National Council for Prescription Drug Programs

NCPDP

NCPDP Standard Sig Industry Task Group

Laura Topor

National Committee on Vital and Health Statistics

July 26, 2005

Washington, D.C.

NCPDP Standard Sig Industry Task Group - Agenda

- Overview
- Work to date
- Structure
- Impact to other standards

National Council for Prescription Drug Programs
NCPDP

Overview

- History
  - 10+ years
- Stakeholders
  - Changing industry environments
- Previous efforts
  - NCPDP, ASTM CCR, HL7
- Operating Assumptions
  - Flexibility
  - 80/20
  - Multiple industry segments (inpatient/outpatient)

National Council for Prescription Drug Programs
NCPDP

Overview

- Membership
  - ~ 100 representatives; ~20 highly active
  - Pharmacy providers, physicians, knowledge vendors, payers, e-solution organizations, academia, other SDOs.
- Goals/Objectives
  - Conformance, but not duplication, with existing e-prescribing scenarios.
  - Leverage industry experiences and work product.
  - Flexibility and interoperability.

National Council for Prescription Drug Programs
NCPDP

Work to Date

- Bi-weekly conference calls
- Four face-to-face meetings
- Collaboration with other organizations
- Developed format
  - Mapped 30 sample Sigs to format
- Drafted implementation guide
- Confirmed conformance with ASTM CCR

National Council for Prescription Drug Programs
NCPDP

Structure

- Relationship with other standards
  - SCRIPT
  - HL7
  - ASTM CCR
- Segments
  - Dose, Dose Calculation, Dose Restriction, Vehicle, Route, Site, Frequency, Interval, Administration Time, Duration, Stop, Indication, Free Text.

National Council for Prescription Drug Programs
NCPDP

The Elements To Describe A Sig

National Council for Prescription Drug Programs
NCPDP

Field Name	Field Description
DOSE SEGMENT	This is the dose segment of the Sig which can define a fixed dose or can repeat to define a variable dose, dose range, or dose options.
Dose Indicator	1. Specified - remaining fields populated 2. As needed - skip rest of dose segment. 3. As directed - skip rest of dose segment. 4. Unspecified - see free text.
DOSE DELIVERY METHOD TEXT	This is the method in which the dose is delivered (describes how the dose is administered/consumed) i.e. take, apply, swish, swallow, inject, insert, chew, use, give, sprinkle, mix, dissolve…
DOSE DELIVERY METHOD CODE	This is the code assigned for the dose delivery method.
DOSE DELIVERY METHOD CODE SYSTEM	This is the code system that is the source of the dose delivery method code.
DOSE DELIVERY METHOD CODE SYSTEM VERSION	This is the code system version.
DOSE DELIVERY METHOD MODIFIER TEXT	sparingly, frequently, repeatedly, gently, lightly, every
DOSE DELIVERY METHOD MODIFIER CODE	This is the code assigned for the dose delivery method modifier.
DOSE DELIVERY METHOD MODIFIER CODE SYSTEM	This is the code system that is the source of the dose delivery method modifier code.
DOSE DELIVERY METHOD MODIFIER CODE SYSTEM VERSION	This is the code system version.

National Council for Prescription Drug Programs
NCPDP

DOSE	This is the numeric or text expression of the dose. A simple dose example would be '250mg' where the numeric value in this field would be '250'.
DOSE UNITS TEXT	This is the dose units text - the units should be standardized; abbreviations are not recommended (ISMP/JCAHO). The text value in this field for the above example would be 'milligram'.
DOSE UNITS CODE	This is the code assigned for the dose units.
DOSE UNITS CODE SYSTEM	This is the code system that is the source of the dose units code.
DOSE UNITS CODE SYSTEM VERSION	Coding system version.
DOSE SEQUENCE POSITION	This is used for a dose range to define which dose string is in what position in a range or variable dose sequence. This must be an integer starting with 1, a Null value means that this is a unique string with no repeat/no sequence.
DOSE RANGE MODIFIER TEXT	Can have one of two values - TO and OR are used to signify that the SIG contains more than one dose which represent a dose range (TO) (for example - 250 - 500 mg) or contains a dose option (OR) (for example - 1 or 2 tablets).

