

**Using SNOMED CT
to clarify prescription directions
in the US e-prescribing standard**

NCPDP 'Structured Sig'

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Topics



Background: E-prescribing in the United States

- The US e-prescribing environment
- E-prescribing challenges
(spoiler: includes issues with directions/sig)

SNOMED CT in Structured Sig

- Development and testing of the standard
- Use of SNOMED CT in the structured format
- Adoption of the standard

The NCPDP *Implementation of Structured Sig* task group

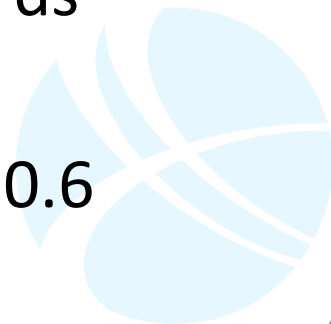
- Helping first-time implementers with SNOMED CT
- SNOMED CT in initial Structured Sig examples
- Next efforts to increase adoption



BACKGROUND: E-PRESCRIBING IN THE UNITED STATES

E-prescribing in the US today

- E-prescribing (eRx) is becoming the norm in the United States, largely due to federal incentive programs
 - From December 2006 to April 2014, the nation went from very few physicians e-prescribing to 70%¹
 - In every state, more than 90% of pharmacies can accept e-prescriptions (as of April 2014)¹
 - From 2008 to 2013, new and renewal prescription volume sent electronically increased 13-fold¹
- NCPDP: US-specific pharmacy exchange standards body
- The current US eRx standard is NCPDP SCRIPT 10.6



eRx challenges

- Even with e-prescribing, pharmacists must intervene when content contains errors or conflicting info
 - 2011: Pharmacists intervene on 3.8%² of e-prescriptions
- Pharmacist intervention may have *increased* due to eRx
 - A 1992 study³ by same researcher: 1.9% intervention rate
- A recent US eRx error reporting project⁴ found that most challenges were related to...
 - **sig / directions (25%)**
conflicting or missing info, inappropriate directions
 - quantity selection (18%)
 - conflicting information (11%)
 - dose selection (10%)



Other eRx opportunity areas

- Long-term and post-acute care
 - Use is low but increasing due to a federal rule taking effect Nov. 2014. More complex **timing, instructions**
- Specialty pharmacy
 - Requires additional patient clinical and **administration detail** not currently supported by NCPDP SCRIPT. NCPDP has work underway to extend the standard
- “Optional” prescription content and workflows
 - Prescription cancelation, change and dispense message
 - Enhanced content to clarify diagnosis, alerts and **directions**



