

Computable and “Living” Guidelines

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U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Healthcare Knowledge Ecosystem Today

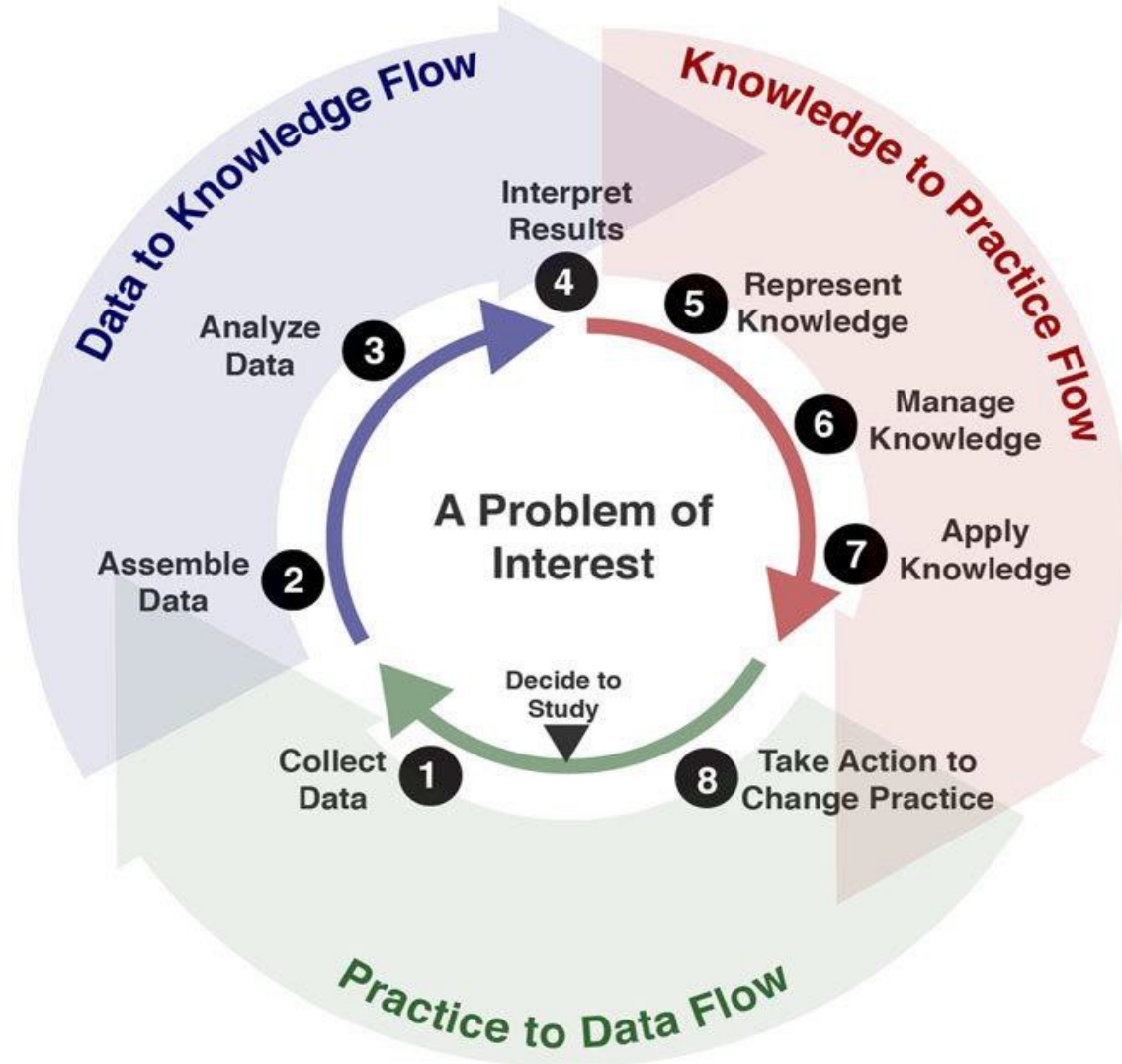


Healthcare Knowledge Ecosystem Desired



Healthcare Knowledge Ecosystem Desired

The Learning Health System



Multi-stakeholder CDC Kaizen Event



- [“Adapting Clinical Guidelines for the Digital Age Meeting”](#) – Feb 5-9, 2018
- Incorporates all relevant perspectives in both a strategic and tactical method FROM THE BEGINNING
- Achieves big changes in short order
- Provides transparency among participants, which contributes to high level of buy-in & better understanding of the challenges from each perspective



