SENTINEL COMMON DATA MODEL

LABORATORY RESULT TABLE DOCUMENTATION

Version 1.0

Prepared by: SCDM Clinical Data Elements Workgroup

JULY 2015

Sentinel is a pilot project sponsored by the U.S. Food and Drug Administration (FDA) to inform and facilitate development of a fully operational active surveillance system, the Sentinel System, for monitoring the safety of FDA-regulated medical products. Sentinel is one piece of the Sentinel Initiative, a multi-faceted effort by the FDA to develop a national electronic system that will complement existing methods of safety surveillance. Sentinel Collaborators include Data and Academic Partners that provide access to health care data and ongoing scientific, technical, methodological, and organizational expertise. The Sentinel Coordinating Center is funded by the FDA through the Department of Health and Human Services (HHS) Contract number HHSF223201400030I.

LOG OF CHANGES

Version Number	Description of Changes	Date
v1.0	First release	July 2015

Sentinel Common Data Model

Laboratory Result Table Documentation

Table of Contents

I. INTRODUCTION

The Sentinel Common Data Model (SCDM) Laboratory Result Table provides information on key laboratory results data elements needed for Sentinel activities. Data Partners transform their laboratory results data locally according to the SCDM, which enables the Sentinel Operations Center (SOC) to distribute standardized computer programs that run identically at each Data Partner site.

The SCDM Clinical Data Elements Workgroup's Laboratory Result Table Quality Assurance and Development Team meets regularly to update, review, and refine the content and structure of the SCDM Laboratory Result Table. By utilizing analytic programs, reports, and newly published national recommendations and guidelines to thoroughly review each test, the team has standardized the table content and, in this document, has compiled this guidance for all laboratory result test types included in the SCDM Laboratory Result Table.

The guidance in this document is common to all Data Partners participating in the SCDM Laboratory Result Table. The Clinical Data Elements Workgroup's Lead Team may have provided your site additional guidance beyond what is included here. If so, please follow the additional site-specific instructions. Questions or input related to the SCDM Laboratory Result Table or the guidance provided, can be sent to msoc@harvardpilgrim.org.

II. OVERVIEW OF SCDM LABORATORY RESULT TABLE STRUCTURE

A. PATID

1. Description of Variable

Arbitrary person-level identifier.

- Used to link record across tables.
- Populated for all records.

2. Variable Attributes

- Type: character
- Length: site-specific

3. Acceptable Values

- Unique member identifier, site-specific.

4. Additional Notes

- None.

B. MS_TEST_NAME

1. Description of Variable

Abbreviated test name.

- Populated for all records.

2. Variable Attributes

- Type: character
- Length: 10

3. Acceptable Values

- ALP = alkaline phosphatase
- ALT = alanine aminotransferase
- ANC = absolute neutrophil count
- BILI_TOT = total bilirubin
- CHOL_HDL = cholesterol high density lipoprotein

- CHOL_LDL = cholesterol low density lipoprotein
- CHOL_TOT = cholesterol total
- CK = creatine kinase total
- CK_MB = creatine kinase MB
- CK_MBI = creatine kinase MB/creatine kinase total
- CREATININE = creatinine
- D_DIMER = d-dimer
- GLUCOSE = glucose
- HGB = hemoglobin
- HGBA1C = glycosylated hemoglobin
- INF_A = influenza virus A
- INF_AB = influenza virus A + B
- INF_B = influenza virus B
- INF_NS = influenza virus not specified
- INR = international normalized ratio, prothrombin
- LIPASE = lipase
- PG = pregnancy test
- PLATELETS = platelet count
- SODIUM = sodium
- TRIG = triglycerides
- TROP_I = troponin I cardiac
- TROP_T = troponin T cardiac
- TSH = thyroid stimulating hormone

4. Additional Notes

- Several LOINC codes (LOINC) and/or local codes (LOCAL_CD) can point to one MS_Test_Name.

C. RESULT_TYPE

1. Description of Variable

Result_Type indicates whether the laboratory test result is numeric (e.g., 100 mg/mL, <100 mg/mL, >100 mg/mL) and MS_Result_N will be populated, or character (e.g., for character results such as: +, POS, POSITIVE, and ranges, such as 50-100 mg/mL) and MS_Result_C will be populated, based on Data Partner's source data.

2. Variable Attributes

- Type: character
- Length: 1

3. Acceptable Values

- N = numeric
- C = character

4. Additional Notes

- Note that results that contain ranges, such as, 50-100 mg/mL have Result_Type=C, but results with modifiers, such as >5 ng/mL have Result_Type = N.
- Examples:

Source Data	Result_Type
100 mg/mL	N
>5 ng/mL	N
50-100 mg/mL	C
POSITIVE	C
+	C

D. MS_TEST_SUB_CATEGORY

1. Description of Variable

Sub-category for MS_Test_Name.

- Sub-categories apply to only select laboratory tests.

- Please see the guidance by test name (characterized tests) or guidance by test name (tests under development) section(s) for additional details on how to populate this variable by MS_Test_Name.

