CTSU

Cancer Trials Support Unit

CDISC-Compliant Rave GLIB ALS v1.0 Release Notes

Version 1.0 - Draft

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Document Information

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1.   Introduction

1.1   Overview

The use of CDISC (Clinical Data Interchange Standards Consortium) standards is required for data submissions to the US Food and Drug Administration (FDA). CDISC submissions to the FDA require the use of controlled terminology and datasets formatted according to Study Data Tabulation Model (SDTM). Collecting clinical data using Clinical Data Acquisition Standards Harmonization (CDASH) facilitates this submission process.

The following provides an overview of the NCI's CDISC Implementation, as per the *NCI CDISC Implementation Wiki*:

> "The FDA has mandated sponsors whose studies start after Dec 17, 2016, must submit their clinical study data sets in the Study Data Tabulation Model (SDTM) standard format. For INDs, the requirement applies for studies that start after Dec. 17, 2017. SDTM provides a standard for organizing and formatting data to streamline the process in collection, management, analysis and reporting. The Clinical Data Interchange Standards Consortium (CDISC) is a global nonprofit standards development organization with a worldwide team of staff and volunteer experts across the medical community. CDISC provides data standards to streamline clinical research, one of which being the SDTM. CDISC is also developing Clinical Data Acquisition Standards Harmonization which establishes a standard way to collect data in a similar way across studies and sponsors so that data formats and structures provide clear traceability of submission into the SDTM. To support the FDA mandate of submitting clinical study stat sets to the FDA in the SDTM format, the NCI is transitioning their current Network Rave Data Standards (NRDS) Initiative, led by the Cancer Therapy Evaluation Program (CTEP) into the CDISC implementation."
> (*https://wiki.nci.nih.gov/display/CDISC/NCI+CDISC+Implementation+Home*)

> "The NCI/CTEP is transitioning the existing NRDS initiative to the CDISC Implementation initiative to meet the FDA mandate of submitting clinical study data sets in the SDTM format. Although the FDA does not require data to be collected in a certain format, the NCI is working in collaboration with CDISC to collect data in the CDASH format for the Oncology Patient Enrollment Network System (OPEN), Clinical Therapy Evaluation Program Adverse Event Reporting System (CTEP-AERS) and the Clinical Data Update System (CDUS). According to the FDA Study Data Conformance Guide, section 4.1.2 (SDTM General Considerations), it is recommended that sponsors implement the SDTM standard for representation of the clinical trial tabulation data prior to the conduct of the study. The use of case report forms that incorporate SDTM standard data elements such as CDASH allows for a more simplified process for the creation of the SDTM domain."
> (*https://wiki.nci.nih.gov/display/CDISC/CDISC+Implementation+Project+Overview*)

Per the NCI, all IND studies activated on or after 01/01/2020 must be CDISC-compliant. The CTSU is supporting the NCI's CDISC implementation by development of a CDISC-Compliant Rave Global Library (GLIB) Architect Loader Specification (ALS). The CDISC-compliant Rave GLIB ALS will specify CDASH and SDTM variables; the Lead Protocol Organizations (LPOs) will utilize this ALS for building their own Rave CDISC-compliant GLIBs.

1.2 Acronyms and Definitions

Table 1: Acronyms and Definitions

Acronym	Definition
CDASH	Clinical Data Acquisition Standards Harmonization. Basic standards for the collection of clinical trial data and how to implement the standard for specific case report forms (CRFs). Optimized for data capture, investigator site activities and data cleaning. The CDASH standard includes the CDASHIG (including the metadata) and the CDASH Model.
CDASHIG	CDASH Implementation Guide provides information on the implementation of CDASH standards for specific topics of data. Each topic is represented by a CDASH domain. CDASH domains, variables and controlled terminology are aligned with SDTM. Each CDASHIG domain contains a description of the data topic, a specification table, including standard metadata for data collection, general assumptions/rules, and example forms.
CDASH Model	Provides a general framework and root metadata for creating fields to collect information on forms. Root metadata includes root variables and root questions. The root CDASH Model variables are intended to facilitate mapping to the SDTMIG variables while addressing specific data collection needs.
CDASH Metadata Table	Includes variables commonly implemented by a significant number of the organizations/companies (e.g., Medical History, Adverse Events).
SDTM	Study Data Tabulation Model provides a standard for organizing and formatting data to streamline processes in collection, management, analysis and reporting. Optimized for tabulation, analysis dataset creation, and data submission.
SDTMIG	SDTM Implementation Guide contains detailed information for each domain, associated variables, assumptions, business rules, and examples for preparing standard tabulation datasets that are based on the SDTM.
SDTM Model	Describes the general conceptual model for organizations/companies involved in the collection, preparation and analysis of clinical study data that is submitted to regulatory authorities. The model contains general information that can be used across domains.
SDTM Metadata Table	Includes the standard metadata found in the applicable SDTM model and/or Implementation Guide.
Controlled Terminology	Set of CDISC-developed or CDISC-adopted standard expressions (values) used with data items within CDISC-defined datasets (e.g., a CDISC specific list of values). Controlled terminology should be used throughout the clinical research lifecycle, from data collection through analysis and submission.
ALS	Architect Loader Specification
ARM	In SDTM, an ARM is a complete planned path that a study subject will have from the beginning to the end of a study.
caDSR	Cancer Data Standards Registry and Repository
CDUS	Clinical Data Update System
CTEP	Cancer Therapy Evaluation Program

Acronym	Definition
CTEP-AERS	Clinical Therapy Evaluation Program Adverse Event Reporting System
ELEMENT	In SDTM an ELEMENT is a discrete state of being, or building block for ARMs. ELEMENTS are defined with start and end rules, and then placed in a specific order to create a study ARM.
FDA	US Food and Drug Administration
GLIB	Global Library
GLV	Global Library Volume
LPO	Lead Protocol Organization
NCI	National Cancer Institute
NRDS	Network Rave Data Standards
OPEN	Oncology Patient Enrollment Network System
TAC	Treatment Assignment Code
TAD	Treatment Assignment Description

1.3   Scope

This document outlines the details of the CDISC Compliant Rave GLIB ALS created by CTSU. It also contains information to assist Lead Protocol Organizations (LPOs) in configuring CDISC-compliant-LPO-specific forms directly in Rave, using the CDISC-compliant GLIB ALS.

1.4   Audience

This document was developed by CTSU for release to the LPO Staff responsible for Study Build activities in Medidata Rave.

2. CDISC Versions

The CDISC-compliant Rave GLIB ALS Version 1.0 includes forms that were created based on versions of the CDISC components listed below.

Instruction: To access the files, log into the CDISC website (https://www.cdisc.org) using your NIH email address. These links only work for NIH staff members or if LPOs have their own account access.

