



# Using Specific COVID-19 Targets and Patient Care Settings as a Springboard for Driving Global Improvements in the Learning Health System Cycle for COVID-19 and Beyond

S60 – November 02, 2021

Steve Bernstein, BS (AHRQ)

Jerome A. Osheroff, MD (TMIT Consulting)

Julia Skapik, MD (National Association of Community Health Centers)

Christopher Tignanelli, MD (University of Minnesota)

Matthew Burton, MD (Holistic Healthcare Solutions)





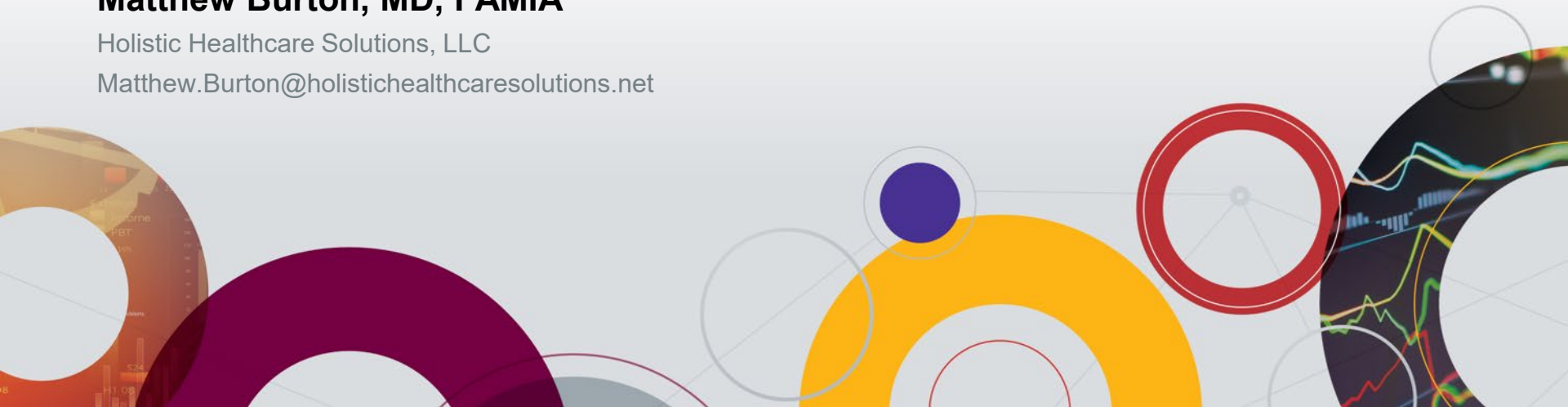
# Computable Guidance for COVID-19: Re-Usable Data & Knowledge as a Catalyst for a Rapid-Cycle Learning Health System

S60 – November 02, 2021

**Matthew Burton, MD, FAMIA**

Holistic Healthcare Solutions, LLC

[Matthew.Burton@holistichealthcaresolutions.net](mailto:Matthew.Burton@holistichealthcaresolutions.net)



# Disclosure

---



I have no relevant relationships with commercial interests to disclose.

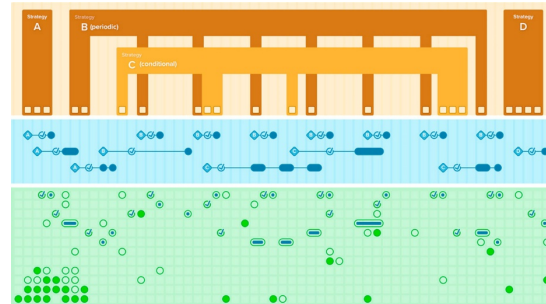
## C-19 DGWG Best Practice Collaborative

- Evolved from: CDC Adapting Clinical Guidelines for the Digital Age
- And Co-Evolved with: AHRQ ACTS COVID-19 Collaborative
- CPG = Clinical Practice Guidelines (care processes)
- > 150 Participants
  - > 50 Organizations (Providers- incl AMCs, Vendors, Prof Soc, etc)
- Agile CPG Development (Integrated Process, Agile KE, CPG-on-FHIR)
  - IP = concurrent development of guidance and computable content
  - Functional Teams with Cross-Functional Agile CPG Teams
  - CPG-IG: shareable, re-usable computable clinical knowledge & data across LHS

# HL7 CPG-on-FHIR

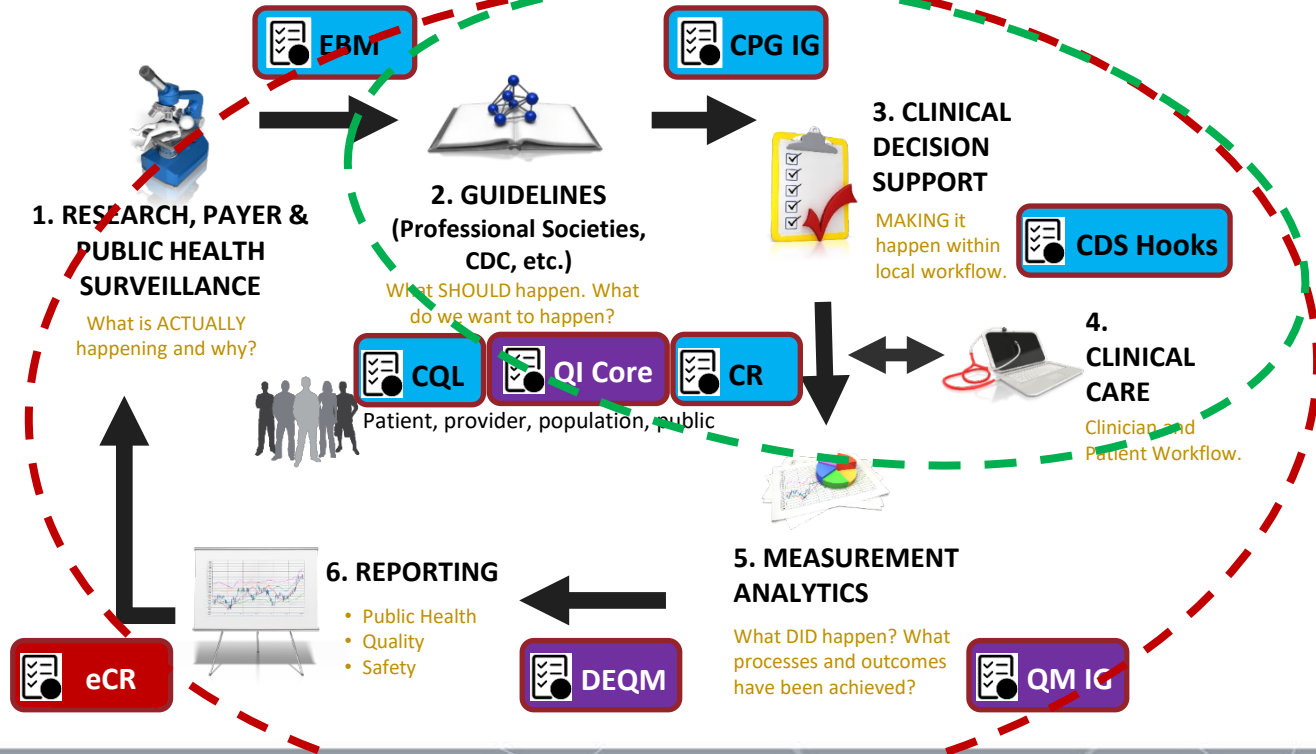
HL7 FHIR CPG-IG STU1.0 (based on FHIR Clinical Reasoning Module)