2. Variable Attributes

- Type: character
- Length: 6

3. Acceptable Values

- BHCG = beta human choriogonadotropin
- CLC = calculated
- DDU = d-dimer units
- DIRECT = direct
- EIA = enzyme immunoassay
- FEU = fibrinogen equivalent units
- HCG = human choriogonadotropin
- IF = immunofluorescence
- NS = not specified
- PCR = probe and target amplification
- VTC = organism-specific culture

4. Additional Notes

- There are a number of "acceptable values" for MS_Test_Sub_Category, however, only select values are valid for each test. For example:
    - 'DIRECT' and 'CALCULATED' is only populated for MS_Test_Name = CHOL_LDL.
    - 'DDU' and 'FEU' is only populated for MS_Test_Name = D_DIMER, Result_Type = N.
    - 'BHCG' and 'HCG' is only populated for MS_Test_Name = PG.

E. FAST_IND

1. Description of Variable

Fasting indicator.

2. Variable Attributes

- Type: character
- Length: 1

3. Acceptable Values

- F= fasting
- R= random
- X= not applicable

4. Additional Notes

- Not all laboratory tests are differentiated by fasting status. For laboratory tests where fasting status is not considered to interpret results, FAST_IND is marked "X" (not applicable).
- For laboratory test results where fasting status may be considered to interpreting test results (e.g., glucose), FAST_IND is marked "F" (fasting) only if the source data included with the laboratory test result indicates a fasting test.
- All other laboratory test results where fasting status may be considered that is not explicitly marked as fasting, FAST_IND is marked "R" (random).
- Please see guidance by test name (characterized tests) or guidance by test name (tests under development) section(s) for additional information to populate this variable.

F. SPECIMEN_SOURCE

1. Description of Variable

Specimen source.

- Populated for all records.

2. Variable Attributes

- Type: character
- Length: 6

3. Acceptable Values

- BAL = bronchoalveolar lavage
- BALBX = bronchoalveolar biopsy
- BLOOD = blood
- CSF = cerebrospinal fluid
- NPH = nasopharyngeal swab
- NPWASH = nasopharyngeal wash
- NSWAB = nasal swab or nose specimen
- NWASH = nasal wash
- OTHER = other
- PLASMA = plasma
- PPP = platelet poor plasma
- SERUM = serum
- SPUTUM = sputum
- SR_PLS = serum/plasma
- THRT = throat swab, oropharyngeal swab
- UNK = unknown or missing
- URINE = urine

4. Additional Notes

- Some laboratory tests have several possible valid values for Specimen_Source.
- Please see the guidance by test name (characterized tests) or guidance by test name (tests under development) section(s) for additional details on how to populate this variable by test.

G. LOINC

1. Description of Variable

Logical Observation Identifiers, Names, and Codes (LOINC) is a universal coding system for tests, measurements, and observations developed by the Regenstrief Institute. LOINC provides very granular information about the tests such as the long name of the test, test definition/description, component, system, property, timing, scale, method, and examples of units.

2. Variable Attributes

- Type: character
- Length: 10

3. Acceptable Values

- All parts of the LOINC code, including the hyphen, are included.
    - The last digit of the LOINC code is a check digit and is always preceded by a hyphen.
- If a record utilizes a local LOINC (e.g., LOINC candidate codes), the result of that record is included, however, the LOINC variable is set to *null*.

4. Additional Notes

- Values in the LOINC variable do not contain leading zeros.
- LOINC is populated when available, thus not all records have LOINC.
- Please see guidance by test name (characterized tests) or guidance by test name (tests under development) section(s) for known LOINC codes for each MS_Test_Name.

H. STAT

1. Description of Variable

Immediacy of test. The intent of this variable is to determine whether the test was obtained as part of routine care or as an emergent/urgent diagnostic test (designated as Stat or Expedite).

2. Variable Attributes

- Type: character
- Length: 1

3. Acceptable Values

- E = Expedite
- R = Routine
- S = Stat
- U = Unknown or missing

4. Additional Notes

- None.

I. PT_LOC

1. Description of Variable

Patient location where the lab specimen was obtained.

2. Variable Attributes

- Type: character
- Length: 1

3. Acceptable Values

- E = Emergency department
- H = Home
- I = Inpatient
- O = Outpatient
- U = Unknown or missing

4. Additional Notes

- None.

J. RESULT_LOC

1. Description of Variable

Location of the test result.

2. Variable Attributes

- Type: character
- Length: 1

3. Acceptable Values

- L = Lab
- P = Point of Care
    - Point of Care locations may include anticoagulation clinic, newborn nursery, finger stick in provider office, or home.

4. Additional Notes

- The default value is "L" unless the result is Point of Care.
- There are not any *null* values.

K. LOCAL_CD

1. Description of Variable

Local code (non-LOINC) related to an individual lab test.

2. Variable Attributes

- Type: character
- Length: site-specific

3. Acceptable Values

- Values for LOCAL_CD are not required. LOCAL_CD is only populated if available in source data.

4. Additional Notes

- This variable will not be used in queries, but may be used by local programmers to identify and extract the required CDM tests.

