PLEASE SEND COMMENTS AND CHANGES TO ANDRÉ (a.boudreau@boroan.ca).

NB: We have 2nd version of the home care storyboard. Which one is right?

We have a new Pediatric and Allergy/Intolerance Care Plan Storyboard.

We need to complete the whole set of SBs

André, 2011-06-22



Patient Care Workgroup

Care Plan Storyboards

*Based on HL7 HDF Release 1.5*

Working Document v0.2d

2011-06-22

© 2011 Health Level Seven, Inc.  
Ann Arbor, MI  
All rights reserved.

|  |  |
| --- | --- |
| Co-Lead/Co-Editor: | André Boudreau Boroan inc. a.boudreau@boroan.ca |
| Co-Lead/Co-Editor | Laura Heerman Langford Intermountain Healthcare  [Laura.Heermann@imail.org](mailto:Laura.Heermann@imail.org) |
| Current Working Group also includes: | Stephen Chu (Patient care Work group Co-Chair), Peter MacIsaac, Adel Ghlamallah, Jay Lyle, Margaret Dittloff, Ian McNicoll, Gordon Raup, Susan Campbell, Elayne Ayres, and others |

Acknowledgments

This guide was produced and developed through the efforts of the Patient Care Workgroup within the Health Level 7 (HL7) organization

We acknowledge the foundational work on the Health Level Seven (HL7) Modeling and Methodology Work Group for the creation of the Healthcare Development Framework Version 1.5 Release 1.

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Rev | Date | By Whom | Changes |
| 0.1 | 2011-04-20 | Danny Probst and Laura Heerman Langford et al | First document draft |
| 0.2 | 2011-04-27 | Care Plan meeting participants | Minor updates. Refinement of list of storyboards. |
| 0.2a | 2011-04-28 | André Boudreau | Integrated the wiki material to arrive at a single document |
| 0.2b | 2011-05-11 | André Boudreau | Restructured home care plan storyboard. Reviewed and updated with Care Plan Meeting participants. |
| 0.2c | 2011-06-21 | Danny Probst  Susan Campbel | Second Home care storyboard  New Pediatric and Allergy/Intolerance Care Plan Storyboard |
| 0.2d | 2011-06-22 | Care Plan meeting participants | Revised Pediatric and Allergy/Intolerance Care Plan Storyboard  Added actors to Chronic Care Plan SB |

Table of Contents

1 Introduction 5

1.1 Storyboard Purpose 5

1.2 Storyboard Scope 5

1.3 List of Storyboards for Care Plan 5

1.4 Storyboard Timing 5

1.5 Storyboard Outline 6

1.6 Storyboard Naming Standards 6

1.7 Steps for writing storyboards 6

2 Chronic Care Plan Storyboard 8

2.1 Storyboard Topic 8

2.2 Storyboard Actors and Roles 8

2.3 Pre-Condition 8

2.4 Sequence of Events, Storyboard, Activities 8

2.5 Post Condition 9

3 Acute Care Plan Storyboard 10

3.1 Storyboard Topic 10

3.2 Storyboard Actors and Roles 10

3.3 Pre-Condition 10

3.4 Sequence of Events, Storyboard, Activities 10

3.5 Post Condition 10

4 Home care Plan Storyboard- Version 1 11

4.1 Storyboard Topic 11

4.2 Storyboard Actors and Roles 11

4.3 Pre-Condition 11

4.4 Sequence of Events, Storyboard, Activities 11

4.5 Post Condition 12

4.6 Notes 12

5 Home care Plan Storyboard- Version 2 13

5.1 Determine and Narrow the Topic 13

5.2 Identify Actors and Roles 13

5.3 Pre-Condition 13

5.4 Sequence of Events, Storyboard, Activities 13

5.5 Post Condition: 14

6 Perinatology Storyboard 15

6.1 Storyboard Topic 15

6.2 Storyboard Actors and Roles 15

6.3 Pre-Condition 15

6.4 Sequence of Events, Storyboard, Activities 15

6.5 Post Condition 16

7 Pediatric and Allergy/Intolerance Care Plan Storyboard 17

7.1 Storyboard Topic 18

7.2 Storyboard Actors and Roles 18

7.3 Pre-Condition 18

7.4 Sequence of Events, Storyboard, Activities 19

7.5 Post Condition 19

8 Stay Healthy care Plan Storyboard 20

8.1 Storyboard Topic 20

8.2 Storyboard Actors and Roles 20

8.3 Pre-Condition 20

8.4 Sequence of Events, Storyboard, Activities 20

8.5 Post Condition 20

9 References and Acronyms 21

10 Appendix: Storyboard naming standards 22

# Introduction

Storyboard Purpose

A storyboard is a narrative description of a series of steps involving some exchange of information between different participants to achieve the objectives of a healthcare business process. The list of steps can be in generalized, abstract terms, or in the form of a real-world example. A storyboard illustrates the basic path, simple path, alternate, or error path of information and its content is comprised primarily from guidance by the domain experts.

* Storyboards should be written using business terminology to illustrate the context for the message exchange, functional model, etc.
* The content of the initial storyboards should be representative of normal business processes. Avoid exception cases. Attempting to document all exception cases in a business process can be an exhaustive task that diverts focus from the typical case, particularly at this early stage of the requirements process.
* A storyboard may be imprecise or incomplete in its initial draft. It should be revised over time if changes/updates are deemed important. It typically has no branching or decision points. The information in a storyboard will typically be made more precise when the corresponding Activity Diagram is created.
* The storyboard may include examples (e.g. names of people, organizations, systems, and data values) as appropriate. This helps make storyboards illustrative of the real work and also to make clear that items of interest may be of different types than assumed (e.g. that a patient in some cases may be an animal, that a guarantor may be an organization, etc).
* Avoid the use of acronyms, abbreviations, etc.; because the intended audience is a diverse group, some of whom would likely be confused. If these constructs are deemed important for the intended audience, they can be included in parentheses after the term. For example, Department of Motor Vehicles (DM).