Table 2: CDISC Version and Links

CDISC Version	Links
CDASH Model v1.0	https://www.cdisc.org/standards/foundational/cdash/cdash-model-10
CDASHIG v2.0	https://www.cdisc.org/standards/foundational/cdash/cdash-20
CDASH and SDTM Controlled Terminology packages P36 released through December 21, 2018 *Note: Controlled Terminology are released quarterly. You can access the older versions via CDISC Library Archive.*	https://evs.nci.nih.gov/ftp1/CDISC/SDTM
CDASHIG v2.0 Metadata Table	https://www.cdisc.org/cdisc-library https://www.cdisc.org/members-only/cdisc-library-archives
SDTM Model v1.7	https://www.cdisc.org/standards/foundational/sdtm/sdtm-v1-7
SDTMIG v3.3	https://www.cdisc.org/standards/foundational/sdtmig/sdtmig-v3-3
SDTMIG v3.3 Metadata Table	https://www.cdisc.org/cdisc-library https://www.cdisc.org/members-only/cdisc-library-archives

3. CDISC Standard Forms

The CDISC-compliant Rave GLIB ALS Version 1.0 is the initial version released for use by LPOs; it contains the standard CDASH and SDTM form details to assist the LPOs in building their CDISC-compliant Rave GLIB and their subsequent CDISC-compliant study builds. Following are the CDISC-compliant GLIB components included in the ALS:

- CDASH and SDTM Domains or Forms
- CDASH Variables
- SDTM Variables (no direct mapping to CDASH)
- Controlled Terminologies Assigned to Variables

3.1 CDASH and SDTM Domains

3.1.1 List of Domains Included in this Release

Following is a list of domains included in this ALS. There are 25 CDASH and SDTM domains (e.g., AE, CE, CE, etc.) containing the CDASH and SDTM variables, and 18 SDTM domains (AG, CV, FT, etc.) containing only the SDTM variables. Controlled terminologies assigned to variables are also added to the DataDictionaries and DataDictionaryEntries tabs in the ALS.

Table 3: List of Domains Included in this Release

Seq. #	Domain/Form	Form Name	CDASH and SDTM or SDTM?
1.	AE	Adverse Events	CDASH and SDTM
2.	AG	Procedure Agents	SDTM
3.	CE	Clinical Events	CDASH and SDTM
4.	CM	Concomitant/Prior Medications	CDASH and SDTM
5.	CO	Comments	CDASH and SDTM
6.	CV	Cardiovascular System Findings	SDTM
7.	DA	Drug Accountability	CDASH and SDTM
8.	DD	Death Details	CDASH and SDTM
9.	DM	Demographics	CDASH and SDTM
10.	DS	Disposition	CDASH and SDTM
11.	DV	Protocol Deviations	CDASH and SDTM
12.	EC	Exposure as Collected	CDASH and SDTM
13.	EG	ECG Test Results	CDASH and SDTM
14.	FA	Findings About Events or Interventions	CDASH and SDTM
15.	FT	Functional Tests	SDTM

Seq. #	Domain/Form	Form Name	CDASH and SDTM or SDTM?
16.	HO	Healthcare Encounters	CDASH and SDTM
17.	IE	Inclusion/Exclusion Criteria Not Met	CDASH and SDTM
18.	IS	Immunogenicity Specimen Assessments	SDTM
19.	LB	Laboratory Test Results	CDASH and SDTM
20.	MB	Microbiology Specimen	SDTM
21.	MH	Medical History	CDASH and SDTM
22.	MI	Microscopic Findings	CDASH and SDTM
23.	MK	Musculoskeletal System Findings	SDTM
24.	ML	Meal Data	SDTM
25.	MS	Microbiology Susceptibility	SDTM
26.	NV	Nervous System Findings	SDTM
27.	OE	Ophthalmic Examinations	SDTM
28.	PC	Pharmacokinetics Concentrations	CDASH and SDTM
29.	PE	Physical Examination	CDASH and SDTM
30.	PP	Pharmacokinetics Parameters	SDTM
31.	PR	Procedures	CDASH and SDTM
32.	QS	Questionnaires	SDTM
33.	RE	Respiratory System Findings	SDTM
34.	RP	Reproductive System Findings	CDASH and SDTM
35.	RS	Disease Response and Clin Classification	SDTM
36.	SC	Subject Characteristics	CDASH and SDTM
37.	SR	Skin Response	CDASH and SDTM
38.	SS	Subject Status	SDTM
39.	SU	Substance Use	CDASH and SDTM
40.	TR	Tumor/Lesion Results	SDTM
41.	TU	Tumor/Lesion Identification	SDTM
42.	UR	Urinary System Findings	SDTM
43.	VS	Vital Signs	CDASH and SDTM

3.1.2   List of Domains Not Included in this Release

Following is a list of domains not included in this ALS.

Table 4: List of Domains Not Included in this Release

Domain	Domain Name	Comments
EX	Exposure	EX has very specific rules for what can and cannot go into it, and it is not designed to be used for data collection. Instead, use EC as EC is designed to be used for data collection.
MO	Morphology	This domain has been replaced by Body System-based Morphology/Physiology domains (i.e., CV, MK, UR, etc.).
OI	Non-host Organism Identifiers	This is not collected data. It is a study-level reference table that will be set up once per study.
SE	Subject Elements	Due to decisions made by NCI during the TAC/TAD/ARM discussions, avoid collecting data that has to do with Subject Element until further guidance from NCI is available.
SM	Subject Disease Milestones	This is an SDTM-only domain. Data for this domain is derived from variables collected in other domains.
SV	Subject Visits	This is not collected data in Rave.
TA	Trial Arms	These domains will not be developed in the database as they represent study level information and do not contain subject data.
TD	Trial Disease Assessments	
TE	Trial Elements	
TI	Trial Inclusion/Exclusion Criteria	
TM	Trial Disease Milestones	
TS	Trial Summary Information	
TV	Trial Visits	

3.1.3   List of Variables Not Included in this Release

Following is a list of variables not included in this ALS.

Table 5: List of Variables Not Included in this Release

Variable Name	Variable Label/ Description	Comments/Instructions
DOMAIN	Domain Abbreviation	Variable is not used for data collection.
RDOMAIN	Related Domain Abbreviation	Variable is not used for data collection.
USUBJID	Unique Subject Identifier	Variable is not used for data collection.
STUDYID, SITEID, SUBJID	Study Identifier Study Site Identifier Subject Identifier for the Study	Concepts that are "built in" to the Rave application do not need to repeat these variables in each form. These variables should be defaulted from the study setup and should not be an enterable field.
--SEQ, --DY, --STDY, --ENDY, VISITDY, TAETORD, --STRF, --ENRF, --BODSYS, --BDSYCD, --STRESC, --STRESN, --STRESU	SDTM Variables	These SDTM variables should be derived based on specific rules for population that cannot be done through data collection.
--BLFL, --LOBXFL, --DRVFL	SDTM Variables	These should be derived based on a single rule per variable for each domain (e.g., --LOBXFL or --BLFL could be last non-null observation prior to dosing). It would not be "reliable" to collect a value into these variables. The rule for –LOBXFL is: "Operationally-derived indicator used to identify the last non-missing value prior to RFXSTDTC. Should be "Y" or null."
TAETORD	Planned Order of Element within Arm	Due to decisions made by NCI during the TAC/TAD/ARM discussions, avoid collecting anything that has to do with subject element in the ALS until the internal implementation is aligned with SDTM.
--DTC	Date and time variables in ISO 8601 character format	Not included for the CDASH and SDTM domains as the CDASH date and time variables do not map directly to an SDTMIG variable. All collected CDASH DATE and TIME components are concatenated and populate the SDTMIG variable --DTC in ISO 8601 format.

Variable Name	Variable Label/ Description	Comments/Instructions
--DUR, --STRTPT, --STTPT, --ENRTPT, --ENTPT	Using CDASH Concept instead of SDTM Concept	Avoid having duplicate concepts in the ALS (the CDASH one and the SDTM one). If there is a choice, include the CDASH concept instead of the SDTM concept because the CDASH concept was created to address the needs of data collection and data management. Best practice is to collect any numeric value that has an associated unit in two separate fields. Using --CDUR and --CDURU is more user friendly and supports data management processes. --DUR (from SDTM) was removed and added --CDUR and --CDURU (from CDASH) in the ALS. In addition, SDTM variables –STRTPT, --STTPT, --ENRTPT and --ENTPT were removed and instead added the CDASH variables --PRIOR, --ONGO and --RFTDAT in the ALS.
VISITNUM and --TPTNUM		Not recommended as a collection variable. If added to the domain, do not display on the form and use the variable as defined in the SDTMIG.

