

THE FUTURE OF
CLINICAL DEVELOPMENT



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Let's Create Standard Value Level Metadata

PhUSE US Connect 2019

Paper DS12

February 27, 2019

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Let's Create Standard Value Level Metadata

Value Level Metadata

- Value Level Metadata is an important part of the Define-XML that allows us to explain our study data.
- Value Level Metadata explains variable metadata under conditions of other variables.

Value Level Metadata - EG [EGSTRESC]

Variable	Where	Type	Length / Display Format	Controlled Terms or Format
EGSTRESC	EGTESTCD = "AVCOND" (Atrioventricular Conduction)	text	200	["1ST DEGREE AV BLOCK", "2ND DEGREE AV BLOCK", "3RD DEGREE AV BLOCK"] < ECG Result (AVCOND) >
EGSTRESC	EGTESTCD = "AXISVOLT" (Axis and Voltage)	text	200	["EARLY R WAVE TRANSITION", "ELECTRICAL ALTERNANS", "INDETERMINATE QRS AXIS"] < ECG Result (AXISVOLT) >
EGSTRESC	EGTESTCD = "MI" (Myocardial Infarction)	text	200	["ACUTE ANTERIOR WALL MYOCARDIAL INFARCTION", "ACUTE ANTEROLATERAL WALL MYOCARDIAL INFARCTION", "ACUTE ANTEROSEPTAL WALL MYOCARDIAL INFARCTION"] < ECG Result (MI) >
EGSTRESC	EGTESTCD = "RHYNOS" (Rhythm Not Otherwise Specified)	text	200	["ASYSTOLE", "BRADYCARDIA"] < ECG Result (RHYNOS) >
EGSTRESC	EGTESTCD = "STSTWUW" (ST Segment, T wave, and U wave)	text	200	["BORDERLINE QTCB", "BORDERLINE QTCF"] < ECG Result (STSTWUW) >



- There isn't any formal standard value level metadata, but it does exist in various forms amongst the CDISC standards.
- Value Level Metadata can be found in the following:
 - Codetable Mapping Files
 - Questionnaires, Ratings and Scales (QRS) supplements
 - Therapeutic Area User Guides (TAUG's)



- CDISC Codetable Mapping files can be found on the CDISC website (www.cdisc.org) under Controlled Terminology and expanding the “Codetable Mapping Files” section.

+ Codetable Mapping Files

- There are Codetable's available for CV, ECG, Oncology, Racec-Ethnicc, SC, TS, and VS.



- Controlled Terminology consists of codelists which are a set of values that can be used for variables within datasets.
- Codetables provide the relationships **across** codelists.
- An example of simple Codetable is Test Name (--TEST) and Test Codes (--TESTCD)
 - Use the Concept Code to merge the codelists to create a Codetable.
 - (Tip: Don't use the --TESTCD synonym as the submission value for --TEST)
 - Other pairs can be merged (--TN and --TC, --PARMCD and --PARM)



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VS Codetable

- VS Codetable (2018-12-21) for VSTEST=Height and Temperature.

C-code (Concept Code)	Vital Signs Test Code (VSTESTCD) (codelist code = C66741)	Vital Signs Test Name (VSTEST) (codelist code = C67153)	C-code (Concept Code)	Units for Vital Signs Results (VSRESU) (codelist code = C66770)
C25347	HEIGHT	Height	C49668	cm
C25347	HEIGHT	Height	C48500	in
C25206	TEMP	Temperature	C44277	F
C25206	TEMP	Temperature	C42559	C

- A typical study might have Height collected in centimetres or inches and Temperature in F or C.



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VS Codetable as Value Level Metadata

- Value Level Metadata for VSORRESU will explain the codelist values for each test.

VARIABLE	OID	WHERE CLAUSE	CONTROLLED TERMS	CODELIST VALUES
VSORRESU	VSORRESU.VSTESTCD_HEIGHT	VSTESTCD="HEIGHT"	VSRESU_HEIGHT	cm
				in
VSORRESU	VSORRESU.VSTESTCD_TEMP	VSTESTCD="TEMP"	VSRESU_TEMP	F
				C

- A subset codelist is needed for each condition.
 - The codelist VSRESU_HEIGHT 'Units for Vital Signs Results (HEIGHT)' would have values of cm and in
 - The codelist VSRESU_TEMP 'Units for Vital Signs Results (TEMP)' with values F and C.
- A standard ODM element Identifier (OID) is needed for the condition.