L. BATTERY_CD

1. Description of Variable

Local code (non-LOINC) related to a battery or panel of lab tests.

2. Variable Attributes

- Type: character
- Length: site-specific

3. Acceptable Values

- Values for BATTERY_CD are not required. BATTERY_CD is only populated if available in source data.

4. Additional Notes

- This variable will not be used in queries, but may be used by local programmers to identify and extract the required CDM tests.

M. PX

1. Description of Variable

Procedure Code associated with the laboratory result record.

2. Variable Attributes

- Type: character
- Length: site-specific

3. Acceptable Values

- Values for PX are not required. PX is only populated if available in source data.

4. Additional Notes

- PX is populated if PX_CODETYPE is populated.

N. PX_CODETYPE

1. Description of Variable

Procedure code type associated with the laboratory result record.

2. Variable Attributes

- Type: character
- Length: 2

3. Acceptable Values

- 09 = ICD-9-CM
- 10 = ICD-10-CM
- 11 = ICD-11-CM
- C2 = CPT Category II
- C3 = CPT Category III
- C4 = CPT-4 (i.e., HCPCS Level I)
- H3 = HCPCS Level III
- HC = HCPCS (i.e., HCPCS Level II)
- LO = Local homegrown
- OT = Other
- RE = Revenue

4. Additional Notes

- Values for PX_CODETYPE are not required. PX_CODETYPE is only populated if available in source data.
- PX_CODETYPE is populated if PX is populated.

O. ORDER_DT

1. Description of Variable

Date that the test was ordered, represented as a SAS date value.

2. Variable Attributes

- Type: numeric
- Length: 4
- Format: MMDDYY10

3. Acceptable Values

- SAS date.

4. Additional Notes

This date could fall anywhere from the same day the specimen was collected to months before the specimen was collected. There are three dates that can be associated to the laboratory results:

- Order date (ORDER_DT)
- Laboratory date (LAB_DT)
- Result date (RESULT_DT)

The typical sequence of these date variables, from earliest to latest occurrence, is:

ORDER_DT ≤ LAB_DT ≤ RESULT_DT

One or more of these dates is populated for each record in the Laboratory Result Table. These dates are all populated if available in source data.

P. LAB_DT

1. Description of Variable

Date that the specimen was collected, represented as a SAS date value. For most Sentinel activities, this is the most relevant date.

2. Variable Attributes

- Type: numeric
- Length: 4
- Format: MMDDYY10

3. Acceptable Values

- SAS date.

4. Additional Notes

There are three dates that can be associated to the laboratory results:

- Order date (ORDER_DT)
- Laboratory date (LAB_DT)
- Result date (RESULT_DT)

The typical sequence of these date variables, from earliest to latest occurrence, is:

ORDER_DT ≤ LAB_DT ≤ RESULT_DT

One or more of these dates is populated for each record in the Laboratory Result Table. These dates are all populated if available in source data.

Q. LAB_TM

1. Description of Variable

Time of day that the specimen was collected, represented as a SAS time value.

2. Variable Attributes

- Type: numeric
- Length: 4
- Format: HHMM

3. Acceptable Values

- Valid values are between 00:00 to 23:59.

4. Additional Notes

- Please note that LAB_TM is associated with LAB_DT.

R. RESULT_DT

1. Description of Variable

Date that the laboratory test was resulted. Dependent on the time of the test, this date could be the same day the specimen was collected or any date up to weeks later.

2. Variable Attributes

- Type: numeric
- Length: 4
- Format: MMDDYY10

3. Acceptable Values

- SAS date.

4. Additional Notes

There are three dates that can be associated to the laboratory results:

- Order date (ORDER_DT)
- Laboratory date (LAB_DT)
- Result date (RESULT_DT)

The typical sequence of these date variables, from earliest to latest occurrence, is:

ORDER_DT ≤ LAB_DT ≤ RESULT_DT

One or more of these dates is populated for each record in the Laboratory Result Table. These dates are all populated if available in source data.

S. RESULT_TM

1. Description of Variable

Time that the laboratory test was resulted, represented as a SAS time value.

2. Variable Attributes

- Type: numeric
- Length: 4
- Format: HHMM

3. Acceptable Values

- Valid values are between 00:00 to 23:59.

4. Additional Notes

- None.

T. ORIG_RESULT

1. Description of Variable

- Populated for all records.
- If Result_Type = "N", then the Orig_Result value represents the numeric portion of the test result, stripped of any modifiers (e.g., >, LE, GT) and/or result units (e.g., ng/ml, cells/mm3, %).
- If Result_Type = "C", Orig_Result value reflects the test string based on source data. See example in Additional Notes section below.

2. Variable Attributes

- Type: character
- Length: 50

3. Acceptable Values

- For records where Result_Type = C:
  - Values may include a decimal point ('.'), a sign ('-', '+') or text (e.g., 'POSITIVE', 'NEGATIVE', 'DETECTED').
- For records where Result_Type = N:
  - The symbols >, <, >=, <= are removed from the value and stored in the Modifier variable.
  - Result units are removed and stored as Orig_Result_unit variable.

