nancy Nightingale, the Palliative Care team and Dr Primary, are focused on involving additional specialist services in the care of Mr Everyman and upon keeping all members of the multidisciplinary team informed on activities.

Request Specialist Clinical Services



Pastoral Care

Purpose

This storyboard illustrates the communication flow associated with provision of pastoral care services involving paid and unpaid service providers.

Precondition: Mrs Eve Everywoman is a resident in the Green Acres Retirement Home (GARH) who is receiving palliative care. She has insight into her deteriorating condition which is causing her high stress and anxiety. Her husband feels she has unresolved issues she needs to deal with in relation to her eldest daughter, with whom she has been estranged for the past five years. Mr Neville Nuclear feels this anxiety is counteracting the pain medication she is taking. Mr Nuclear is aware that GARH has an excellent pastoral care service, which draws upon trained volunteers from local organisations, including the local Catholic Church. He discusses with his wife the idea of contacting someone for her to talk with "in private' about their daughter.

Activities:

Request spiritual needs support

Larry Listener, Director of Pastoral Care, receives a call from Mrs Everywoman's husband requesting pastoral care services for his wife. As GARH is part of the region managed by Pastoral Care Coordinator Helen Helper, Larry Listener sends a note to ask Helen to arrange services for Mrs Everywoman[Interaction: Care Transfer Request]. Helen Helper confirms with Larry Listener that she has received the request and that she has made an appointment to visit Mrs Everywoman the following day [Interaction: Care Transfer Promise].

Assign pastoral care support worker

Following her visit and assessment of Mrs Everywoman, Helen Helper prepares a care plan for Mrs Everywoman based on their discussions. She checks her list of pastoral care volunteers to see who has the capacity to take on Mrs Everywoman's care. As she only meets with her volunteers monthly Helen sends a request to Valerie Volunteer, who is both a Catholic and whose case-load has recently been reduced. She asks Valerie if she is available to take on a new client, providing details of Mrs Everywoman's location and the contact details of the Residential Care Coordinator [Interaction: Care Transfer Request].

Valerie Volunteer accesses the request via her mobile phone. She notifies Helen Helper that she is able to take on Mrs Everywoman, subject to Mrs Everywoman's acceptance [Interaction: Care Transfer Promise].

Helen Helper advises Larry Listener that Valerie Volunteer has been assigned to Mrs Everywoman and that a care plan is in place that has been agreed to with Mrs Everywoman. A copy of this message is sent to Nancy Nightingale, the Residential Care Coordinator, so that she can upload Valerie Volunteer's contact details and a copy of the pastoral care plan into the nursing documentation system [Interaction: Care Transfer Promise].

Pastoral care provision ongoing

Valerie Volunteer commences visits with Mrs Everywoman. With reference to the pastoral care plan, she documents each visit incorporating information on the duration of her visit (detailed notes of their discussions are not recorded). The nursing care documentation system automatically sends a summary of Valerie Volunteer's visits to Helen Helper. [Interaction: Activate Care Provision].This allows Helen Helper to monitor the quality and level of activity of her team of pastoral care volunteers, in addition to providing an audit trail of this and subsequent pastoral care activities [Interaction: Append Care Provision].

Suspension of pastoral care services

After six visits Mrs Everywoman is reconciled with her daughter. Mrs Everywoman requests a temporary suspension of visits while she enjoys time with her daughter. Valerie Volunteer documents this outcome in Mrs Everywoman's records and sends a summary of the last visit to Helen Helper who records a requested suspension in pastoral care services. [Interaction: Suspend Care Provision]. In turn she sends a copy of this message to the Director of Pastoral Care, Larry Listener [Interaction: Suspend Care Provision].

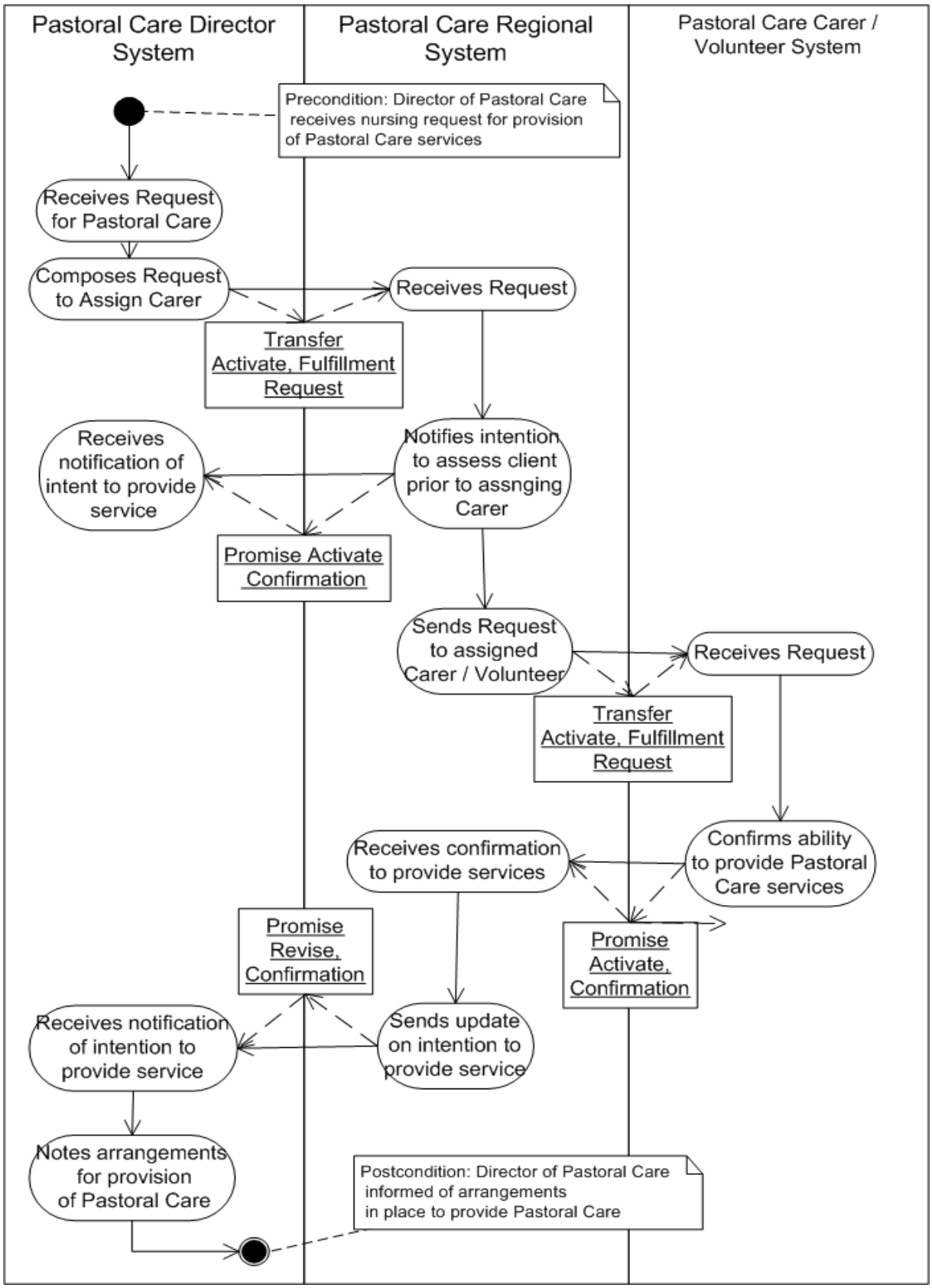
Postcondition:

Documentation of the impact of the pastoral care services provided to Mrs Everywoman by Valerie Volunteer appears in the nursing documentation. In addition, Helen Helper has been able to maintain an arms length observation of the frequency and duration of Valerie Volunteer's visits. Should Mrs Everywoman request further pastoral care services, the relevant details of this recent service will be available for the requesting staff member.

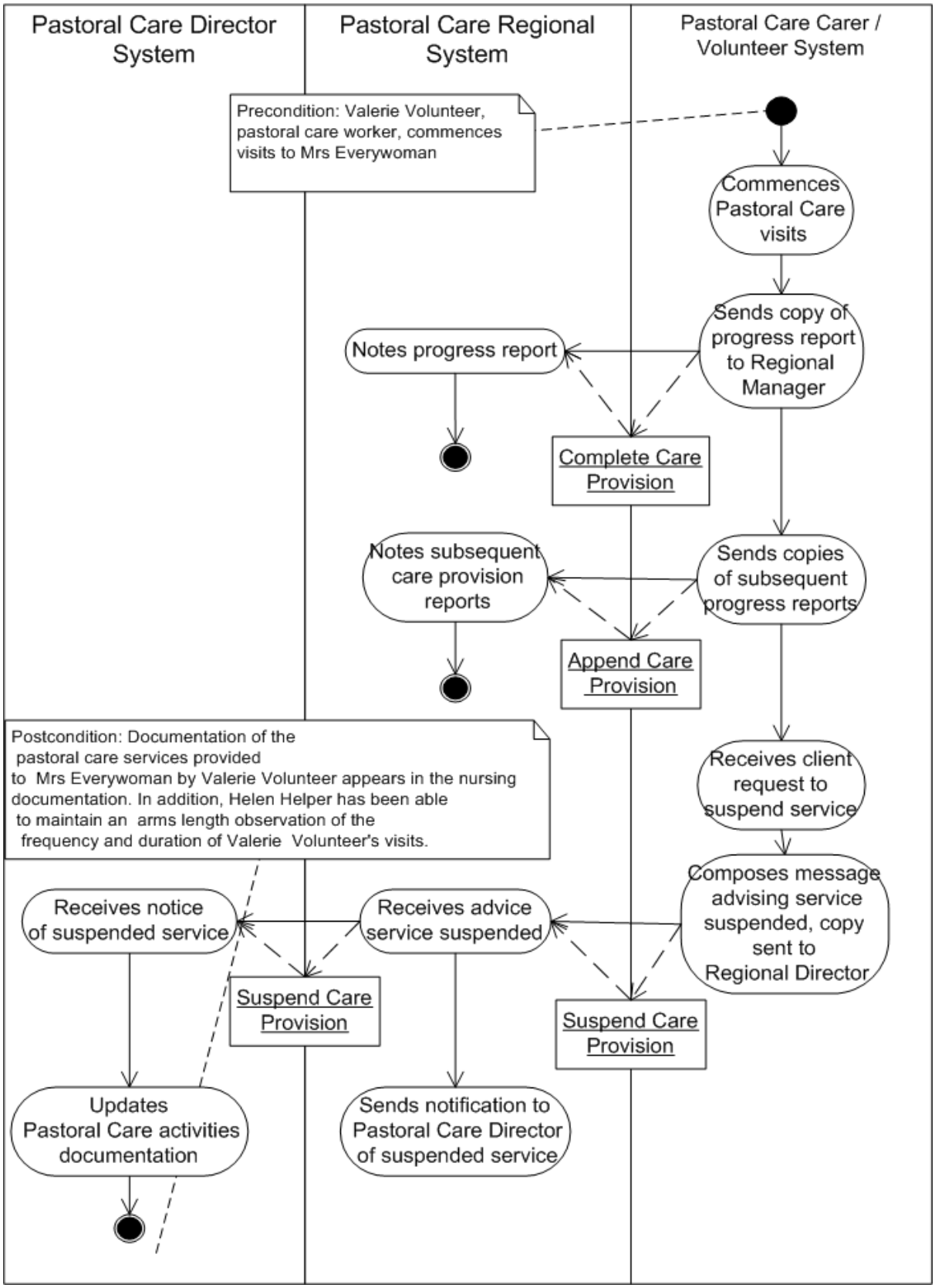
Updates Requirement Summary:

The communicators of this interaction, the Director of Pastoral Care, a Regional Pastoral Care Coordinator and the carer providing the actual Pastoral Care, are focused on responding to requests for the provision of pastoral care and on monitoring who and when pastoral care services are being provided.