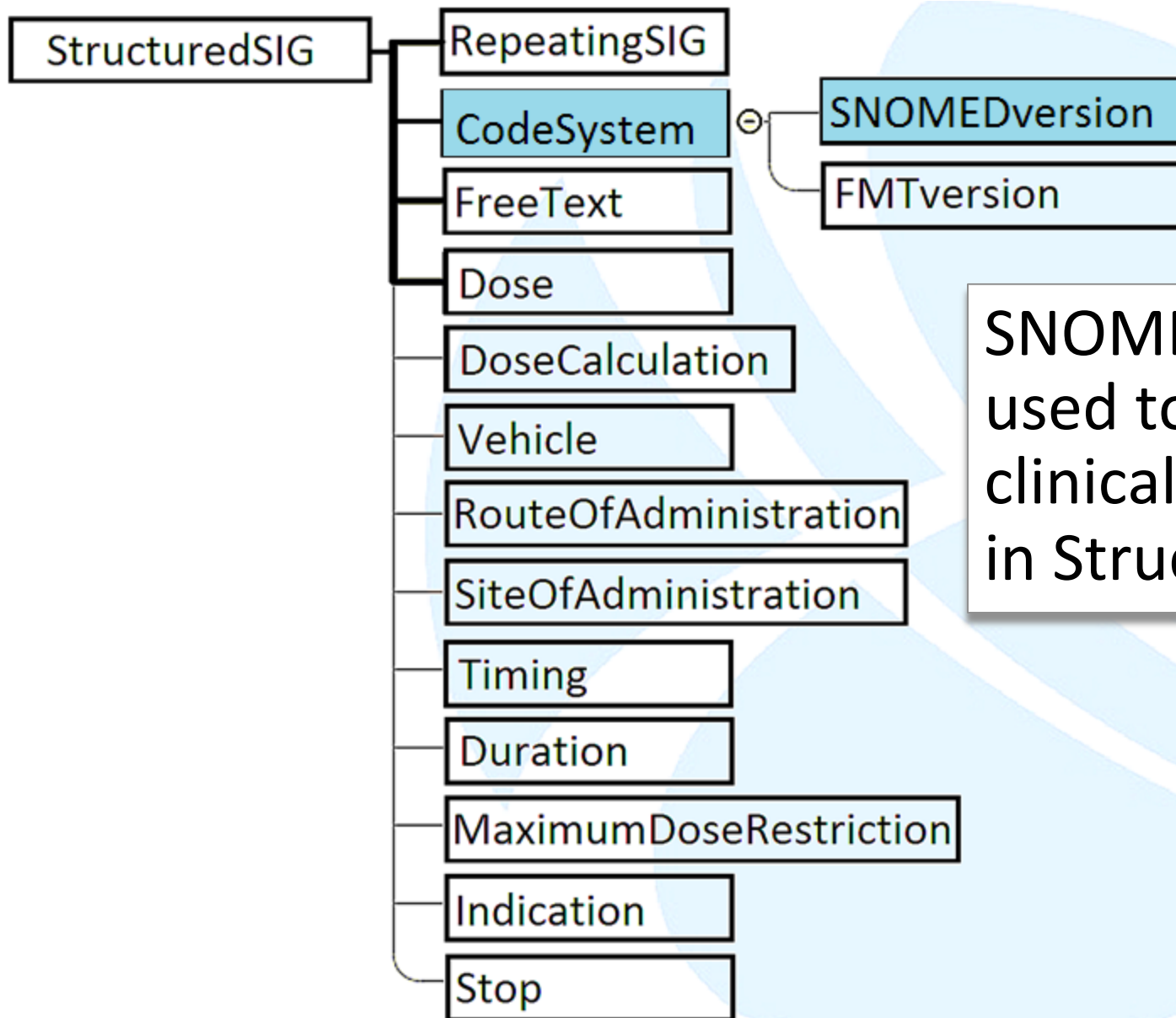


SNOMED CT IN STRUCTURED SIG

NCPDP *Structured Sig* standard

- *Structured Sig* is an NCPDP standard that represents Sig information in a standardized, unambiguous format
- Used within NCPDP e-prescribing messages
- Development began in 2004, at request of the National Committee on Vital and Health Statistics (NCVHS)
- 2009 test by RAND⁵ found that Structured Sig supported 95% of 20,000+ consecutive prescriptions from 82 prescribers in three US states
 - RAND also identified opportunities for improvement—esp. in the representation of multi-step instructions—addressed in later versions of the standard



