STANDARDS-BASED ONC-CDC DECISION SUPPORT RESOURCES FOR CDC PRESCRIBING GUIDELINE: DEVELOPMENT, USE, AND LESSONS LEARNED

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KENSAKU KAWAMOTO, MD, PHD, MHS

ASSOCIATE CHIEF MEDICAL INFORMATION OFFICER

VICE CHAIR OF CLINICAL INFORMATICS, DEPT. OF BIOMEDICAL INFORMATICS

DISCLOSURES

- In the past year, I have been a consultant or sponsored researcher on clinical decision support for ONC*, Hitachi, McKesson InterQual, and Klesis Healthcare

*via SRS, Inc. and ESAC, Inc.

ONC-CDC OPIOID DECISION SUPPORT PROJECT

- Goal: provide point-of-care, standards-based decision support for CDC Prescribing Guideline
- ONC and CDC-sponsored effort
- Contributors: CDC, ONC, AHRQ, Yale, SRS, ESAC, Epic, and many others
- Approach:
  - Use of HL7 standards: CDS Hooks, SMART on FHIR, CQL
  - Use of open-source OpenCDS framework (opencds.org)
  - Pilot implementation at University of Utah with Epic EHR using CDS Hooks and SMART on FHIR

TARGETED RECOMMENDATIONS (INITIAL)

4. When starting opioid therapy for chronic pain, prescribe **immediate-release opioids** instead of extended-release/long-acting (ER/LA) opioids

5. Carefully reassess evidence of individual benefits and risks when considering increasing dosage to ≥50 **morphine milligram equivalents (MME)**/day, and avoid increasing dosage to ≥90 MME/day or carefully justify a decision to titrate dosage to ≥90 MME/day

TARGETED RECOMMENDATIONS (INITIAL)

7. **Evaluate** benefits and harms with patients within 1 to 4 weeks of starting opioid therapy for chronic pain or of dose escalation. Evaluate benefits and harms of continued therapy with patients every 3 months or more frequently.