Pastoral Care Transfer
Part 1



Pastoral Care Transfer Part 2



Physician Requests Clinical Data on Patient

Purpose

This storyboard demonstrates the flow of communication under the Care Record Query Topic and the Care Record Document Topic. A Care Record Summary document is the document type that would be returned by Dr Hormone.

Precondition:

Dr. Ramsey Reaction, allergist/immunologist, has been requested by Mr. Adam Everyman to offer a second opinion on a condition that has been evaluated previously by Dr. Horace Hormone.

Activities:

Dr. Reaction requests information relating to Adam Everyman's condition from Dr Hormone Hormone [Interaction: Get Care Record Profile Query]. Dr. Hormone sends the documents from his previous visits relating to Adam Everyman's condition [Interaction: Get Care Record Profile Response].

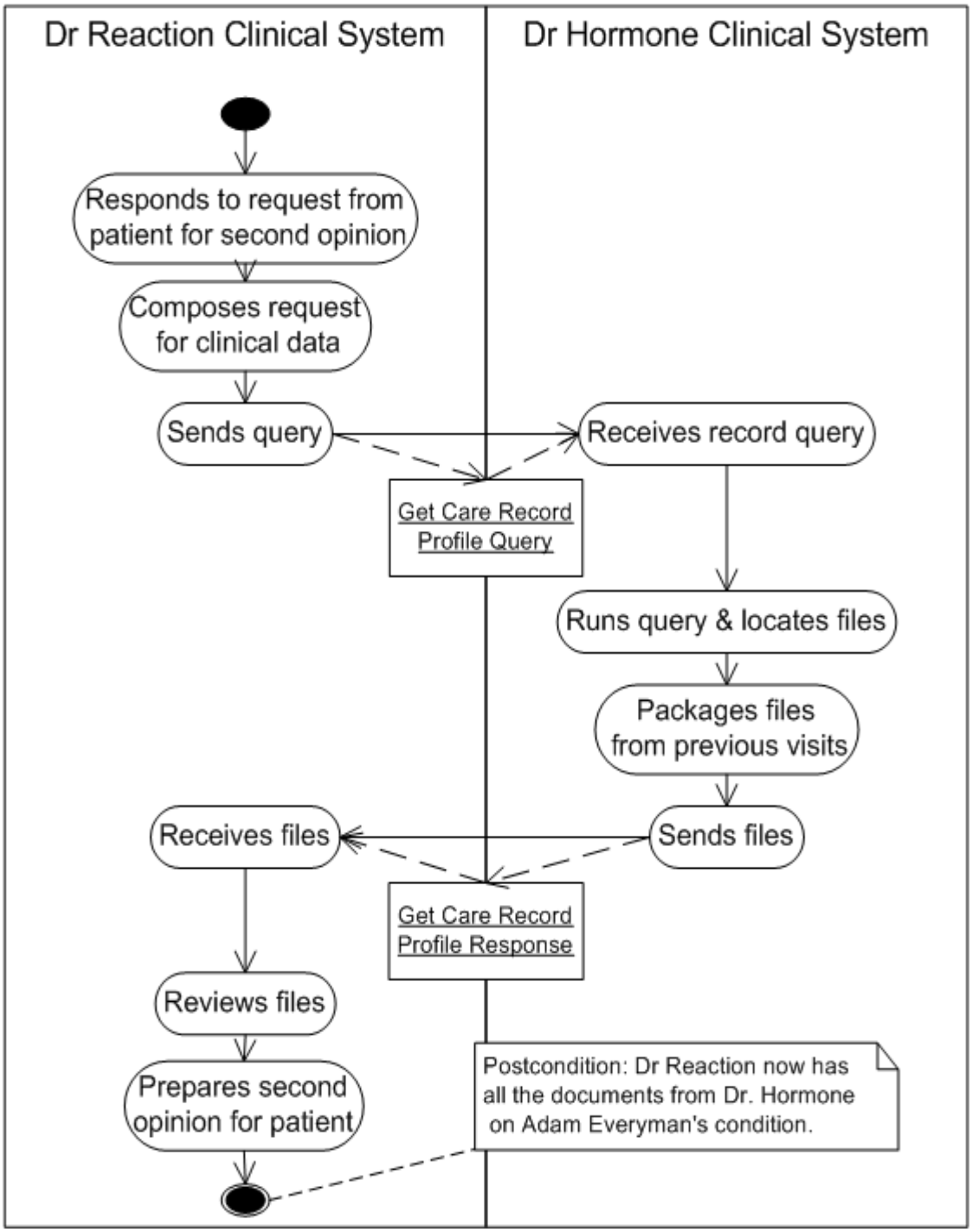
Postcondition:

Dr. Reaction now has all the documents from Dr. Hormone on Adam Everyman's condition.

Update requirements summary:

The communicators of this storyboard, Drs. Reaction and Hormone are focused on exchanging historical patient records on Mr. Adam Everyman.

Physician Request Clinical Data on Patient



Query Aged Care Assessment Record

Purpose

This storyboard demonstrates querying a national aged care eligibility assessment forms database.

Precondition:

Nancy Nightingale is evaluating whether she can provide a home health care service to potential client Mrs. Eve Everywoman. However, it is not clear from the application form (completed on her behalf by her husband, Boris Betterhalf) whether Mrs. Everywoman has been assessed as eligible for this subsidized service. As she is authorised to access the national aged care eligibility assessment forms registry and has Mr. Betterhalf's consent, Nancy Nightingale sends a request to the national aged care eligibility assessment forms registry to determine whether a current or previous eligibility assessment exists for Mrs. Everywoman.

Activities:

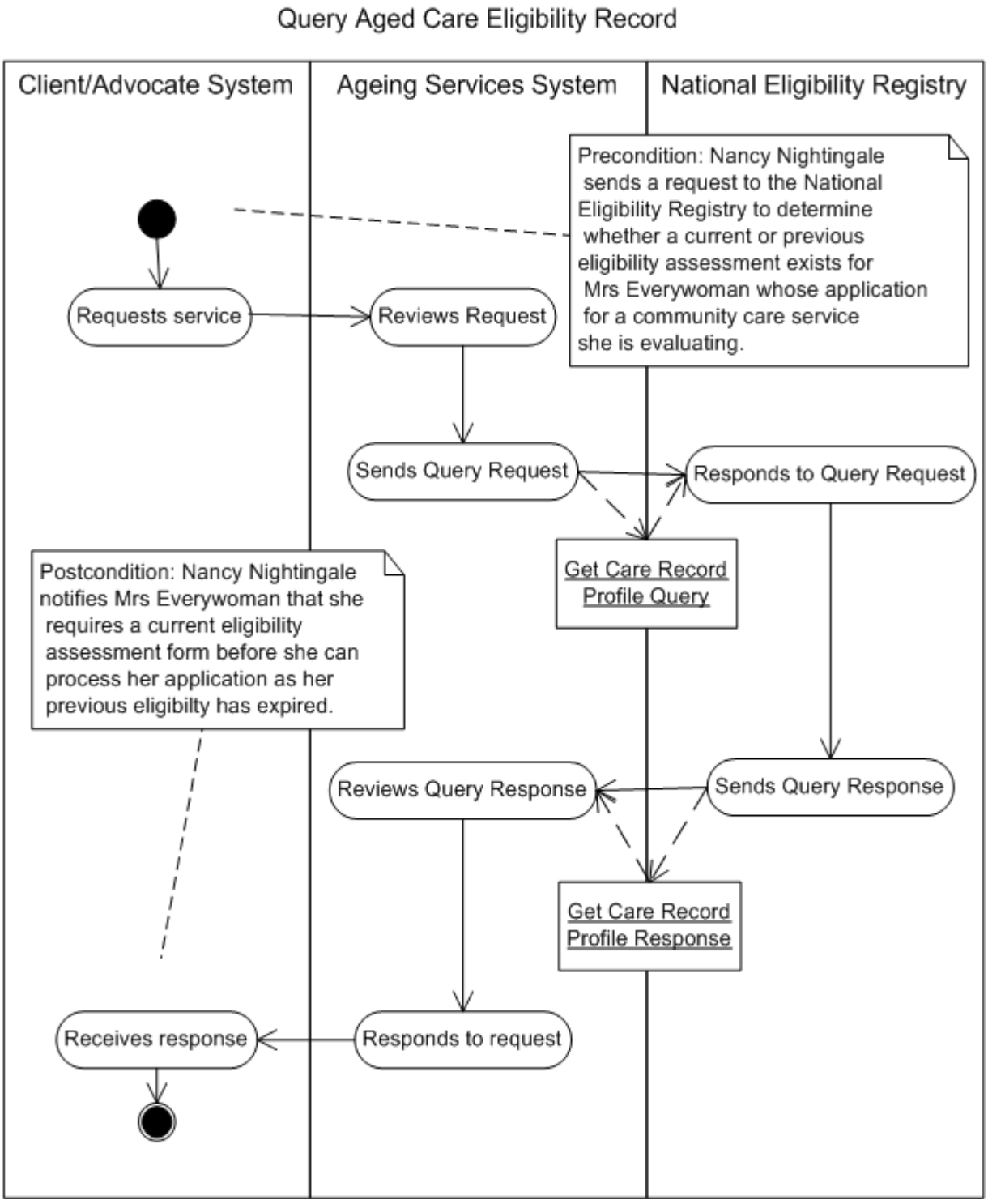
Nancy Nightingale logs onto the national aged care eligibility assessment forms registry. She enters Mrs. Everywoman's details to query whether a current or previous eligibility assessment exists for Mrs. Everywoman. [Interaction: Get Care Record Profile Query]. She receives a response confirming that an eligibility assessment was completed two years previously, is now expired, and was undertaken by an assessment team in Melbourne, where Mrs. Everywoman used to live. [Interaction: Get Care Record Profile Response].