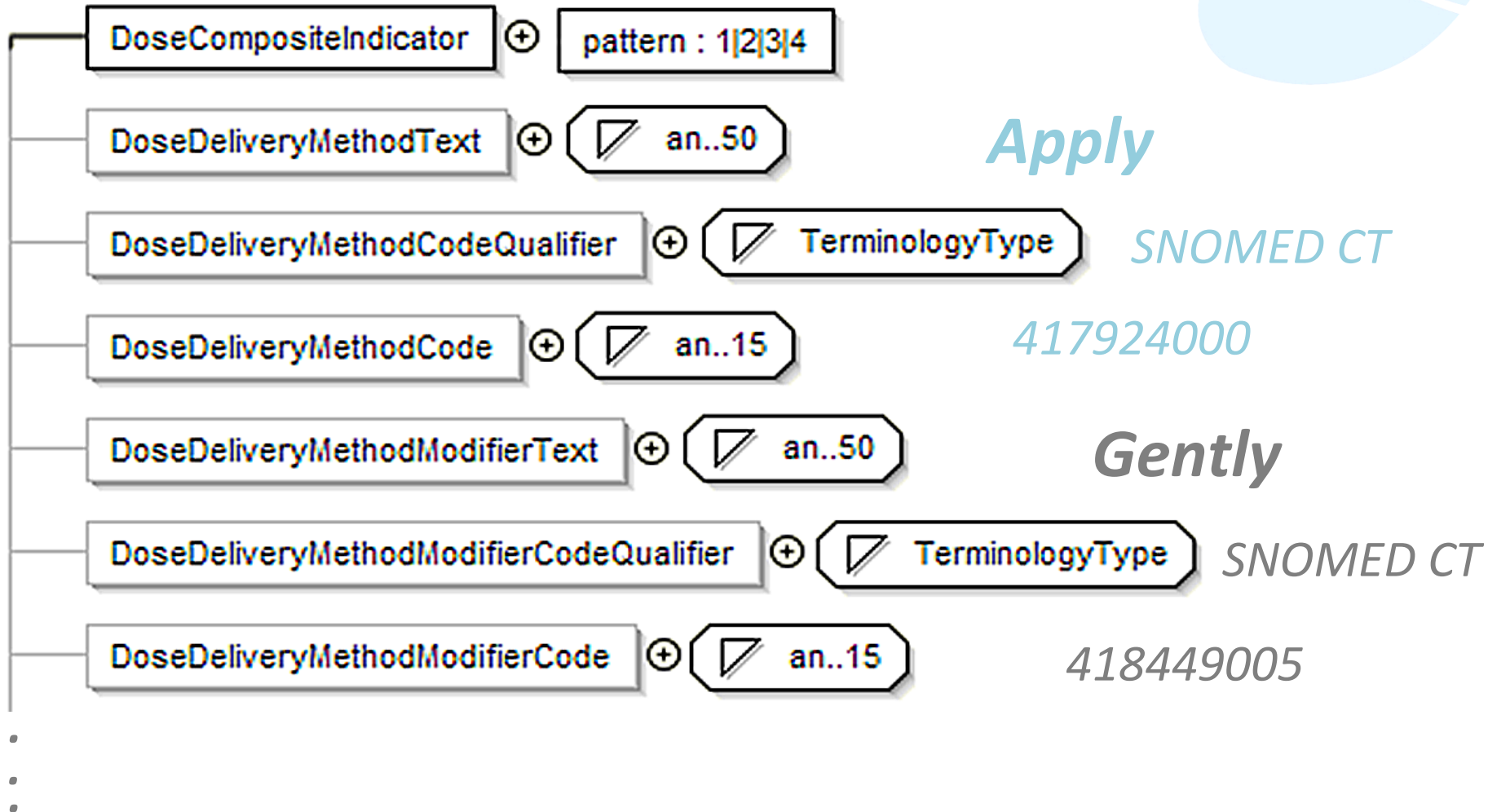


SNOMED CT is used to codify clinical concepts in Structured Sig

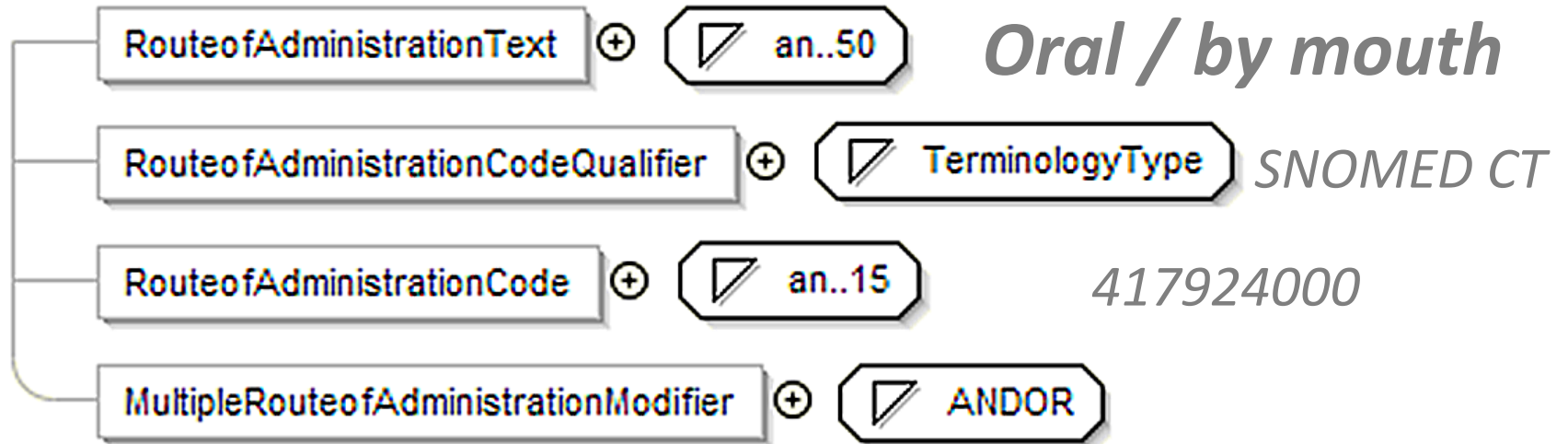
Some examples...