4. Additional Notes

- Examples:

Source Data	Result_Type	Modifier	Orig_Result	Orig_Result_Unit
100 10^9/L	N	EQ	100	10^9/L
2.5 mg/ml	N	EQ	2.5	mg/ml
>5 ng/mL	N	GT	5	ng/mL
50-100 mg/mL	C	TX	50-100 mg/mL	*null*
positive	C	TX	positive	*null*
+	C	TX	+	*null*

U. MS_RESULT_C

1. Description of Variable

- Standardized result value for text or character results (Result_Type = C).
- If Result_Type = "C" and the source result is a range (e.g., 50-100 mg/mL), then populate MS_Result_C using Orig_Result with the start and end values of the range delimited by a vertical bar (e.g., "50-100 mg/mL" becomes "50|100 mg/mL").

2. Variable Attributes

- Type: character
- Length: 50

3. Acceptable Values

- BORDERLINE
- NEGATIVE
- POSITIVE
- UNDETERMINED
- RANGE: *start*|*end unit* (see Example below)

4. Additional Notes

- This variable is only populated for text/character results (Result_Type = C), and is *null* for numeric results (Result_Type = N).
- Examples:

Source Data	Result_Type	Modifier	Orig_Result	Orig_Result_Unit	MS_Result_C
100 10^9/L	N	EQ	100	10^9/L	*null*
2.5 mg/ml	N	EQ	2.5	mg/ml	*null*
>5 ng/mL	N	GT	5	ng/mL	*null*
50-100 mg/mL	C	TX	50-100 mg/mL	*null*	50|100 mg/mL
positive	C	TX	positive	*null*	POSITIVE
+	C	TX	+	*null*	POSITIVE

V. MS_RESULT_N

1. Description of Variable

- Standardized/converted numeric result for records where Result_Type=N.

2. Variable Attributes

- Type: numeric
- Length: 8

3. Acceptable Values

- Numeric digits with or without a decimal (“.”).

4. Additional Notes

- This variable is only populated for numeric test results (Result_Type = N).
- This variable is *null* for text/character results (Result_Type = C).
- This variable does not contain negative values.
- Examples:

Source Data	Result_Type	Modifier	Orig_Result	Orig_Result_Unit	MS_Result_N
100 10^9/L	N	EQ	100	10^9/L	100
2.5 mg/ml	N	EQ	2.5	mg/ml	2.5
>5 ng/mL	N	GT	5	ng/mL	5
50-100 mg/mL	C	TX	50-100 mg/mL	*null*	*null*
positive	C	TX	positive	*null*	*null*
+	C	TX	+	*null*	*null*

W. MODIFIER

1. Description of Variable

Modifier for result values.

2. Variable Attributes

- Type: character
- Length: 2

3. Acceptable Values

- EQ = equal
- GE = greater than or equal to
- GT = greater than
- LE = less than or equal to
- LT = less than
- TX = text

4. Additional Notes

- Any relational operators in the original source data value (e.g., <, >, or =) are reflected in the Modifier variable.
    - For example, if the original source data value is "<=200", then Orig_Result = '200' and Modifier = 'LE'.
- If the original source data result value is text, then Modifier = 'TX'.
- If the original source data result value is numeric (digits with or without decimal) and does not contain an operator, then Modifier = 'EQ'.
- Examples:

Source Data	Result_Type	Modifier	Orig_Result	Orig_Result_Unit
100 10^9/L	N	EQ	100	10^9/L
2.5 mg/mL	N	EQ	2.5	mg/mL
>5 ng/mL	N	GT	5	ng/mL
50-100 mg/mL	C	TX	50-100 mg/mL	*null*
positive	C	TX	positive	*null*
+	C	TX	+	*null*

X. ORIG_RESULT_UNIT

1. Description of Variable

Original units for the test result, as reported in your source data. This variable is directly related to ORIG_RESULT and MODIFIER.

2. Variable Attributes

- Type: character
- Length: 20

3. Acceptable Values

- Text.

4. Additional Notes

- This variable does not include the test name, or any special characters, unless that character is part of the unit value.

- For example, special characters are included in "10^9/L". However, special characters are not included in "^U/L^", as these carats are not part of the unit value.

- Some laboratory tests may not have a result unit.
- Examples:

Source Data	Result_Type	Modifier	Orig_Result	Orig_Result_Unit
100 10^9/L	N	EQ	100	10^9/L
2.5 mg/mL	N	EQ	2.5	mg/mL
> 5 ng/mL	N	GT	5	ng/mL
50-100 mg/mL	C	TX	50-100 mg/mL	*null*
positive	C	TX	positive	*null*
+	C	TX	+	*null*

Y. STD_RESULT_UNIT

1. Description of Variable

Standardized units for the result. The purpose of STD_RESULT_UNIT is to modify ORIG_RESULT_UNIT from free text to a standardized unit, as an intermediary step in converting from ORIG_RESULT_UNIT to MS_RESULT_UNIT.