8. Consider offering **naloxone** when factors that increase risk for opioid overdose are present

10. Use **urine drug testing** before starting opioid therapy and consider urine drug testing at least annually

11. Avoid prescribing opioid pain medication and **benzodiazepines** concurrently

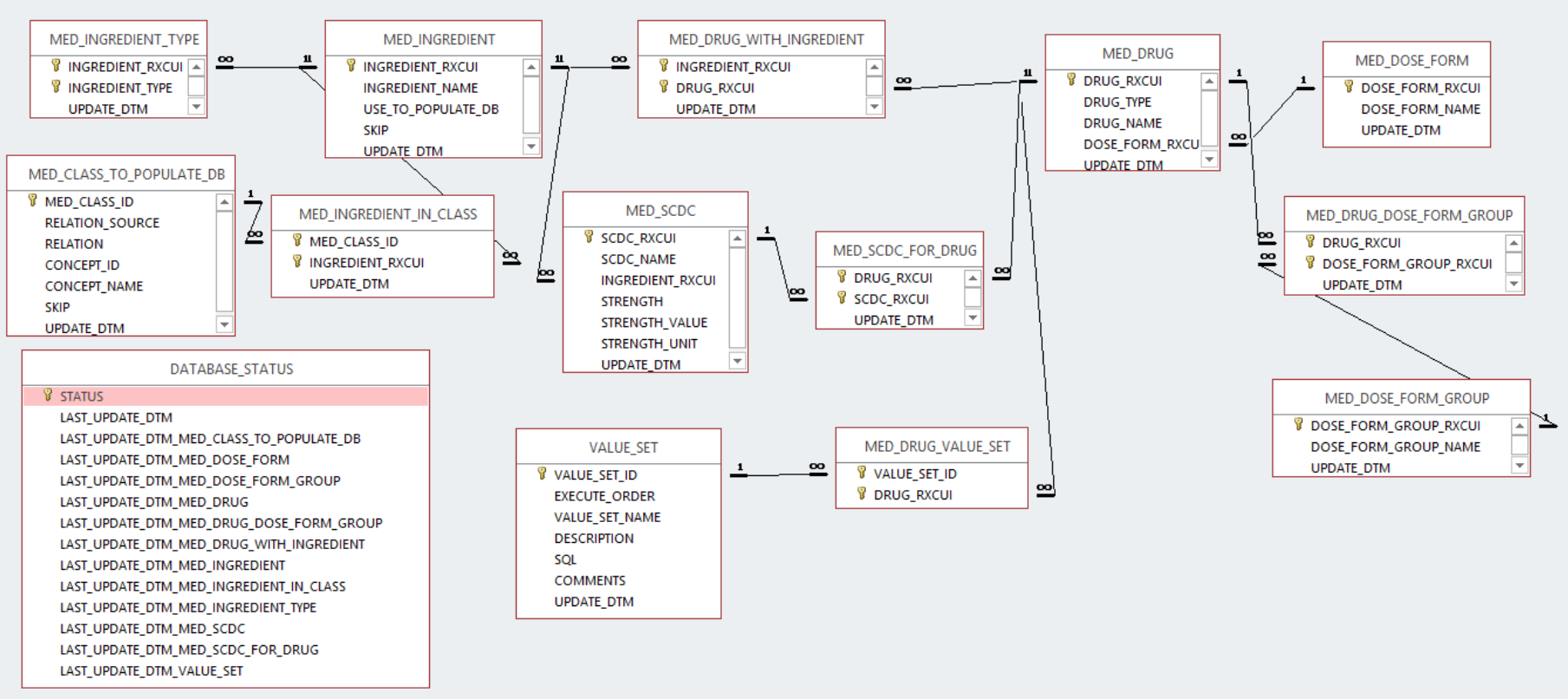
EXAMPLE CQL

```
// TotalMME - Sum of all MME for currently and about-to-be prescribed opioid medications
define TotalMME: System.Quantity { value: Sum(MME M return M.mme.value), unit: 'mg/d' }

define IsMME50OrMore: TotalMME >= 50 'mg/d'

define Results:
  IsMME50OrMore M
  return {
    mmeOver50: M,
    title:
      if M
      then 'High risk for opioid overdose - '
           + case when TotalMME.value >= 90
               then 'taper now'
               else 'consider tapering'
             end
      else 'MME is within the recommended range.',
      description:
        if M
        then 'Total morphine milligram equivalent (MME) is ' + ToString(TotalMME) + '. Taper to less than 50.'
        else 'Total morphine milligram equivalent (MME) is ' + ToString(TotalMME) + '. This falls within the accepted range.'
  }
```

NLM RXNAV-BASED TERMINOLOGY KNOWLEDGE



FREE TEXT SIG PARSING

- Close to 20% of opioid Rxs use free-text Sigs (>10,000 unique patterns). E.g.:
  - 1-2 tablets q 3 hours as needed for pain up to a max of 12/day. Not valid without seal. May fill 3 days before use date. Use dates: X/XX-X/XX/2017.
- Traditional analytics tools cannot evaluate free-text Sigs
- Parsing algorithms developed to enable computation on ~80% of Sigs

BestPractice Advisory - Testpatient,Opioid1

Patient's average oral morphine equivalence (OME) is **87.33** mg/day. CDC recommends reassessing evidence of individual benefits and risks when increasing dosage to >= 50 OME/d.

Active Opioid Rx	Start Date	Ave. OME/day*	Max OME/day*
[New] Oxycodone Hydrochloride 5 MG Oral Tablet > Sig: 5 mg Oral Every 6 hours as needed Click for Details	02/10/18	30 mg	30 mg
FENTANYL CITRATE 200 MCG BU LPOP ***** May be expiring soon ***** > Sig: Place 1 each (200 mcg) inside cheek every 2 hours as needed. Use prior to bowel movements, maximum 4 per day Click for Details	02/06/18	17.33 mg	104 mg
HYDROCODONE-ACETAMINOPHEN 10-325 MG PO TABLET ***** Not adding OME for presumed redundant Rxs with start dates of 02/06/18 and 04/06/18. ***** > Sig: Earliest Fill Date: 3/7/18. Take 1-1.5 tables by mouth every 4 hours as needed for pain Click for Details	03/06/18	40 mg	90 mg
Total		**87.33 mg**	**224 mg**