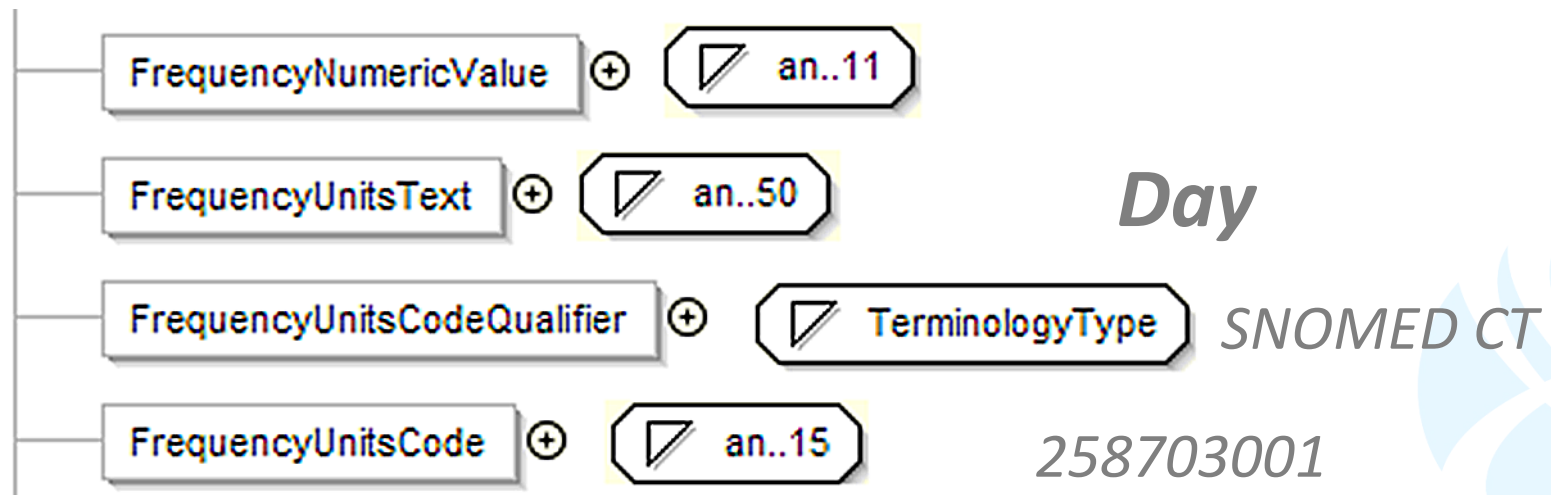
Dose



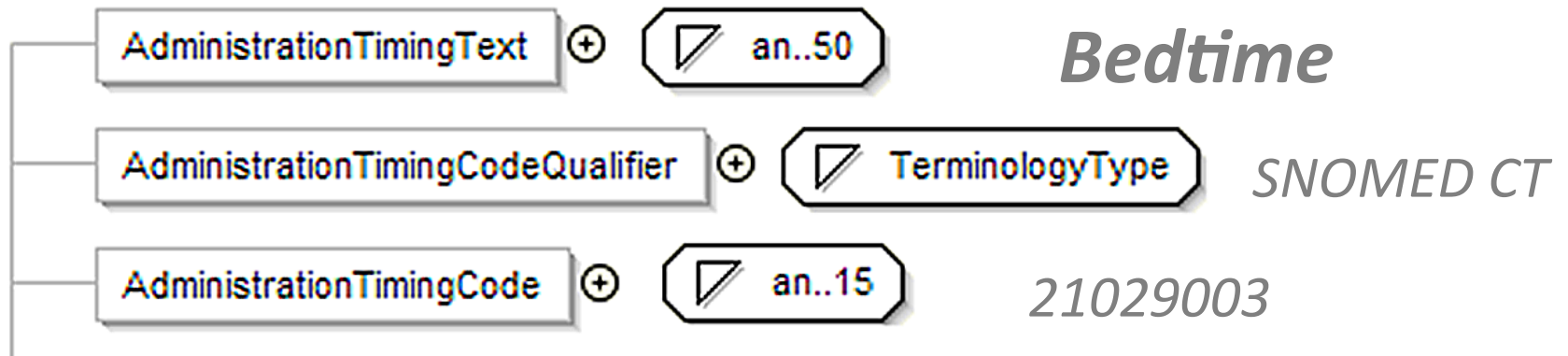