2. Variable Attributes

- Type: character
- Length: 11

3. Acceptable Values

- This variable is only populated for records where Result_Type = "N".
- Common rules and guidelines for populating STD_RESULT_UNIT include:
  - Converting all text values for ORIG_RESULT_UNIT to uppercase.
  - Using standard abbreviations listed in Appendix A: SCDM Laboratory Standard Abbreviations Table.

- Examples:

ORIG_RESULT_UNIT	STD_RESULT_UNIT
milligram/deciliter, MG/DL, mg/dl	MG/DL
Cells/cuMM	CELL/MM3
%, percent, PCT	PERCENT
10*9/L, 10^9/liter	BIL/L

4. Additional Notes

- This variable does not include special characters, unless that character is part of the unit.
  - For example, special characters are included in "10^9/L". However, special characters are not included in "^U/L^", as these carats are not part of the unit value.
- This value is *null* for character tests (Result_Type = C) until that test has been reviewed and characterized by the Clinical Data Elements Workgroup.
- This value is not usually *null*. However, there are exceptions, such as when the test result is a ratio (e.g., International Normalized Ratio [INR]).

Z. MS_RESULT_UNIT

1. Description of Variable

Converted/standardized result units for the value populated in MS_RESULT_N.

2. Variable Attributes

- Type: character
- Length: 11

3. Acceptable Values

- Text.

4. Additional Notes

- This value is *null* for:
  - Records where Result_Type = C, and

- Laboratory tests that have not been characterized and reviewed by the Clinical Data Elements Workgroup (please see the guidance by test name [tests under development] section).

- This value may be *null* for some numeric tests (e.g., as International Normalized Ratio [INR] is a ratio, it does not have a result unit).
- For tests that require a result unit, MS_RESULT_UNIT is set to "UNKNOWN" for all records where the original result unit is missing or blank, "NULL", "N/A", "NA", or "UNK."
- Guidance is only provided for laboratory tests that have been reviewed by the Clinical Data Elements Workgroup. Please see the guidance by test name (characterized tests) or guidance by test name (tests under development) section(s) for additional details.

AA.NORM_RANGE_LOW

1. Description of Variable

- Lower bound of the normal reference range, as assigned by the laboratory.
- The normal range associated with a test, as assigned by the laboratory is parsed out into the following variables: NORM_RANGE_LOW, MODIFIER_LOW, NORM_RANGE_HIGH, MODIFIER_HIGH, and reflects what is seen in your source data.

2. Variable Attributes

- Type: character
- Length: 8

3. Acceptable Values

- Value only contains the value of the lower bound of the normal reference range.
- This value is not converted and unit of measure is not included. It is assumed that the associated unit is the same as the original result unit from your source data. The symbols >, <, >=, <= are removed.
  - For example, if the normal range for a test is >100 and <300, then "100" is entered.

4. Additional Notes

- This value is *null* for records where Result_Type = C.
- Examples:

Example of range in source data	NORM_RANGE _LOW	MODIFIER _LOW	NORM_RANGE _HIGH	MODIFIER _HIGH
Normal range = 30-50	30	EQ	50	EQ
Normal range = <5	*null*	*null*	5	LT
Normal range = >100	100	GT	*null*	*null*

BB. MODIFIER_LOW

1. Description of Variable

- Modifier for Norm_Range_low values.
- The normal range associated with a test, as assigned by the laboratory is parsed out into the following variables: NORM_RANGE_LOW, MODIFIER_LOW, NORM_RANGE_HIGH, MODIFIER_HIGH and reflects what is seen in your source data.

2. Variable Attributes

- Type: character
- Length: 2

3. Acceptable Values

- EQ = equal
- GE = greater than or equal to
- GT = greater than

4. Additional Notes

- This value is *null* for records where Result_Type = C.
- For numeric results (Result_Type = N) one of the following needs to be true:

- Both Modifier_low and Modifier_high contain EQ (e.g., normal values fall in the range 3-10).
- Modifier_low contains GT or GE and Modifier_high is *null* (e.g., normal values are >3 with no upper boundary).
- Modifier_high contains LT or LE and Modifier_low is *null* (e.g., normal values are <=10 with no lower boundary).

- Examples:

Example of range in source data	NORM_RANGE _LOW	MODIFIER _LOW	NORM_RANGE _HIGH	MODIFIER _HIGH
Normal range = 30-50	30	EQ	50	EQ
Normal range = <5	*null*	*null*	5	LT
Normal range = >100	100	GT	*null*	*null*

CC. NORM_RANGE_HIGH

1. Description of Variable

- Upper bound of the normal reference range, as assigned by the laboratory.
- The normal range associated with a test, as assigned by the laboratory is parsed out into the following variables: NORM_RANGE_LOW, MODIFIER_LOW, NORM_RANGE_HIGH, MODIFIER_HIGH and reflects what is seen in your source data.

2. Variable Attributes

- Type: character
- Length: 8

3. Acceptable Values

- Value only contains the value of the upper bound of the normal reference range.

- This value is not converted and unit of measure is not included. It is assumed that the associated unit is the same as the original result unit from your source data. The symbols >, <, >=, <= are removed.
    - For example, if the normal range for a test is >100 and <300, then "100" is entered.