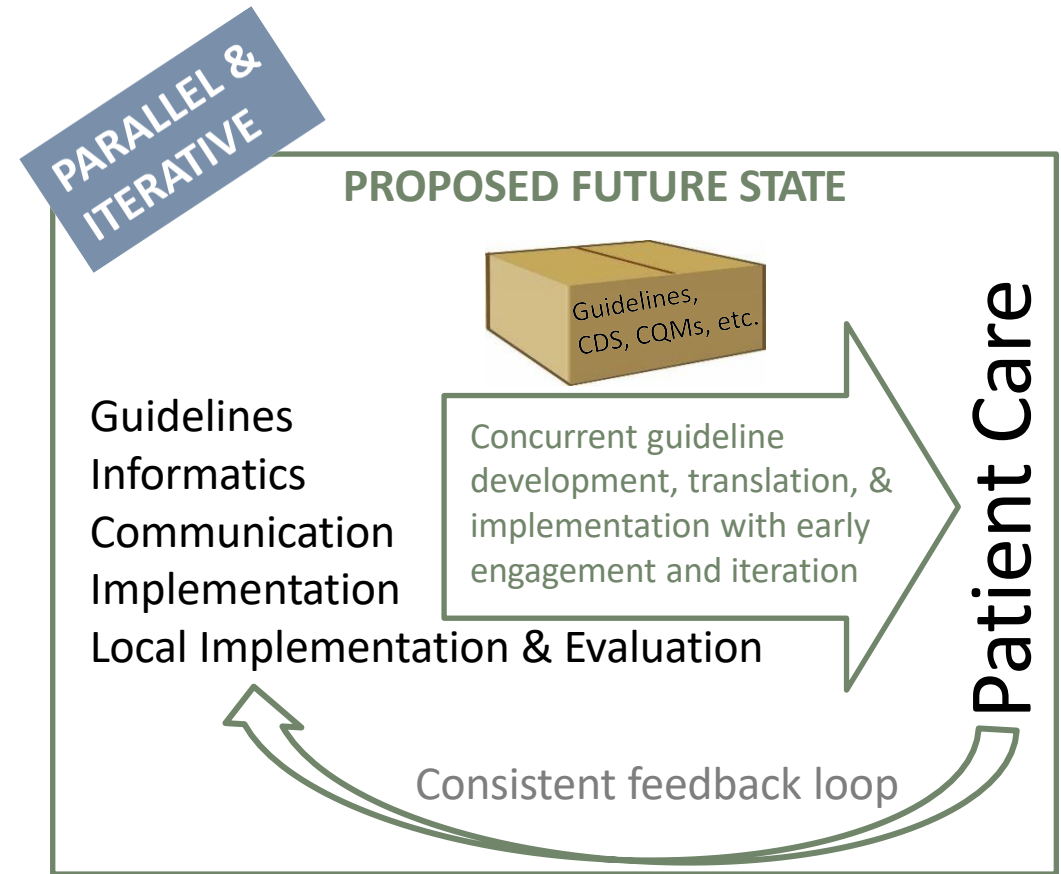
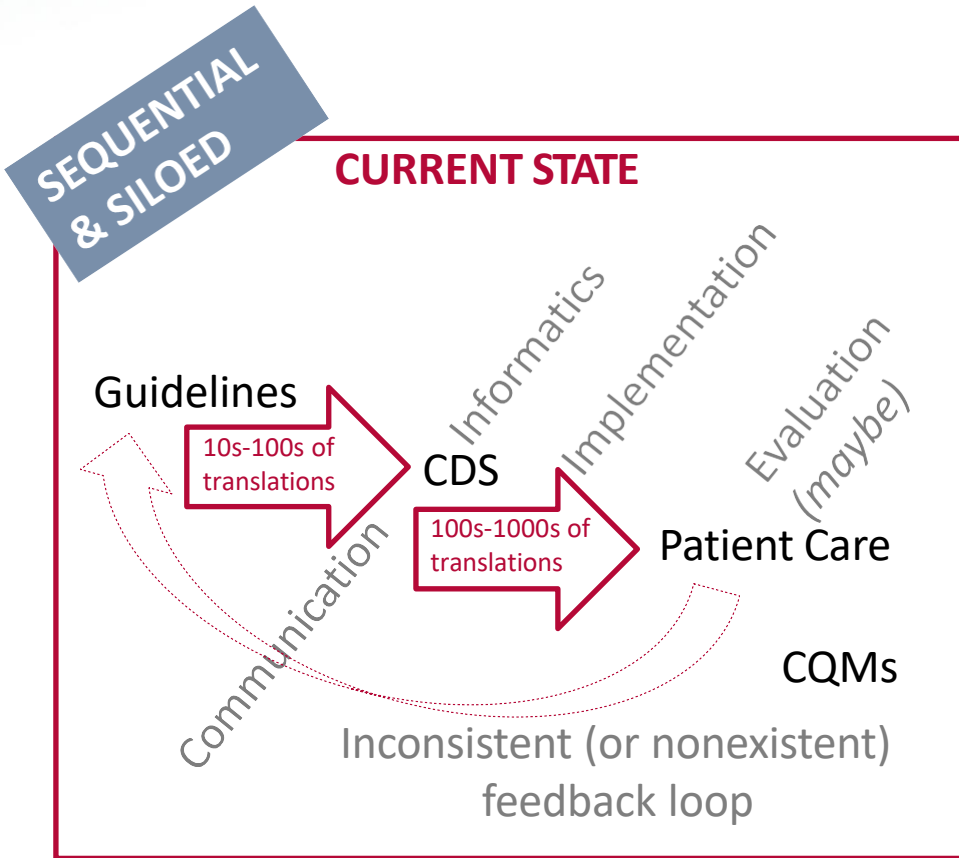
Participating Partner Groups