Postcondition:

Nancy Nightingale notifies Mrs. Everywoman that she requires a current eligibility assessment form before she can process her application for a home health care service. She advises Mrs. Everywoman she will make arrangements for her to be seen by the local eligibility assessment team who will be able to re-assess her care needs and eligibility for government subsidised services.

Updates Requirement Summary:

The communicators of this query message, Nancy Nightingale and the national aged care eligibility assessment form registry, ensure ready access by clinicians to copies of current or preexisting eligibility assessments, avoiding delays in accessing services due to expired or non existent eligibility assessments.


Query Aged Care Eligibility Record
Client/Advocate System
Ageing Services System
National Eligibility Registry
Precondition: Nancy Nightingale sends a request to the National Eligibility Registry to determine whether a current or previous eligibility assessment exists for Mrs Everywoman whose application for a community care service she is evaluating.
Requests service
Reviews Request
Sends Query Request
Responds to Query Request
Get Care Record Profile Query
Postcondition: Nancy Nightingale notifies Mrs Everywoman that she requires a current eligibility assessment form before she can process her application as her previous eligibilty has expired.
Reviews Query Response
Sends Query Response
Get Care Record Profile Response
Receives response
Responds to request

Referral Between Two Specialists

Purpose

This storyboard demonstrates the communication between two specialists, cardiologist and electrophysiologist.

Precondition:

Mr. Adam Everyman, a 45-year old male patient, has been referred to cardiologist Dr. Patrick Pump with the appropriate data. Dr. Pump sees Mr. Everyman in his office.

Activities:

Dr. Pump performs a history and physical and learns that Adam Everyman actually has had symptoms for many years, and was treated in another state. Dr. Pump reviews the EKG and makes a diagnosis of Wolff-Parkinson-White Syndrome. He does an echocardiogram in the office and determines that there is no chamber enlargement. He then refers Mr. Everyman to an electrophysiologist, Dr. Nigel Neural for ablation of the accessory pathway [Interaction: Care Transfer Request]. In his referral, Dr Pump includes the following data elements:

1. (Including: CC, HPI, ROS, PE, MDM, Disposition/Plan*)

2. DATA TESTS: EKG Tracing*, ECHO

3. CCR*

4. TREATMENT: anti-arrhythmic *

5. REASON FOR REFERRAL: consider radioablation

6. EXPECTATION FOR FOLLOW UP / RECOMMENDATIONS: please send patient back to me for repeat evaluation.

[* = elements that can be extracted, slightly modified from initial referral from Dr. Primary to Dr. Pump]

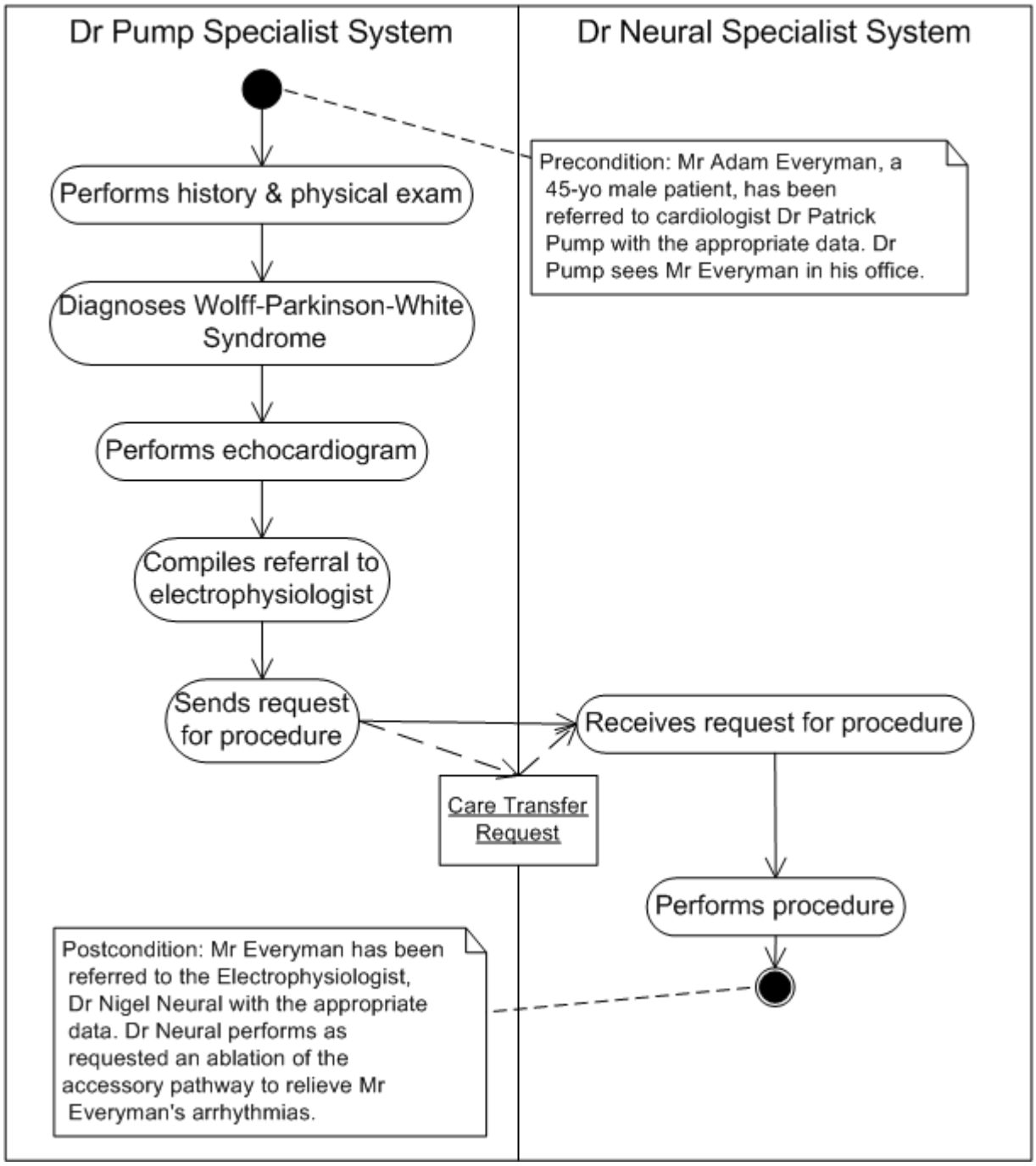
Postcondition:

Mr. Everyman has been referred to the Electrophysiologist, Dr. Nigel Neural with the appropriate data. Dr. Neural performs as requested an ablation of the accessory pathway to relieve Mr. Everyman's arrhythmias.

Updates Requirement Summary:

The communicators of this storyboard, Dr.Pump and Dr. Neural are focused on providing detailed clinical data to enable appropriate radioablation of Mr. Everyman's accessory pathway.

Referral Between Two Specialists



Request for Changes to Ongoing Services

Purpose

This storyboard demonstrates the communication flow between a client/resident or their advocate requesting a change to an existing service.

Precondition:
Mr. Adam Everyman, who lives at home receives the equivalent of one meal a day from the meals on wheels service operated by the Green Acres Retirement Home (GARH) group. His daughter, who pays the client contribution towards the cost of this service, notes he is continuing to lose weight and persuades Mr. Everyman to change his current order to two meals a day.

Activities:

On behalf of her father, Ms. Nancy Nuclear sends a request to GARH's dietician service with a request for changes to her father's existing meals service [Interaction: Revise Care Transfer Request]. Before the dietician can arrange the additional meal for Mr. Everyman, Ms. Nuclear is required to authorise the additional client contribution. The Dietician, Connie Chow, sends an authorisation request to Ms. Nuclear [Interaction: Service Provision Authorisation Catering Event Activate, Fulfillment Request]. Ms. Nuclear is happy to pay the extra contribution for the additional daily meal and advises Connie Chow to proceed [Interaction: Service Provision Authorisation Catering Event Complete, Confirmation]. Upon receipt of the authorisation acceptance, the hospitality service confirms the new arrangements are in place for Mr. Everyman's meals by sending a new care plan for Mr. Everyman to Ms. Nuclear [Interaction: Replace Care Provision].

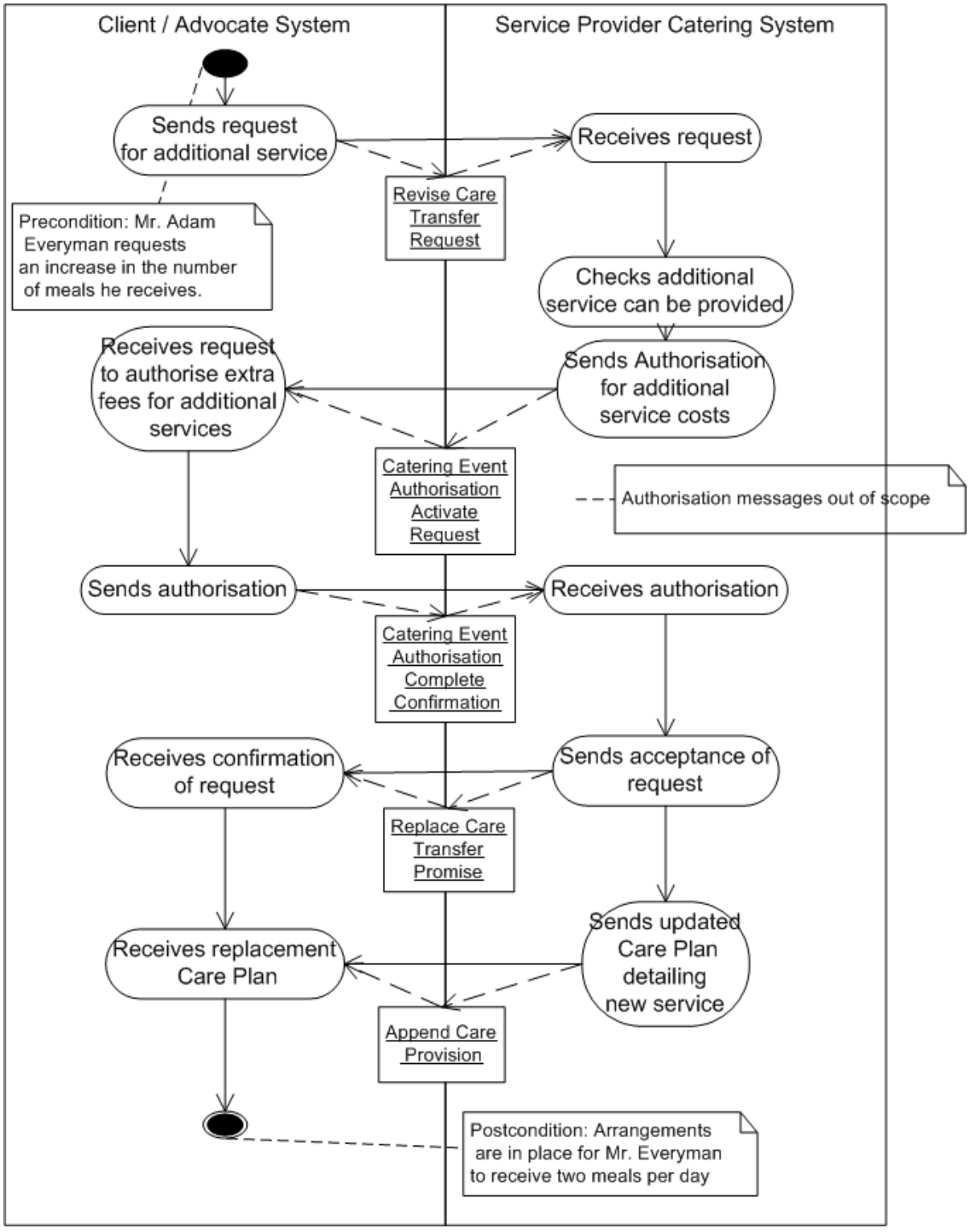
Postcondition:

Arrangements are in place for Mr. Everyman to receive two meals per day, with the revised invoice going to his daughter. Having made the necessary arrangements with the meals on wheels delivery service, Connie Chow's ordering systems automatically sends a message to the GARH client account system advising of the additional charges to be invoiced to Ms. Nuclear as the designated payor for Mr. Everyman [Interaction: Update Client Billing Account, Notification].

Update Requirements Summary:

The communicators of this storyboard, Ms Brown, on behalf of her father, and the catering services client manager, Jim Olive, are focused on ensuring that requested changes to ongoing services (in this case catering) are actioned in a timely manner, with documentation of appropriate authorisations.

Request for Changes in Ongoing Services



Request Medication Chart Review

Purpose

This storyboard demonstrates a request by a nurse of a Primary Care Physcian (GP) to review a resident's medication chart.

Precondition:

Nancy Nightingale, RN at Green Acres Retirement Home, is concerned that Mr Everyman's pain management is no longer effective. She feels a review of all his medications might be in order. She discusses her concerns with the Palliative Care Clinical Consultant who agrees a review of all Mr. Everyman's current medication is a good idea.

Activities:

Nancy Nightingale sends a request to Dr. Patricia Primary outlining the need for a review of Mr Everyman's medication chart. She provides a copy of the 24 hour pain chart findings which demonstrates Mr. Everyman is experiencing too frequent breakthrough of pain [Interaction: Care Transfer Request].

Dr. Primary notifies Nancy Nightingale she will visit Mr Everyman later that day [Interaction: Care Transfer Promise]. Dr. Primary visits Mr. Everyman later that day and with Nancy Nightingale reviews all Mr. Everyman's medications. She provides a revised Medication Chart for Mr. Everyman [Interaction: Medication Administration Order Activate, Fulfillment Request]. As Nancy Nightingale uploads the new medication chart into the electronic drug chart system an automatic message is sent to the off-site Pharmacist's System to notify the changed orders for Mr. Everyman [Interaction: Combined Order Activate, Fulfillment Request]. (N.B The Pharmacy has a contract to supply medications to the nursing home.)

Alternative view:

Dr. Primary receives the request from Nancy Nightingale but feels a review is not required at this time [Interaction: Reject Care Transfer].

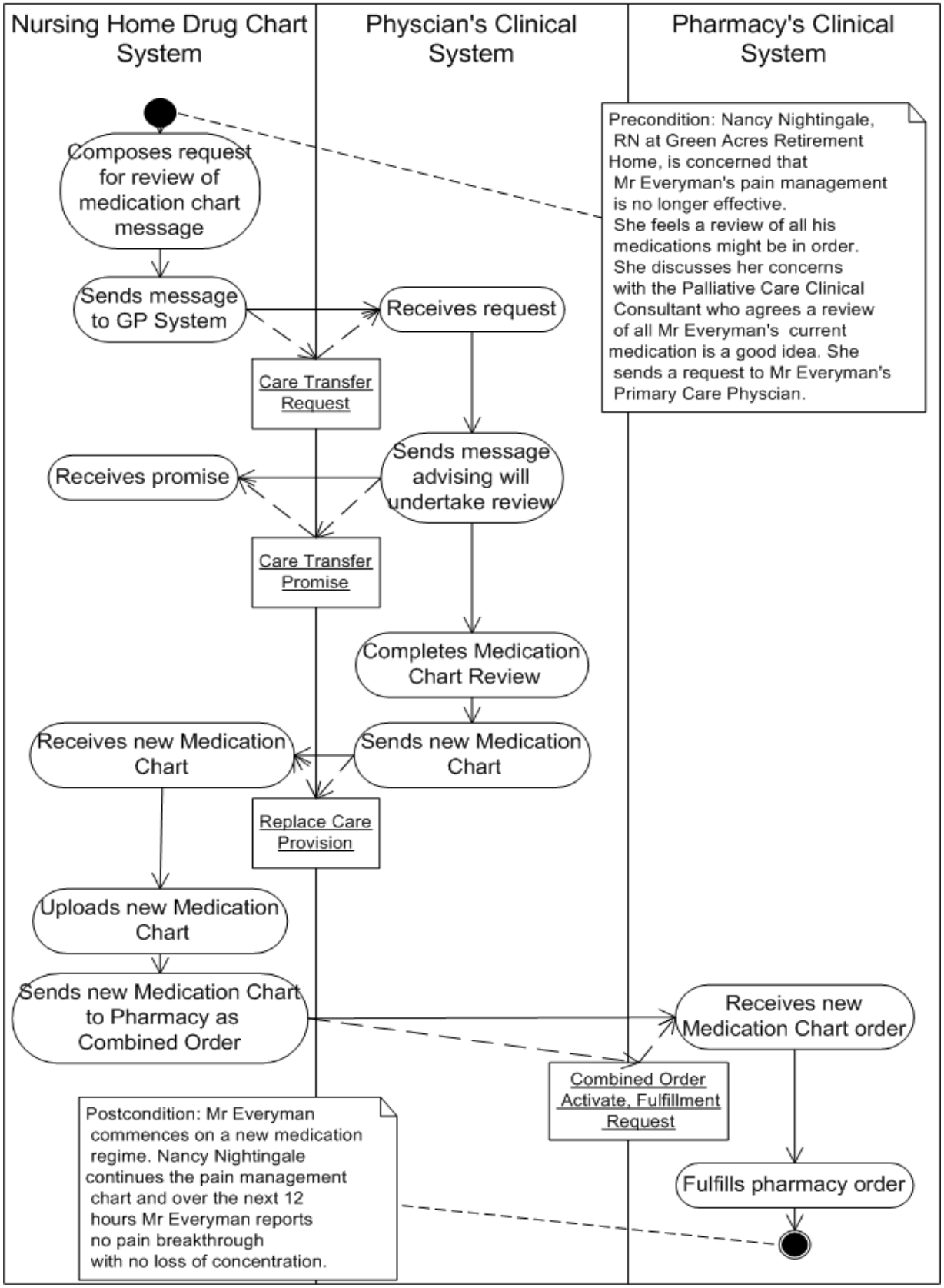
Postcondition:

Mr. Everyman commences on a new medication regime that same evening. Nancy Nightingale continues the pain management chart and over the next 12 hours Mr. Everyman reports no pain breakthrough with no loss of concentration.

Updates Requirement Summary:

The communicators of this message, RN, Nancy Nightingale, and Dr. Primary, are focused on requesting and completing a review of Mr. Everyman's medication chart. The outcome of the review is communicated to the off-site pharmacy so that the new supplies can be provided directly to the nursing home in a timely manner.

Request Medication Chart Review



Resident Transfer (Discharge Summary)

Purpose

This storyboard demonstrates communication associated with the transfer of care of a resident/client by an aged care service provider to another care facility (hospital, hospice, rehabilitation unit).

Precondition:

Nancy Nightingale, RN at Home Away from Home nursing home transfers Mrs. Eve Everywoman to Good Health Hospital following sudden onset of high fever and suspected septicaemia associated with her infected leg ulcer. Mrs. Everywoman has Type II Diabetes Mellitus, early stage Alzheimer's disease and depression. Her husband is her authorised legal representative. Currently Mrs. Everywoman has only been assessed by the local geriatric assessment team as eligible for residential respite. Should she return to Home Away from Home or require admission to another residential treatment facility for permanent residency following her hospitalisation she will need to be re-assessed by the hospital geriatric assessment team.

Activities:

Nancy Nightingale prepares a discharge summary for Mrs. Everywoman. This includes a copy of her care plan, which includes details not just on her nursing and personal care needs and activities but also details relating to diversional therapy and pastoral care, which have been particularly helpful in managing Mrs. Everywoman's behavioral problems and her depression. The contact details of the relevant members of her multidisciplinary care team are included. Because Mrs. Everywoman has only been assessed by the geriatric assessment team for residential respite, Nancy Nightingale includes details about Mrs. Everywoman's assessed eligibility for subsidised long term care from the relevant national eligibility assessment form.

Nancy Nightingale sends the discharge summary to the geriatric nurse consultant at Good Health Hospital. [Interaction: Care Transfer Request]. Receipt of the summary is acknowledged by the geriatric nurse consultant. A copy is sent to Mrs. Everywoman's primary care physician and to the Manager of the hospital geriatric assessment team [Interaction: Notify Care Transfer Request].