Storyboard Scope

Storyboards identify the system under design. Storyboarding is an initial steps in the HDF methodology and are the least formal. Their semantics are somewhat loose, and their detail somewhat sparse, facts that are consistent with their purpose of being the "first-cut" at system requirements. Use them for what they are good for and do not expect them to provide information they cannot.

List of Storyboards for Care Plan

The following list of storyboards covers the relevant range of situations sufficient to identify the needs for Care Plan interoperability. Discussion notes for each storyboard are inserted at the beginning of each storyboard section in this document.

* Chronic Care
* Acute Care
* Home Care
* Perinatology
* Pediatric and Allergy/Intolerance??
* Stay healthy?

## Storyboard Timing

Storyboarding, the semi-structured process of collecting time sequenced anecdotes or "stories" in a somewhat *ad hoc* fashion from domain experts, is often a more effective and thus essential prelude to formal Use Case analysis. In particular, storyboards, i.e., the documentation of simple narratives involving a series of interactions and/or message communications that "makes sense" to the domain expert, typically contain more than one Use Case and multiple Application roles. As such, they serve as a valuable source of material from which individual Use Cases can be mined, i.e., explicitly extracted and formally modeled.

Within the context of the HDF, HL7 has made the decision to create Use Case analysis as its methodology for capturing user requirements. However, as explained in the previous Section, Use Case analysis is often most productively done as the first *formal* process to follow the more *informal* process of Storyboarding. The first sub-process in the Requirements Documentation process analyzes specific issues or requirements in the context of the healthcare business process that is to be improved either by developing new software or through HL7-based interoperability. This is accomplished using one or more storyboards

## Storyboard Outline

* *Pre-Condition:* Identifies the setting, the roles of the participants or actors, and identifies the name of the characters. Identifies what must be true before the storyboard can be triggered and perhaps another storyboard must precede this one
  + *Sample:* Christine, age 46, was recently diagnosed with stage II breast cancer. She is scheduled to receive her first round of chemotherapy in a few days. Susan, an RN, is seeing Christine in the clinic.
* Storyboard / Activities:
  + *Sample:* Christine expresses concern about the nausea & vomiting in chemotherapy. Susan reviews Christine’s chart including the problem list, allergies, chemotherapy protocol, orders, results and the patient education plan. She schedules Christine for education on the disease and on the side effects of chemotherapy.
* *Post-Condition:* Identifies what must be true upon completion of the storyboard
  + *Sample:* Christine is scheduled to receive education on side effects related to the chemotherapy and education on the disease.

Storyboard Naming Standards

The names of persons, places and organizations that are used in storyboards and examples are fictional. Any resemblance of actual persons, living or dead, or places and/or organizations is unintentional and coincidental. See in Appendix A HL7 publishing committee’s storyboard names for the names of persons, places and organizations that are used in storyboards.

Steps for writing storyboards

* Determine and Narrow the Topic
* Identify Actors:

It is often helpful to begin the process of Storyboarding and/or Use Case analysis by identifying the key stakeholders in the system-of-interest, i.e., in Use Case parlance, the Actors. Clear and consistent definitions of Actors -- *each* Actor should have a short, concise, and *clear* definition associated with its (noun) name -- result in consistent definitions of system boundaries. Conversely, the inability to define Actors in a clear and consistent fashion often indicates an unclear Scope Statement. Left unchecked, this deficiency can lead to unrelenting "scope creep" with the inevitable result of having a Technical Committee full of frustrated and unproductive domain experts. Identifying Actors, particularly through the process of Storyboarding, is also quite helpful as a tool for Use Case discovery. Once an Actor is identified, write down the Product(s) of Value that the Actor expects / wants / needs to obtain from the system.

* Identify the Pre-condition
  + Setting
  + Roles of Participants / Actors
  + Name of Characters
* Sequence of Events
  + Write the Story
  + Simple Sentences: Subject, verb, object and linear
  + Describe interactions with system(s)
* Check Flow of Story
  + Send out for review and validation by domain experts
  + Iterative Process With Other Problem-Space Artifacts
* Declare Post-condition

# Chronic Care Plan Storyboard

Discussion notes:

* Add asthma?

Storyboard Topic

The purpose of the chronic care plan and story board is to illustrate the communication flow and documentation of a care plan between a patient, his or her primary care provider and various care team members (i.e. diverse health care professionals) specialist involved for a patient diagnosed with type II diabetes.

Storyboard Actors and Roles

Primary Care Physician

Dr. Patricia Primary:

Patient

Bob Glucose Patient:

Diabetes Educator

Debbie Diabetic Educator

Podiatrist

Dr. Paul Bunion

Optician

Dr. Victor Vision

Pharmacist

Susan Script

Psychologist

Larry Listener

Dietician

Connie Chow

Electronic Health System- PCP

Electronic Health System- diabetes educator

Electronic Health System- podiatrist

Electronic Health System- optician

Electronic Health System- pharmacist

Electronic Health System- psychologist

REMOVE THIS (is in each of the above EHS): Electronic Care Plan

Pre-Condition

Adam Everyman, a 56 year old male is sitting in the clinic of his primary care physician (PCP), Dr. Patricia Primary. Dr. Patricia Primary after reviewing the results of Adam Everyman’s oral glucose tolerance test has just diagnosed Adam Everyman with Type II diabetes. Dr. Patricia Primary has accessed Adam Everyman’s EMR/EHR and has added type II diabetes to the problem list. Each of the team members have their own private office with distinct electronic systems.