- Guideline authors
- Health IT developers
- Communicators
- Clinicians
- Patients / Patient Advocates
- Medical Societies
- Public Health Organizations
- Evaluation experts

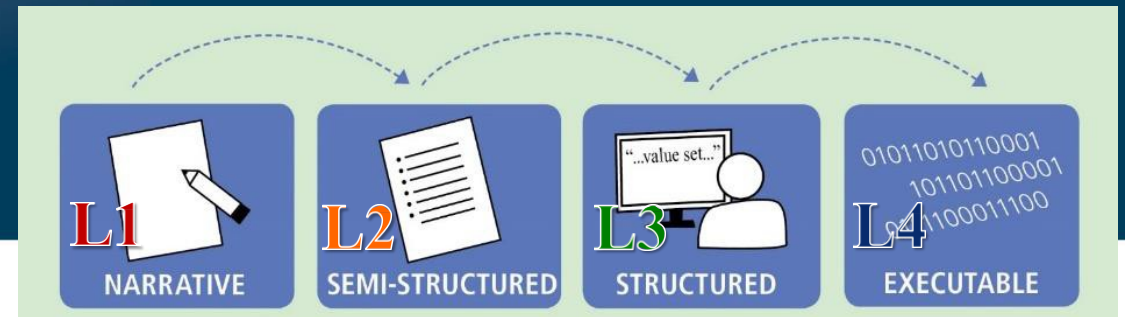


- Standards experts
- Clinical decision support developers
- Clinical quality measure developers
- Policy or technical support for implementation