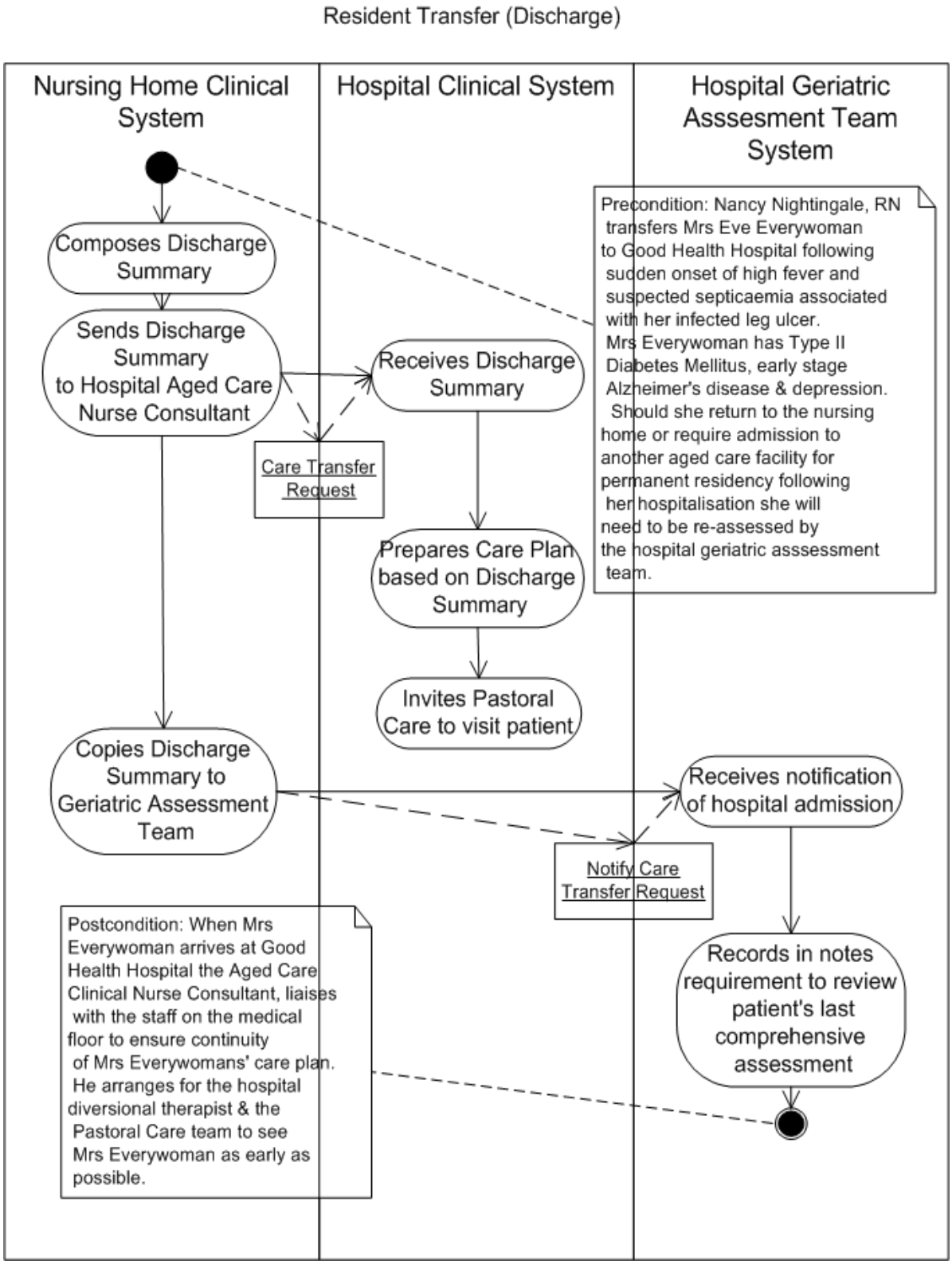
Postcondition:

When Mrs. Everywoman arrives at Good Health Hospital the geriatric nurse consultant liaises with the staff on the medical floor to ensure continuity of Mrs. Everywoman's care plan. He arranges for the hospital diversional therapist and the Pastoral Care team to see Mrs. Everywoman as early as possible.

Update Requirements Summary:

The communicators of this storyboard, Nancy Nightingale and the geriatric nurse consultant at the hospital, are focused on ensuring continuity of care for Mrs. Everywoman when she is transferred from the nursing home to hospital. They are

also focused on ensuring plans are put into place to ensure smooth discharge from the hospital following completion of her current admission.



Respond to Personal Alarm in Community

Purpose

This storyboard demonstrates the flow of communication associated with activiation by a client living in the community of their personal alarm and responses by care providers (includes role of Call Centre).

Background:

Mr. Adam Everyman lives at home alone. He has diabetes, hypertension and shows early signs of Alzheimer's disease. He is receiving daily nursing and personal care services as a home health care client of Home Health Care Clinic (HHCC). His daughter, Nancy Nuclear pays for a personal alarm service to respond to any emergencies. The personal alarm service is operated by HHCC but is a separate business to the home health care service. The personal alarm service has a detailed record of Mr. Everyman's living and personal circumstances and after hours contact details for Ms. Nuclear and Nancy Nightingale, the Home Health Care Coordinator. The personal alarm service operates a 24 hour call centre from its offices in the city (50 kms from where Mr. Everyman lives). The on duty RN is Ruth Ready, the Call Centre Nurse who has been provided with a copy of the recent changes to Mr. Everyman's medication regime and related care activities.

Precondition:

Mr. Everyman is having difficulties sleeping. He is worried about changes made to his medication regime by his primary care physician earlier in the day. He wonders if he has taken his new medication and if he should take a 'make up' dose in case he has not. He decides to contact the nurse at the other end of his personal alarm service.

Activities:

Activate and Respond to Personal Alarm

Mr. Everyman activates his personal alarm to talk to the friendly nurse in the HHCC Call Centre, this action triggers a message in Personal Alarm Registry at the call centre [Interaction: Activate Care Provision]. His call is answered by Ruth Ready, the Call Centre Nurse asking him how she can be of help. Referring to her copy of the recent changes to Mr. Everyman's medication chart Ruth Ready is able to reassure Mr. Everyman that he is not due to take the new medication until the following day, when his community care worker Clarence Barton is due to visit. Relived, Mr. Everyman thanks Ruth Ready and is able to go to sleep. Ruth Ready records her handling of the call (time, outcome etc) in the Personal Alarm Registry, providing an audit trail of the frequency, nature and outcome of calls made by Mr. Everyman using his personal alarm [Interaction: Complete Care Provision].

Respond to Personal Alarm with Follow -up

Two nights later, Mr. Everyman is disoriented and anxious and convinced he is to go on holiday overseas the next day. He can't find his suitcase and, frustrated activates his personal alarm. He tells Ruth Ready his concerns. She notes his confusion and

attempts, unsuccessfully to placate him. She is concerned that Mr. Everyman will attempt to leave his house in the middle of the night and sends an alert to the General Practice (GP) After-Hours Service, with whom HHCC has a contractual relationship [Interaction: Care Transfer Request]. The operator of the After-Hours Service answers, by confirming they will check up on Mr. Everyman [Interaction: Care Transfer Promise].

The After-Hours GP sends a message from her PDA to Ruth Ready to notify her the incident with Mr. Everyman has been resolved, how and by whom [Interaction: Complete Care Provision]. Ruth Ready in turn updates her system to record the matter has been resolved and is no longer active, this action also sends an automatic notification to the Personal Alarm System.

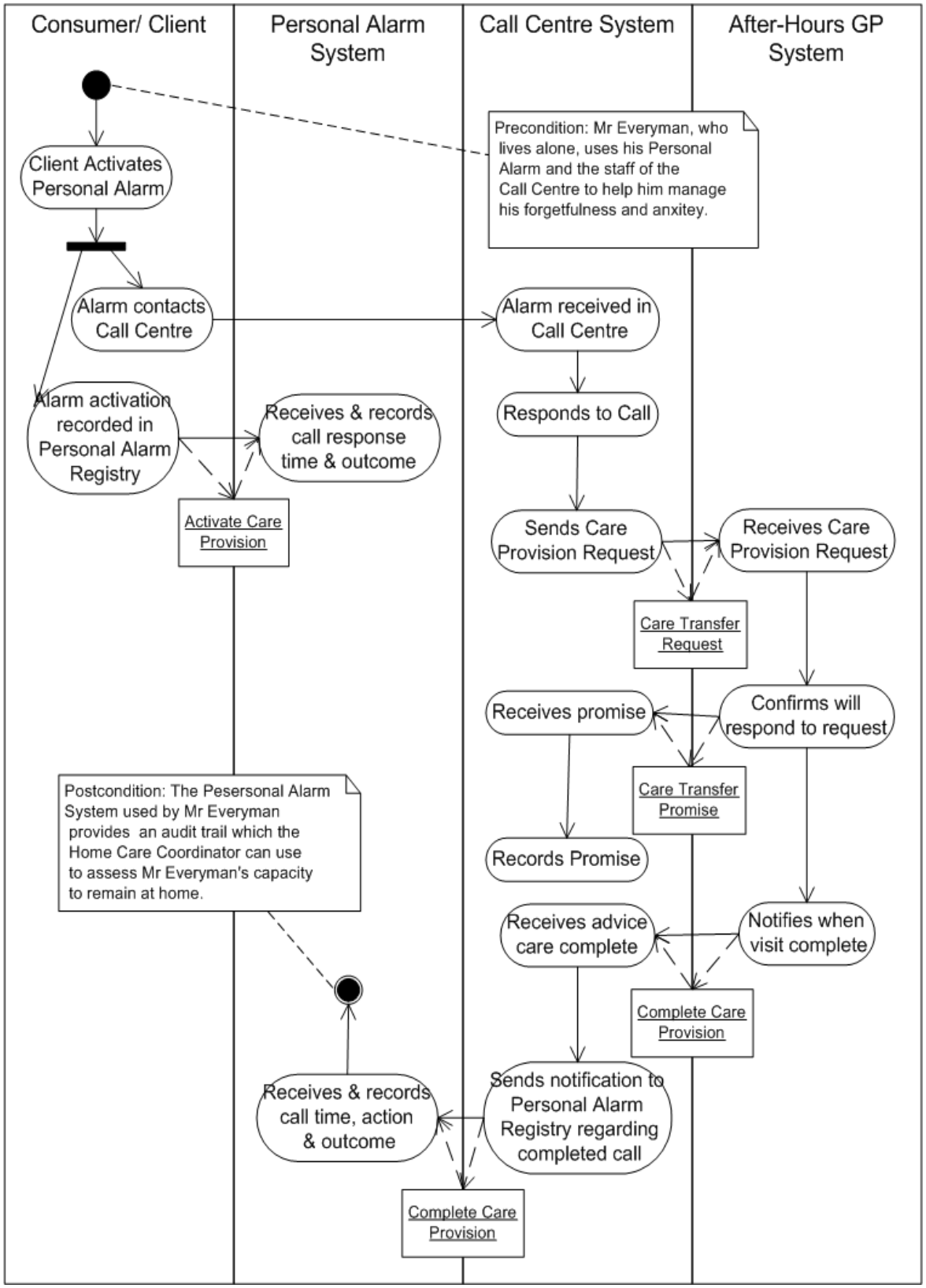
Postcondition:

Ruth Ready is able to generate a report on the frequency, nature and outcome of calls made by Mr. Everyman to the Call Centre. This provides her with information she can provide to the Home Health Care Coordinator when reviewing the care and support needs for Mr. Everyman.

Updates Requirement Summary:

The communicators of this storyboard, Mr. Everyman, the Call Centre Nurse and the After-Hours GP service are focused on responding to ad hoc requests for service from Mr. Everyman, who, despite his frailty and multiple medical conditions, is being supported in his own home in the community.