Sequence of Events, Storyboard, Activities

While Dr. Patricia Primary is in Adam Everyman’s EMR/EHR, she updates the care plan with activities common to diabetes care. The updated care plan includes a schedule of activities that are to be performed by the patient, the physician and the care team. The care team has been identified as a diabetes educator, podiatrist, optician, pharmacist, and a psychologist. Dr. Patricia Primary reviews the care plan, and adds any final notes. Dr. Patricia Primary gives Adam Everyman a copy of the care plan in either paper or electronic form and answers any unresolved questions. Once the care plan is updated, a referral in the form of a notification is sent to the team notifying them of the intent of Adam Everyman to schedule an appointment. As part of the notification the message includes the notes and activities associated with the care plan. Each member on the referral list, on receiving notification, accesses Adam Everyman’s care plan and acknowledges receipt of the notification. As Adam Everyman visits with the healthcare provider, each provider updates a summary statement “tweet” (a very short note) indicating the status of the relevant activities in the care plan. The providers may also choose to submit an encounter record including any reports relating to the encounter.

Post Condition

Six months later, Adam Everyman visits Dr. Patrician Primary for a regular review. Dr. Patricia Primary is able to access the care plan and can see the updates relating to Adam’s activities including visits to his care team. Adam has also been able to access his personal health record attached to the EMR/EHR and enter data relating to his self monitoring activities including visits to his care team. Adam has entered data relating to his self monitoring activities with random blood glucose and weight records. There is a record of assessment, a diagram and an update from the podiatrist. The update indicates that the activities for podiatry are on track. There is an assessment and an update from the diabetes educator indicating that there is an issue warranting further attention. Dr. Patricia Primary finds the assessment from the diabetes educator in the repository, counsels Adam on the issue, and then encourages Adam to follow up on the issues flagged by the diabetes educator in the assessment. There is no update from the optician. Dr. Patricia Primary asks Adam if he has visited the Optician, and Adam confirms that there was no appointment made. Dr Patricia Primary counsels Adam on the risks of retinopathy and advises him to visit the optician for a check as soon as possible.

# Acute Care Plan Storyboard

Discussion notes:

* car accident, hip fracture: emergency services, OR, ICU, inpatient nursing unit, outpatient, rehab unit, SNF/Nursing Home, assisted living facilities (assume different IT solutions in same hospital, so semantic interoperability requirements)

Storyboard Topic

The purpose of the acute care plan and story board is to illustrate the communication flow and documentation of a care plan between a patient and various care team members (i.e. diverse health care professionals) involved for a patient admitted by ambulance at a hospital emergency services with a fractured hip following a car accident.

Storyboard Actors and Roles

Triage Nurse

Trauma Physician

Etc.

Pre-Condition

To be inserted

Sequence of Events, Storyboard, Activities

To be inserted

Post Condition

To be inserted.

# Home care Plan Storyboard- Version 1

Storyboard Topic

The purpose of the Home Care Plan storyboard is to illustrate the communication flow and documentation of a care plan and its update between a patient and various care team members (i.e. diverse health care professionals) involved for a patient receiving home care.

Storyboard Actors and Roles

Home Health Nurse: Nancy Nightingale

Patient: Adam Everyman

Physician: Dr. Patricia Primary

Dietician: Connie Chow

Pre-Condition

Nancy Nightingale is a home health nurse responsible for Adam Everyman, a sixty seven year old male who is at home and in need of assistance from a skilled nurse to help in his rehabilitation efforts after suffering from a minor stroke and being discharged from hospital the week before. In preparing for the home visit, Nancy downloaded to her computer a copy of the care plan that was created for Adam when he was an inpatient in the hospital.

Adam is scheduled to meet with his primary care provider, Dr. Patricia Primary, on a monthly basis to assess his health and prevent future complications.

Sequence of Events, Storyboard, Activities

Nancy arrives at Adam’s home. She takes a few minutes to introduce herself and get to know Adam. Nancy pulls up the care plan on her laptop as a reference, as she discusses the prior care given to Adam and the instructions provided to him when he was discharged from the hospital. Nancy is able to see the platelet inhibitor and cholesterol reducing medications that Adam was discharged on. Nancy asks Adam if he has any questions regarding the medications or any discharge orders that he was sent home with. Nancy also performs a quick assessment including a basic set of vital signs, and she documents this in the appropriate area on the home visit form. As Nancy and Adam talk about rehabilitation efforts, one of the goals that Adam identifies is related to managing his weight. Nancy documents this along with a set of realistic interventions and steps for weight management. She leaves a copy of these notes to Adam. As Nancy leaves this home health visit, she reminds Adam of the goals they just discussed and they agree on a time for the next visit.

Three weeks later, Adam makes his first visit to Dr. Patricia Primary since his minor stroke occurrence. However, Adam has already met with Nancy, his home care nurse, four times already. Dr. Patricia Primary accesses the EHR and Adam’s care plan and reviews the assessments and progress made over the last four weeks. Dr. Patricia Primary notices that one of Adam’s goals is weight management. Dr. Patricia Primary congratulates Adam on his weight loss over the last four weeks, expresses some concern regarding Adam’s elimination of some meals, and discusses the advantages of an appropriate diet along with the program of exercises. With Adam’s approval, Dr. Patricia Primary schedules an appointment with a registered dietician, Connie Chow, to consult on diet along with his exercise program.

Post Condition

Arriving at home, every day, Nancy connects to the internet, logs on to the secure access system and uploads her patient visit notes and care plans to the EHR. During Nancy’s subsequent visits to Adam, Nancy is able to reference the care plan and update assessments and progress.

After Adam leaves her office, Dr. Patricia Primary takes a few minutes to update the care plan and dictates progress notes and recommendations to the home nurse.