<http://hl7.org/fhir/uv/cpg/index.html>



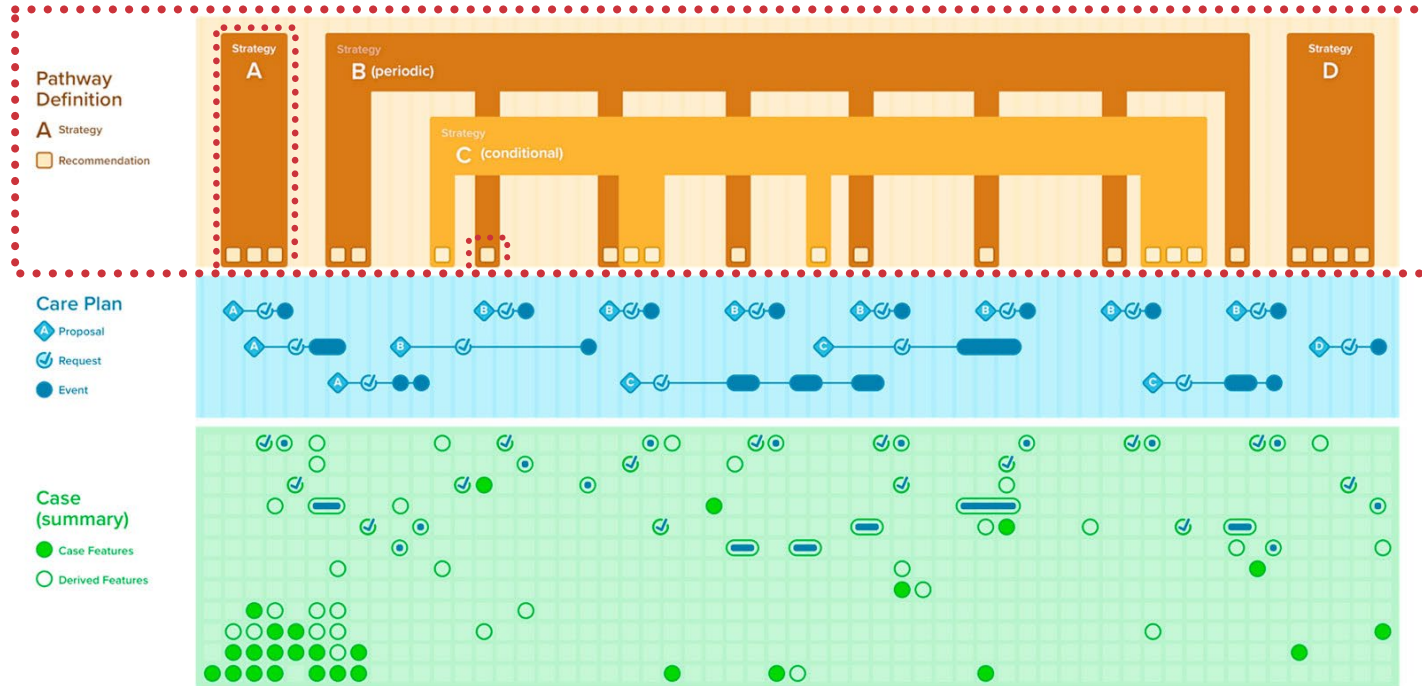
# Computable Clinical Practice Guidelines (CPGs)

As keystone to an interoperable Learning Health System



# Clinical Practice Guidelines | CPGs

## HL7 FHIR CPG-IG STU1.0 - CDS, QM, eCR, Apps (Cog Support)



Source: <http://hl7.org/fhir/uv/cpg/documentation-approach-12-conceptual-knowledge-architecture.html>