Respond to Personal Alarm in the Community

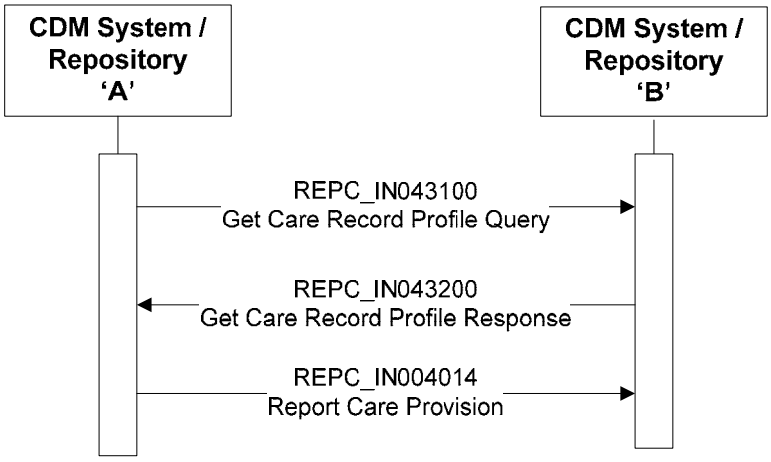


Retrieve a person's CDM data

Purpose:

Illustrate the events that occur when a person with a chronic condition presents for care to a new member of the Chronic Disease Management (CDM) Team. The new provider needs to be able to access and update the person's condition-specific CDM information.

Diagram:



Precondition:

Mrs. Everywoman meets with Dr. Specialize, her new Diabetologist.

Activities:

Mrs. Everywoman meets with Dr. Specialize, who needs information from the existing CDM record such as:

- CDM history.
- Relevant medical history.
- Relevant laboratory test results.
- CDM specific goals and targets in Mrs. Everywoman's diabetes care plan.

During Mrs. Everywoman's visit, Dr. Specialize retrieves the history of all prior CDM encounters. He checks Mrs. Everywoman's blood pressure, cholesterol levels and discusses her psychosocial history.

Based on the review of the relevant data, Dr. Specialize orders additional laboratory tests.

The results of the tests are entered into the CDM System, and the updated CDM record is communicated to all members of the CDM Team.

Post condition:

Review of current and historical medical records by Dr. Specialize, who orders additional tests. The results are entered into the CDM System, and communicated to all members of the CDM Team.

Schedule Specialist Referral with Follow-up

Purpose

This storyboard demonstrates the communication flow associated with both a referral for specialist clinical services and the logistic arrangements associated with achieving that referral.

Precondition:

Nancy Nightingale, Community Care Coordinator at Home Health Care Clinic (HHCC) has responsibility for ensuring care recipient Mr. Everyman attends a geriatric outpatient assessment by Dr. Stanley Sage. She must coordinate arrangements for getting Mr. Everyman to his appointment; including arranging the appointment with Dr. Sage; coordinating transport for Mr. Everyman - who will require an ambulance; providing Dr. Sage with a copy of his current care plan and nursing notes; and providing any follow up nursing care arising from the appointment.

Activities:

Request to manage specialist appointment

Nancy Nightingale has received notification from Mr. Everyman's Primary Care Physician, Dr. Patricia Primary, [Interaction: Care Transfer Request] that she has referred Mr. Everyman for a specialist geriatric assessment with Dr. Sage [Interaction: Care Transfer Request].

Schedule specialist outpatient appointment

Nancy Nightingale requests an appointment for Mr. Everyman from the Outpatient Department where Dr. Sage works, citing the referral ID contained in the referral from Dr. Primary to Dr. Sage [Interaction: Outpatient Appointment Activate, Fulfillment Request]. In her request, Nancy gave some date and time options for when it would be possible for Mr. Everyman's Community Care Support Worker to accompany him for the appointment. Nancy Nightingale receives notification from the Outpatient Department Appointments system of an appointment in two weeks time for Mr. Everyman [Interaction: Outpatient Appointment Activate, Confirmation].

Alternative flow:

Nancy Nightingale discovers she is unable to arrange transport for Mr Everyman for the original appointment date provided for Mr. Everyman. She requests an alternate date [Interaction: Outpatient Appointment Revise Activate, Fulfillment Request]. She receives an alternate appointment for Mr Everyman from Dr. Sage's Outpatient Appointment's System [Interaction: Outpatient Appointment Revise Activate, Confirmation].

Schedule transport for outpatient appointment

When she knows the date and time for Mr. Everyman's appointment with Dr. Sage, Nancy Nightingale submits a request to the patient transport service at Safe and

Speedy Ambulance Services , requesting an ambulance with oxygen supplies and a wheel chair [Interaction: Transport Services Appointment Activate, Fulfillment Request]. She receives confirmation of her booking for Mr. Everyman and his Community Care Support Worker [Interaction: Transport Services Appointment Activate, Confirmation].

Continuing care provider event summary

On the day of his appointment, Nancy Nightingale prepares an event summary of the nursing and related care being provided for Mr. Everyman. His medication chart is included, along with pathology results received that morning from Reliable Labs. This information provides Dr. Sage with an up-to-date summary on Mr. Everyman's physical, emotional and spiritual needs and goals [Interaction: Report Care Provision].

Ongoing care provision request

In addition to his report to Dr. Primary, Dr. Sage sends Nancy Nightingale instructions for ongoing care and assessments for Mr. Everyman [Interaction: Care Transfer Request]. Nancy Nightingale is grateful to receive this request so promptly because it enables her to immediately begin review of Mr Everyman's care plan in light of Dr. Sage's recommendations. As Dr. Sage has handed over care to Dr. Primary, he has requested that Nancy Nightingale provide follow up reports on Mr. Everyman's clinical condition directly to Dr. Primary rather than himself. Nancy Nightingale sends the first summary of Mr Everyman's response to Dr Sage's prescribed care to Dr. Primary [Interaction: Activate Care Provision] and all subsequent summaries related to Dr. Sage's instructions [Interaction: Append Care Provision].

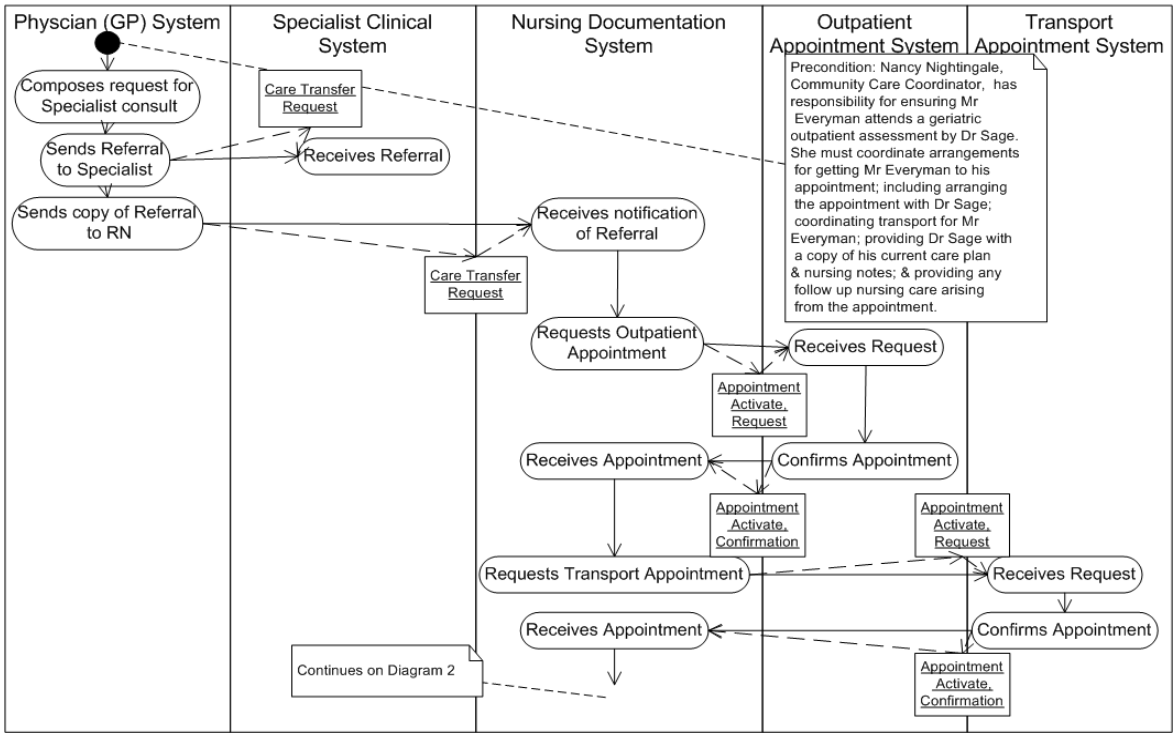
Postcondition:

Following Mr. Everyman's visit to Dr. Sage, the specialist geriatrician, Nancy Nightingale implements a new regime of care and assessments for Mr. Everyman which she reports on to Dr. Primary.

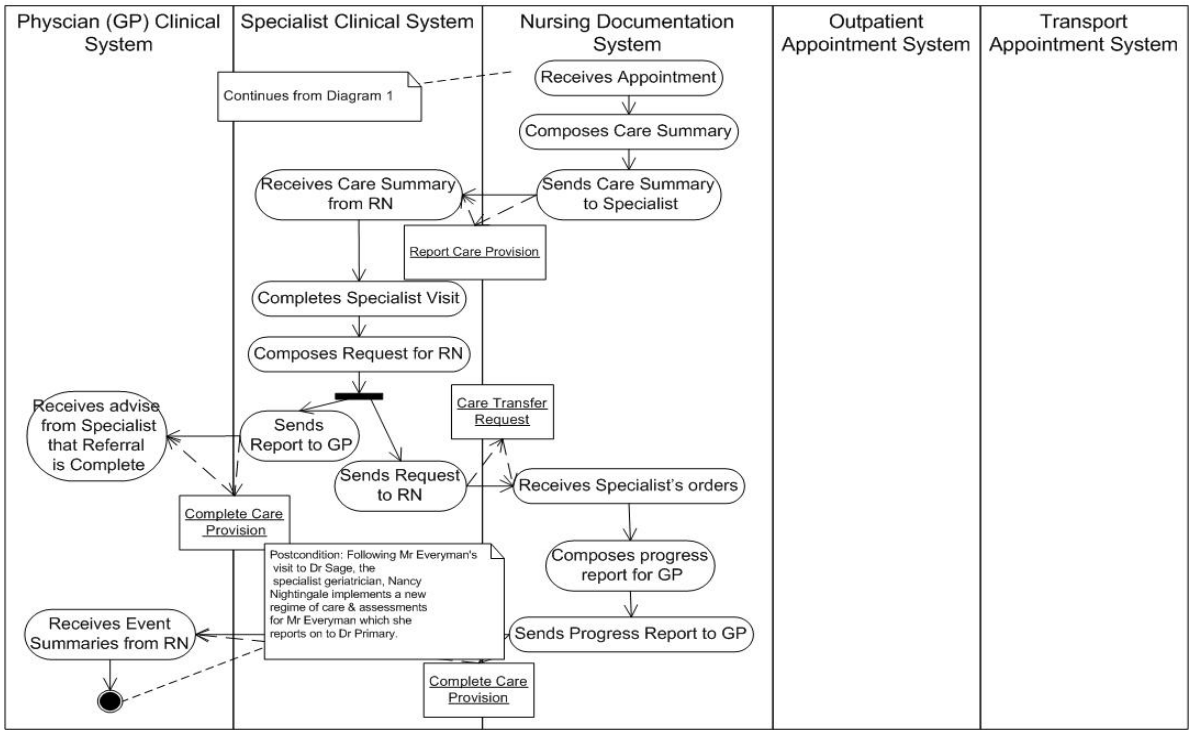
Updates Requirement Summary:

The communicators of this storyboard, Dr. Primary, Nancy Nightingale and Dr. Sage, are focused on ensuring Mr. Everyman, who lives alone, is able to access specialist geriatric medical advice. The storyboard highlights the coordination and logistical arrangements involved in achieving this objective.