A week after Adam met with Dr. Patricia Primary, Nancy, the home health nurse, visits Adam. Nancy again accesses the care plan and reviews the updates, progress notes and recommendations of Dr. Patricia Primary. Nancy notices that Dr. Patricia Primary advised Adam to consult with a dietician and asks Adam how that appointment went and what were the results.

Notes

See the Swedish paper: *Modeling shared care plans using CONTsys and openEHR to support shared homecare of the elderly*, by Maria Hagglund, Rong Chen, Sabine Koch; J Am Med Inform Assoc 2011;18:66e69. doii:10.1136/jamia.2009.000216

# Home care Plan Storyboard- Version 2

Determine and Narrow the Topic

The purpose of the home care, care plan and story board is to illustrate the communication flow and documentation of a care plan between a patient, his or her primary care provider and the home health specialists involved in the rehabilitation efforts for a patient recovering from a minor stroke.

Identify Actors and Roles

Primary Care Physician

Dr. Patricia Primary:

Patient

Eve Everywoman:

Home Health Nurse

Nancy Nightingale

Dietician

Connie Chow

Electronic Health System

Electronic Care Plan

Pre-Condition

Eve Everywoman, a sixty-seven year old female has just been discharged from the hospital after suffering from a minor stroke. Dr. Patricia Primary at the time of discharge accessed Eve Everywoman’s EMR and scheduled a list of rehabilitation activities that are to be performed by a home health skilled nurse. Once the care plan was updated, a referral in the form of a notification was sent to the home health agency notifying the agency of the need to have a home health nurse visit Eve Everywoman and help in her rehabilitation efforts

Sequence of Events, Storyboard, Activities

Nancy Nightingale, a home health nurse upon receiving the request from Dr. Patricia Primary accesses Eve Everywoman’s care plan, acknowledges receipt of the request and reviews the notes and activities that Dr. Patricia Primary desires to be completed in Eve Everywoman’s rehabilitation efforts. During the first home visit, Nancy Nightingale takes a few minutes to introduce herself and get to know Eve Everywoman. Nancy Nightingale came prepared with a copy of the care plan that was updated during Eve Everywoman’s hospital stay and discharge. Nancy Nightingale opens the static care plan on her laptop and uses the care plan as a reference as she visits with Eve Everywoman and discusses the rehabilitation efforts Dr. Patricia Primary desires. Included in the care plan is the platelet inhibitor and cholesterol reducing medications that Eve Everywoman was discharged on. Nancy Nightingale discusses any questions regarding the medications and or any discharge orders that Eve Everywoman was sent home with. Nancy Nightingale takes a few minutes to perform a quick assessment including a basic set of vital signs and documents this in the appropriate area on the care plan. As Nancy Nightingale and Eve Everywoman talk about rehabilitation efforts, one of the goals that Eve Everywoman would like to work on is managing her weight. Nancy Nightingale documents this along with a set of realistic interventions and steps on weight management. As Nancy Nightingale leaves this home health visit, she reminds Eve Everywoman of the goals they have discussed and the time of the next visit. A few times a week Nancy Nightingale stops by her office and is able to dock her laptop and upload Eve Everywoman’s updated care plan. During Nancy Nightingale’s subsequent visits to Eve Everywoman, Nancy Nightingale is able to reference the care plan and update assessments and progress. Eve Everywoman is scheduled to meet with her primary care provider on a monthly basis to assess her health and prevent future complications.

Post Condition:

Today is Eve Everywoman’s first visit to Dr. Patricia Primary since her minor stroke occurrence. However, Eve Everywoman has already met with Nancy Nightingale, her home care nurse, four times. Dr. Patricia Primary accesses Eve Everywoman’s care plan and reviews the assessments and progress made over the last four weeks. Dr. Patricia Primary notices that one of Eve Everywoman’s goals is weight management. Dr. Patricia Primary congratulates Eve Everywoman on her weight loss over the last four weeks and also discusses the advantages of diet along with her exercise. With Eve Everywoman’s approval Dr. Patricia Primary schedules an appointment with a registered dietician to consult on diet along with her exercise. After Eve Everywoman leaves the office Dr. Patricia Primary takes a few minutes to update the care plan and dictates progress notes. A week after Eve Everywoman’s appointment with Dr. Patricia Primary, Nancy Nightingale the home health nurse visits Eve Everywoman. Nancy Nightingale again accesses the care plan and reviews the updates and progress notes of the appointment with Dr. Patricia Primary. Nancy Nightingale notices that Dr. Patricia Primary advised Eve Everywoman to consult with a Dietician and asks Eve Everywoman if she needs any help scheduling that appointment.

# Perinatology Storyboard

Discussion notes:

This is the material that was on the wiki.

Patient Mary Maternity has just returned the new patient history form to the front desk in the waiting room of Dr. Rachel Obstetrics. Patient Mary Maternity is excited for the first Dr’s visit after finding out she is expecting her first child. The individual at the front desk takes a few moments to create and enter the information contained on the form into the clinics EHR and also activates a new Obstetric Care Plan. Patient Mary Maternity is taken back into the clinic where Melissa Medical Assistant measures Patient Mary Maternities weight and blood pressure. These measurements are entered into the EHR. Dr. Rachel Obstetrics enters the room, pulls up the EHR and newly created care plan. Dr. Rachel Obstetrics reveiws Patient Mary Maternities history performs both a subjective and objective assessment and updates any new or additional information brought up during the visit. The next visit is scheduled and Patient Mary Maternity is feeling confident about the plan of care discussed duirng the appointment. Today is Patient Mary Maternities first visit to Dr. Rachel Obstetrics since the sixteenth week ultrasound. Dr. Patricia has just completed a quick assessment and has reviewed the recent ultrasound performed last week. Dr. Rachel Obstetrics has some concerns about a few of the findings associated with the ultrasound. Dr. Rachel Obstetrics has a referral relationship with Dr. Patricia Perinatologist and discusses the benefits of the additional care a Perinatologist can provide. Dr. Rachel Obstetrics schedules a referral appointment, and updates the care plan. When the care plan is updated a message is sent in the form of a notification to Dr. Patricia Perinatologist with the intent of Patient Mary Maternity to schedule an appointment. As part of the notification, the message includes a copy of the care plan. Patient Mary Maternity visits with Dr. Patricia Perinatologist for the first visit. Dr. Patricia Perinatologist is able to access the care plan and can see the documents relating to Patient Mary Maternities plan of care up to this point.