National Council for Prescription Drug Programs
NCPDP

DOSE CALCULATION SEGMENT	This segment is used to express a dose as a calculation, such as '40mg/kg/day divided into 3 doses'. This segment is used in conjunction with the Dose (SIG) Segment to allow the expression of a dose as a calculation. As an example - amoxicillin for a child is dosed at approximately 40mg/kg/day/2 to 3 doses. For a 9kg child, an appropriate dose would be 125mg tid. To express this, the prescribing physician would put '125mg' in the *Dose (SIG) Segment* (and 'tid' in the *Frequency (SIG) Segment*) and '40mg/kg/day/3 doses' in the *Dose Calculation (SIG) Segment* This allows the pharmacist to look at the dose (125mg tid) and do a secondary patient safety check against the desired dosing of '40mg/kg/day/3 doses'. the *Dose Calculation (SIG) Segment* would also be used to express doses to be calculated by nurses based on physiological parameters, such as Dopamine, Nipride, etc.
DOSE	This is the numeric or text expression of the dose. An example of a calculated dose would be '40mg/kg/day divided into 3 doses'. The value in this field for this example would be '40'.
DOSE UNITS TEXT	This is the dose units - the units should be standardized (SNOMED CT mapped to NCPDP Units, for example). The value in this field for the above example would be 'mg'.
DOSE UNITS CODE	This is the dose units code.
DOSE UNITS CODE SYSTEM	This is the dose units coding system.
DOSE UNITS CODE SYSTEM VERSION	This is the code system version.

National Council for Prescription Drug Programs
NCPDP

DOSE CALCULATION EQUATION CODE	This is the calculation equation code for a dose calculation.
DOSE CALCULATION EQUATION CODE SYSTEM	This is the dose calculation equation code system.
DOSE CALCULATION EQUATION CODE SYSTEM VERSION	This is the code system version.
DOSE SEQUENCE POSITION	This is used for a dose range to define which dose string is in what position in a range or variable dose sequence. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
DOSE RANGE MODIFIER	Can have one of two values - TO and OR are used to signify that the SIG contains more than one dose which represent a dose range (TO) (for example - 250 - 500 mg) or contains a dose option (OR) (for example - 1 or 2 tablets).
DOSE VARIABLE ELEMENT	This is a variable for dose calculations. For the example this variable would be '1' for a dose that is 'mg', '1' for 'kg, '1' for /day' and '3' for '3 doses' and the DOSE VARIABLE UNITS TEXT (see below) would be 'kg' and 'day' and 'doses'.
DOSE VARIABLE UNITS TEXT	This is the dose variable units - the units should be standardized (SNOMED CT mapped to NCPDP Units, for example). For the example, above, the DOSE VARIABLE UNITS would be 'kg' and 'day' and 'doses'.