Specialist Referral With Follow Up
Part 1



Specialist Referral With Follow-Up
Part 2



Specialist to Primary Physician

Purpose

This storyboard demonstrates the communication between a specialist and the referring primary physician.

Precondition:

Mr. Adam Everyman, a 45-yo male patient, is now status post radiofrequency ablation and has been referred back to the cardiologist Dr. Patrick Pump by the neurophysiologist Dr. Nigel Neural, with the appropriate data.

Activities:

Dr. Pump sees Mr. Everyman. He evaluates him and finds his arrhythmia problem abated. As Mr. Everyman is to see his primary physician in the next two days, Dr. Patricia Primary, Dr. Pump sends a report to Dr. Primary [Interaction: Complete Care Provision]. He includes the following data elements:

1. H&P* (CC, HPI, ROS, PE, MDM, Disposition/Plan*)

2. DATA & TESTS: EKG Tracing*, ECHO*,

3. CCR*

4. TREATMENT: antiarrhythmic (discontinued)*, radiofrequency ablation performed*

4. REASON FOR REFERRAL: completion of ablative procedure* WPW resolved*

5. EXPECTATIONS FOR FOLLOW UP / RECOMMENDATIONS: No further problems

expected, follow up only as necessary

* = elements that can be extracted, slightly modified from initial referral from Dr. Primary to Dr. Pump.

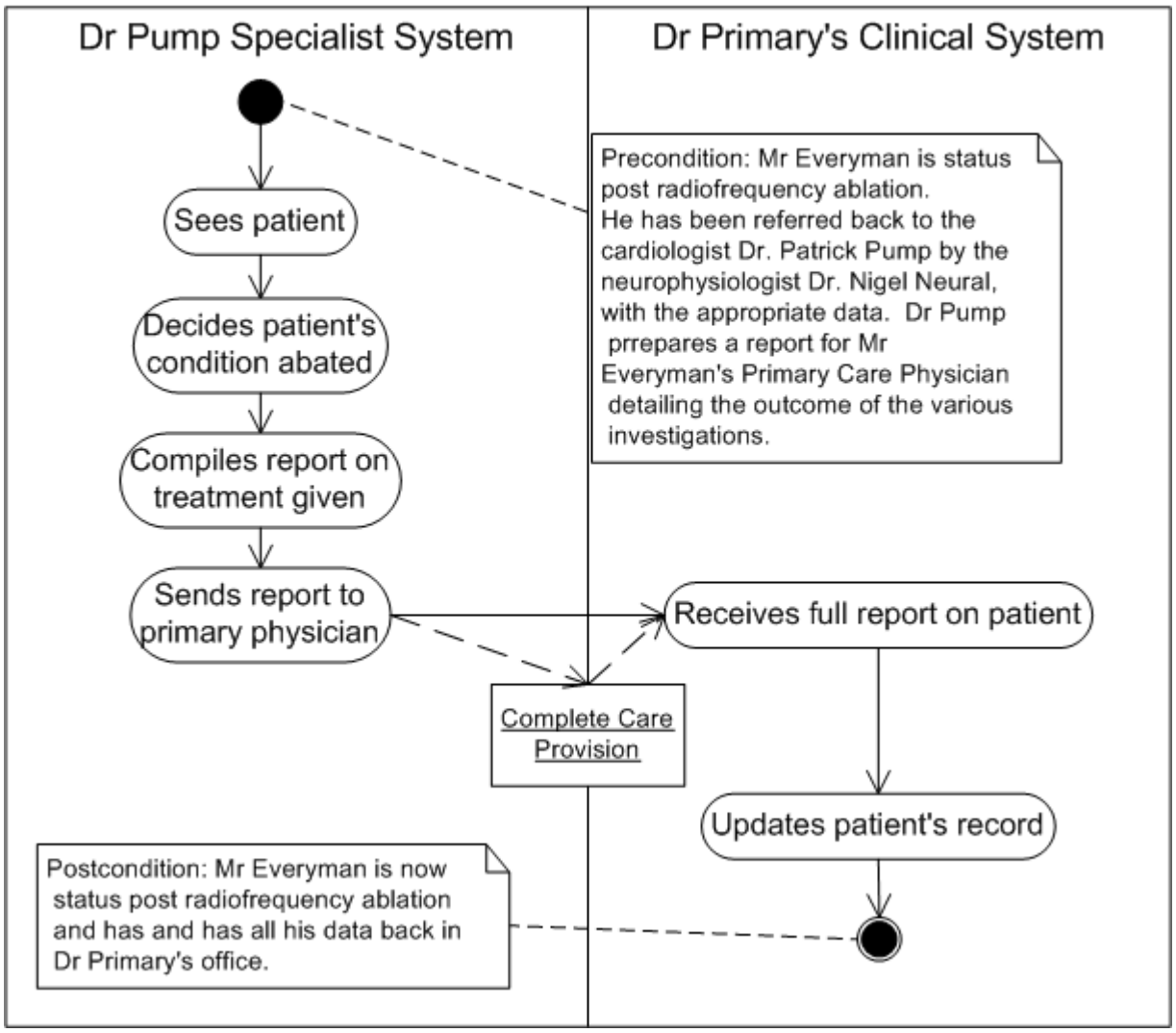
Postcondition:

Mr. Everyman is now status post radiofrequency ablation and has all his data back in Dr. Primary's office.

Updates Requirement Summary:

The communicators of this storyboard, Dr. Pump and Dr. Primary, are focused on recording the outcomes associated with the treatment of Mr. Everyman's original complaints of rapid heart beat.

Specialist Care Record to Primary Care Physician



Surgical Specialist to Specialist

Purpose

This storyboard demonstrates the communication between two specialists, the referred to electrophysiologist and the referring cardiologist specialist.

Precondition:

Mr. Everyman has been referred to the Electrophysiologist, Dr. Nigel Neural, by the cardiologist Dr. Pump, with the appropriate data.

Activities:

Dr. Neural is seeing Mr Everyman. Dr. Neural performs a radiofrequency ablation. He discontinues the antiarrhythmic medication prescribed by Dr. Pump [Interaction: Combined Order Abort, Confirmation (out of scope)]. He then provides his report to Dr. Pump [Interaction: Activate Care Provision]. In his report he includes the following data elements:

1. P* (CC, HPI, ROS, PE, MDM, Disposition/Plan*)

2. DATA TESTS: EKG Tracing*, ECHO*,

3. CCR*

4. TREATMENT: antiarrhythmic (discontinued), radiofrequency ablation performed

5. REASON FOR REFERRAL: follow-up with cardiologist AC

6. EXPECTATIONS FOR FOLLOW UP / RECOMMENDATIONS: No further problems expected, follow up only as necessary

* = elements that can be extracted, slightly modified from initial referral between Dr. Primary and Dr. Pump.

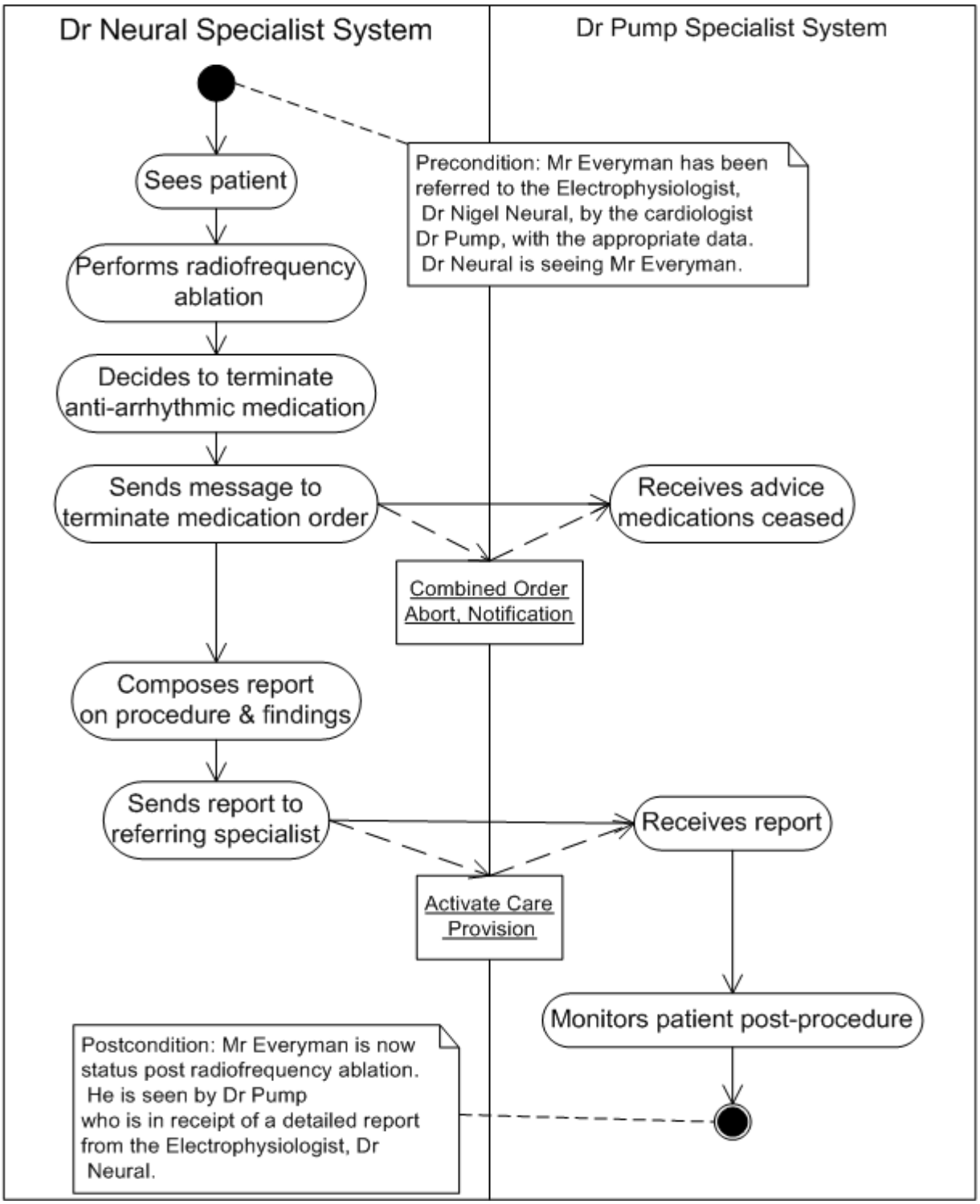
Postcondition:

Mr. Everyman is now status post radiofrequency ablation. He is seen by Dr. Pump who is in receipt of a detailed report from Dr. Neural.