Storyboard Topic

The purpose of the XXX care plan and story board is to illustrate the communication flow and documentation of a care plan between a patient and various care team members (i.e. diverse health care professionals) involved for a patient etc...

Storyboard Actors and Roles

Triage Nurse

Trauma Physician

Etc.

Pre-Condition

To be inserted

Sequence of Events, Storyboard, Activities

To be inserted

Post Condition

To be inserted.

# Pediatric and Allergy/Intolerance Care Plan Storyboard

THESE NOTES SHOULD BE ELIMINATED FOR THE NEXT VERSION.

Notes/thoughts by Susan Campbell, 2011-06-08. (See first draft of story after the wiki material. later in this section):

At first I thought the NP would see the pediatric patient and then ask the primary care doctor to step in (here I think PCP is effectively a family practice physician).  But the situation I described is really simple and straightforward enough that the care plan that most NP would and should be qualified to manage independently.  As you will see, my pediatric care plan consists of:

* Advise patient and care-giver on self-care (**treatment)** of present illness (sinusitis as a complication of seasonal allergy) including prescription for OTCs for symptom management (NSAID for headache and saline nasal wash, as well as **e-prescription medication** (Flonase) [should we consider building an update for “fill date” of prescription back to the prescribing clinician’s E.H.R. (?)  I think this is in keeping with Kevin’s concerns.
* Advise patient and care-giver on self-care: **prevention** of sinusitis recurrence: us saline nasal wash and Flonase when symptoms recur
* Refer patient to (pediatric) allergist for **confirmation** **of diagnosis** and to rule out additional common allergies (allergen reactions).

I wonder if best practice would have the child return to the PCP office for verification of resolution of sinusitis?  I feel that most NPs or PCPs would not schedule a follow up visit for something that is expected to be self-limiting.  However, if it was a first time the child suffered this condition, or the sinusitis was severe, and the NP wanted to confirm resolution and check patient understanding of the treatment plan including prevention, it might be good to add it to determine whether there is a need to refer to otolaryngology for evaluation of sinus health.

For the follow-on use case, the **allergy consultation**, the penicillin allergy could be indicated in the taking of patient history by the specialist, and tested and found to be inaccurate (as indicated by the writer of the adult use case listed below).

The finding by allergist of “no penicillin allergy”) is an interesting situation as it would mean transmitting information about clarification of incorrect allergy status back to the E.H.R. of the referring clinician and to the pharmacy.

THESE NOTES SHOULD BE ELIMINATED FOR THE NEXT VERSION.

This is the Allergy/Intolerance material that was on the wiki. To be deleted...

Storyboard: Physician Manages Allergy & Intolerance List;

Purpose: To illustrate common practices in allergy management.

Precondition: Dr. Patricia Primary is viewing the EMR of Patient Everyman. Dr. Primary has completed the subjective and objective portions of the visit and is now drawing together the findings into an impression of the patient. Dr. Primary has a referral relationship to an allergist, Dr. Richard Reaction.

Activities: Dr. Primary identifies two findings that support the diagnosis of a \*\*\*\*\*\*\*: an itchy rash with linear patterns of distribution; and a potential exposure while walking in the woods prior to the rash. She then places \*\*\*\*\*\* on the allergy list. She identifies two findings that support the diagnosis of spring pollen allergies: a history of sinus infections in a seasonal pattern and a family medical history of allergies. She also places the Spring Pollen Allergies on the allergy list and activates a care plan with anti-histamines as needed and a referral to an allergist, Dr. Reaction, for assessment of the Spring Pollen Allergies. Penicillin with a reaction of hives is also placed on the allergy list. The referral appointment for the allergy concern assessment is scheduled. When the allergist, Dr. Reaction, views the referral document for the Spring Pollen Allergies, he navigates from the allergy list to the respective diagnoses, findings, and care plans for each allergy in order to validate the data. He imports the data into his EMR system. He modifies and adds to the basic data in his EMR. These updates and additions include more detail on the symptoms and timelines related to the “Spring Pollen Allergies,” the family medical history of allergies, and more information on the penicillin allergy. He applies skin tests for multiple allergens, including spring pollen allergens and penicillin, and asks Mr. Everyman to return for readings on the tests. When Mr. Everyman returns, Dr. Reaction reads the tests, identifies the positive reactions to Pine Pollens, and updates the allergy list including revising the Spring Pollen Allergy and removing the penicillin allergy. Dr. Reaction returns the information to Dr. Primary in a referral report (consultants’ report) document along with recommended updates to the care plans. Dr. Primary reviews the recommendations from the allergist and adjusts the care plans to include a repeat visit by Mr. Everyman to discuss the recommendations. Dr. Primary also updates the allergies on the allergy list with more specific descriptions of the allergies and marks the penicillin allergy as obsolete.

Post-condition: Mr. Everyman has progress notes, findings, impressions, referral documents, care plans, and a populated allergy list in the EMR that are captured in a manner that allows navigation from one related data item to the next. Specifically, the user is able to navigate from the current name of the allergy on the allergy list to the string of observations and treatment activities associated with management of that allergy over time. Additionally, the user is able to navigate from a data item to the allergy management programs supported by the data element.