# CDS Reminder (Event-Condition-Action Rule)

## (Profiled) FHIR Plan Definition + CQL

### Pathway Definition

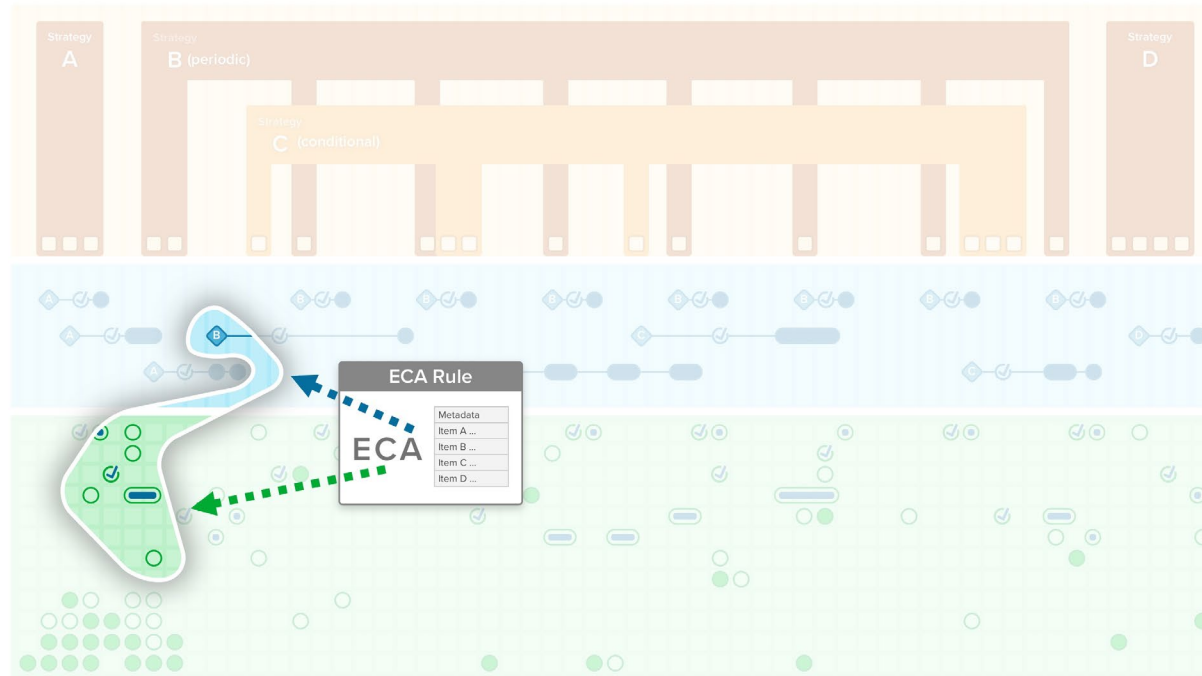
- A Strategy
- Recommendation

### Care Plan

- Proposal
- Request
- Event

### Case (summary)

- Case Features
- Derived Features

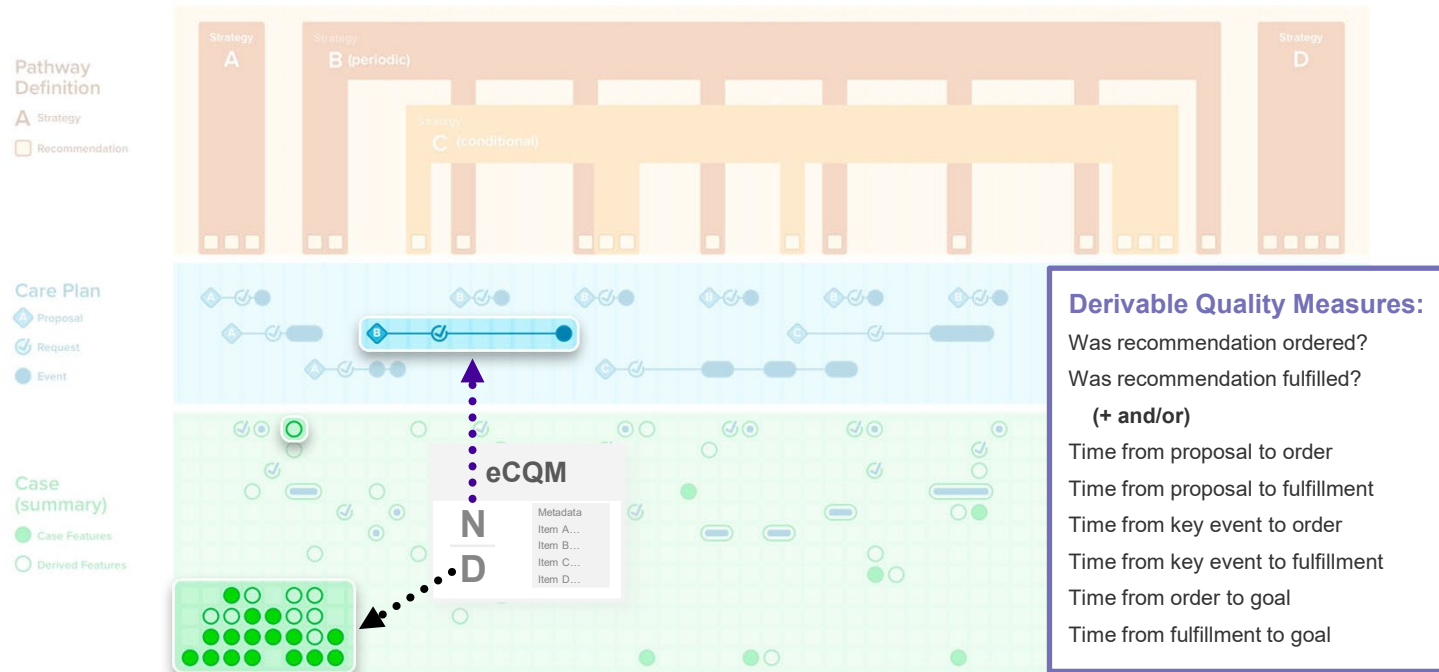


Source: <http://hl7.org/fhir/uv/cpg/documentation-approach-12-07-cpg-derivative-and-related-assets.html>



# Clinical Quality Measure (eCQM)

## FHIR Measure + CQL (derived directly from the CPG)



Source: <http://hl7.org/fhir/uv/cpg/documentation-approach-12-07-cpg-derivative-and-related-assets.html>

