CDS HOOKS

HL7 FHIR

Overview

EHR Med Order
Rx Toprol XL 50 mg daily

1 EHR triggers a **CDS hook** and invokes a remote service

CDS Services

2 **CDS service** executes its own rules, leveraging FHIR data as needed

information card
$200 per month (patient pays $30)

3 Returns **CDS cards** (rendered and displayed by EHR)

suggestion card
Try HCTZ as first-line
Switch to HCTZ

smart app link card
Managing hypertension?
Launch JNC 8 Rx Pro

EHR FHIR Server

Links

Spec:
https://cds-hooks.hl7.org/1.0/

Sandbox:
http://sandbox.cds-hooks.org/

Quick Start:
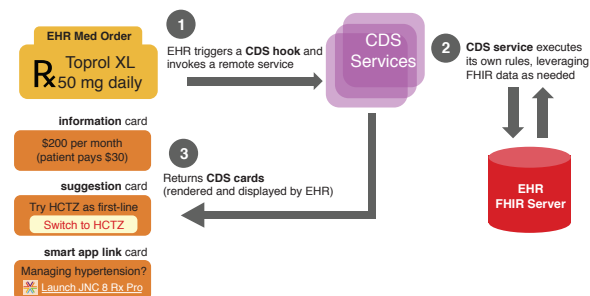https://cds-hooks.org/quickstart/

CDS Service Response Body

cards - REQUIRED - an array of **Cards** with a combination of information, suggested actions, and links

Card:
summary - REQUIRED - <140-character summary sentence for display to the user inside of this card
detail - OPTIONAL - optional detailed information to display (GitHub Flavored Markdown)
indicator - REQUIRED - urgency/importance of what this card conveys (`info`/`warning`/`critical`)
source - REQUIRED - grouping structure for the **Source** of information displayed on this card
suggestions - OPTIONAL - array of **Suggestions** for changes in the context of the current activity
selectionBehavior - OPTIONAL - intended behavior of the suggestions. If suggestions present, value must be `at-most-one`
links - OPTIONAL - array of **Links** to suggest an app or other additional information

Source:
label - REQUIRED - short, human-readable label to display source of the card's information
url - OPTIONAL - optional absolute URL to load to learn more about the organization or data set
icon - OPTIONAL - absolute url for an icon for the source of this card (100x100 pixel PNG without any transparent regions)

Suggestion
label - REQUIRED - human-readable label to display for this suggestion
uuid - OPTIONAL - unique identifier for auditing and logging suggestions
actions - OPTIONAL - array of suggested **Actions** (logically AND'd together)

Action:
type - REQUIRED - type of action being performed (`create`/`update`/`delete`)
description - REQUIRED - human-readable description of the suggested action
resource - OPTIONAL - FHIR resource to create/update or id of resource to delete

Link:
label - REQUIRED - human-readable label to display
url - REQUIRED - URL to GET when link is clicked
type - REQUIRED - type of the given URL (`absolute`/`smart`)
appContext - OPTIONAL - additional context to share with a linked SMART app

```
{
    "cards":[
        {
            "summary": "<140 char Summary Message",
            "detail": "optional GitHub Markdown details",
            "indicator": "info",
            "source":{
                "label": "Human-readable source label",
                "url": "https://example.com",
                "icon": "https://example.com/img/icon-100px.png"
            },
            "suggestions":[
                {
                    "label": "Human-readable suggestion label",
                    "uuid": "e1187895-ad57-4ff7-a1f1-ccf954b2fe46",
                    "actions":[
                        {
                            "type": "create",
                            "description": "Create a prescription for Acetaminophen 250 MG",
                            "resource":{
                                "resourceType": "MedicationRequest",
                                "...": "<snipped for brevity>"
                            }
                        }
                    ],
                    "links":[
                        {
                            "label": "SMART Example App",
                            "...": "<snipped for brevity>"
                        }
                    ]
                }
            ]
        }
    ]
}
```

CDS Service Discovery – `GET {baseUrl}/cds-services`

Response Body
services - An array of **CDS Services**

CDS Service:
hook - REQUIRED - hook this service should be invoked on
title - RECOMMENDED - human-friendly name of this service
description - REQUIRED - description of this service
id - REQUIRED - {id} portion of service URL: {baseUrl}/cds-services/{id}
prefetch - OPTIONAL - Object containing key/value pairs of FHIR queries that this service is requesting the CDS Client to include on service calls

```
{
    "services": [
        {
            "hook": "hook-noun-verb",
            "title": "CDS Service Example",
            "description": "An example of a CDS Service
             that returns a card",
            "id": "patient-greeter",
            "prefetch": {
                "patientToGreet": "Patient/
{{context.patientId}}"
            }
        }
    ]
}
```

CDS Service Request – `POST {baseUrl}/cds-services/{id}`

Request Body
hook - REQUIRED - hook that triggered this CDS Service call
hookInstance - REQUIRED - UUID for this hook call
fhirServer - OPTIONAL - base URL for CDS Client's FHIR server
fhirAuthorization - OPTIONAL - structure with **FHIR Authorization** information for the above url
context - REQUIRED - hook-specific contextual data
prefetch - OPTIONAL - FHIR data prefetched by the CDS Client

FHIR Authorization
access_token - REQUIRED - OAuth 2.0 access token
token_type - REQUIRED - fixed value: `Bearer`
expires_in - REQUIRED - lifetime in seconds of the access token
scope - REQUIRED - scopes the access token grants to the CDS Service
subject - REQUIRED - OAuth 2.0 client id of the CDS Service's auth server registration

```
{
    "hook": "hook-noun-verb",
    "hookInstance": "d1577c69-dfbe-44ad-ba6d-3e05e953b2ea",
    "fhirServer": "https://fhir.client.com/version",
    "fhirAuthorization": {
        "access_token": "opaque-token",
        "...": "<snipped for brevity>"
    },
    "context": {
        "userId": "Practitioner/example",
        "...": "<snipped for brevity>"
    },
    "prefetch": {
        "patientToGreet":{
            "resourceType": "Patient",
            "...": "<snipped for brevity>"
        }
    }
}
```