Route



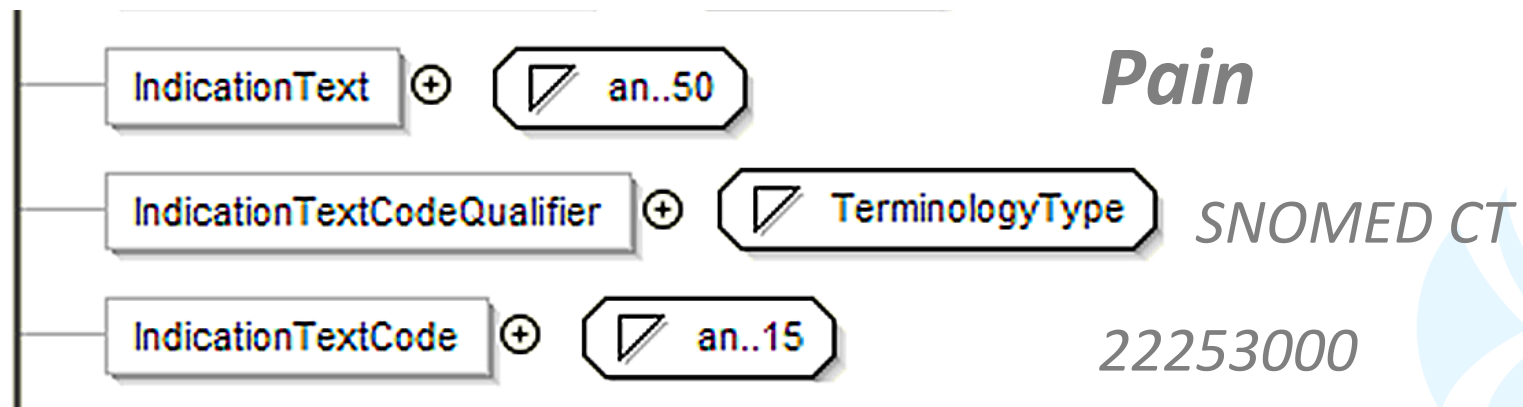
Timing (units)



Timing (qualifier)