# eCase Report (Registries)

## (Profiled) FHIR Graph definition, Composition + CQL

### Pathway Definition

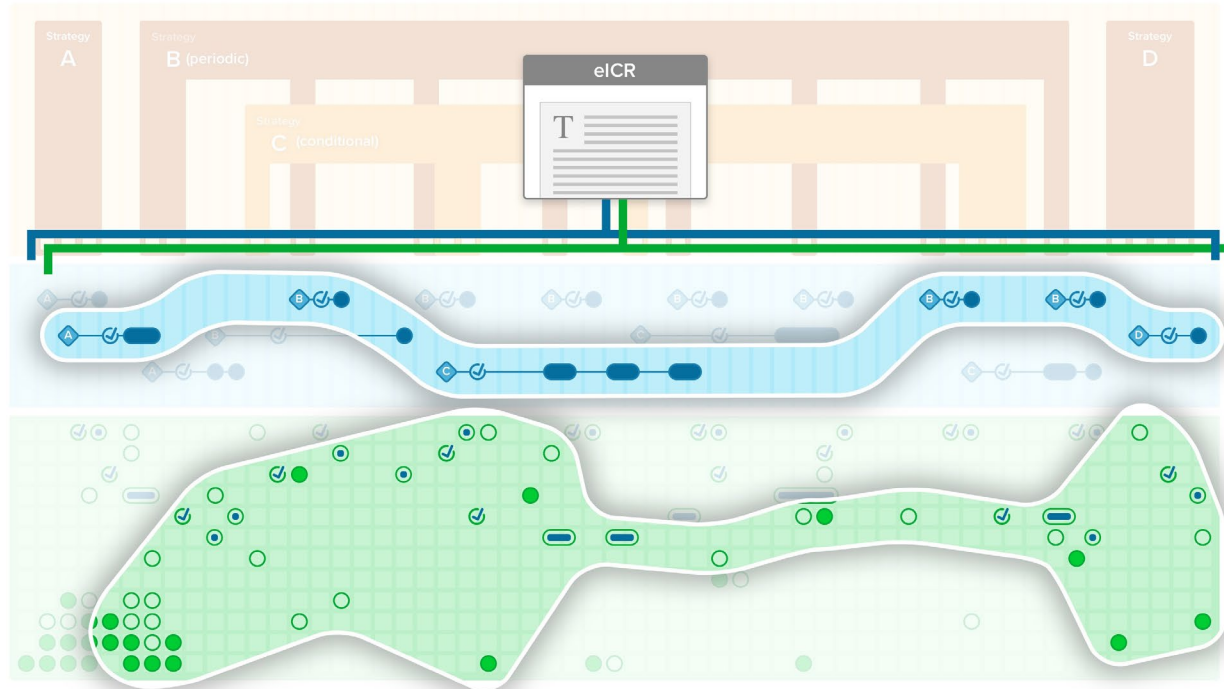
- A Strategy
- Recommendation

### Care Plan

- Proposal
- Request
- Event

### Case (summary)

- Case Features
- Derived Features

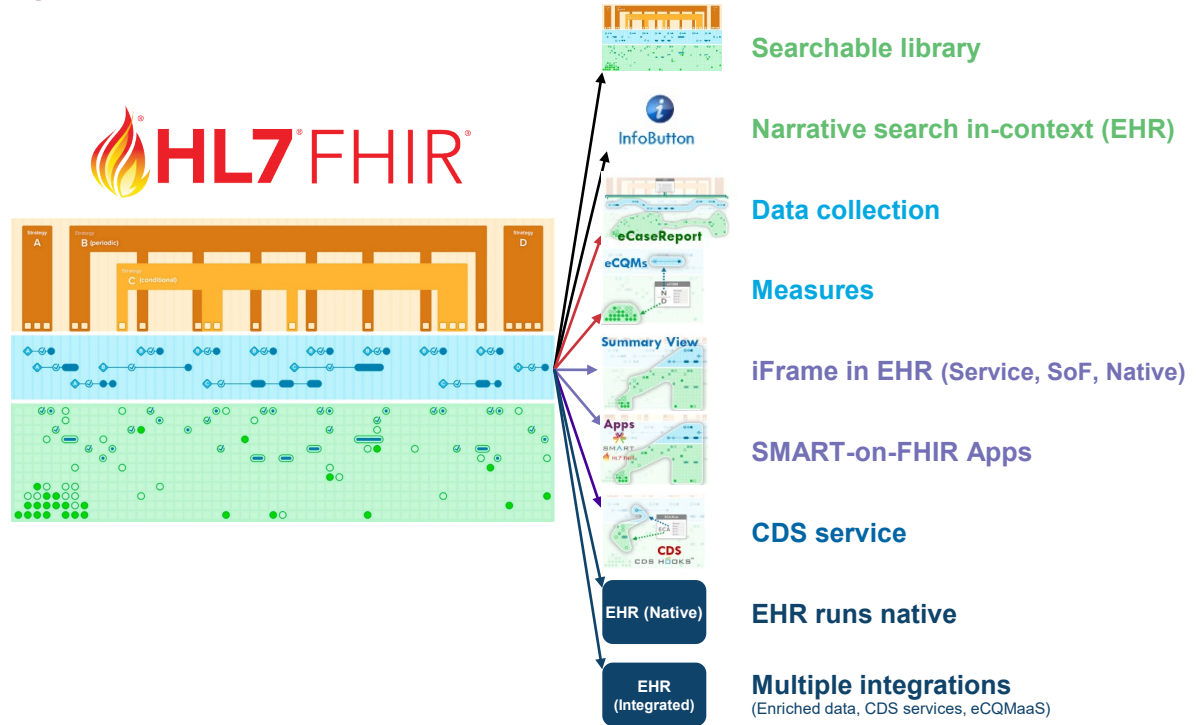


Source: <http://hl7.org/fhir/uv/cpg/documentation-approach-12-07-cpg-derivative-and-related-assets.html>