4. Additional Notes

- This value is *null* for records where Result_Type = C.
- Examples:

Example of range in source data	NORM_RANGE _LOW	MODIFIER _LOW	NORM_RANGE _HIGH	MODIFIER _HIGH
Normal range = 30-50	30	EQ	50	EQ
Normal range = <5	*null*	*null*	5	LT
Normal range = >100	100	GT	*null*	*null*

DD. MODIFIER_HIGH

1. Description of Variable

- Modifier for Norm_Range_high values.
- The normal range associated with a test, as assigned by the laboratory is parsed out into the following variables: NORM_RANGE_LOW, MODIFIER_LOW, NORM_RANGE_HIGH, MODIFIER_HIGH and reflects what is seen in your source data.

2. Variable Attributes

- Type: character
- Length: 2

3. Acceptable Values

- EQ = equal
- LE = less than or equal to

- LT = less than

4. Additional Notes

- The value is *null* for records where Result_Type = C.
- For numeric results (Result_Type = N) one of the following needs to be true:
  - Both Modifier_low and Modifier_high contain EQ (e.g., normal values fall in the range 3-10).
  - Modifier_low contains GT or GE and Modifier_high is *null* (e.g., normal values are >3 with no upper boundary).
  - Modifier_high contains LT or LE and Modifier_low is *null* (e.g., normal values are <=10 with no lower boundary).
- Examples:

Example of range in source data	NORM_RANGE _LOW	MODIFIER _LOW	NORM_RANGE _HIGH	MODIFIER _HIGH
Normal range = 30-50	30	EQ	50	EQ
Normal range = <5	*null*	*null*	5	LT
Normal range = >100	100	GT	*null*	*null*

EE. ABN_IND

1. Description of Variable

Abnormal result indicator.

2. Variable Attributes

- Type: character
- Length: 2

3. Acceptable Values

- AB = abnormal
- AH = abnormally high
- AL = abnormally low

- CH = critically high
- CL = critically low
- CR = critical
- IN = inconclusive
- NL = normal
- UN = unknown or missing

4. Additional Notes

- This value comes directly from the source data; this value is not created programmatically based on variables such as MS_Result_N, Norm_Range_high, or Norm_Range_low.

FF. ORDER_DEPT

1. Description of Variable

Local code for ordering provider department.

2. Variable Attributes

- Type: character
- Length: site-specific

3. Acceptable Values

- Values for ORDER_DEPT are not required.

4. Additional Notes

- Populate only if ordering provider department is available in your source data.

GG. FACILITY_CODE

1. Description of Variable

Local facility code that identifies the hospital or clinic. Taken from facility claims. This information is useful when locating medical charts for review.

2. Variable Attributes

- Type: character
- Length: site-specific

3. Acceptable Values

- Values for FACILITY_CODE are not required.

4. Additional Notes

- Populate only if facility code is available in your source data.

III. GUIDANCE FOR RECORD INCLUSION

The SCDM Laboratory Result Table contains the results of laboratory tests performed on patients. If a test is not resulted or if the result is unknown for whatever reason (e.g., specimen not sufficient, patient did not show), then the test does not appear in the table. Additionally, negative numeric values (e.g., -5.0 mg/ml) are not included.

An original result that shows the following text (or similar) may imply a non-resulted test:

- Cancelled or Canceled
- Clotted
- DNR or Do not report
- DUP or Duplicate or Dupe
- EXPIRED
- FAILED
- Hemolyzed
- Note or See note or See below or Comm or Comment
- Invalid
- Q.N.S. or QNS or Quantity not sufficient
- TNP or Test not performed
- Invalid
- Not applicable or NA
- No specimen

This is not a complete list of results indicating a non-resulted record. Please use your own discretion in removing records containing other messages that indicate a non-resulted test result.

IV. GUIDANCE BY TEST NAME (CHARACTERIZED TESTS)

The laboratory tests found in this section represent laboratory test results that have been characterized and reviewed by the Clinical Data Elements Workgroup. For the laboratory tests in this section, the workgroup reviewed distribution of test results by Data Partner, Care Setting, LOINC, and result unit, among others, in an effort to harmonize, across Data Partners.

A. ALKALINE PHOSPHATASE (ALP)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	ALP	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in U/L.
MS_Result_unit	U/L	
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "ALP."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are “BLOOD”, “PLASMA”, “SERUM”, “SR_PLS”, or “UNK.”

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
ALP	N	*null*	BLOOD	1783-0	
ALP	N	*null*	SR_PLS	6768-6	

- Note:
  - LOINCs 12805-8, 14588-8, 16182-8 and 33063-9 are not included, as these codes are for isoenzyme tests.

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as ALP only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be converted to U/L.

9. MS_Result_unit

For records where the original result unit contains any permutation/abbreviation of "Units/Liter” or "International Units/Liter" (i.e., Units/L, u/l, IU/L, iu/l, UNITS, etc.), MS_Result_unit is "U/L."