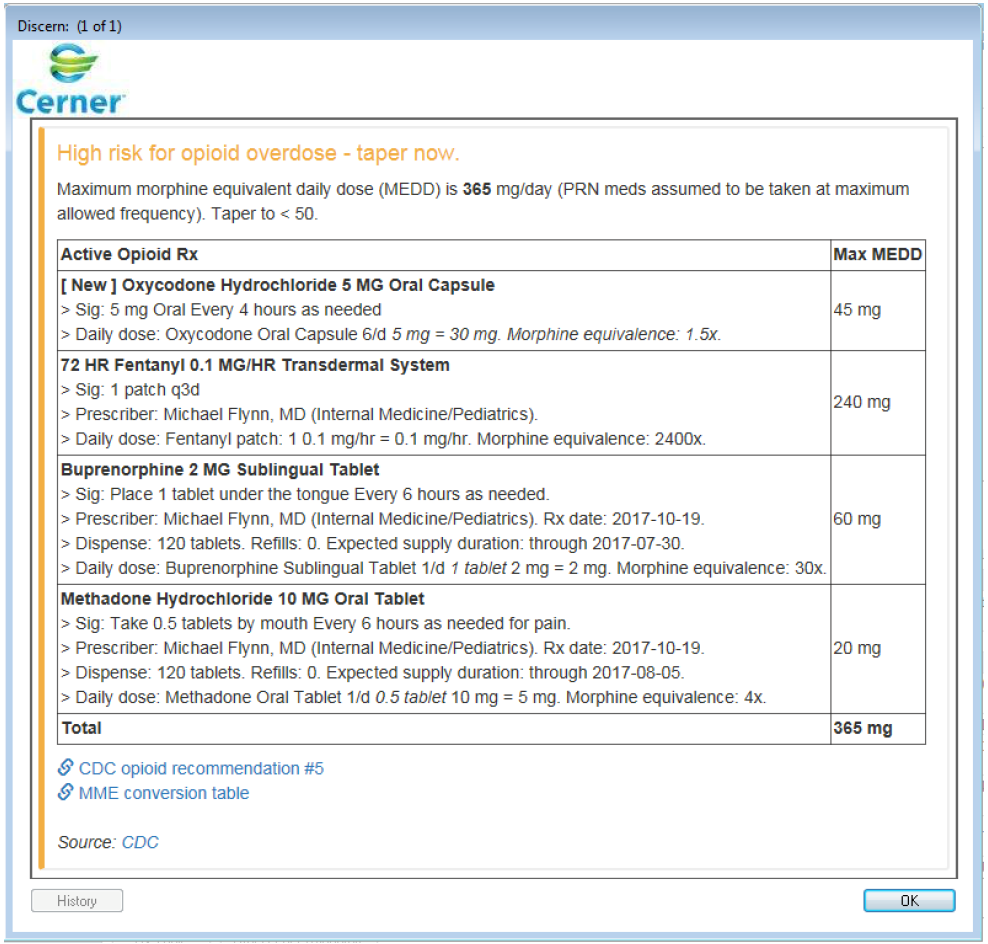
*Ave OME = (qty dispensed)/(days supply). 30d supply assumed unless otherwised noted in Sig or note to pharmacy.
*Max OME = max amount patient may take on a given day according to Sig, even if patient runs out of med early.

OME conversion table
CPG opioid Rx guideline
Source: CDC opioid Rx guideline -- recommendation #5

Acknowledge Reason

Rx appropriate currently - snooze 3 mo | Actual OME is lower - snooze 3 mo | Opioid taper in progress - snooze 3 mo
Will reduce dose - snooze 1 mo | Tx for opioid use disorder - snooze 6 mo | Active cancer Tx - snooze 6 mo
Palliative care - snooze forever

Accept | Cancel



BestPractice Advisory - Testpatient,Opioid1

Patient's average oral morphine equivalence (OME) is 192.33 mg/day.