3.2   Standard Conventions

The CDISC-compliant Rave GLIB forms were setup in the ALS based on the standard conventions as indicated in the table below:

Table 6: Standard Conventions for CDISC-Compliant GLIB

Form Attributes	CDISC-Compliant GLIB CDASH Domain	CDISC-Compliant GLIB SDTM Domain	LPO Allowed to Modify During *Study Build*
Form Name	Domain Name *(Example: Adverse Events)*	Domain Name *(Example: Tumor/Lesion Results)*	Yes
Form OID	2 Letter Domain *(Example: AE)*	2 Letter Domain *(Example: TR)*	Yes
Variable OID	CDASH variable from caDSR (CDE Short Name)	SDTM variable from SDTM 3.3 Metadata table if no direct mapping of CDASH to SDTM available	Yes
Field Name	Variable Label + PID (caDSR)	Variable Label from SDTM 3.3 Metadata table	No
Field OID	CDASH variable from caDSR (CDE Short Name)	SDTM variable from SDTM 3.3 Metadata table if no direct mapping of CDASH to SDTM available	No
Field Label	Question Text or Prompt (For Field with no labels, the Field Label will be the CDASHIG Variable Label from CDASH 2.0 Metadata table)	Variable Label from SDTM 3.3 Metadata table	Yes
Format - Date	dd MMM yyyy	dd MMM yyyy	Yes
Format - Time	HH:nn:ss (24 hr)	HH:nn:ss (24 hr)	Yes
Format- Char (W Dictionary)	Same as caDSR	Maximum length of longest CDISC Submission Value *(Note: If variable exists in caDSR or same codelist being used across variables in caDSR, followed format as in caDSR, else followed this standard.)*	Yes
Format- Char (W/O Dictionary)	Same as caDSR	$10 *(Note: If variable exists in caDSR, followed format as in caDSR, else followed this standard.)*	Yes
Format - Numeric	Same as caDSR	10 *(Note: If variable exists in caDSR, followed format as in caDSR, else followed this standard.)*	Yes
Control Type	Text = Character or numeric variable with format <= 50 Long Text = Non-enumerated variables with format > $50 DATE/TIME = Date or time variable Dropdown = Variables having dictionary <=10 entries SearchList = Variables having dictionary > 10 entries	Text = Character or numeric variable with format <= 50 Long Text = Non-enumerated variables with format > $50 DATE/TIME = Date or time variable Dropdown = Variables having dictionary <=10 entries SearchList = Variables having dictionary > 10 entries	Yes
SAS Label	Variable Label from SDTM if variable directly mapping to SDTM. If variable not directly mapping to SDTM or does not exist in SDTM Model, use CDASH variable label	Variable Label from SDTM 3.3 Metadata table	No
Auto-Query for Future Date	Checked for all dates	Checked for all dates	Yes

Form Attributes	CDISC-Compliant GLIB CDASH Domain	CDISC-Compliant GLIB SDTM Domain	LPO Allowed to Modify During *Study Build*
Data Dictionary Name	CDISC Submission Value of the Codelist Name from CDASH Terminology file (Value Domain Short Name from caDSR)	CDISC Submission Value of the Codelist Name from SDTM Terminology file	No
Data Dictionary Values:			
User Data String	PV Meaning from caDSR	NCI Preferred Term from SDTM Terminology file	No
Coded Data	PV from caDSR	CDISC Submission Value of the Codelist Term from SDTM Terminology file	No

3.3   Additional Standards

The table below provides a list of items including recommendations/instructions on how to use them in study build following the CDISC standards.

Table 7: List of Items with Special Instructions

Variable/Item	Description	Recommendations/Instructions
--DECOD, --PTCD, --LLT, --LLTCD, --HLT, --HLTCD, --HLGT, --HLGTCD, --SOC, --SOCCD	Coding Variables	These coding variables are specifically designed for use with the MedDRA structure, but may be useful with other dictionaries. These variables should only be setup to support internal coding process (i.e., derive from the MedDRA coding dictionary for Adverse Events) and should NOT be available for use by the site. For –DECOD (which can be used to select values from a provided list of values in the form), CTSU created a dummy coding dictionary (e.g., LPO_TBD) and attached it to the --DECOD coding variable. LPOs need to change the control type and attached the locally defined coding dictionary to --DECOD in study build.
--CLAS, --CLASCD, --ATC1, --ATC1CD, --ATC2, --ATC2CD, --ATC3, --ATC3CD, --ATC4, --ATC4CD, --ATC5, --ATC5CD	Coding Variables	These coding variables are specifically designed for use with the WHO-DD structure, but may be useful with other dictionaries. These variables should only be setup to support internal coding process (i.e., derive from the WHO-DD coding dictionary for Concomitant Medication) and should NOT be available for use by the site.
--MODIFY	Topic Variable	This variable is for internal coding purposes only. If the collected/reported terms in an Interventions or Event domain is modified (e.g., splitting terms, changing spelling) to facilitate coding, the modified verbatim is stored in –MODIFY. If coding staff are not allowed to modify collected/reported terms for coding purposes, then LPOs can remove --MODIFY from all domains.
Partial Dates	Date Format	If date fields must allow for the entry of partial dates, Rave provides different date formats that allow partial dates entry.

Variable/Item	Description	Recommendations/Instructions
STUDYID, SITEID, SUBJID, EPOCH, VISIT, --SPID, --TESTCD, --TEST, --CAT, --SCAT, --TPT, --GRPID, --LNKID, --LNKGRP	SDTMIG Variables Used for Display Only	These fields should not be used for asking a question or any data entry, but should be used for displaying a value on the form.
--TEST, --TESTCD, --CAT, --SCAT, AEREL, --TPT *Note: These are some example of variables that are intended to use controlled terminology. This list may not be complete.*		Some CDASHIG and SDTMIG variables are intended to use controlled terminology even though a codelist is not specified for them in the Implementation Guides. These variables require "sponsor-defined" terminology. CTSU created a dummy data dictionary (e.g., LPO_TBD) and attached it to these variables. LPOs need to attach the required "sponsor-defined" terminology in study build, except AEREL will use CTSU Standard form dictionary. In addition if LPOs add a variable from SDTM that requires terminology but is not listed here and does not have a specific codelist defined, the Implementation Notes in the CDASH Metadata table could be useful to help LPOs understand when controlled terminology is needed for the variables.
SDTMIG Variables		If LPOs want to add in variables from SDTMIG that are not already existed in that domain in the CDASHIG and SDTM-only domains, use the root metadata Question Text from the CDASH Model to create PreText.
--AENO, --MHNO	Variables	For the --AENO and --MHNO variables, consider writing a custom function that will build search lists for all of the AEs and all of the MHs that are entered, and make the search list available on the forms that use those variables (e.g., CM, PR).