Redesigning Guideline Development, Implementation, and Feedback Loops



Translating Evidence to Executable CDS

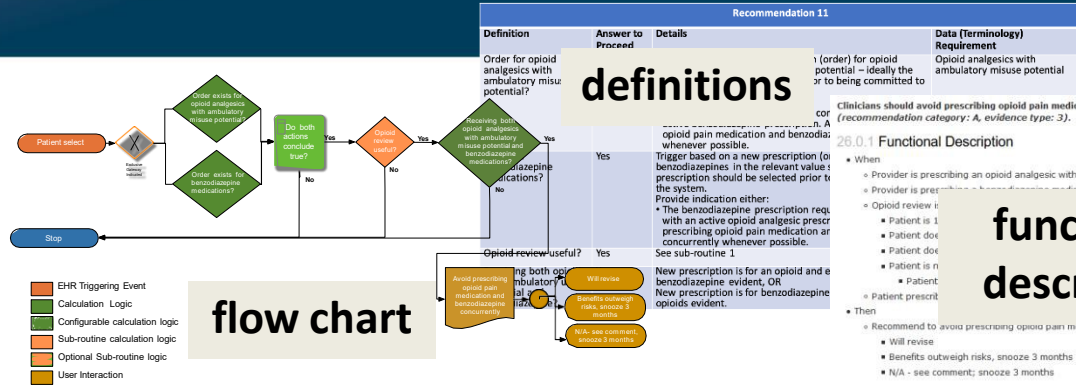


Knowledge Level	Description	Example
L1	Narrative	Guideline for a specific disease that is written in the format of a peer-reviewed journal article
L2	Semi-structured	Flow diagram, decision tree, or other similar format that describes recommendations for implementation [HUMAN READABLE]
L3	Structured	Standards-compliant specification encoding logic with data model(s), terminology/code sets, value sets that is ready to be implemented [COMPUTER READABLE]
L4	Executable	CDS implemented and used in a local execution environment (e.g., CDS that is live in an electronic health record (EHR) production system) or available via web services

How Computable Guidelines Work in Practice

L1

L2



functional description

26.0.1 Functional Description

- When
 - Provider is prescribing an opioid analgesic with ambulatory misuse potential in the outpatient setting;
 - Provider is prescribing a benzodiazepine;
 - Opioid review is required;
 - Patient is 18 years of age or older;
 - Patient does not have a documented history of substance use disorder;
 - Patient is not pregnant;
 - Patient is not breastfeeding;
 - Patient is not on a benzodiazepine concurrently;
- Then
 - Recommend to avoid prescribing opioid pain medication and benzodiazepine concurrently;
 - Will revise
 - Benefits outweigh risks, snooze 3 months
 - N/A - see comment; snooze 3 months

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Opioid Overdose

CDC - Opioid Overdose - Information for Providers

CDC Guideline for Prescribing Opioids for Chronic Pain

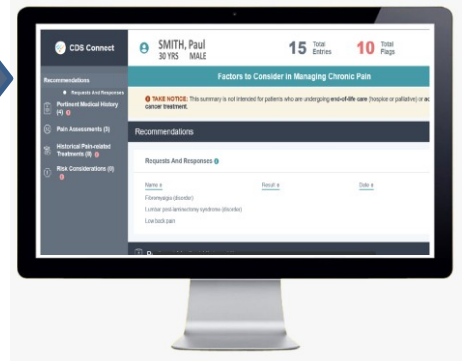
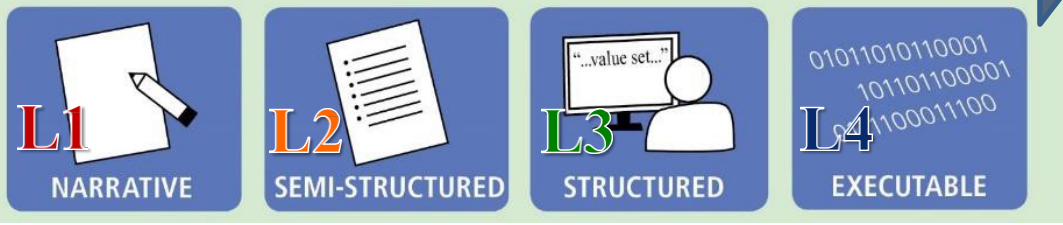
Improving the way opioids are prescribed through practice guidelines can more effectively reduce the number of people who die from opioid overdose.