Storyboard Topic

TO BE REVISED: The purpose of the XXX care plan and story board is to illustrate the communication flow and documentation of a care plan between a patient and various care team members (i.e. diverse health care professionals) involved for a patient etc...

Storyboard Actors and Roles

TO BE DONE:

Triage Nurse

Trauma Physician

Etc.

Pre-Condition

NEED REMOVE WHAT IS NOT IMPORTANT HERE.

Kari Kidd has been sneezing and sniffling for a week. She complains of being tired and refuses to participate in her after school sports activities. In the mornings she coughs up some greenish material and complains of a sore throat and headache. It is early June and lovely weather outside. The trees and flowers are in bloom so Nelda Nuclear, Kari’s Mother thinks Kari should be outside enjoying the weather and her friends. She sends Kari out to take their dog on a walk through the woods. Nelda Nuclear has given Kari the usual over-the-counter medications for common cold. But Kari says nothing helps and only wants to lie on the couch and watch TV surrounded by several boxes of tissues. Kari starts whimpering. When Nelda asks her what is wrong, Kari shows her a reddish area on her leg and cries “It’s itchy, Mom! I can’t stand it!” Although she hoped Kari would just get through the cold on her own, the itchy rash is something unexpected. Mother and daughter drive to the clinic.

Sequence of Events, Storyboard, Activities

Kari Kidd and her Mother Nelda Nuclear arrive at the primary care office of Patricia Primary. As is the custom in the practice, Kari is examined first by Nurse Practitioner, Amanda Assigned. She asks Kari to explain when the rash started. Kari indicates she first noticed it after taking their dog for a walk in the woods. Kari’s itchy rash is spreading quickly and she is scratching it constantly. Amanda takes out some Calamine lotion and applies it to Kari’s leg, explaining that it will soothe this poison ivy itch and Kari should try not to scratch it. Amanda knows the pollen count has been exceptionally high this month. She asks Kari and Nelda whether Kari usually gets cold symptoms in the spring. They nod their heads “yes” in unison. What about the headache, sore throat, and morning phlegm…do you get that every spring too, she asks? Again, the answer is “yes.” Amanda explains that Kari is suffering from spring allergies to pollen. When the pollen gets into the sinuses of her nasal tract, it stimulates an immune response that results in swelling of the passages. That leads to the stuffy nose. Then the sinuses become infected. The inflammation and pressure resulting from the sinus infection cause headache. During her sleep the sinuses drain better than when she is awake and upright and some of this material enters Kari’s trachea. When she awakens, she coughs it up. Her throat is red because of the infected drainage down the back of her throat and from the coughing.

Amanda explains that the cold symptoms, headache and sore throat are all responses and complications of spring pollen allergy. She recommends sniffing saline solution twice a day to clear the nasal passages and as a preventive to bacterial infection. She suggests a prescription for Flonase twice a day to each nostril to open the sinus passages. She tells Kari it is ok to use an over-the-counter NSAID like Tylenol or Motrin for the headache. She offers to refer Kari to a pediatric allergist to confirm the allergens and consider whether Kari could benefit from a desensitization protocol.

The itchy rash is from contact with poison ivy or another irritating plant. Amanda recommends that Nelda obtain Calamine lotion at the pharmacy over-the-counter. She exlains that Kari should apply Calamine lotion as needed to help her control the itch. She recommends wearing long pants when walking in the woods. She then writes out a referral slip to Dr. Richard Reaction. She sends the pharmacy an e-prescription for Flonase twice a day to each nostril and tells Kari to use it as long as she feels nasal stuffiness. She explains to Kari and Nelda that using Flonase in the spring when nasal stuffiness first starts can help prevent a repeat sinus infection. Nelda asks about antibiotics. Amanda explains that sinus infections are usually caused by many types of bacteria and is self-limiting if good nasal hygiene is followed. She explains how to do a sinus wash with saline and suggests Kari to do that morning and night before applying the Flonase.

Post Condition

TO BE COMPLETED. SEE EXAMPLES OF SB ABOVE (e.g. Chronic care).

Visit to pharmacy, allergist

~~Sinus infection stemming from seasonal allergy to pollen.~~

~~Rash caused by poison ivy or other plant~~

# Stay Healthy care Plan Storyboard

Discussion notes:

Storyboard Topic

The purpose of the XXX care plan and story board is to illustrate the communication flow and documentation of a care plan between a patient and various care team members (i.e. diverse health care professionals) involved for a patient etc...

Storyboard Actors and Roles

Triage Nurse

Trauma Physician

Etc.

Pre-Condition

To be inserted

Sequence of Events, Storyboard, Activities

To be inserted

Post Condition

To be inserted.

# References and Acronyms

HL7 Healthcare Development Framework Version 1.5 Release 1

| **Acronym** | **Meaning** | **Note** |
| --- | --- | --- |
| EHR | Electronic Health Record |  |
| EMR | Electronic Medical Record |  |
| HDF | HL7 Development Framework | The HL7 development methodology |
| PHR | Personal Health Record |  |
|  |  |  |
|  |  |  |