Let's Create Standard Value Level Metadata

ECG Codetable

- ECG Codetable (2015-09-25) file. There is a one -to-many relationship between the ECG result (EGSTRESC) and the ECG test code and test name.

C-code (Concept Code)	ECG Test Code (EGTESTCD) (codelist code = C71153)	ECG Test Name (EGTEST) (codelist code = C71152)	C-code (Concept Code)	ECG Result (EGSTRESC) (codelist code = C71150)
C111131	AVCOND	Atrioventricular Conduction	C111088	1ST DEGREE AV BLOCK
C111131	AVCOND	Atrioventricular Conduction	C62016	2ND DEGREE AV BLOCK
C111131	AVCOND	Atrioventricular Conduction	C111091	3RD DEGREE AV BLOCK
C111132	AXISVOLT	Axis and Voltage	C102628	EARLY R WAVE TRANSITION
C111132	AXISVOLT	Axis and Voltage	C71035	ELECTRICAL ALTERNANS
C111132	AXISVOLT	Axis and Voltage	C102701	INDETERMINATE QRS AXIS
C111280	MI	Myocardial Infarction	C71065	ACUTE ANTERIOR WALL MYOCARDIAL INFARCTION
C111280	MI	Myocardial Infarction	C102591	ACUTE ANTEROLATERAL WALL MYOCARDIAL INFARCTION
C111280	MI	Myocardial Infarction	C102592	ACUTE ANTEROSEPTAL WALL MYOCARDIAL INFARCTION
C111307	RHYNOS	Rhythm Not Otherwise Specified	C116130	ASYSTOLE
C111307	RHYNOS	Rhythm Not Otherwise Specified	C111120	BRADYCARDIA
C111363	STSTWUW	ST Segment, T wave, and U wave	C92228	BORDERLINE QTCB
C111363	STSTWUW	ST Segment, T wave, and U wave	C92229	BORDERLINE QTCF

- EGSTRESC codelist is often used in collecting the abnormality.



Let's Create Standard Value Level Metadata

ECG Codetable

- Data collection (CRF) and vendor data is often set up in a way that the abnormal result is captured but not the test name.

What was the interpretation of the ECG?	☐ NORMAL ☐ ABNORMAL EGORRES WHERE EGTESTCD="INTP"
If Abnormal, what was the abnormality?	☐ 1ST DEGREE AV BLOCK ☐ 2ND DEGREE AV BLOCK ☐ 3RD DEGREE AV BLOCK EGORRES WHERE EGTESTCD ="AVCOND" ☐ EARLY R WAVE TRANSITION ☐ ELECTRICAL ALTERNANS ☐ INDETERMINATE QRS AXIS EGORRES WHERE EGTESTCD ="AXISVOLT" ☐ ACUTE ANTERIOR WALL MYOCARDIAL INFARCTION ☐ ACUTE ANTEROLATERAL WALL MYOCARDIAL INFARCTION ☐ ACUTE ANTEROSEPTAL WALL MYOCARDIAL INFARCTION EGORRES WHERE EGTESTCD ="MI" ☐ ASYSTOLE ☐ BRADYCARDIA EGORRES WHERE EGTESTCD ="RHYNOS" ☐ BORDERLINE QTCB ☐ BORDERLINE QTCF EGORRES WHERE EGTESTCD ="STSTWUW"

- Using the ECG Codetable the result can be mapped to EGTESTCD in the SDTM Dataset.



Let's Create Standard Value Level Metadata

ECG Codetable as Value Level Metadata

- The value level metadata for EGSTRESC will have a where clause for each ECG Test Code (EGTESTCD).

VARIABLE	OID	WHERE CLAUSE	CONTROLLED TERMS
EGSTRESC	EGSTRESC.EGTESTCD_AVCOND	EGTESTCD="AVCOND"	EGSTRESC_AVCOND
EGSTRESC	EGSTRESC.EGTESTCD_AXISVOLT	EGTESTCD="AXISVOLT"	EGSTRESC_AXISVOLT
EGSTRESC	EGSTRESC.EGTESTCD_MI	EGTESTCD="MI"	EGSTRESC_MI
EGSTRESC	EGSTRESC.EGTESTCD_RHYNOS	EGTESTCD="RHYNOS"	EGSTRESC_RHYNOS
EGSTRESC	EGSTRESC.EGTESTCD_STSTWUW	EGTESTCD="STSTWUW"	EGSTRESC_STSTWUW

- To create the value level metadata a codelist subset will need to be created for each ECG test.
- For Example the subset codelists
 - EGSTRESC_AVCOND
 - (1ST DEGREE AV BLOCK, 2ND DEGREE AV BLOCK, 3RD DEGREE AV BLOCK)



Let's Create Standard Value Level Metadata

ECG Codetable as Value Level Metadata

- Here is how the Define.xml will appear.