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - %
  - G/DL (or g/dL)
  - MG/DL

11. Example

An ALP result of "75 IUnits/L" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	75
Orig_Result_unit	IUnits/L
Std_Result_unit	IU/L
MS_Result_N	75
MS_Result_unit	U/L

B. ALANINE AMINOTRANSFERASE (ALT)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	ALT	Serum glutamic-pyruvic transaminase (SGPT) is an older name for this enzyme.
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*)
Specimen_Source	BLOOD=blood PLASMA=plasma SERUM=serum SR_PLS=serum/plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in U/L.
MS_Result_unit	U/L	
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "ALT."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
ALT	N	*null*	SR_PLS	1742-6	
ALT	N	*null*	SR_PLS	1743-4	
ALT	N	*null*	SR_PLS	1744-2	
ALT	N	*null*	SR_PLS	44785-4	

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as ALT only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- SOC will provide guidance on how to convert results with other units; until then MS_Result_N = Orig_Result, and MS_Result_unit is equal to the units in your source data.
- Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to U/L.

9. MS_Result_unit

For records where the original result unit contains any permutation/abbreviation of "Units/Liter" or "International Units/Liter" (i.e. Units/L, UL, U L, u/l, IU/L, iu/l, UNITS, etc.), MS_Result_unit is "U/L."

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - %
  - G/DL (or g/dL)
  - MG/DL

11. Example

An ALT result of "25 iu/l" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	25
Orig_Result_unit	iu/l
Std_Result_unit	IU/L
MS_Result_N	25
MS_Result_unit	U/L

C. ABSOLUTE NEUTROPHIL COUNT (ANC)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	ANC	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in KU/L.
MS_Result_unit	K/UL	
	UNKNOWN	
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "ANC."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD" or "UNK." If you find other specimen sources in your data for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
ANC	N	*null*	BLOOD	26499-4	
ANC	N	*null*	BLOOD	751-8	
ANC	N	*null*	BLOOD	752-6	
ANC	N	*null*	BLOOD	753-4	

- Note:
  - LOINCs 30451-9 and 768-2 are not included, as they are segmented neutrophils only.

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as ANC only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to K/UL.

9. MS_Result_unit

- Allowable values are "K/UL", indicating "thousand per microliter". One thousand per microliter is equivalent to one billion per liter (i.e., K/UL = 10*9/L). One microliter is equivalent to one cubic millimeter (i.e., UL = MM*3).
- MS_Result_unit is set to "UNKNOWN" for any records where Orig_Result_unit has values that are missing a numerator or a denominator.

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - %
- There are many ways of writing "thousand per microliter." Some helpful reminders are:
  - "thousand" may be written as "K", "10*3", or many permutations of this
  - one cubic millimeter of blood is equivalent to one microliter (UL); cubic millimeter is often written as "MM*3" or "CU MM."
  - "billion per liter" is equivalent to K/UL
- ANC is commonly expressed as "cells per microliter." Results that are recorded as such are converted to K/UL using the conversion factors provided by SOC.

11. Example

An ANC result of "3,500 cells/cumm" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	3,500
Orig_Result_unit	cells/cumm
Std_Result_unit	CELL/UL
MS_Result_N	3.5
MS_Result_unit	K/UL

D. BILIRUBIN, TOTAL (BILI_TOT)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	BILI_TOT	Cord blood bilirubin results are not included.
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in MG/DL.
MS_Result_unit	MG/DL	Milligrams per deciliter.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "BILI_TOT." Cord blood bilirubin results are not included.

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", SR_PLS", or "UNK." If you find other specimen sources in your data for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
BILI_TOT	N	*null*	SR_PLS	14631-6	
BILI_TOT	N	*null*	SR_PLS	1975-2	
BILI_TOT	N	*null*	SR_PLS	33898-8	
BILI_TOT	N	*null*	SR_PLS	33899-6	
BILI_TOT	N	*null*	SR_PLS	34543-9	Battery, direct and total panel.
BILI_TOT	N	*null*	SR_PLS	35194-0	
BILI_TOT	N	*null*	BLOOD	42719-5	
BILI_TOT	N	*null*	SR_PLS	50189-0	Neonatal panel.
BILI_TOT	N	*null*	BLOOD	54363-7	LOINC has different units from most others: expected units are mol/volume (e.g., micromoles/L).
BILI_TOT	N	*null*	BLOOD	59827-6	LOINC has different units from most others: expected units are mol/volume (e.g., micromoles/L).
BILI_TOT	N	*null*	BLOOD	59828-4	LOINC has different units from most others: expected units are mol/volume (e.g., micromoles/L).

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as BILI_TOT only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to MG/DL.

9. MS_Result_unit

MS_Result_unit is "MG/DL."

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - IU/L
  - IU/ML
  - U/L
  - U/ML
- For any records with an Orig_Result_unit of "µmol/L" (or any variation of millimoles per liter such as MMOL/L), MS_Result_N is converted to MG/DL using the following equation: MS_Result_N = Orig_Result* 0.0585.