Daily Average OME (mg/day)

For adults, CDC recommends reassessing evidence of individual benefits and risks when increasing dosage to >= 50 OME/day, and avoid increasing dosage to >= 90 OME/day or carefully justifying such a decision.

Active Opioid Rx	Avg OME/day*
New **Oxycodone Hydrochloride 15 MG Oral Tablet**	135 mg
FENTANYL CITRATE 200 MCG BU LPOP	17.33 mg
⚠ Verify taking; Rx may have expired	
HYDROCODONE-ACETAMINOPHEN 10-325 MG PO TABLET	40 mg
⚠ Verify taking; Rx may have expired	
⚠ Not adding OME for presumed redundant Rxs with start dates of 02/07/18 and 03/07/18.	
Total Average OME/Day	192.33 mg

*Avg OME = (qty dispensed)/(days supply). 30d supply assumed unless otherwised noted in Sig or note to pharmacy.

*Max OME (see details) = max amount patient may take on a given day according to Sig, even if patient runs out of med early.

OME conversion table

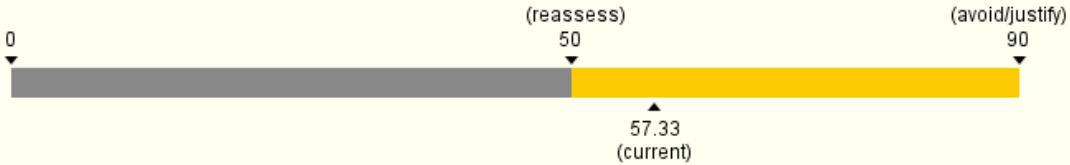
CDC opioid Rx guideline

Accept Cancel

Outpatient Opioid Oral Morphine Equivalence (OME) Calculator

Patient's average oral morphine equivalence (OME) is **57.33** mg/day.

Daily Average OME (mg/day)