National Council for Prescription Drug Programs
NCPDP

VARIABLE SEQUENCE POSITION	This defines the sequence position for the DOSE VARIABLE. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence. For the example, for a dose that is '____mg/kg/day', '1 kg' is in VARIABLE SEQUENCE POSITION '1', '1' mg is in VARIABLE SEQUENCE POSITION '2', '1 day' is in VARIABLE SEQUENCE POSITION '3' and '3 doses' is in VARIABLE SEQUENCE POSITION '4'.
DOSE CALCULATION EQUATION	This is the calculation equation for a dose calculation. For the example it would be 'DOSE VARIABLE (Fn1) DOSE VARIABLE (Fn1) DOSE VARIABLE (Fn1) DOSE VARIABLE' for '40 mg/kg/day/3 doses' (40 milligrams per kilogram per day divided into three doses), with VARIABLE1 = '40', fn1=/ VARIABLE2 = '1' fn 1 = /', VARIABLE3 = '1' fn1 = /', and VARIABLE4 = '3'.
DOSE RESTRICTION SEGMENT	This is the dose restriction segment of the SIG which defines a maximum or dose limit. This segment can repeat for more than one dose restriction. This segment is useful for peds, narcotics, ototoxic and renal toxic scripts. It allows the max to be calculated, be a single max or a range.
DOSE MAXIMUM VALUE	This defines a DOSE MAXIMUM, so that the SIG can represent the concept, 'Not to exceed _____.' Expression of a DOSE MAXIMUM involves placing the core dose value in this field and the units and variables in the fields that follow. Examples: '10 Tablets in 24 Hours' or '1000 mg/kg/hr' - for these examples the value '10' or '1000' would go in this DOSE MAXIMUM VALUE field.

National Council for Prescription Drug Programs
NCPDP

DOSE MAXIMUM UNITS TEXT	This is the DOSE MAXIMUM UNITS - the units should be standardized (SNOMED CT mapped to NCPDP Units, for example). For the above examples, the values 'Tablets' or 'mg' would be placed in this field
DOSE MAXIMUM UNITS CODE	This is the dose maximum units code.
DOSE MAXIMUM UNITS CODE SYSTEM	This is the dose maximum units code system.
DOSE MAXIMUM UNITS CODE SYSTEM VERSION	This is the code system version.
DOSE MAXIMUM VARIABLE UNITS	This is a variable for maximum dose calculations. For the above examples the value in this field would be '24' for the first example and '1', '1' and '1' for a dose that is '____mg/kg/hr' for the second example.
DOSE MAXIMUM VARIABLE UNITS TEXT	This is the dose variable units - the units should be standardized (SNOMED CT mapped to NCPDP Units, for example). For the above examples this would be 'Hours' for the first example and 'kg' and 'hr' for the second example.
DOSE MAXIMUM VARIABLE UNITS CODE	This is the dose maximum variable units code.
DOSE MAXIMUM VARIABLE UNITS CODE SYSTEM	This is the dose maximum variable units code system.
DOSE MAXIMUM VARIABLE UNITS CODE SYSTEM VERSION	This is the code system version.

DOSE MAXIMUM VARIABLE SEQUENCE POSITION	This defines the sequence position for the DOSE VARIABLE. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence. For above examples, the value is '24 Hours' and '1kg' are in VARIABLE SEQUENCE POSITION '1' and '1 hr' is in VARIABLE SEQUENCE POSITION '2' for the second example.
DOSE MAXIMUM CALCULATION EQUATION CODE	This is the calculation equation code for a dose calculation.
DOSE MAXIMUM CALCULATION EQUATION CODE SYSTEM	This is the dose maximum calculation equation code system.
DOSE MAXIMUM CALCULATION EQUATION CODE SYSTEM VERSION	This is the code system version.
VEHICLE SEGMENT	This defines a 'vehicle' used to package/administer the drug - for example an IV admixture of the drug in 125ml (cc) of D5W normally. But, because the patient is a diabetic, the prescriber desires this to specifically be in Normal Saline. This segment can repeat for more than one vehicle. This segment is used if a vehicle is needed, i.e. admixture. We need to expand the definition to clarify that this is a vehicle for the delivery of the product. Or, Mix with Applesauce as opposed to Take with Applesauce.