Updates Requirement Summary:

Mr. Everyman makes a complete recovery from his surgery and requires no further followup from Dr. Pump.

Surgical Specialist Report to Specialist



PeDS SIG Immunization Registry

Purpose:

This storyboard demonstrates the communication between a doctor's clinical EMR and the state/local immunization registry.

Precondition:

Billy Newpatient is 4 years old. He has been seen at other clinics in the state.

However, he is a new patient at Dr. Shotz's clinic. He is there for a pre-school physical.

Dr. Shotz's clinic EMR is able to interface with state/local immunization registry.

The state/local immunization registry conforms to CDC Minimal Functional Standards for Immunization Registries.

The clinic EMR conforms to HL-7 EHR-S Functional Model.

The state/local registry is able to locate the patient's immunization record.

Storyboard:

Billy has previously been seen at other clinics in the same state. The caretaker does not have his immunization record. In preparing his new patient record for Dr. Shotz to review, the nurse initiates the clinic EMR to query the state immunization registry. The immunization registry finds and sends data to clinic EMR. The clinic EMR populates Billy's patient record with that data. The clinic EMR generates immunization recommendations using a decision support engine.

Alternate Flow #1:

The state registry uses a decision support engine and sends recommendations along with Billy's immunization data. Dr. Shotz reviews the record and notes (amongst other data) Billy's immunization record (or its absence thereof) and recommendations. After taking history from the caretaker and performing physical exam, she orders immunizations. The nurse administers the shots and documents them in the clinic's EMR. The clinic EMR sends the message about the new immunizations to the state registry which updates its record. The nurse also prints an updated paper record of Billy's immunizations.

Alternate Flow #2:

Dr. Shots determines that Billy does not require or decides to withhold immunizations at this stage. No updates are made to the immunization history in the patient record. No data is sent to the registry.

Post-condition:

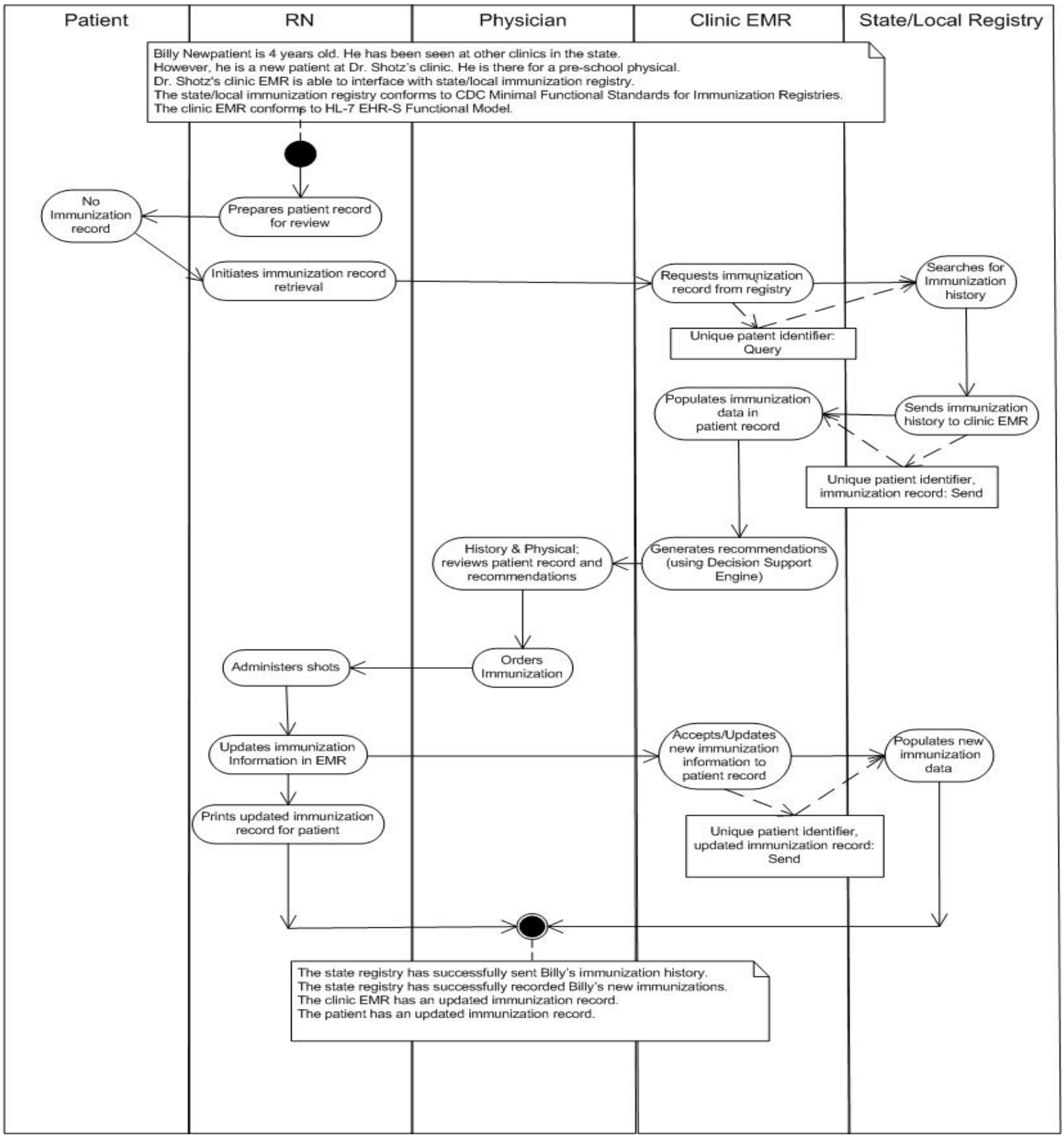
The state registry has successfully sent Billy's immunization history.

The state registry has successfully recorded Billy's new immunizations.

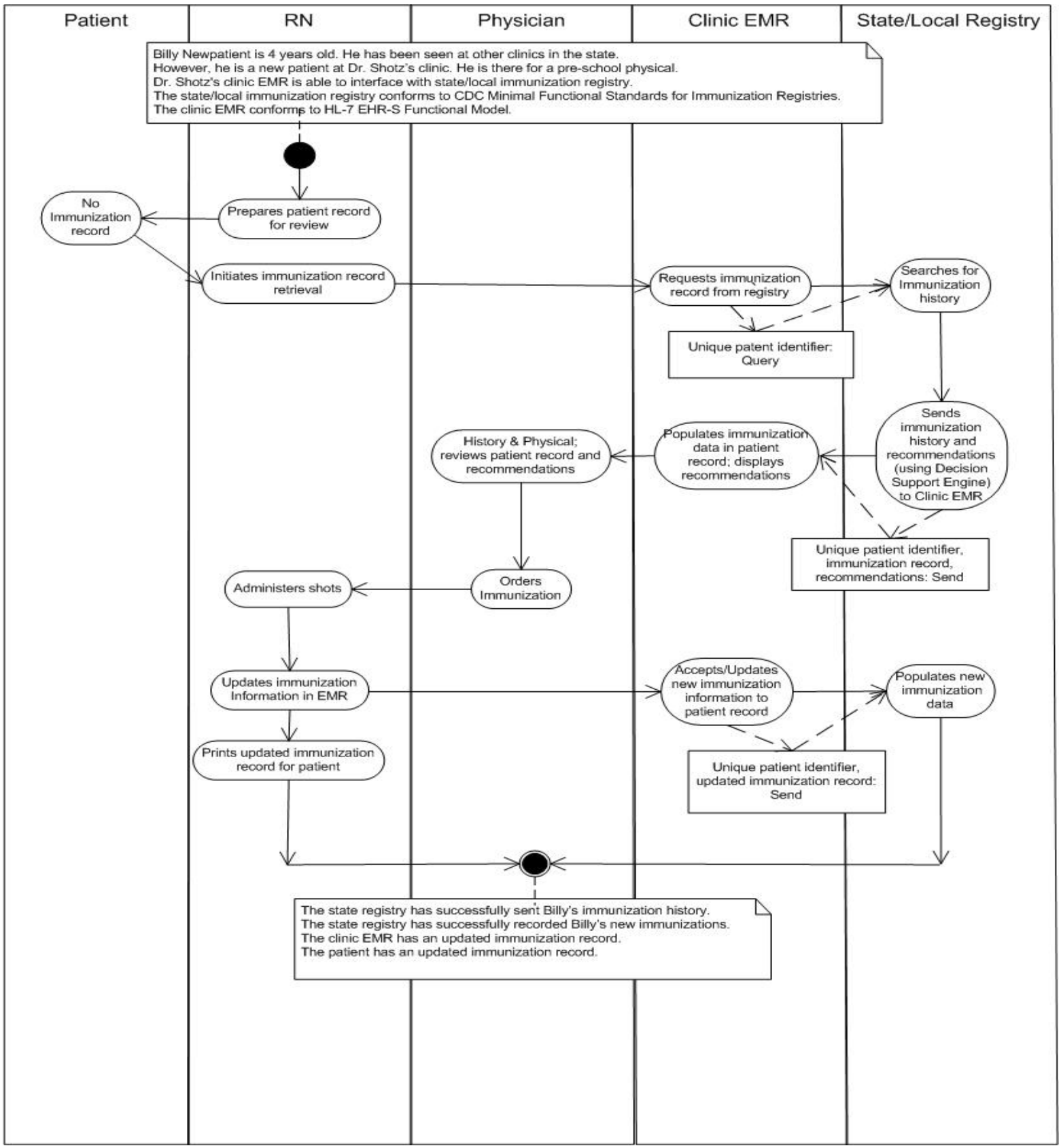
The clinic EMR has an updated immunization record.

The patient has an updated immunization record.

EMR and Immunization Registry Activity Diagram



Alternate Flow #1



Alternate Flow #2