Medication Workflow

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Learning Objectives

• What does FHIR offer in support of medication workflows? How does it support prescriptions, supplies and administrations?

• Learning goals:
  • Describe the key aspects of the various Medication* resources, and how they can be used to support the standard medication workflow.
  • Apply the MedicationUsage resource as an aid to solve the 'list of current medications' question.
  • Relate these workflow resources to the regulatory (IDMP) resources.

• Prerequisite knowledge: no prior knowledge of medication workflows required.
Medications

• All aspects of prescribing, administration, dosing, and supply
• In typical workflow sequence
  • MedicationRequest – prescribing
  • MedicationDispense – supply
  • MedicationAdministration – taking (or giving)
• Medication
• MedicationUse - observation
Medications – Adam Everyman example
Resource Overview – Medication

• actual medication that can be given to a patient, and referenced by the other medication resources.

• In many cases, this resource is not needed and the drug is indicated by a reference to the appropriate terminology.
Resource Overview - MedicationRequest

- Represents an instruction for the administration of medication to a patient.
Resource Overview - MedicationDispense

- The provision of a supply of a medication with the intention that it is subsequently consumed by a patient.
Resource Overview - MedicationAdministration

• A record of a patient actually consuming a medicine, or if it has otherwise been administered to them.
Resource Overview - Immunization

• Describes the event of a patient being administered a vaccine or a record of an immunization as reported by a patient, a clinician or another party.
  • Compare with MedicationAdministration, MedicationUse
Order Management

• Request-Event workflow pattern
• Request (a.k.a. Order)
  • Some service which is desired/authorized to occur
• Event (e.g. Supply, and/or Administration)
  • Some service has occurred/is occurring
  • May be related to a prior request
RESTful FHIR

• FHIR uses a “repository model” and is based on client-driven orchestration. A request is therefore “recorded as-is”, and is not an actionable item.

• To add “please do”, we’ll need to either:
  1. POST/PUT the request to the Filler application
  2. Use FHIR messaging (implicit workflows)
  3. Use the Task resource to record the workflow status (RESTful FHIR)
Task Resource

• A task resource describes an activity that can be performed and tracks the state of completion of that activity.

• Task is what lets you say "please do", "yes I will", "no I won't", "done“, "please suspend" or "please stop".

• Task is a shared resource, updated by a Placer, Fillers and/or centralized Workflow managers.
Order / Response, with Task resource
Task Status
Workflow Example
Medication workflow example (1/5) – new request

MedicationRequest
- status: ACTIVE
- intent: order
- authoredOn: June 15, 2020, 09:27
- dosageInstruction.text: 2 spoonfuls, twice a day

Task
- code: prescription
- intent 1..1: original-order
- status 1..1: REQUESTED

Patient
- Adam Everyman

Practitioner
- Dr. Hippocrates

Medication
- Reference
- Amoxicillin
- 250mg/5ml

subject 1..1
for 0..1
requester 0..1
mediation Reference

focus 0..1
requester 0..1
Medication workflow example (2/5) – find tasks

• The Localtown Pharmacy system needs to inspect the Task queue to determine Tasks it could potentially execute
  • Polling, Subscription
    • GET /Task?status=requested&intent=order,original-order&owner:Organization.identifier=12345&focus:MedicationRequest.status=active
    • GET /Task?status=requested&intent=order,original-order&focus:MedicationRequest.status=active
  • $find-task operation
    • Server side rules as to what request is appropriate for which kind of filler; e.g. omit requests which have been rejected in the past by this specific filler, or use load-balancing procedures.
Medication workflow example (3/5) – accept ownership of task
Medication workflow example (4/5) – task complete
Medication workflow example (5/5) – order completed
Order reject, cancel and update
Rejection of a request: e.g. Prescription Reject

Placer seeks fulfillment of its order by assigning a task to Pharmacy A. Pharmacy A rejects. Placer creates a new task to assign to Pharmacy B. Pharmacy B accepts the task.

Filler A says “no”: REJECTED

Filler B says “OK”: ACCEPTED, ...
MedicationRequest cancel (by Filler or Placer)

Filler and/or Placer can change status to CANCELLED, specifying the reason for doing so in Task.statusReason.

If Filler cancels, this does not imply that Placer has to cancel its MedicationRequest. Filler is cancelling its own activities related to the task (i.e. stops administering the medication).
MedicationRequest cancel by a third party

Requesting Dr.Hippocrates to cancel a prescription.
The ‘list of active medications’
Gather from various sources: MedicationUsage

- This is a record indicating that a patient may be taking a medication now, has taken the medication in the past, or will be taking the medication in the future.

GET /MedicationUsage?patient=[id]&status=active
&_include=MedicationUse:medication

a.k.a. MedicationStatement in FHIR R3
Questionnaire -> MedicationUse

prescriptions, supply, administration

Gather from all sorts of sources. De-duplicate. Create pre-populated questionnaire.

Questionnaire (for patient)

Extract content from populated questionnaire.

0..* MedicationUsage
Or: server side logic

• Leave it to a server to somehow create an active medication list
  • Includes de-duplication effort
• E.g. $medication-overview, returns a bundle of MedicationUsage resources

https://simplifier.net/NictizSTU3-Zib2017/Medication-Overview
Definitional resources
Regulatory data

- Links between clinical workflow resources and definitional (regulatory) resources
- Link via terminology, e.g. Medication.code

Diagram courtesy of Rik Smithies
Summary

• You’ve seen the key aspects of the various Medication* resources, and how they can be used to support the standard medication workflow.
  • Task resource, request/event pattern

• The MedicationUsage resource can be used as an aid to solve the 'list of current medications' question.
  • Involves server side logic, or the use of Questionnaires

• The medication resources have a relationship with the regulatory (IDMP) resources.
  • Medication.code as the linking pin
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