11. Clinicians should avoid prescribing opioid pain medication and benzodiazepines concurrently whenever possible (recommendation category: A, evidence type: 3).

prose recommendation

<https://www.cdc.gov/drugoverdose/prescribing/guideline.html>

progressively more structured



L4

executed in an EHR

30.25.1 Opioid Analgesics With Ambulatory Misuse Potential

Summary

Definition URL: <http://fhir.org/guides/ctd/ctd/StructureDefinition/opioid-analgesics-with-ambulatory-misuse-potential>

Name: Opioid_Analgesics_With_Ambulatory_Misuse_Potential

Status: Experimental

Version: 1.0.0

Identified by those using an

terminology

30.25.1 StructureDefinition: CDC_MedicationRequest

data elements

This structure is derived from CDMMedicationRequest

Name	Flags	Card.	Type	Description & Constraints
MedicationRequest	0..*	1	CDMMedicationRequest	Ordering of medication for patient or group
medication[x]	1..1	1	CodeableConcept	Medication to be taken
dosageInstruction	1..1	1	Dosage	How the medication should be taken
timing	1..1	1	Timing	When medication should be administered
repeat	1..1	1	Element	When the event is to occur
frequency	1..1	1	Duration	Event occurs frequency times per period
period	1..1	1	Duration	Event occurs frequency times per period
permitted	1..1	1	Code	1..1 Min [1..1] Max [1..1] a = unit of time (UCUM) Task: "to-restrict" (ncr-0)
authoredOn	0..1	1	Instant	Task: "to-restrict" (ncr-0)

logic

```

context Patient

define "Opioid Analgesic Common: Is Opioid Analgesic":
  "http://fhir.org/guides/ctd/ctd/StructureDefinition/opioid-analgesics-with-ambulatory-misuse-potential"

define "Benzodiazepine Common: Is Benzodiazepine":
  "http://fhir.org/guides/ctd/ctd/StructureDefinition/benzodiazepine"

define "Patient Is Being Prescribed Opioid Analgesic with Ambulatory Misuse Potential":
  OpioidAnalgesicCommon.IsOpioidAnalgesic

define "Patient Is Being Prescribed Benzodiazepine":
  BenzodiazepineCommon.IsBenzodiazepine

define "Patient Is Being Prescribed Opioid Analgesic with Ambulatory Misuse Potential and Benzodiazepine Concurrently":
  Patient.IsBeingPrescribedOpioidAnalgesicWithAmbulatoryMisusePotential
  and
  Patient.IsBeingPrescribedBenzodiazepine

define "Opioid Review Useful?":
  Patient.IsBeingPrescribedOpioidAnalgesicWithAmbulatoryMisusePotential
  and
  Patient.IsBeingPrescribedBenzodiazepine
  and
  Patient.IsNotPregnant
  and
  Patient.IsNotBreastfeeding
  and
  Patient.IsNotOnBenzodiazepineConcurrently
  and
  Patient.IsNotOnSubstanceUseDisorder
  and
  Patient.IsNotOnBenzodiazepineConcurrently

define "Action":
  {
    "title": "Existing patient has concurrent opioid and benzodiazepine prescriptions.",
    "description": "Checking if the trigger prescription meets the inclusion criteria for recommendation",
    "documentation": [
      {
        "type": "documentation",
        "url": "http://fhir.org/guides/ctd/ctd/StructureDefinition/opioid-analgesics-with-ambulatory-misuse-potential",
        "display": "documentation"
      }
    ]
  }

define "Code":
  {
    "code": "strong",
    "display": "strong"
  }

define "ValueSet":
  {
    "valueSet": "http://hl7.org/fhir/StructureDefinition/cd-qualityofevidence",
    "valueSetConcept": "http://hl7.org/fhir/StructureDefinition/cd-qualityofevidence-3"
  }
    
```