Value Level Metadata - EG [EGSTRESC]

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EGSTRESC	EGTESTCD = "AVCOND" (Atrioventricular Conduction)	text	200	["1ST DEGREE AV BLOCK", "2ND DEGREE AV BLOCK", "3RD DEGREE AV BLOCK"] < ECG Result (AVCOND) >
EGSTRESC	EGTESTCD = "AXISVOLT" (Axis and Voltage)	text	200	["EARLY R WAVE TRANSITION", "ELECTRICAL ALTERNANS", "INDETERMINATE QRS AXIS"] < ECG Result (AXISVOLT) >
EGSTRESC	EGTESTCD = "MI" (Myocardial Infarction)	text	200	["ACUTE ANTERIOR WALL MYOCARDIAL INFARCTION", "ACUTE ANTEROLATERAL WALL MYOCARDIAL INFARCTION", "ACUTE ANTEROSEPTAL WALL MYOCARDIAL INFARCTION"] < ECG Result (MI) >
EGSTRESC	EGTESTCD = "RHYNOS" (Rhythm Not Otherwise Specified)	text	200	["ASYSTOLE", "BRADYCARDIA"] < ECG Result (RHYNOS) >
EGSTRESC	EGTESTCD = "STSTWUW" (ST Segment, T wave, and U wave)	text	200	["BORDERLINE QTCB", "BORDERLINE QTCF"] < ECG Result (STSTWUW) >



Questionnaires, Ratings and Scales (QRS)

- There is a lot of value level metadata in the questionnaires, ratings and scales supplements.
 - The codelists for the results (QSORRES/QSSTRESC) are usually not included in CDISC controlled terminology.



Let's Create Standard Value Level Metadata

Questionnaires, Ratings and Scales

- To create value level metadata for the results (QSSTRESC) a codelist is created for each set of responses.
- This can be time consuming for a study with multiple questionnaires.





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Questionnaires, Ratings and Scales

- Here is an example of the Eastern Cooperative Oncology Group Performance Status (ECOG).

DOMAIN	QSTESTCD	QSTEST	QSCAT	QSORRES	QSSTRESC
QS	ECOG101	ECOG1-Performance Status	ECOG	Fully active, able to carry on all pre-disease performance without restriction	0
QS	ECOG101	ECOG1-Performance Status	ECOG	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work	1
QS	ECOG101	ECOG1-Performance Status	ECOG	Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours	2
QS	ECOG101	ECOG1-Performance Status	ECOG	Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours	3
QS	ECOG101	ECOG1-Performance Status	ECOG	Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair	4
QS	ECOG101	ECOG1-Performance Status	ECOG	Dead	5

- The table shows the possible rows that would be in our study data.
- The values of 0-5 are the possible standard result for the performance status question. Data acquisition would be set up using a pick list for the possible responses in QSORRES.



Let's Create Standard Value Level Metadata Questionnaires, Ratings and Scales

- Conventions are needed to create where clauses and OID's.
 - Some considerations are the variables that are included and the order they appear.
 - In a Findings domain Grouping Qualifiers (--CAT, --SCAT) followed by the Topic (--TESTCD) would be a logical choice.
- A convention for QSSTRESC could be
QSSTRESC.
QSCAT_<CDISC Synonym for Category of
Questionnaire>.
QSTESTCD_<CDISC Submission Value for the question>.

Wouldn't it be nice when you purchased a questionnaire that you also received a value level metadata file?



Let's Create Standard Value Level Metadata

Questionnaires, Ratings and Scales

- Here are some examples of ECOG101 and CSS0501A and CSS0501B questions.

QSCAT and QSTESTCD are used in the where clause.