Indication (precondition)



Take 1 tablet by mouth every 6 hours as needed for pain

(SCRIPT 10.6)

Structured Sig Element	Value
CodeSystem	
SNOMEDVersion	20130731
FMTVersion	14.01d
FreeText	
SigFreeTextStringIndicator	2
SigFreeText	Take 1 tablet by mouth every 6 hours as needed for pain
Dose	
DoseCompositeIndicator	1
DoseDeliveryMethodText	take
DoseDeliveryMethodCodeQualifier	SNOMED CT
DoseDeliveryMethodCode	419652001
DoseQuantity	1
DoseFormText	tablet
DoseFormCodeQualifier	2
DoseFormCode	C42998

Structured Sig Element	Value
RouteofAdministration	
RouteofAdministrationText	oral route
RouteofAdministrationCodeQualifier	SNOMED CT
RouteofAdministrationCode	26643006
Timing	
IntervalNumericValue	6
IntervalUnitsText	Hour
IntervalUnitsCodeQualifier	SNOMED
IntervalUnitsCode	258702006
Indication	
IndicationPrecursorText	as needed for
IndicationPrecursorCodeQualifier	SNOMED CT
IndicationPrecursorCode	420449005
IndicationText	Pain
IndicationTextCodeQualifier	SNOMED CT
IndicationTextCode	22253000

ADOPTION



Adoption of Structured Sig is... slow

“It’s needed. It’s proven. People must be using it, right?”

- Actually, no. Very limited adoption to-date
- Due to...
 - Concerns over complexity—the standard covers complex sigs used in inpatient and long-term care, but uncommon elsewhere. “Where do I stop?”
 - Uncertainty about what parts of the standard their information exchange partners will support
 - Especially on the pharmacy side. “What should I expect to receive?”
 - Conflicting development priorities (especially federal Meaningful Use / EHR certification). “I don’t have time to implement everything”



Industry requested a smaller and more concrete starting point

- In 2013, the National Institute of Standards and Testing (NIST) held listening sessions with pharmacies, EHR vendors, networks representing majority of US eRx use
- Many were interested in pursuing Structured Sig

But...

- Unfamiliarity with—and size of—SNOMED CT given as an obstacle. Need direction, examples
- Size of the Structured Sig standard is another big obstacle. Several requested an initial, constrained “Structured Sig implementation subset”





NCPDP 'IMPLEMENTATION OF STRUCTURED SIG' TASK GROUP

Task group's goal...

Remove implementation uncertainties

- Approach: Define a concrete, modest, but useful target for implementers
 - **Identify a small set of directions/sigs that cover the majority of ambulatory prescriptions in the US**
 - Create a full set of example messages for these, including SNOMED CT concepts
 - Provide basic guidance on SNOMED CT specific to concepts used in the small “starter set” of sigs
Reference IHTSDO resources, including the Starter Guide, browser listing, and online content in the E-Learning Center
 - Capture concrete implementation questions/answers



Focused on a limited set of sigs

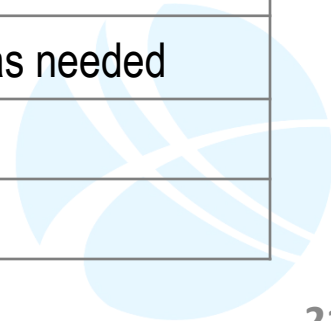
- Helped limit distractions and hypotheticals
- Enabled the group to thoroughly understand implementers' obstacles.
- By building out all of the examples in detail, the task group ran into the questions that implementers would confront
 - The group could then determine the resolution and capture the guidance—clearing the way for others
- Gave the group permission to finish a limited but useful set of work



24 Sigs cover most US prescriptions

(Based on volume at participating national retail chains & mail service pharmacies)