Variable/Item	Description	Recommendations/Instructions
CDASH Concept vs. SDTM Concept		Avoid having duplicate concepts in the ALS (the CDASH one and the SDTM one), and if there is a choice, include the CDASH concept instead of the SDTM concept because the CDASH concept was created to address the needs of data collection and data management. An example was the use of SDTM --DUR vs. the use of CDASH --CDUR and --CDURU. Best practice is to collect any numeric value that has an associated unit using two separate fields to allow for edit checks, etc. --DUR has a required format using the ISO 8601 Period standard, which would require the site to enter data using that format (e.g., P2W). Using --CDUR and --CDURU is more user friendly and supports data management processes better. Other examples of preferring the CDASH concept over the SDTM concept are: | CDASH Concept	SDTM Concept
---	---
--DAT and --TIM	--DTC
--PRIOR, --ONGO, --RFTDAT	--STRTPT, --STTPT, --ENRTPT, --ENTPT	
--DOSFRM, --DOSFRQ, --ROUTE	CDASH Subset Codelists	For CDASHIG variables that have both a complete SDTM codelist and a subset CDASH codelist, the subset codelists were attached to the CDASH variables which come from caDSR. LPOs can modify the subset codelists to include other values from the complete codelists at the study level, and create subsets using values from the complete SDTM codelists. Following are list of CDASH codelists that have been subsetted from the complete SDTM codelists: | CDASH Subset Codelists	SDTM Complete Codelists
---	---
--DOSFRM	FRM
--DOSFRQ	FREQ
--ROUTE	ROUTE	
Questionnaires (QS), Functional Tests (FT), Disease Response and Clin Classifications (RS)	Domains	QRS Instruments: These domains are governed by both the SDTMIG domain sections AND the relevant QRS Supplements (https://www.cdisc.org/foundational/qrs). For all published QRS Supplements, there are related controlled terminology codelists published in P36 for QSTESTCD, QSTEST, QSCAT, FTTESTCD, FTTEST, FTCAT, RSTESTCD, RSTEST, RSCAT, and some other variables. Reference the individual Supplements for more information on which fields require Controlled Terminology.

Variable/Item	Description	Recommendations/Instructions
Question Text vs. Prompt		As an alternative to using the complete Question Text, LPOs can use the CDASH Prompts for PreText. In some cases, the Prompt provides a more clear explanation of what should appear on the form (e.g., Category values should be displayed rather than asking "What is the category").
ALS for domains based on the Findings Class		The ALS includes some domains that are based on the SDTM/CDASH Findings Observation Class. These domains **may** contain multiple copies of the same field because CDASH presents multiple use cases (e.g., core lab vs. local lab) and some CDASH domains include de-normalized examples. The intention is that the LPOs will build a relevant set of fields for each of these domains based on the TESTs that require for the studies.
EPOCH, VISIT, --SPID, --TESTCD, --TEST, --CAT, --SCAT, --TPT, --GRPID, --LNKID, --LNKGRP.		These fields should only be used to display a value on the form.
RACE vs. CRACE		Only use RACE or CRACE, but not BOTH for any given study. Use RACE when the five designations for race used by the FDA are collected (American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; White). Use CRACE when more detailed race categorizations are collected (e.g., more than the five minimum designations for race used by the FDA).
ETHNIC vs. CETHNIC		Only use ETHNIC or CETHNIC, but not BOTH for any given study. Use ETHNIC when values are being collected using the exact non-extensible ETHNIC codelist (C66790) values. Use CETHNIC when values are collected using the NCI Thesaurus codelist for Ethnicity As Collected (C128690), the extended HL7 hierarchy of codelist values, or other Regulatory Agency specific controlled terminology for Ethnic Group. LPOs may append a suffix to denote multiple collected ethnicities (e.g., CETHNIC1, CETHNIC2).
CO	Comments Domain	CDASH does NOT recommend to create a separate Comments form. The COVAL variable should be added to any forms that requires to collect comment.
--PERF vs. --STAT		Either or both of these variables may be used on the form. --PERF is useful at the form or form section level, i.e., general prompt question to be used as a data management tool to verify that missing results are confirmed missing. --STAT may be used on the --TEST level, i.e., use to indicate that data are not available by having the site recording the value as "Not Done".

4. CDISC Implementation Workflow
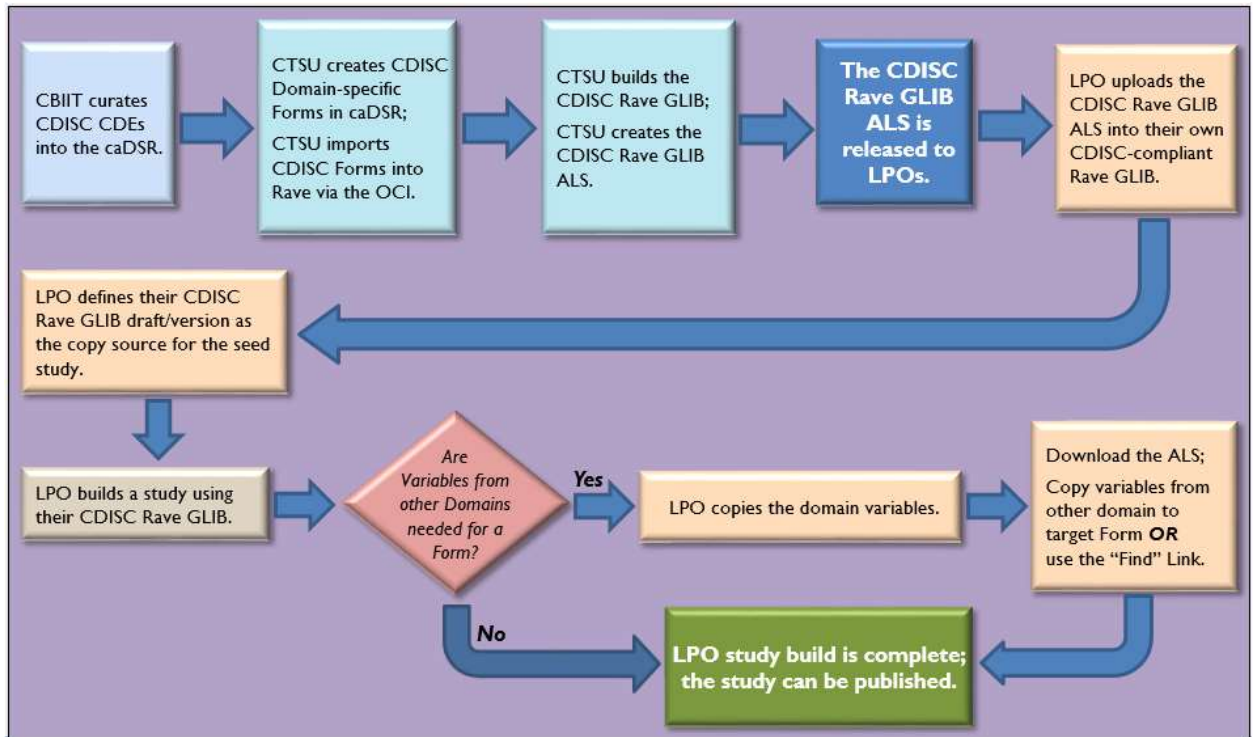
Figure 1: CDISC Implementation Workflow

5. How to Use the CDISC-Compliant Rave GLIB ALS for Study Build

The CDISC implementation workflow identifies that LPOs will utilize the CDISC-compliant Rave GLIB ALS to build their own CDISC-compliant Rave GLIBs to be used as the copy source for the seed studies.

5.1 Creating the LPO CDISC-compliant GLIB in Rave

Using the CDISC-compliant GLIB ALS provided by CTSU, LPOs build the CDISC-compliant GLIB draft in the Rave Global Library Volume (GLV).