OID	WHERE CLAUSE
QSSTRESC.QSCAT_ECOG1.QSTESTCD_ECOG101	QSCAT="ECOG" AND QSTESTCD="ECOG101"
QSSTRESC.QSCAT_CSS05.QSTESTCD_CSS0501A	QSCAT=" C-SSRS ALREADY ENROLLED SUBJECTS" AND QSTESTCD="CSS0501A"
QSSTRESC.QSCAT_CSS05.QSTESTCD_CSS0501B	QSCAT=" C-SSRS ALREADY ENROLLED SUBJECTS" AND QSTESTCD="CSS0501B"

QSSTRESC.
QSCAT_<CDISC Synonym for Category of Questionnaire>.
QSTESTCD_<CDISC Submission Value for the question>.



Let's Create Standard Value Level Metadata

Questionnaires, Ratings and Scales

- The define.xml shows how this is represented in value level metadata.
 - The where clause starts with the category followed by the test code as QSCAT=ECOG and QSTESTCD=ECOG101.
 - A subset codelist ECOG1-Performance Status is created to show the values 0-5 and their display value as the original result.

Value Level Metadata - QS [QSSTRESC]

Variable	Where	Type	Length / Display Format	Controlled Terms or Format	Origin
QSSTRESC	QSCAT = "ECOG" and QSTESTCD = "ECOG101" (ECOG1-Performance Status)	text	200	ECOG1-Performance Status	eDT

ECOG1-Performance Status [CL.QSSTRESC_ECOG101]

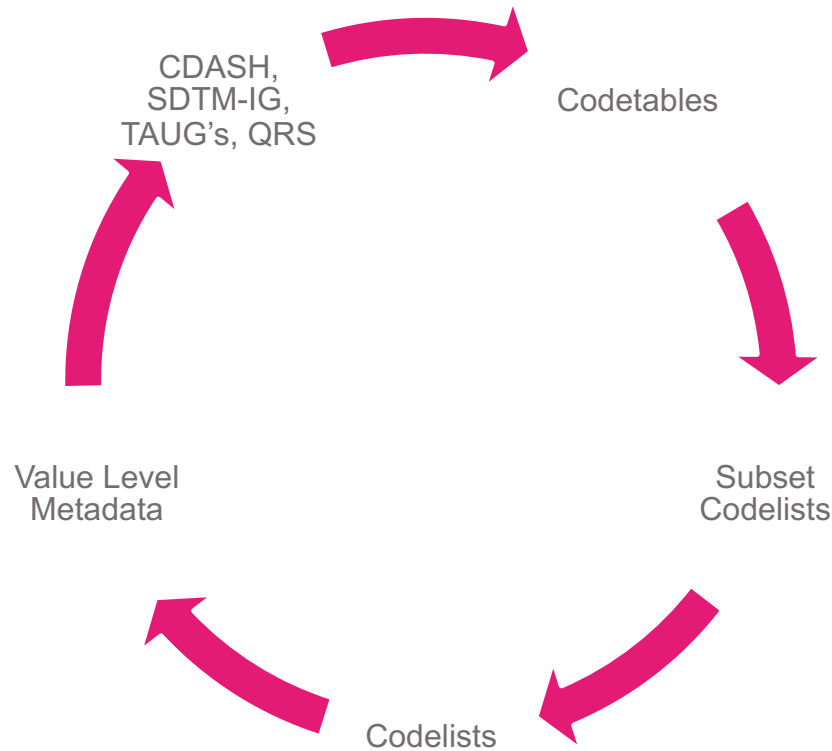
Permitted Value (Code)	Display Value (Decode)
0	Fully active, able to carry on all pre-disease performance without restriction
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work
2	Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours
3	Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours
4	Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair
5	Dead



Let's Create Standard Value Level Metadata

Creating Standard Value Level Metadata

- Creating Standard Value Level Metadata.





Let's Create Standard Value Level Metadata

Creating Standard Value Level Metadata

- How do we get to standard Value Level Metadata
 1. Create Codelists for Categories and Subcategories
 2. Create Codelist subsets (databased)
 - Including result level from QRS supplementals.
 3. Create Codetables
 - Included with releases from TAUG's and QRS Supplements.
 4. Naming and order convention for Where Clauses.
 5. Include checks in validation tools.