# Appendix: Storyboard naming standards

Table 5: Patient Information for Storyboards

| Cast | Family | Given | MI | Gender | SSN | Phone |
| --- | --- | --- | --- | --- | --- | --- |
| patient, female | Everywoman | Eve | E | F | 444-22-2222 | 555-555-2003 |
| patient, male | Everyman | Adam | A | M | 444-33-3333 | 555-555-2004 |
| patient, child | Kidd | Kari | K | F | 444-55-5555 | 555-555-2005 |
| family, daughter | Nuclear | Nancy | D | F | 444-11-4567 | 555-555-5001 |
| family, husband | Nuclear | Neville | H | M | 444-11-1234 | 555-555-5001 |
| family, son | Nuclear | Ned | S | M | 444-11-3456 | 555-555-5001 |
| family, wife | Nuclear | Nelda | W | F | 444-11-2345 | 555-555-5001 |
| next of kin (parent) | Mum | Martha | M | F | 444-66-6666 | 555-555-2006 |
| next of kin (child) | Sons | Stuart | S | M | 444-77-7777 | 555-555-2007 |
| next of kin (spouse) | Betterhalf | Boris | B | M | 444-88-8888 | 555-555-2008 |
| next of kin (other) | Relative | Ralph | R | M | 444-99-9999 | 555-555-2009 |
| contact person | Contact | Carrie | C | F | 555-22-2222 | 555-555-2010 |

Table 6: Healthcare Staff for Storyboards

| Cast | Family | Given | MI | Gender | SSN | Phone |
| --- | --- | --- | --- | --- | --- | --- |
| healthcare provider | Seven | Henry | L | M | 333-33-3333 | 555-555-1002 |
| assigned practitioner | Assigned | Amanda | A | F | 333-44-444 | 555-555-1021 |
| physician | Hippocrates | Harold | H | M | 444-44-4444 | 555-555-1003 |
| primary care physician | Primary | Patricia | P | F | 555-55-5555 | 555-555-1004 |
| admitting physician | Admit | Alan | A | M | 666-66-6666 | 555-555-1005 |
| attending physician | Attend | Aaron | A | M | 777-77-7777 | 555-555-1006 |
| referring physician | Sender | Sam | S | M | 888-88-8888 | 555-555-1007 |
| intern | Intern | Irving | I | M | 888-22-2222 | 555-555-1022 |
| resident | Resident | Rachel | R | F | 888-33-3333 | 555-555-1023 |
| chief of staff | Leader | Linda | L | F | 888-44-4444 | 555-555-1024 |
| authenticator | Verify | Virgil | V | M | 999-99-9999 | 555-555-1008 |
| specialist | Specialize | Sara | S | F | 222-33-3333 | 555-555-1009 |
| allergist/immunologist | Reaction | Ramsey | R | M | 222-22-3333 | 555-555-1025 |
| anesthesiologist | Sleeper | Sally | S | F | 222-66-6666 | 555-555-1012 |
| cardiologist | Pump | Patrick | P | M | 222-33-4444 | 555-555-1027 |
| cardiovascular surgeon | Valve | Vera | V | F | 222-33-5555 | 555-555-1028 |
| dermatologist | Scratch | Sophie | S | F | 222-33-6666 | 555-555-1029 |
| emergency medicine specialist | Emergency | Eric | E | M | 222-33-7777 | 555-555-1030 |
| endocrinologist | Hormone | Horace | H | M | 222-33-8888 | 555-555-1031 |
| family practitioner | Family | Fay | F | F | 222-33-9999 | 555-555-1032 |
| gastroenterologist | Tum | Tony | T | M | 222-44-2222 | 555-555-1033 |
| geriatrician | Sage | Stanley | S | M | 222-44-3333 | 555-555-1034 |
| hematologist | Bleeder | Boris | B | M | 222-44-3344 | 555-555-1035 |
| infectious disease specialist | Pasteur | Paula | P | F | 222-44-5555 | 555-555-1036 |
| internist | Osler | Otto | O | M | 222-44-6666 | 555-555-1037 |
| nephrologist | Renal | Rory | R | M | 222-44-7777 | 555-555-1038 |
| neurologist | Brain | Barry | B | M | 222-44-8888 | 555-555-1039 |
| neurosurgeon | Cranium | Carol | C | F | 222-44-9999 | 555-555-1040 |
| OB/GYN | Fem | Flora | F | F | 222-55-2222 | 555-555-1041 |
| oncologist | Tumor | Trudy | T | F | 222-55-3333 | 555-555-1042 |
| ophthalmologist | Vision | Victor | V | M | 222-55-4444 | 555-555-1043 |
| orthopedic surgeon | Carpenter | Calvin | C | M | 222-55-5545 | 555-555-1044 |
| otolaryngologist (ENT) | Rhino | Rick | R | M | 222-55-6666 | 555-555-1045 |
| pathologist | Slide | Stan | S | M | 222-44-4444 | 555-555-1010 |
| pediatrician | Kidder | Karen | K | F | 222-55-7777 | 555-555-1046 |
| plastic surgeon | Hollywood | Heddie | H | F | 222-55-8888 | 555-555-1047 |
| psychiatrist | Shrink | Serena | S | F | 222-55-9999 | 555-555-1048 |
| pulmonologist | Puffer | Penny | P | F | 222-66-2222 | 555-555-1049 |
| radiologist | Curie | Christine | C | F | 222-55-5555 | 555-555-1011 |
| rheumatologist | Joint | Jeffrey | J | M | 222-66-3333 | 555-555-1050 |
| surgeon | Cutter | Carl | C | M | 222-77-7777 | 555-555-1013 |
| urologist | Plumber | Peter | P | M | 222-66-4444 | 555-555-1051 |
| physician assistant | Helper | Horace | H | M | 222-66-5555 | 555-555-1052 |
| registered nurse | Nightingale | Nancy | N | F | 222-88-8888 | 555-555-1014 |
| nursing assistant | Barton | Clarence | C | M | 222-99-9999 | 555-555-1015 |
| chiropractor | Bender | Bob | B | M | 222-66-6666 | 555-555-1053 |
| dentist | Chopper | Charlie | C | M | 222-66-7777 | 555-555-1054 |
| orthodontist | Brace | Ben | B | M | 222-66-8888 | 555-555-1055 |
| optometrist | Specs | Sylvia | S | F | 222-66-9999 | 555-555-1056 |
| pharmacist | Script | Susan | S | F | 333-22-2222 | 555-555-1016 |
| podiatrist | Bunion | Paul | B | M | 222-77-2222 | 555-555-1057 |
| psychologist | Listener | Larry | L | M | 222-77-3333 | 555-555-1058 |
| lab technician | Beaker | Bill | B | M | 333-44-4444 | 555-555-1017 |
| dietician | Chow | Connie | C | F | 333-55-5555 | 555-555-1018 |
| social worker | Helper | Helen | H | F | 333-66-6666 | 555-555-1019 |
| occupational therapist | Player | Pamela | P | F | 222-77-6666 | 555-555-1059 |
| physical therapist | Stretcher | Seth | S | M | 222-77-8888 | 555-555-1060 |
| transcriptionist | Enter | Ellen | E | F | 333-77-7777 | 555-555-1020 |
| Pastoral Care Director | Sacerdotal | Senior | S | M | 333-77-7777 | 555-555-1020 |
| Chaplain | Padre | Peter | P | M | 333-77-7777 | 555-555-1020 |
| Informal Career | Comrade | Connor | C | M | 333-77-7777 | 555-555-1020 |
| Electrophysiologist | Electrode | Ed | E | M | 333-77-7777 | 555-555-1020 |
| Laboratory Specimen Processor | Spinner | Sam | S | M | 333-45-4545 | 555-555-1020 |
| IT System Administrator | Admin | I. | T. | M | 333-33-3333 | 555-555-1002 |
| Table 7: Organizations for Storyboards |  |  |  |  |  |  |