Figure 2: CDISC-compliant GLIB draft in GLV

Before any objects can be copied from a Global Library Volume (GLV) to a particular project, the GLV must be defined as a Copy Source.
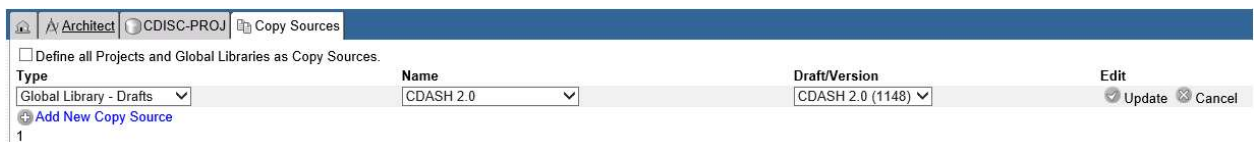
Figure 3: Creating Copy Source CDASH 2.0
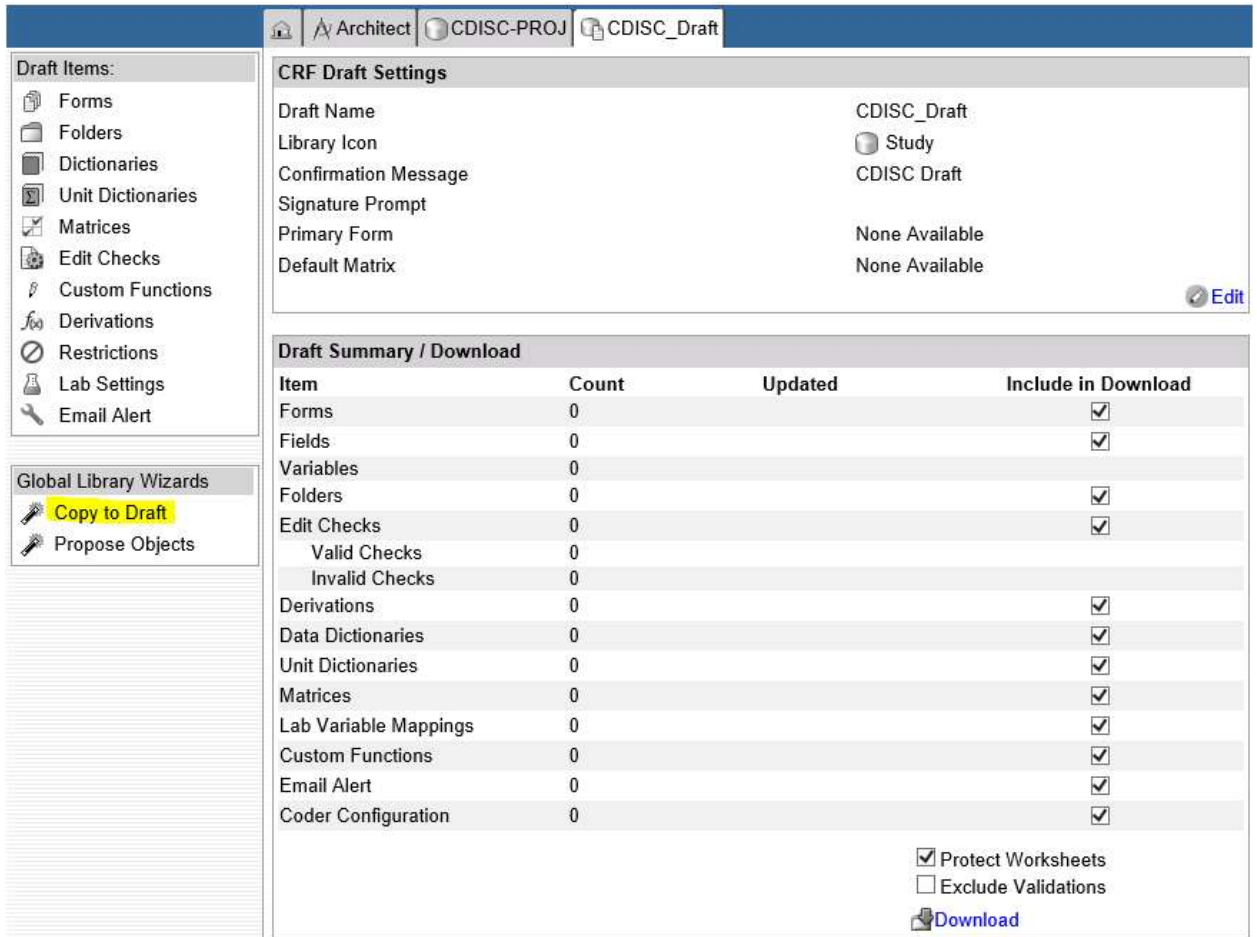
5.2 Options for Building Study Forms Using the CDISC GLIB

There are two options for building the project forms using the CDISC-compliant Rave GLIB.

5.2.1 Option #1: Copying Forms via Copy Sources in Rave

1) Create a blank project draft.

2) Use the Copy Wizard to copy objects from a copy source into a project draft. On the draft page within a Project, click the *Copy to Draft* link in the Global Library Wizards section of the sidebar.

Figure 4: Copy to Draft Link in the Global Library Wizards

3) Select the draft from the copy source by checking the box to the left of a draft.
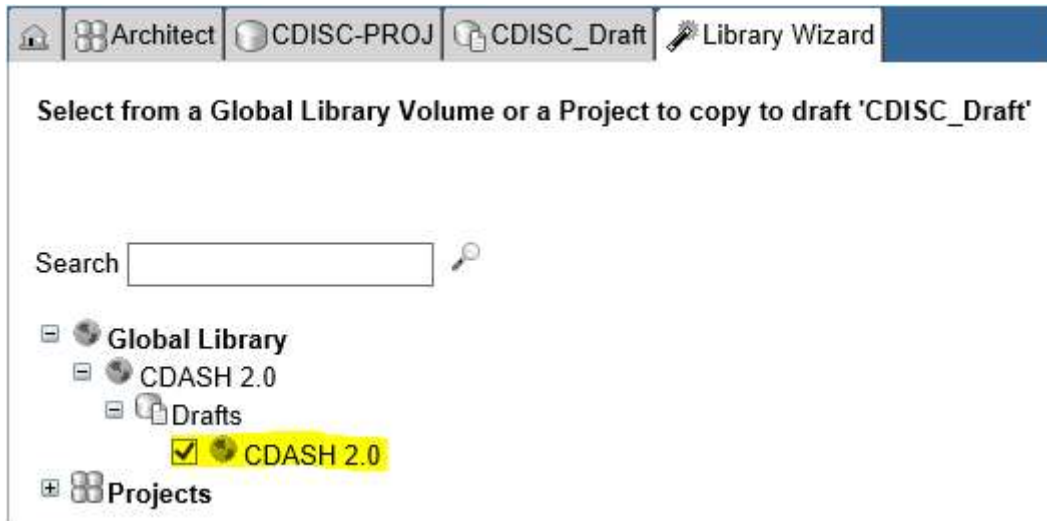
Figure 5: Selecting the Draft as the Copy Source