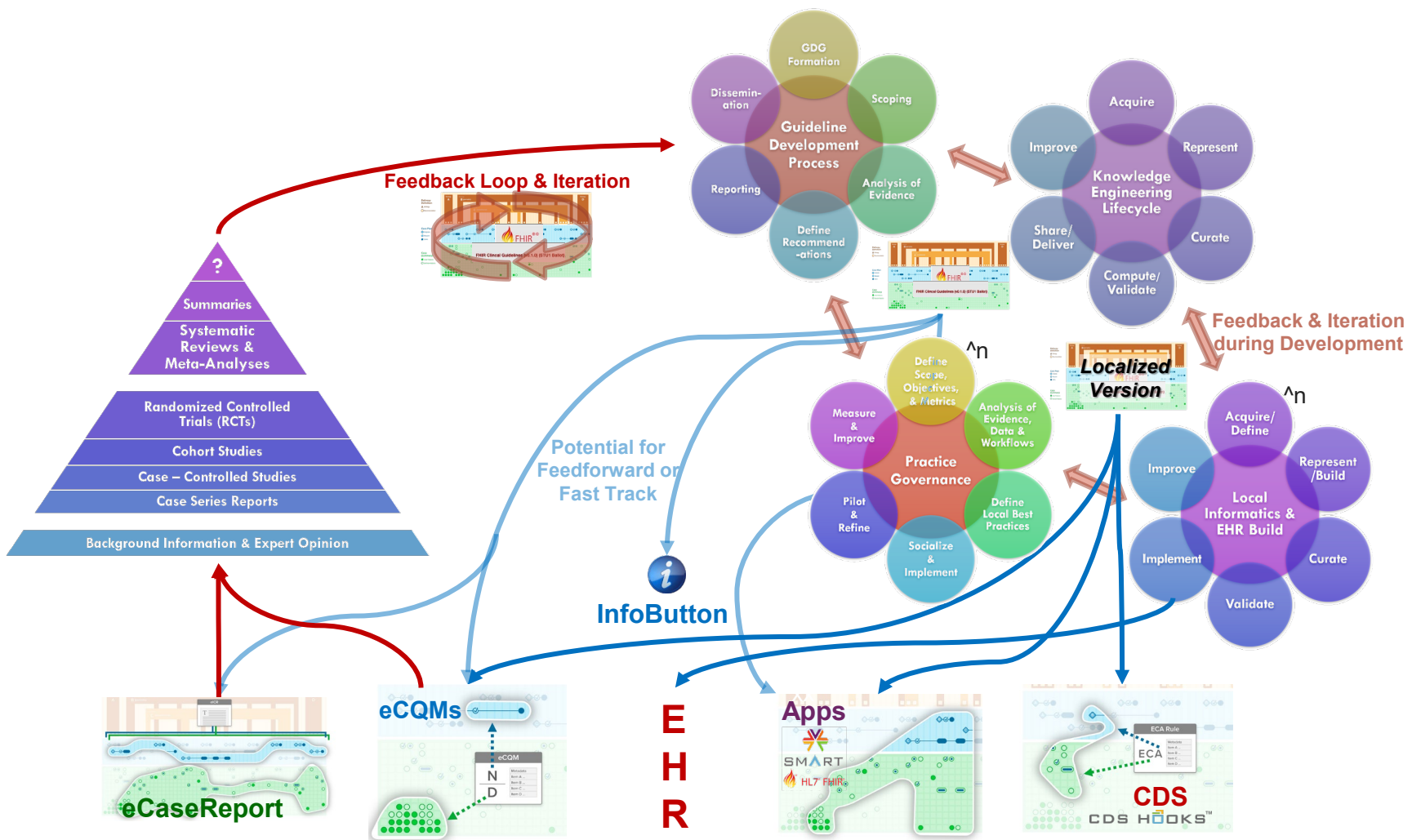
# Standards-Based Knowledge Implementation

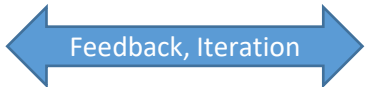
## Representation, Delivery & Integration

**One specification...  
many ways to  
implement it**



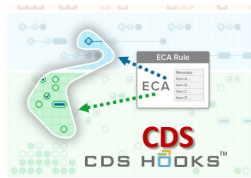
Source: <http://hl7.org/fhir/uv/cpg/documentation-approach-02-05-knowledge-implementation.html>





EBM-on-FHIR

CPG-on-FHIR



KNOWLEDGE

ACTION



EBM on FHIR

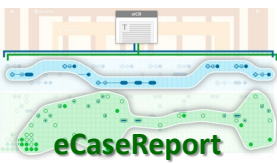


EHR

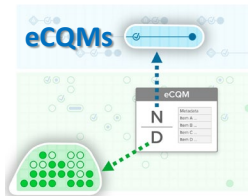
INFORMATION

DATA

RESEARCH



eCR-on-FHIR



DEQM | QM-IG

OMOP ↔ FHIR

# Agile CPG Development

## Integrated Process & Agile Knowledge Engineering

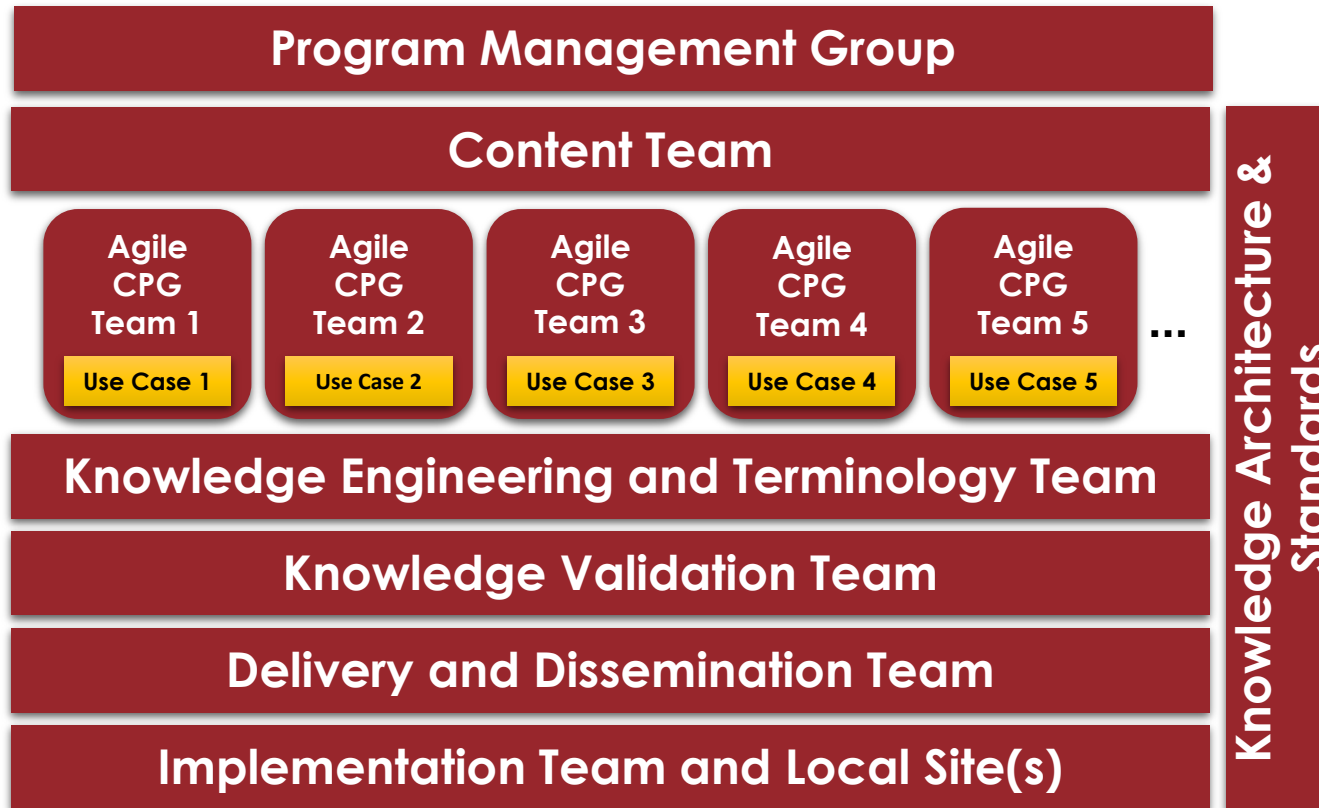
- Integrated Process- Concurrent Development of Content & Computable Representation thereof
- Agile Knowledge Engineering-
  - Cross-functional, Integrated Team
  - “Chunking” (composite artifacts)
  - Iteration, rapid-cycle feedback
  - Test-driven Knowledge Engineering (“Test Cases” as Case Specs)
  - Leverage Knowledge-Driven Systems Principles & Capabilities