Organizational Roles

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Role | Name | Phone | Address | City | State | ZIP |
| healthcare provider organization | Level Seven Healthcare, Inc. | 555-555-3001 | 4444 Healthcare Drive | Ann Arbor | MI | 99999 |
| healthcare insurer #1 | HC Payor, Inc. | 555-555-3002 | 5555 Insurers Circle | Ann Arbor | MI | 99999 |
| healthcare insurer #2 | Uare Insured, Inc. | 555-555-3015 | 8888 Insurers Circle | Ann Arbor | MI | 99999 |
| employer | Work Is Fun, Inc. | 555-555-3003 | 6666 Worker Loop | Ann Arbor | MI | 99999 |
| Health Authority | Health Authority West |  |  |  |  |  |
| terminology provider | Titan Terminology | 555-555-3099 | 22 Wordy Way | Ann Arbor | MI | 99999 |

Table 8: Facilities for Storyboards

| Role | Name | Phone | Address | City | State | ZIP |
| --- | --- | --- | --- | --- | --- | --- |
| healthcare provider | Community Health and Hospitals | 555-555-5000 | 1000 Enterprise Blvd | Ann Arbor | MI | 99999 |
| hospital | Good Health Hospital | 555-555-3004 | 1000 Hospital Lane | Ann Arbor | MI | 99999 |
| hospital unit (e.g., BMT) | GHH Inpatient Unit | 555-555-3005 (ext 123) |  |  |  |  |
| hospital ward | GHH Patient Ward | 555-555-3006 (ext 456) |  |  |  |  |
| hospital room | GHH Room 234 | 555-555-3007 (ext 789) |  |  |  |  |
| emergency room | GHH ER | 555-555-3008 (ext 246) |  |  |  |  |
| operating room | GHH OR | 555-555-3009 (ext 321) |  |  |  |  |
| radiology dept. | GHH Radiology | 555-555-3010 (ext 654) |  |  |  |  |
| laboratory, in-house | GHH Lab | 555-555-3011 (ext 987) |  |  |  |  |
| pharmacy dept. | GHH Pharmacy | 555-555-3012 (ext 642) |  |  |  |  |
| outpatient clinic | GHH Outpatient Clinic | 555-555-3013 (ext 999) |  |  |  |  |
| urgent care center | Community Urgent Care | 555-555-4001 | 1001 Village Avenue | Ann Arbor | MI | 99999 |
| physical therapy clinic | Early Recovery Clinic | 555-555-4006 | 1010 Village Avenue | Ann Arbor | MI | 99999 |
| home health care clinic | Home Health Care Clinic | 555-555-4008 | 1030 Village Avenue | Ann Arbor | MI | 99999 |
| chiropractic clinic | Bender Clinic | 555-555-4009 | 1040 Village Avenue | Ann Arbor | MI | 99999 |
| optician clinic | See Straight Opticians | 555-555-4010 | 1050 Village Avenue | Ann Arbor | MI | 99999 |
| pharmacy, retail | Good Neighbor Pharmacy | 555-555-4002 | 2222 Village Avenue | Ann Arbor | MI | 99999 |
| laboratory, commercial | Reliable Labs, Inc. | 555-555-4003 | 3434 Industrial Loop | Ann Arbor | MI | 99999 |
| nursing or custodial care facility | Green Acres Retirement Home | 555-555-4004 | 4444 Nursinghome Drive | Ann Arbor | MI | 99999 |
| residential treatment facility | Home Away From Home | 555-555-4005 | 5555 Residential Lane | Ann Arbor | MI | 99999 |
| satelite clinic | Lone Tree Island Satellite Clinic | 555-555-5001 | 1001 Lone Tree Rd | Ann Arbor | MI | 99999 |
| satelite clinic | Stone Mountain Satellite Clinic | 555-555-5002 | 1000 Mountain Way | Ann Arbor | MI | 99999 |
| satelite clinic | Three Rivers Satellite Clinic | 555-555-5003 | 1000 River Drive | Ann Arbor | MI | 99999 |
| satelite clinic | Bayview Satellite Clinic | 555-555-5004 | 1000 Lakeside Drive | Ann Arbor | MI | 99999 |