4) Within the copy wizard, each object type (e.g., Forms, Data Dictionaries) has its own page. Check the box next to the specific forms (e.g., AE, CM, DM, EX) or variable (e.g., DTHDAT from the Disposition form) to copy into a project draft.
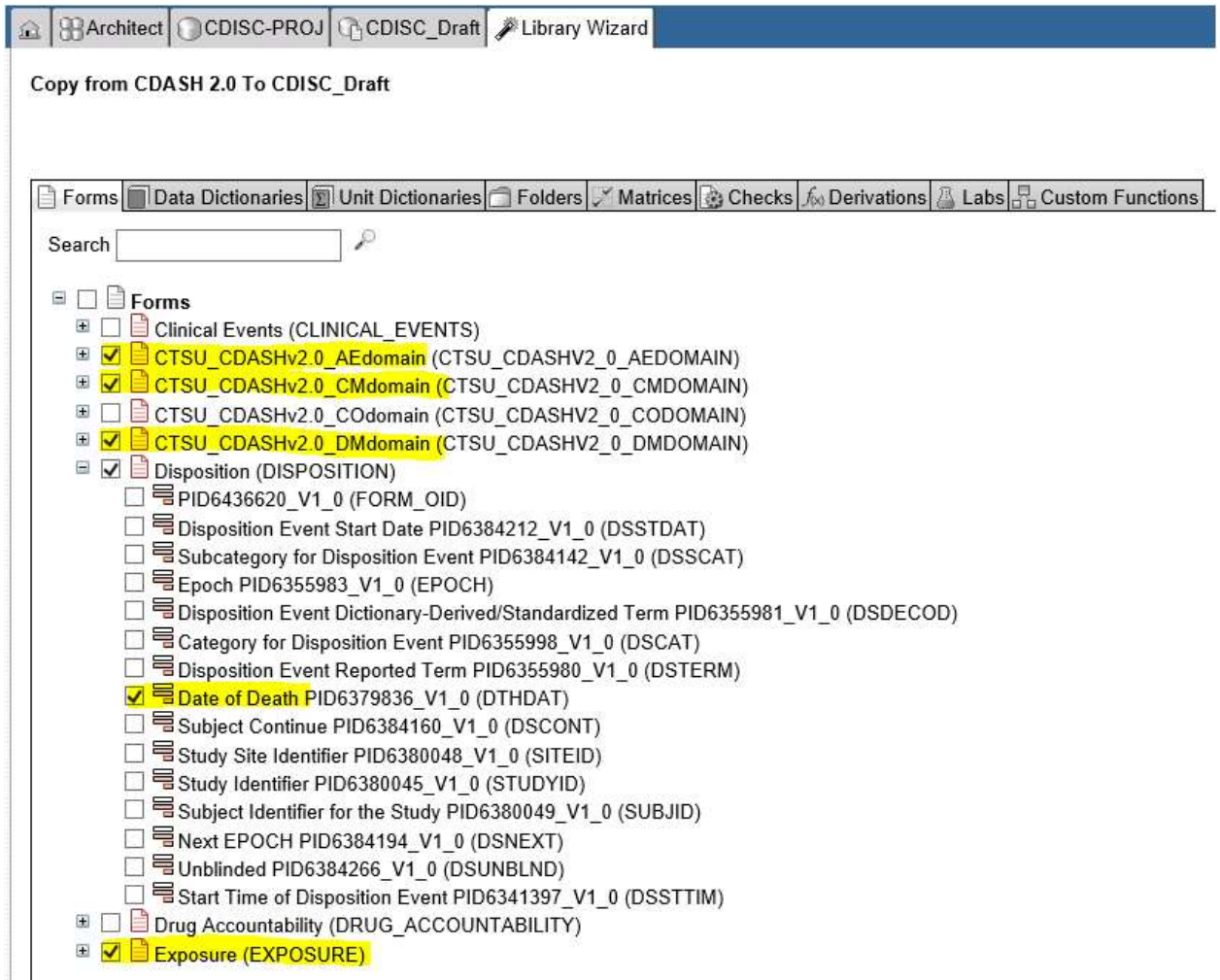
Figure 6: Copy Wizards

> *Note: If the Form box is checked, all children (e.g., variables and data dictionaries) are automatically selected to be copied into the target draft.*
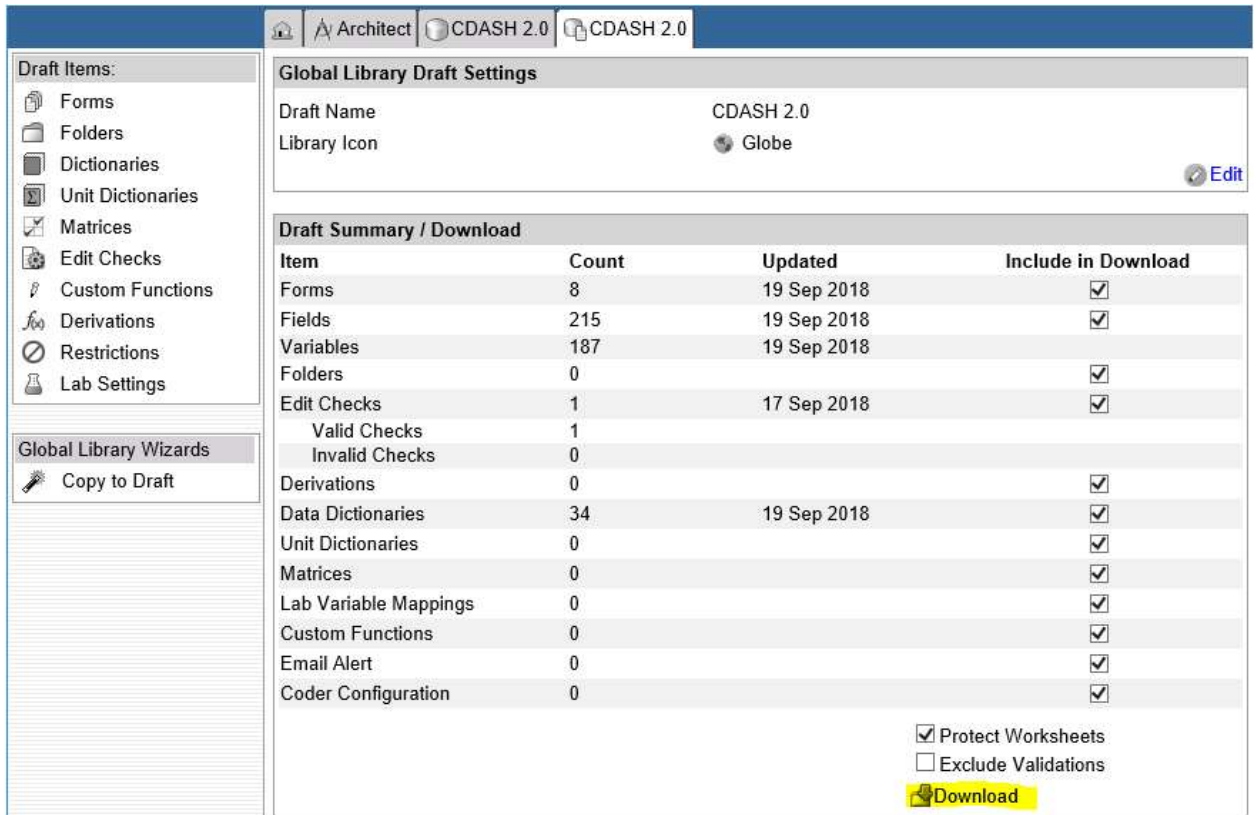
5) Once the form(s) and data dictionaries are copied from the CDISC-compliant Rave GLIB into the project draft, modify the forms per the study requirements.

- Open the form in Rave and click the *Add New* link to add CDISC variables from other forms.

- Use the *Find* link on the variable definition screen to select the new variable and click *Apply* to copy.

> *Note: The Find link copies only the Variable OID, Format and Data/Unit dictionary; the associated Field attributes are not copied.*

- You must manually add any new custom variables that do not exist in the CDISC GLIB.