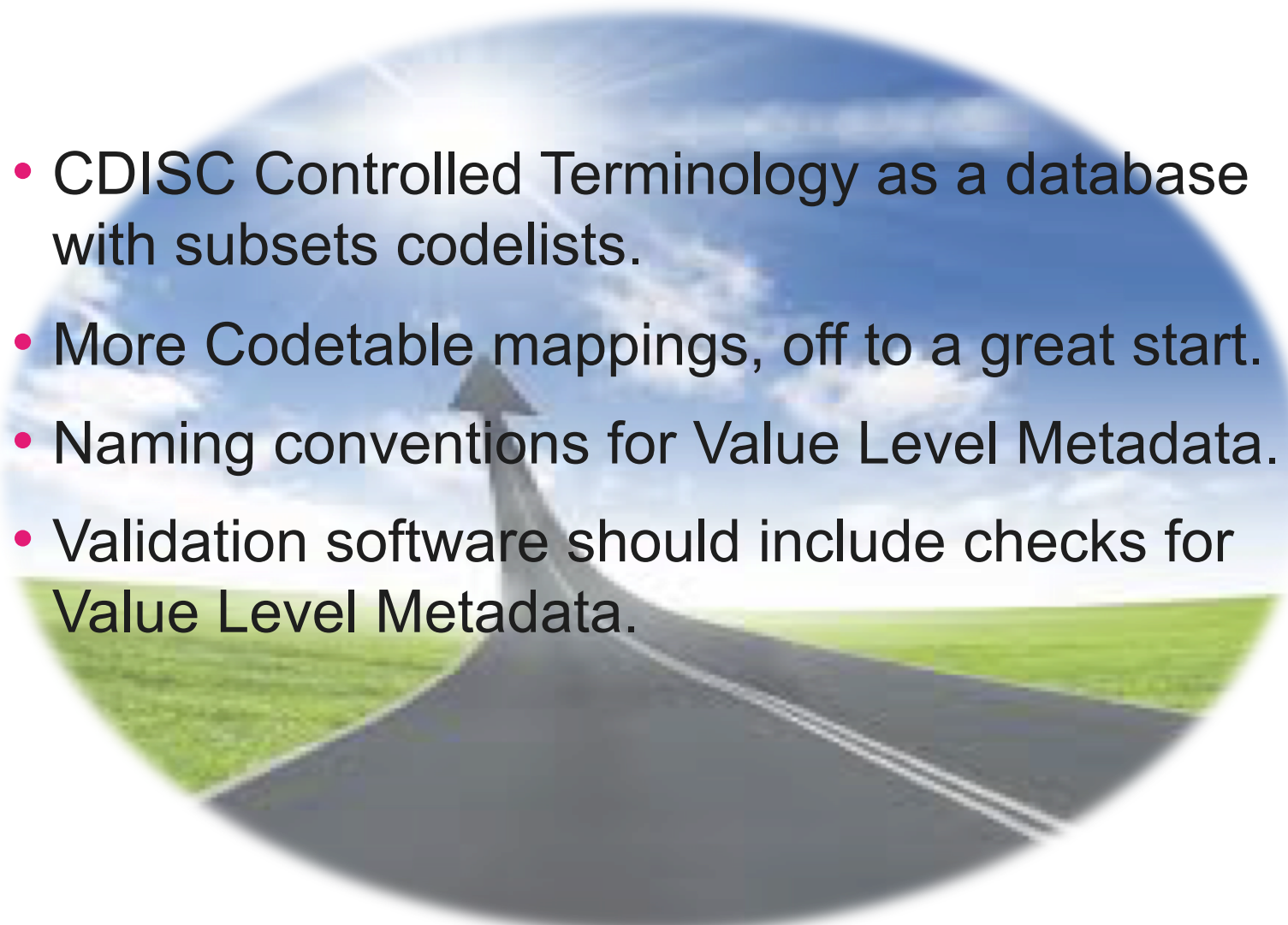


- The Codetable mappings are not published at the same time as CDISC Controlled Terminology.
 - It is important that available Codetable Mappings are maintained with the release of new controlled terminology.
 - Most of the Codetables were updated with the release of the 2018-12-21 release of controlled terminology! ★
- Maintenance of a subset codelists for each quarterly release of CDISC Controlled Terminology can be time consuming.



- Value level metadata allows for other comparators then just equal to.
 - For example, a questionnaire could have many Yes/No response questions an IN statement would be more appropriate.
- Working with spreadsheets instead of a database of codelists and codetables.



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- A circular background image showing a paved road with white lane markings curving into the distance under a blue sky with white clouds. A large, faint, light-blue arrow points upwards from the road towards the sky.
- CDISC Controlled Terminology as a database with subsets codelists.
 - More Codetable mappings, off to a great start.
 - Naming conventions for Value Level Metadata.
 - Validation software should include checks for Value Level Metadata.



Contact Information

- Your comments and questions are valued and encouraged.

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