VEHICLE NAME	The 'vehicle' is Normal Saline in this example.
VEHICLE VOLUME	A volume, expressed in a value and 'units' below. Here, 125 is the vehicle volume.
VEHICLE VOLUME UNITS TEXT	The vehicle volume units in text, here milliliters.
VEHICLE VOLUME UNITS CODE	Code number/value.
VEHICLE VOLUME CODE SYSTEM	Coding system
VEHICLE VOLUME CODE SYSTEM VERSION	This is the code system version.
VEHICLE SEQUENCE POSITION	Used when there is more than one vehicle. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
MULTIPLE VEHICLE MODIFIER	Used with the values AND or OR to denote if for an instance of more than one vehicle if all vehicles are used together (AND), or if each of the listed vehicles is an option (OR).
ROUTE SEGMENT	This defines the route of administration and can repeat for more than one route.
ROUTE TEXT	This is the ROUTE of administration. Examples include orally, by mouth, apply, administer, swallow, insert.
ROUTE CODE	This is the route code.

National Council for Prescription Drug Programs
NCPDP

ROUTE CODE SYSTEM	This is the route code system.
ROUTE CODE SYSTEM VERSION	This is the code system version.
ROUTE SEQUENCE POSITION	Used when there is more than one ROUTE. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
MULTIPLE ROUTE MODIFIER	Used with the values AND or OR to express when there is more than one route as to whether the routes are all required to be used (AND) or if any of the routes can be used (OR).
SITE SEGMENT	This defines the site of administration. This segment can repeat for more than one site.
SITE TEXT	This is the SITE of administration and is used only when a site needs to be specified. Examples include left ear, affected area, antecubital vein.
SITE CODE	This is the site code.
SITE CODE SYSTEM	This is the site coding system.
SITE CODE SYSTEM VERSION	This is the code system version.
SITE SEQUENCE POSITION	Used when there is more than one SITE. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
MULTIPLE SITE MODIFIER	Used with the values , NOT, AND or OR to express when there is more than one site as to whether the sites are all required or excluded to be used (AND) or if any of the sites can be used (OR).

National Council for Prescription Drug Programs
NCPDP

ADMINISTRATION TIMING SEGMENT	This is used to define a specific administration day, date or time. This segment can repeat for more than one administration time.
ADMINISTRATION TIMING TEXT	Can be a text string (Morning, Evening, Before Meals, 1 Hour After Meals, 3 Hours After Meals, Before Bed) or an exact time. Exact dates and/or times should be expressed in a format consistent with ISO-8601 Date-Time Format – yyyy-mm-ddThh:mm.
ADMINISTRATION TIMING CODE	This is the administration timing code.
ADMINISTRATION TIMING CODE SYSTEM	An appropriate coding system needs to be identified (recommend SNOMED CT working with NCPDP, HL7, and ASTM (CCR) to develop the appropriate text strings and their coding).
ADMINISTRATION TIMING CODE SYSTEM VERSION	This is the code system version.
ADMINISTRATION SEQUENCE POSITION	Used when there is more than one ADMINISTRATION TIME. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
MULTIPLE ADMINISTRATION MODIFIER	Used with the values AND or OR to express when there is more than one ADMINISTRATION TIME as to whether the times are all required to be used (AND) or if any of the times can be used (OR).
RATE of ADMINISTRATION	This is the amount of time for a {single} dose to be administered
RATE UNIT OF MEASURE TEXT	This is the period of time (seconds, minutes, hours, days) in which the dose is to be administered.
RATE UNIT OF MEASURE CODE	This is the rate of unit measure code.
RATE UNIT OF MEASURE CODE SYSTEM	This is the rate of unit measure code system.
RATE UNIT OF MEASURE CODE SYSTEM VERSION	This is the code system version.

National Council for Prescription Drug Programs
NCPDP

FREQUENCY SEGMENT	This is used to define a frequency of administration. Frequency is events per unit of time. This segment can repeat for more than one frequency.
FREQUENCY	Used to define a FREQUENCY of administration, such as four times per day.
FREQUENCY UNITS TEXT	The units of FREQUENCY.
FREQUENCY UNITS CODE	This is the frequency units code.
FREQUENCY UNITS CODE SYSTEM	This is the frequency units code system.
FREQUENCY UNITS CODE SYSTEM VERSION	This is the code system version.
FREQUENCY SEQUENCE POSITION	Used when there is more than one FREQUENCY. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
VARIABLE FREQUENCY MODIFIER	Used with the values AND or OR to express when there is more than one FREQUENCY as to whether the frequencies are all required to be used (AND) or if any of the frequencies can be used (OR). An example would be 'bid or tid'.