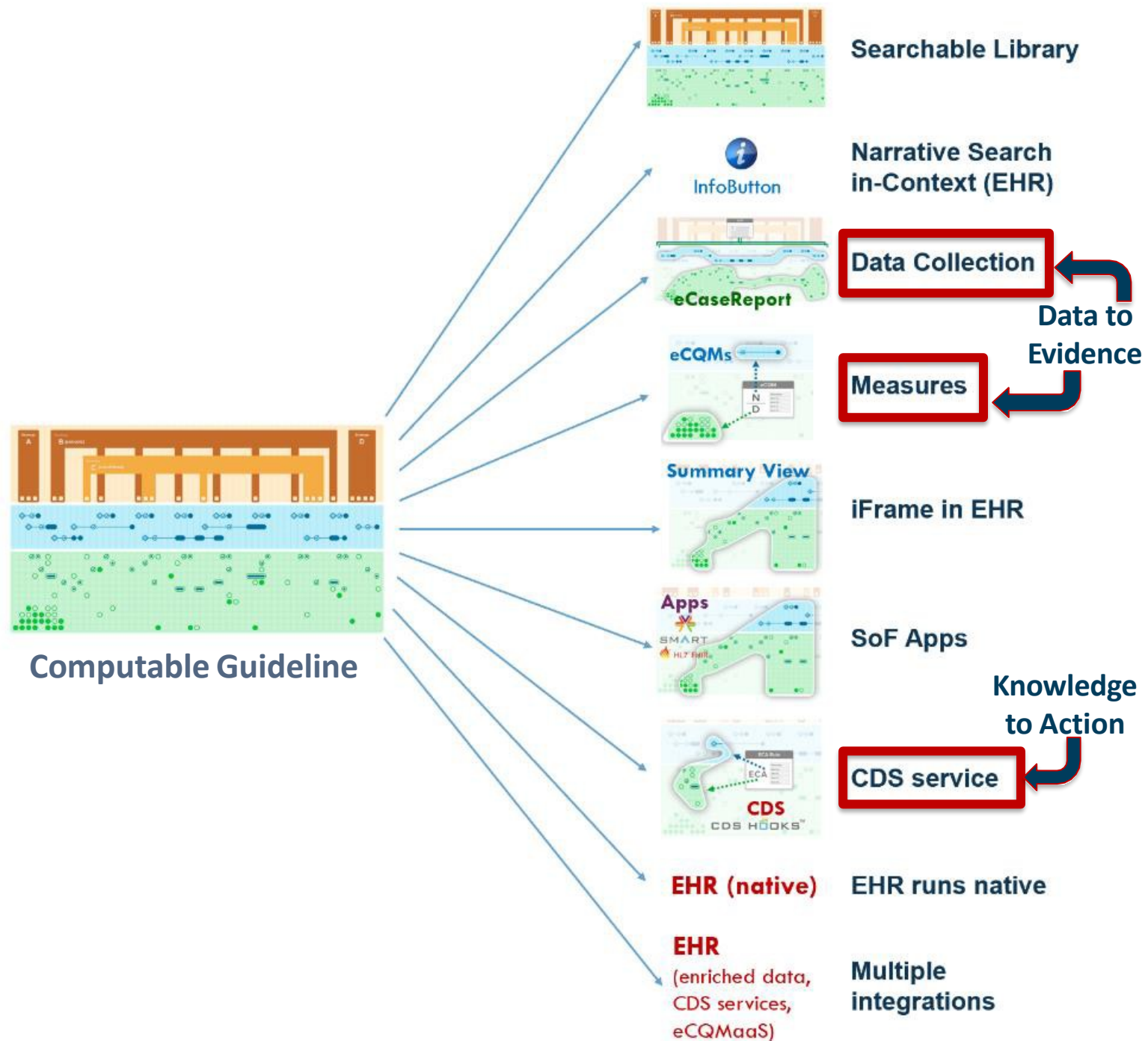
computable recommendation

L3

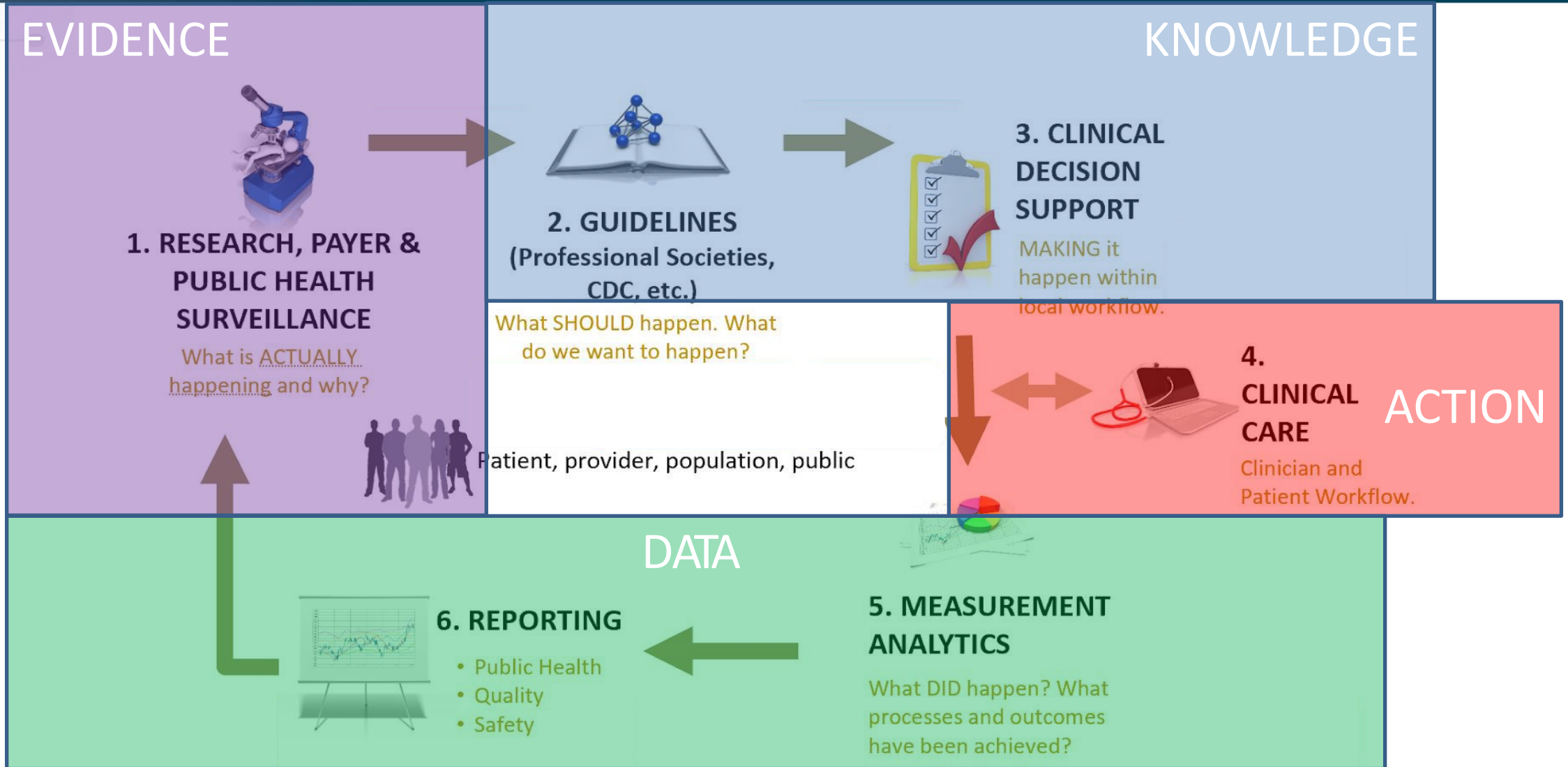
<https://cds.ahrq.gov/cdsconnect/artifact/recommendation-11-concurrent-use-opioids-and-benzodiazepines>

One Translation

Many Ways to Implement It



Clinical Quality Lifecycle / The Learning Health System



QUESTIONS?

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