5.2.2   Option #2: Copying Forms via Download ALS

1) Download the CDISC-compliant GLIB ALS from the GLV.

Figure 7: Downloading the CDISC-compliant GLIB ALS

2) Modify the ALS by copying and pasting variables and/or data dictionaries from other domains
    to the project draft, and/or deleting variables not required for the project, and/or adding a
    new form to the project. The following tabs in the ALS must be updated for the project-
    specific draft.

    - CRFDraft

    - Forms

    - Fields

    - DataDictionaries

    - DataDictionaryEntries

Figure 8: Project Draft ALS

3) Upload the ALS into the project draft in Rave.

5.3   Possible Scenarios in Form Build

5.3.1   Scenario #1: Building Forms from Single Domain

All variables in a form are from a single domain (e.g., Concomitant Medication (CM)). There are
two methods to copy a form for study build:

1) Copy the form via copy source.

   - Use copy wizard to select and copy the CM form, variables and data dictionaries from
     the copy source to the project draft.

Figure 9: Copying Form from Single Domain via Copy Wizard

2) Copy the form via download ALS.

- Copy the CM form from the Form, Fields, DataDictionaries and DataDictionaryEntries tabs in the ALS to the project draft ALS.

Figure 10: ALS for the CM Domain

- After modification of the project ALS, upload the ALS into the project draft in Rave.

StudyDesign: Previous Therapy - General Medications (Previous Therapy - General Medications) [CM_UseCase1b]

Previous Therapy - General Medications Taken [igCM_UseCase1b_YN]

1.	Were any medications taken?	**[CMYN]** [A:N] ○ No [A:Y] ○ Yes

	CM Number	Medication	Start Date	End Date	Indication	MH ID	Reason for Discontinuation
2.							

Previous Medication Entry Entry [igCM_UseCase1b_D]

2.1*	What is the medication / treatment identifier? [read-only] [CM Number]	**[CMSPID]** N3
2.2*	What was the term for the medication / therapy taken? [Medication]	**[CMTRT]** A200
2.3	What was the start date of the medication / therapy? [Start Date]	**[CMSTDAT]** NReq/Unk ∨ / NReq/Unk ∨ / NReq ∨ (2012-2014)
2.4	What was the end date of the medication / therapy? [End Date]	**[CMENDAT]** NReq/Unk ∨ / NReq/Unk ∨ / Req ∨ (2012-2014)
2.5	For what indication was the medication / therapy taken? [Indication]	**[CMINDC]** A50
2.6	What was the ID of the medical history condition(s) for which the medication was taken? [MH ID]	**[CMMHNO]** N4
2.7	What was the reason for medication / therapy discontinuation [Reason for Discontinuation]	**[CMNCOMPLT]** **[cICMNCOMPLT]** ∨

Key: [*] = Item is required

Figure 11: Example of Form Annotation - CM (Concomitant Medication)

5.3.2 Scenario #2: Building Forms from Multiple Domains

A form contains variables from multiple domains (e.g., Exposure form with variables from EX and AE domains). There are two methods to copy the forms and selected variables into a project draft:

1) Copy the forms via copy source.

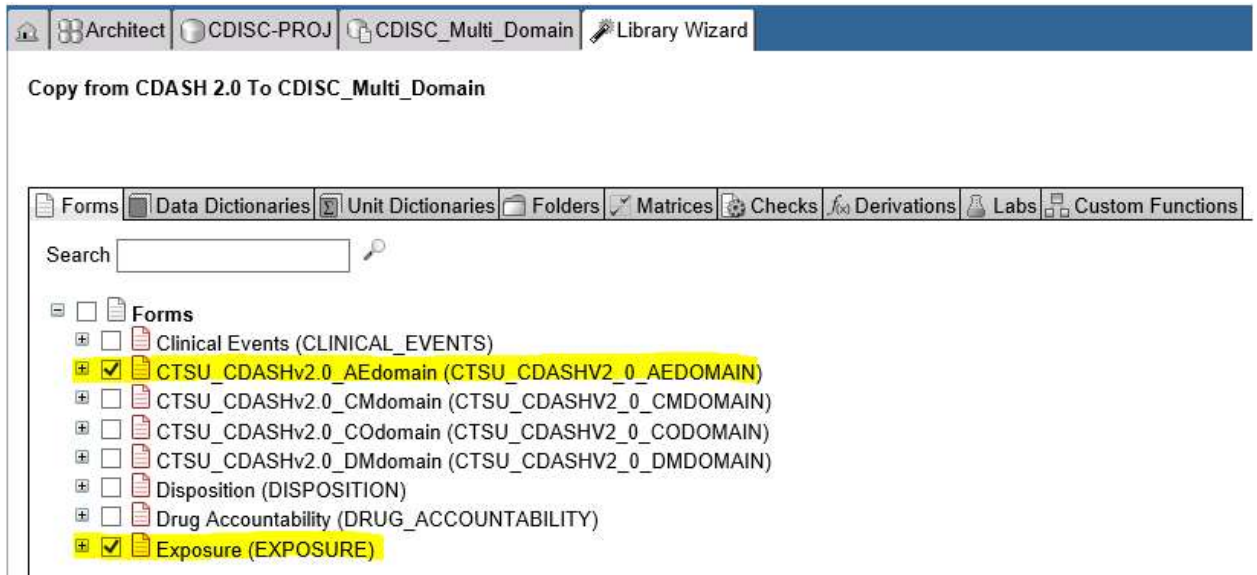- Use copy wizard to copy the EX and AE form to the project draft.

Figure 12: Copying Forms from Multiple Domains via Copy Wizard

- Follow the same steps outlined in "Building Form from Single Domain" to build Exposure form with variables from EX and AE domains.

- Open the EX form in Rave and click the *Add New* link to add the AESPID variable from the AE form or other forms.

- Use the *Find* link on the variable definition screen to select the AESPID variable and click *Apply* to copy.

2) Copy the forms via download ALS.

- In the ALS copy the objects from the Forms, Fields, DataDictionaries and DataDictionaryEntries tabs to the project draft ALS and Upload the ALS into the project draft in Rave.

- For example, to copy variable AESPID from form AE to form EX, go to the Fields tab, filter for FormOID = CTSU_CDASHV2_0_AEDOMAIN and copy the entire row FieldOID = AESPID. Then, filter for FormOID = EXPOSURE and insert the AESPID row to this form.

- To delete forms or variables that are not required for the project draft, update the Forms, Fields, DataDictionaries and DataDictionaryEntries tabs to delete the appropriate objects.

5.3.3   Scenario #3: Building Forms with Custom Domain and Variables

For a new custom domain (e.g., XV) or variables, update the ALS to add the XV domain to the Forms tab, and add new custom variables to the Fields tab. If a codelist is required for the custom variable, add the codelist to the DataDictionaries tab and the codelist values to DataDictionaryEntries tab. See Section 6 for details on creating custom domains and variables.

6. Other Modifications per LPO Study Requirements

6.1 Custom Domains

Use the published, standard domains as much as possible. If necessary, though, you can create custom domains based on one of the three General Observation Classes in the CDASH Model. Reference SDTMIG Section 2.6 for additional details on this process.

Process for creating a custom domain:

1) Step 1: Determine that the data require a domain that does not already exist in CDASH or SDTM. Always use an existing domain if your data meet the definition for that domain.