National Council for Prescription Drug Programs
NCPDP

INTERVAL SEGMENT	This is used to define a frequency of administration. Interval is the time between events. This segment can repeat for more than one interval.
INTERVAL VALUE	Used to define an INTERVAL of administration, such as every 15 minutes, every four hours, etc.
INTERVAL UNITS TEXT	The units of the INTERVAL (minutes, hours, days)
INTERVAL UNITS CODE	This is the interval units code.
INTERVAL UNITS CODE SYSTEM	This is the interval units code system.
INTERVAL UNITS CODE SYSTEM VERSION	This is the code system version.
INTERVAL SEQUENCE POSITION	Used when there is more than one INTERVAL This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
VARIABLE INTERVAL MODIFIER	Used with the values AND or OR to express when there is more than one INTERVAL as to whether the intervals are all required to be used (AND) or if any of the frequencies can be used (OR). An example would be '1 hour post meals' AND '3 hours post meals'.

National Council for Prescription Drug Programs
NCPDP

DURATION SEGMENT	This is used to define a duration of use/therapy. This segment can repeat for more than one duration.
DURATION TEXT	Defines a duration of therapy/use.
DURATION UNITS	Defines the UNITS of the duration.
DURATION UNITS CODE	This is the duration units code.
DURATION UNITS CODE SYSTEM	This is the duration units code system.
DURATION UNITS CODE SYSTEM VERSION	This is the code system version.
DURATION SEQUENCE POSITION	Used when there is more than one DURATION This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
VARIABLE DURATION MODIFIER	Used with the values AND or OR to express when there is more than one DURATION as to whether the durations are all required to be used (AND) or if any of the durations can be used (OR). Examples would be 'x 3-5 days' or 'for 3 days unless symptoms persist, then x 7 days'.
STOP SEGMENT	Used to express a hard stop, such as the last SIG sequence in a tapering dose, where the last sequence is 'then D/C' or where the therapy/drug is used to treat a condition and that treatment is for a fixed duration with a hard stop, such as antibiotic treatment, etc.
STOP INDICATOR	Can have the value Yes or be Null.

National Council for Prescription Drug Programs
NCPDP

INDICATION SEGMENT	This is used to define the indication for use of the medication. This segment can repeat for more than one indication.
INDICATION CODE	This the indication code. Discussion included: 1. As Needed 2. For (need examples) 3. As Directed
INDICATION CODE SYSTEM	This is the indication code system.
INDICATION CODE SYSTEM VERSION	This is the code system version.
INDICATION TEXT	Used to express the text/free text portion of an INDICATION.
INDICATION VALUE	Used for expression of a VALUE when it applies to an INDICATION, such as 'Fingerstick Blood Glucose >180'.
INDICATION VALUE UNITS	Used when UNITS are applicable to the INDICATION.
INDICATION VALUE UNITS CODE	This is the indication value units code.
INDICATION VALUE UNITS CODING SYSTEM	This is the indication value units code system.
INDICATION VALUE UNITS CODING SYSTEM VERSION	This is the code system version.
INDICATION SEQUENCE POSITION	Used when there is more than one INDICATION. This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
VARIABLE INDICATION MODIFIER	Used with the values AND or OR to express when there is more than one INDICATION as to whether all the indications must apply (AND) or if any of the indications can apply (OR). Examples would 'fever and cough' and 'pain or inflammation'.