Described in Detail Here:

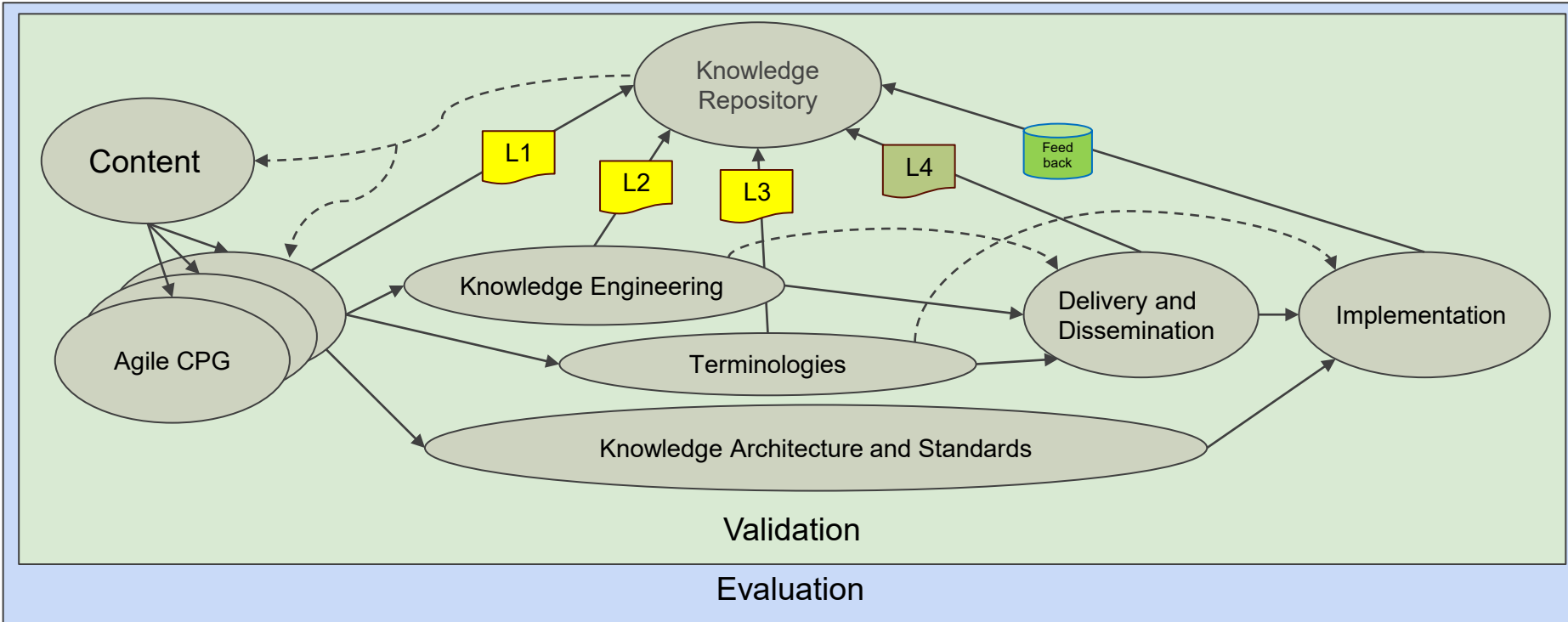
<http://hl7.org/fhir/uv/cpg/documentation-approach-04-05-computable-guideline-artifacts.html>

<http://hl7.org/fhir/uv/cpg/documentation-approach-05-06-agile-cpg-development-approach.html>