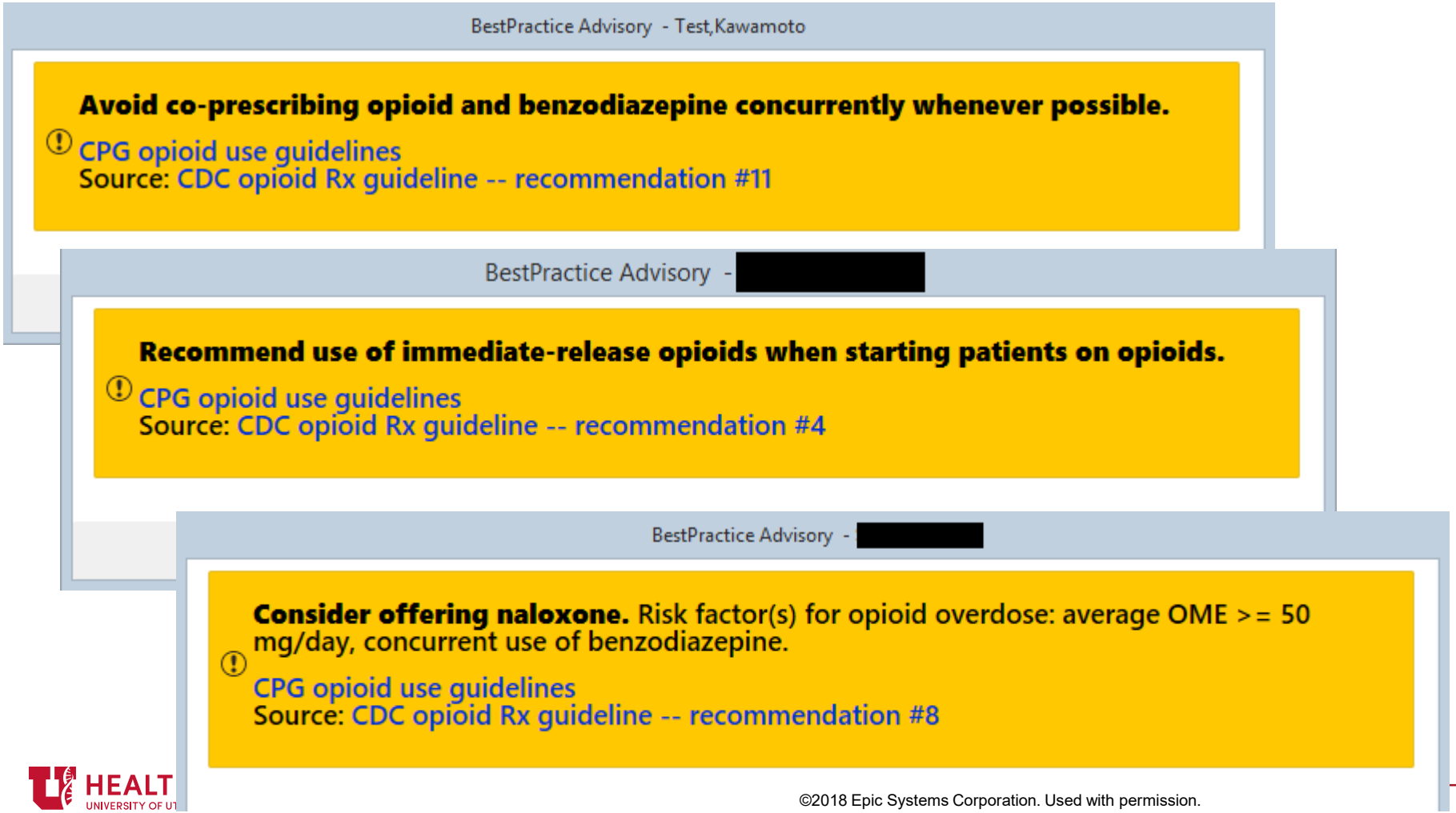


For adults, CDC recommends reassessing evidence of individual benefits and risks when increasing dosage to >= 50 OME/day.

Active Opioid Rx	**Avg OME/day***
FENTANYL CITRATE 200 MCG BU LPOP ⌄⌄	**17.33 mg**
⚠ Verify taking; Rx may have expired	
HYDROCODONE-ACETAMINOPHEN 10-325 MG PO TABLET ⌄⌄	**40 mg**
⚠ Verify taking; Rx may have expired	
⚠ Not adding OME for presumed redundant Rxs with start dates of 02/07/18 and 03/07/18.	
Total Average OME/Day	**57.33 mg**

*Avg OME = (qty dispensed)/(days supply). 30d supply assumed unless otherwised noted in Sig or note to pharmacy.
*Max OME (see details) = max amount patient may take on a given day according to Sig, even if patient runs out of med early.

OME conversion table
CPG opioid Rx guideline
Source: CDC opioid Rx guideline -- recommendation #5



LESSONS LEARNED

- Bleeding-edge work: ordering-based CDS "Hooks" not yet standardized, EHR vendor implementations in process
  - Required use of CDS Hooks middleware and/or SMART on FHIR
- Complex CDS Hooks visual displays handled differently by different EHR vendors; requires further standardization
- Achieving desired end-user functionality requires hybrid of CDS Hooks services and local EHR CDS capabilities
  - E.g., snoozing, enabling 1-click order placement and cancellation, restricting service invocation to relevant contexts
- Despite challenges, evidence-based care supported by standards-based CDS finally appears to be within reach

FUTURE DIRECTIONS

- Standards-based encoding of remaining 6 CDC Prescribing Guideline recommendations as CDS Hooks services
- Pilot deployments and iterative enhancement
- Impact evaluation
- Facilitating enhancement and adoption of underlying standards
- Use of SMART on FHIR in addition to CDS Hooks for workflow integration
- Ultimate goal: widespread dissemination and impact

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Disclaimer: The findings and conclusions in this presentation are those of the presenter and do not necessarily represent the official position of CDC or of the organizations involved

THANK YOU!

Kensaku Kawamoto, MD, PhD, MHS

Associate Chief Medical Information Officer

Vice Chair of Clinical Informatics, Dept. of Biomedical Informatics

University of Utah

kensaku.kawamoto@utah.edu