National Council for Prescription Drug Programs
NCPDP

Sig FREE TEXT STRING SEGMENT	Used to reflect the text string express of the SIG. It should always be used, and in addition is the only segment to place a free text SIG from a generating system that CANNOT generate a structured SIG.
Sig FREE TEXT STRING INDICATOR	Recommended values: 1. If system cannot generate a structured SIG. 2. Capture what the MD ordered. 3. Completely from structured SIG. 4. Pure free text. 5. Fulfillment Instructions 6. Patient Instructions
FREE TEXT STRING	This can contain a free text string only.
REPEATING SIG SEGMENT	Used when there is more than one Sig, such as for a tapered dose or sliding scale.
SIG SEQUENCE POSITION	This must be an integer starting a 1, a Null value means that this is a unique string with no repeat/no sequence.
MULTIPLE SIG MODIFIER	Used with the values AND, OR, or THEN to express when there is more than one SIG as to whether all the SIGs must apply (AND) or if any of the SIGs can apply (OR) or if the SIGs are sequential (THEN), in the sequence defined by SIG SEQUENCE POSITION.

National Council for Prescription Drug Programs
NCPDP

An Example

Prednisone 10 mg
4 po qd x 3d,
3 po qd x 3d,
2 po qd x 3d,
1 po qd x 3d,
then D/C

National Council for Prescription Drug Programs
NCPDP

Field Name	Prednisone 10 mg 4 po qd x 3d, 3 po qd x 3d, 2 po qd x 3d, 1 po qd x 3d, then D/C			
Sig				
DOSE SEGMENT				
Dose Indicator	1			
DOSE DELIVERY METHOD TEXT	take	take	take	take
DOSE	4	3	2	1
DOSE UNITS TEXT	each	each	each	each
DOSE UNITS CODE	385055001	385055001	385055001	385055001
DOSE UNITS CODE SYSTEM	SNOMED	SNOMED	SNOMED	SNOMED
DOSE UNITS CODE SYSTEM VERSION	USD20050131	USD20050131	USD20050131	USD20050131
DOSE SEQUENCE POSITION	1	2	3	4
DOSE RANGE MODIFIER TEXT				

National Council for Prescription Drug Programs
NCPDP

ROUTE SEGMENT				
ROUTE TEXT	orally	orally	orally	orally
ROUTE CODE	14735	14735	14735	14735
ROUTE CODE SYSTEM	HL7	HL7	HL7	HL7
ROUTE CODE SYSTEM VERSION				
ROUTE SEQUENCE POSITION				
MULTIPLE ROUTE MODIFIER				
INTERVAL SEGMENT				
INTERVAL VALUE	1	1	1	1
INTERVAL UNITS TEXT	day	day	day	day
INTERVAL UNITS CODE	SNOMED	SNOMED	SNOMED	SNOMED
INTERVAL UNITS CODE SYSTEM				
INTERVAL UNITS CODE SYSTEM VERSION				
INTERVAL SEQUENCE POSITION				
VARIABLE INTERVAL MODIFIER	then	then	then	then

National Council for Prescription Drug Programs
NCPDP

DURATION SEGMENT				
DURATION TEXT	3	3	3	3
DURATION UNITS	day	day	day	day
DURATION UNITS CODE				
DURATION UNITS CODE SYSTEM				
DURATION UNITS CODE SYSTEM VERSION				
DURATION SEQUENCE POSITION				
VARIABLE DURATION MODIFIER				
Sig FREE TEXT STRING SEGMENT				
Sig FREE TEXT STRING INDICATOR	2			
FREE TEXT STRING	Take 4 tablets a day for 3 days; then take 3 tablets a day for 3 days; then take 2 tablets a day for 3 days; then take one tablet a day for 3 days, then stop.			
REPEATING SIG SEGMENT				
SIG SEQUENCE POSITION	1	2	3	4
MULTIPLE SIG MODIFIER				

National Council for Prescription Drug Programs
NCPDP

Next Steps

- Finalize format
  - Code set validation
    - Selection
    - Maintenance
    - Distribution
- Finalize implementation guide
- Identify pilot participants
- Develop launch/implementation approach

National Council for Prescription Drug Programs
NCPDP

Questions