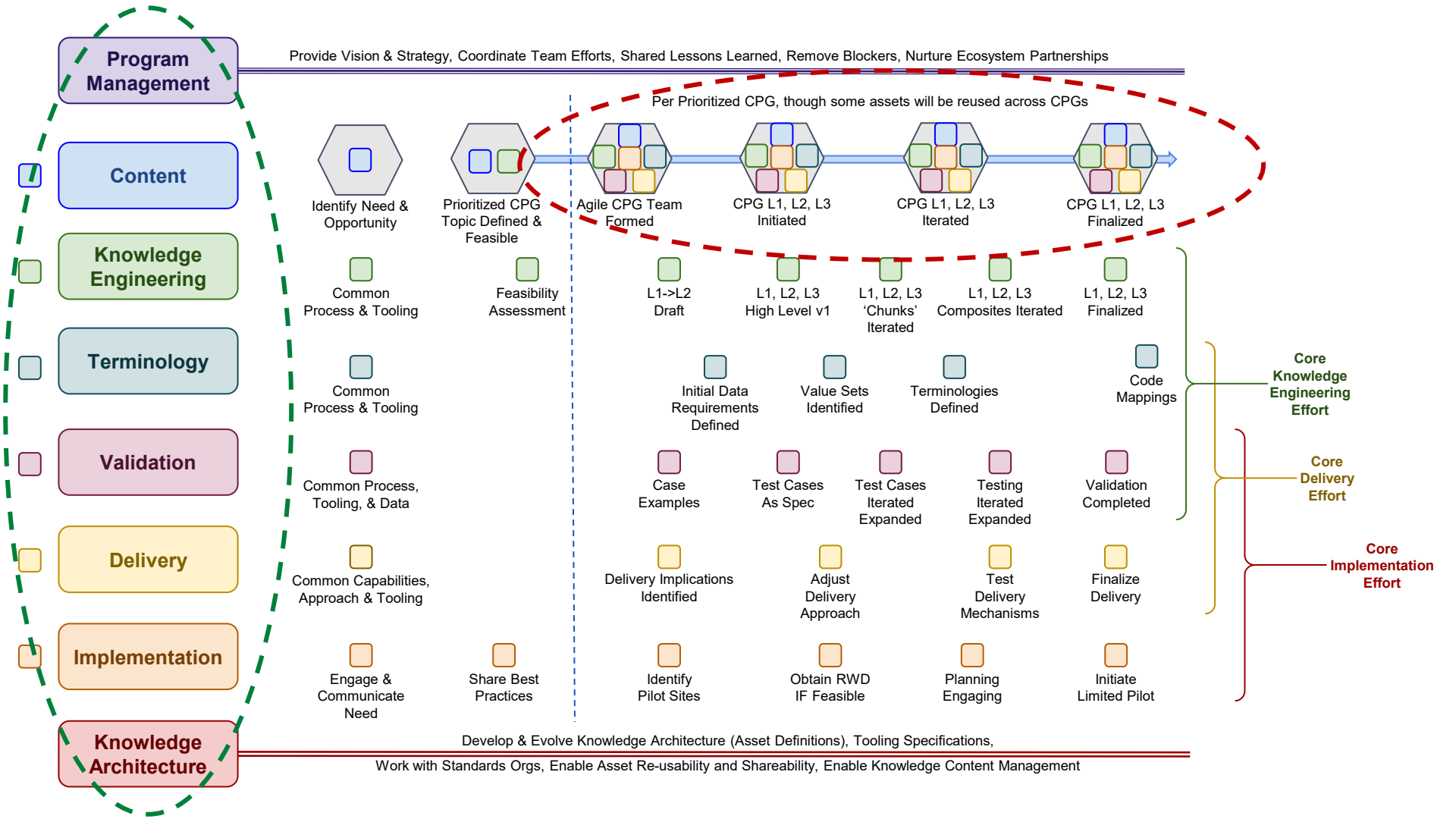
# C19 DGWG Org Structure



# C19 DGWG High Level Approach

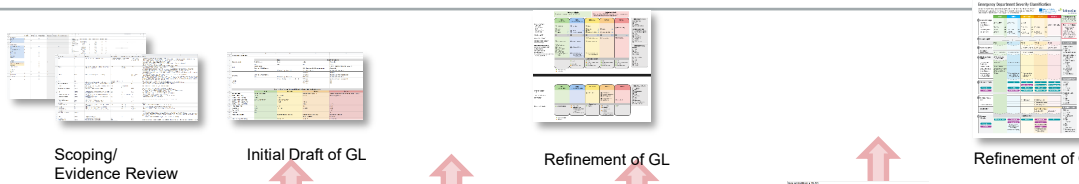




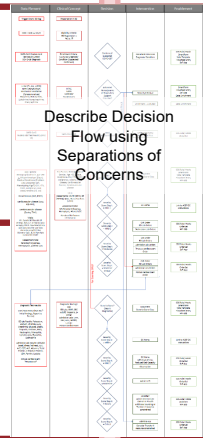
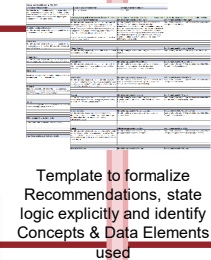


# COVID-19 ED CPG Methodology- Part 1

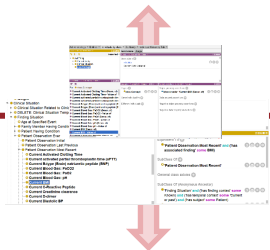
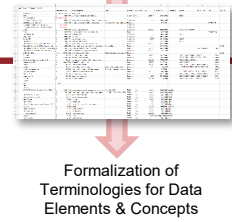
Clinical  
SME/ GDG