Take 1 tablet by mouth daily	Take 1 tablet by mouth every 6 hours as needed
Take 1 tablet by mouth twice a day	Take 2 tablets by mouth twice daily
Take 1 tablet by mouth at bedtime	Take 1 tablet by mouth twice a day for 10 days
Take 1 tablet by mouth 3 times a day	Take 1 tablet by mouth twice a day as needed
Take as directed	Take 1 tablet by mouth daily as directed
Take 1 tablet by mouth every morning	Take 1 tablet by mouth 3 times a day as needed
Take 1 tablet by mouth every evening	Take 1 tablet by mouth every 12 hours
Take 1 tablet by mouth every 6 hours as needed for pain	Take 1 tablet by mouth every 4 to 6 hours as needed for pain
Take 2 tablets by mouth as one dose on the first day then take one tablet daily thereafter	Take 1 to 2 tablets by mouth every 4 to 6 hours as needed for pain
Take 2 tablets by mouth every day for 5 days	Take 1 tablet by mouth at bedtime as needed
Take 2 tablets by mouth daily	Take 1 tablet by mouth weekly
Take 1 tablet by mouth 4 times a day	Take ½ tablet by mouth daily



Dealt with low SNOMED CT familiarity

- Little familiarity with SNOMED CT among those who develop e-prescribing functions in US prescriber and pharmacy systems
- Didn't expect stakeholders to become experts in SNOMED in order to implement Structured Sig
- Took the approach...
 - Direct implementers to existing IHTSDO resources
 - Highlight basic usage rules specific to Structured Sig
 - **Focus on concepts in the selected examples**

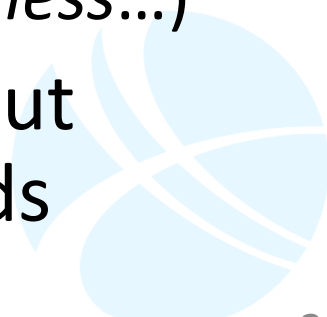


SNOMED CT concepts needed for the majority of US Rx directions

DoseDeliveryMethodCode TAKE – 419652001	IntervalUnitsCode HOUR – 258702006	“As directed” by clinician PROVIDER MEDICATION ADMINISTRATION INSTRUCTIONS – 422037009
RouteofAdministrationCode ORAL – 26643006	DurationTextCode DAY – 258703001 AFTER - 255234002	
AdministrationTimingCode MORNING – 73775008 EVENING - 3157002 BEDTIME – 21029003	IndicationPrecursorCode AS NEEDED FOR 420449005	“As directed” by the manufacturer (pkg. or insert) INSTRUCTIONS FROM THE MEDICATION MANUFACTURER [to be assigned in US extension]
FrequencyUnitsCode DAY – 258703001 WEEK – 258705008	IndicationTextCode PAIN – 22253000	

Task group challenges and learnings

- No real SNOMED CT experts in the group
 - The modest set of sigs gave a gentle learning curve
 - Sought help when we needed it
- Tendency to want to expand scope to a wider range of [more interesting] types of directions
 - Difficult to keep our goals modest
 - Desire to deliver *more*
(even though stakeholders were asking for *less*...)
- Found challenges in the Sig standard—but agreed on and documented workarounds



Next efforts to increase adoption

- Approval at November NCPDP workgroup— incorporated into an NCPDP guidance document
- Continuation of the task group's work, addressing less common (and more complex) directions
- NIST incorporation of the task group's Structured Sig examples into a message validator for industry use
- Possibility of Structured Sig being included in future federal incentive / certification programs
- Availability of a newer Structured Sig version—that addresses challenges identified so far



Thank you, from...

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www.ncdp.org

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2. Warholak TL, Rupp MT. Analysis of community chain pharmacists' interventions on electronic prescriptions. *Journal of the American Pharmacists Association*. 2009;49(1):59-64.
Related: A 2011 study reporting a 9.1 pharmacist intervention rate on e-prescriptions: Gilligan A, Miller K, Mohny A, Montenegro C, Schwarz J, Warholak TL. php32 Analysis of pharmacists' interventions on electronic versus traditional prescriptions in two community pharmacies. Value in Health. 2011;14(3):A17-A17.
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