2) Step 2: Access the CDASH Model and choose the appropriate General Observation Class for your data. There are three General Observation Classes available:

- Findings: for the results of planned tests, measurements and other observations. These may have standard reference ranges, methods of testing, lab names, and other similar concepts.

- Interventions: for data about substances the subject takes into their body. This set of metadata includes variables that hold the name of the substance, how much was used, units of consumption, dosage forms, etc.

- Events: for data about other things that happen, independent of the study design, but which are being tracked because they are of interest for the study.

3) Step 3: From the CDASH Model, add in any Identifiers and Timing variables that are needed for your domain.

4) Step 4: Create a unique 2-character domain code for the custom domain. Domain codes cannot conflict with existing domain codes. To eliminate any risk of using a name that CDISC later determines to have a different meaning, domain codes beginning with the letters X, Y, or Z have been reserved for the creation of custom domains. Any letter or number may be used in the second position. Consider assigning one of these letters to each General Observation Class to facilitate your SDTM programming. E.g., X for Interventions, Y for Events and Z for Findings.

5) Step 5: Add the domain code as a prefix to all your custom domain variables.

6) Step 6: Update the ALS to add the custom domain.

6.2 Custom Variables

For any new variables not included in the CDISC GLIB for a domain, and not already published in an SDTMIG or CDASHIG domain, you can create variable names that follow the CDISC naming convention using CDASH Model or SDTM Model root variable names prefixed by 2 letter domain name code. These are considered standard variables if they are used within a domain based on the same General Observation Class. If you use a root variable from a different General Observation Class, it will become a Supplemental Qualifier in the SDTM domain.

If you need to create a truly new, custom variable (called non-standard variables in SDTM) use the variable naming fragments in Section 6.2.2 and prefix them with your domain code. These will become Supplemental Qualifiers in SDTM.

6.2.1 Variable Following the General Observation Classes

The CDASH Model is structured similarly to the SDTM Model. The CDASH Model organizes data into classes, which represent meaningful groupings of data in clinical research. It defines general observation class variables (Interventions, Events, and Findings), CDASH metadata for identifier variables, and timing variables. The presence of two hyphens before the variable name (e.g., --TRT) is used to indicate the required use of a prefix based on the 2-character domain code (e.g., EX). The domain code is used as a variable prefix to minimize the risk of difficulty when merging or joining domains for reporting purposes. Refer to Section 2 of the CDASH Model Version 1.0 for list of the observation class variable attributes to use for implementing each of the domain classes and create custom domains.

6.2.2 Create Custom Variables from CDISC Naming Fragments

Following is a standard list of fragments (also available in the SDTM Implementation Guideline Appendix D) to use as a guide when naming custom variables. Use the fragment(s) that best convey the meaning of the variable meeting the 8-character variable naming limit of SAS transport files.

Keyword(s)	Fragment	Keyword(s)	Fragment
ACTION	ACN	EVALUATION	EVL
ADJUSTMENT	ADJ	EVALUATOR	EVAL
ANALYSIS DATASET	AD	EXTERNAL	X
ASSAY	AS	FASTING	FAST
BASELINE	BL	FILENAME	FN
BIRTH	BRTH	FLAG	FL
BODY	BOD	FORMULATION, FORM	FRM
CANCER	CAN	FREQUENCY	FRQ
CATEGORY	CAT	GRADE	GR
CHARACTER	C	GROUP	GRP
CLASS	CLAS	HOSPITALIZATION	HOSP
CLINICAL	CL	IDENTIFIER	ID
CODE	CD	INDICATION	INDC
COMMENT	COM	INDICATOR	IND
CONCOMITANT	CON	INTERPRETATION	INTP
CONDITION	CND	INTERVAL	INT
CONGENITAL	CONG	INVESTIGATOR	INV
DATE TIME - CHARACTER	DTC	LIFE-THREATENING	LIFE
DAY	DY	LOCATION	LOC
DEATH	DTH	LOINC CODE	LOINC
DECODE	DECOD	LOWER LIMIT	LO
DERIVED	DRV	MEDICALLY-IMPORTANT EVENT	MIE
DESCRIPTION	DESC	NAME	NAM
DISABILITY	DISAB	NON-STUDY THERAPY	NST
DOSE, DOSAGE	DOS, DOSE	NORMAL RANGE	NR
DURATION	DUR	NOT DONE	ND
ELAPSED	EL	NUMBER	NUM
ELEMENT	ET	NUMERIC	N
EMERGENT	EM	OBJECT	OBJ
END	END, EN	ONGOING	ONGO
ETHNICITY	ETHNIC	ORDER	ORD

Figure 13: List of Fragments

Keyword(s)	Fragment	Keyword(s)	Fragment
ORIGIN	ORIG	SPONSOR	SP
ORIGINAL	OR	STANDARD	ST, STD
OTHER	OTH, O	START	ST
OUTCOME	OUT	STATUS	STAT
OVERDOSE	OD	SUBCATEGORY	SCAT
PARAMETER	PARM	SUBJECT	SUBJ
PATTERN	PATT	SUPPLEMENTAL	SUPP
POPULATION	POP	SYSTEM	SYS
POSITION	POS	TEXT	TXT
QUALIFIER	QUAL	TIME	TM
REASON	REAS	TIME POINT	TPT
REFERENCE	REF, RF	TOTAL	TOT
REGIMEN	RGM	TOXICITY	TOX
RELATED	REL, R	TRANSITION	TRANS
RELATIONSHIP	REL	TREATMENT	TRT
RESULT	RES	UNIQUE	U
RULE	RL	UNIT	U
SEQUENCE	SEQ	UNPLANNED	UP
SERIOUS	S, SER	UPPER LIMIT	HI
SEVERITY	SEV	VALUE	VAL
SIGNIFICANT	SIG	VARIABLE	VAR
SPECIMEN	SPEC, SPC	VEHICLE	V

6.3 CDASH De-normalized Convention Types

Adding new collection fields is often constrained by business rules, clinical data management processes and EDC systems. The naming conventions and other variable creation recommendations in CDASHIG are designed to consistently facilitate transforming the collected data into submission datasets. These conventions and recommendations are described in the following sections.

6.3.1 Changing Data Structure from Vertical to Horizontal

If a study requires capturing data in horizontal (de-normalized) structure that is different from the SDTM vertical (normalized) structure, concatenate the variable (e.g., VS_VSTEST_HR, VS_VSORRES_HR) where part of the variable (e.g., VSTEST, VSORRES) is taken from the SDTM specs and is concatenated with the test name (in this case HR for Heart Rate), using controlled terminology from the appropriate codelist.

One recommendation for creating denormalized varaibles is to follow a pattern-based naming convention so that you can write pattern-based SAS conversion programs to create your SDTM domains. This pattern: [domainCode_targetVariable_(*TOPIC*)] allows you to scan the variable name up to the first underscore and find the name of the domain, then scan to the next underscore (or the end) and find the name of the target variable. The value that is collected in that variable is then placed in that target variable in that domain.

In some cases it is also useful or necessary to have the value of the TOPIC variable for the SDTM record in order to create a unique variable name, as in the case of FINDINGS Observation Class domains where the topic is the short name of the TEST and there may be multiple tests on one form. The example below for Vital Signs illustrates this where we have created multiple Original Result fields that are test-specific.

Figure 14: Example of creating de-normalized variables for the Vital Signs form

6.3.2   Changing Data Type

If a study requires a variable to collect a data type that differs from the SDTM data type (i.e., change data type for variable FAORRES from character to numeric), create a new variable name that follows CDASH convention by adding a "C" for "Collected" in front of the variable root (e.g., FACORRES).