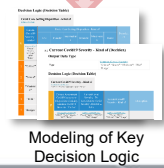
SME KE



Terminologist/  
Ontologist



Technical KE



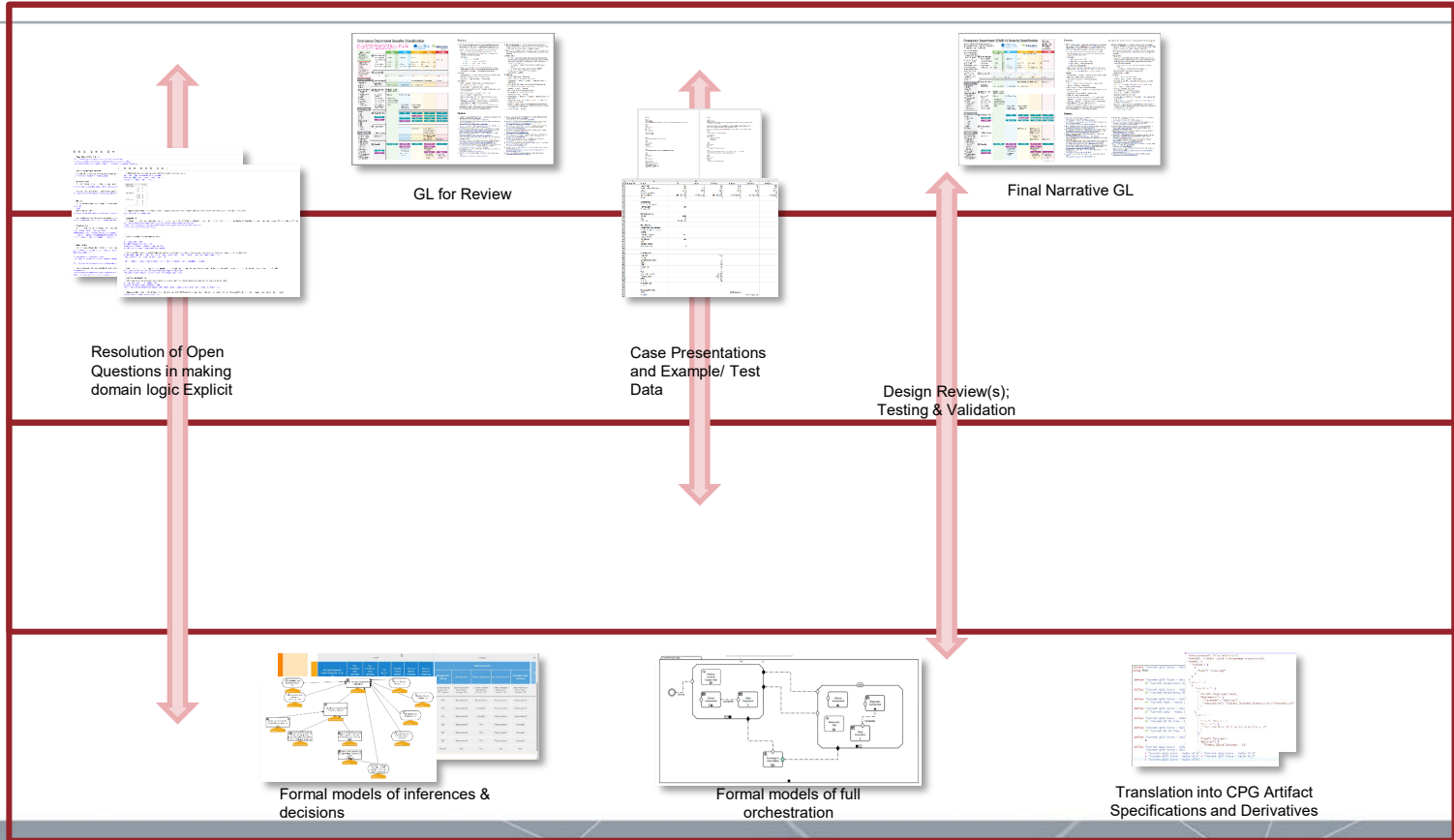
# COVID-19 ED CPG Methodology- Part 2

Clinical  
SME/ GDG

SME KE

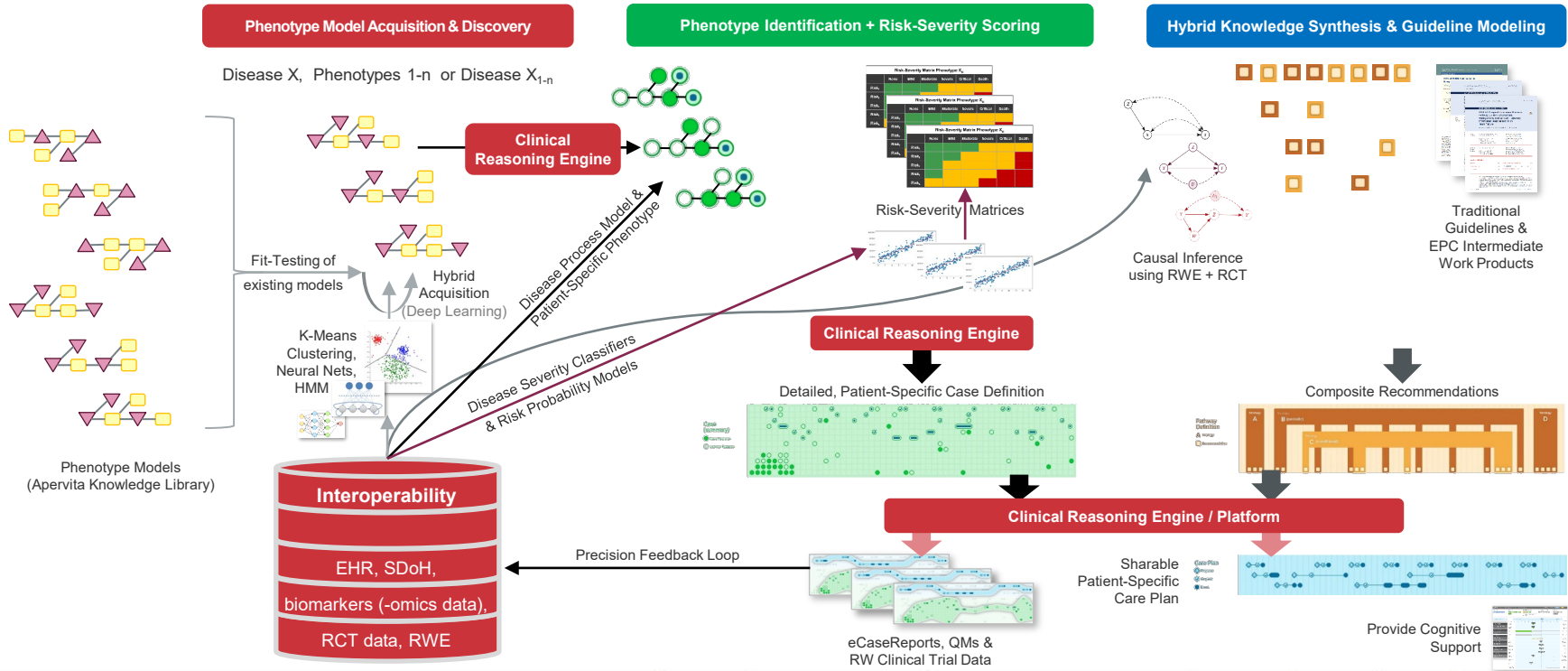
Terminologist/  
Ontologist

Technical KE



# Precision/ Individualized Medicine for Long COVID (PASC)

## Interoperable Rapid-Cycle Learning Health System



# AHRQ ACTS COVID-19 Collaborative



Learning Health System: Evidence to Guidance to Action (...and continuous feedback)

- Key Collaborator(s) (**Enablement**)
- Formation and Evolution of Structure, Process, Approach (**Acceleration**)
- Sharing and Application of Key Learnings (**Cross-Fertilization**)
  
- *Authoring Capabilities (Tooling)*
- *Continuous Improvement (Ecosystem Development)*
- *Vision & Support (LHS Concept Demonstration)*

# Thank you!

Email me at: [Matthew.Burton@HolisticHealthcareSolutions.net](mailto:Matthew.Burton@HolisticHealthcareSolutions.net)

or

[Matthew.M.Burton@Gmail.com](mailto:Matthew.M.Burton@Gmail.com)