11. Example

A BILI_TOT result of "0.3 mg/dL" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	0.3
Orig_Result_unit	mg/dL
Std_Result_unit	MG/DL
MS_Result_N	0.3
MS_Result_unit	MG/DL

E. CREATINE KINASE, TOTAL (CK)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	CK	Creatine phosphokinase (CPK) is an older name for this enzyme.
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in U/L.
MS_Result_unit	U/L	Units per liter.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "CK."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X".

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK." If you find other specimen sources in your data for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
CK	N	*null*	SR_PLS	2157-6	
CK	N	*null*	SR_PLS	24335-2	CK panel.
CK	N	*null*	BLOOD	50756-6	LOINC status is discouraged.

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as CK only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to U/L.
- SOC will provide guidance on how to convert results with other units; until then MS_Result_N = Orig_Result, and MS_Result_unit is equal to the units in your source data.

9. MS_Result_unit

For records where the original result unit contains any permutation/abbreviation of "Units/Liter" or "International Units/Liter" (i.e. Units/L, UL, U L, u/l, IU/L, iu/l, UNITS, etc.), MS_Result_unit is "U/L."

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - %
  - G/DL (or g/dL)
  - MG/DL
  - NG/ML

11. Example

A CK result of "120 iu/l" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	120
Orig_Result_unit	iu/l
Std_Result_unit	IU/L
MS_Result_N	120
MS_Result_unit	U/L

F. CREATINE KINASE MB (CK_MB)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	CK_MB	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in U/L or NG/ML.
MS_Result_unit	NG/ML	Nanograms per milliliter is equivalent to micrograms per liter (i.e., NG/ML = UG/L).
	U/L	Units per liter for enzymatic activity tests (e.g., LOINCs 2154-3, 32673-6).
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "CK_MB."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

- Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."
- If other specimen sources are found for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
CK_MB	N	*null*	SR_PLS	13969-1	
CK_MB	N	*null*	SR_PLS	2154-3	
CK_MB	N	*null*	SR_PLS	32673-6	
CK_MB	N	*null*	BLOOD	49551-5	
CK_MB	N	*null*	SR_PLS	6773-6	

7. MS_Result_C

- Not applicable for this test. Value for all records is *null*, as CK_MB only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- SOC will provide guidance on how to convert results with other units; until then MS_Result_N = Orig_Result, and MS_Result_unit is equal to the units in the source data.

9. MS_Result_unit

- Allowable values are nanograms per milliliter (NG/ML) for mass/volume tests (e.g., LOINC codes 13969-1, 49551-5).
- Allowable values are units per liter (U/L) for enzymatic activity tests (e.g., LOINC codes 2154-3, 32673-6).

10. Orig_Result_unit

- Records where the Orig_Result_unit is indicative of a percent or ratio are not included. If Orig_Result_unit equals the following, then record is not included:
  - %
  - % OF TOTAL
  - % TOTAL
  - % INDEX

11. Example

A CK_MB result of "12 ug/L" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	12
Orig_Result_unit	ug/L
Std_Result_unit	UG/L
MS_Result_N	12
MS_Result_unit	NG/ML

G. CREATINE KINASE MB/CREATINE KINASE, TOTAL (CK_MBI)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	CK_MBI	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood PLASMA=plasma SERUM=serum SR_PLS=serum/plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result as an integer with up to one decimal place.
MS_Result_unit	PERCENT	Percent.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "CK_MBI."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

- Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."
- If you find other specimen sources for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
CK_MBI	N	*null*	SR_PLS	12187-1	
CK_MBI	N	*null*	SR_PLS	12189-7	
CK_MBI	N	*null*	SR_PLS	20569-0	
CK_MBI	N	*null*	SR_PLS	49136-5	Rarely used.

- Note:
  - LOINC 15049-0 is not included, as this is a ratio for CK-MM instead of CK-MB.

7. MS_Result_C

- Not applicable for this test. Value for all records is *null*, as CK_MBI only has numeric results.

8. MS_Result_N

Allowable values are positive numeric values converted from ORIG_RESULT variable. Numeric result is an integer with up to one decimal place. For example, if the original result value is "5.1%" then MS_Result_N is "5.1" and not "0.051."

9. MS_Result_unit

MS_Result_unit is “PERCENT”.

10. Orig_Result_unit

- CK_MBI is the ratio of CK_MB to total CK. Orig_Result_unit reflects this ratio (as a percent, index, or similar). CK_MBI records that have units that are weight/volume are not included. If Orig_Result_unit equals the following, then record is not included:
  - NG/ML
  - U/L
- If it is known that Orig_result_unit is *null* because CK_MBI is technically a unitless ratio, Std_Result_unit for these records is “PERCENT”.

11. Example

A CK_MBI result of "5.1 %" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	5.1
Orig_Result_unit	%
Std_Result_unit	PERCENT
MS_Result_N	5.1
MS_Result_unit	PERCENT

H. CREATININE (CREATININE)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	CREATININE	Creatinine results pre-, during, or post-dialysis are not included.
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in MG/DL.
MS_Result_unit	MG/DL	Milligrams per deciliter.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "CREATININE." Creatinine results pre-, during, or post-dialysis are not included.

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK." If other specimen sources are found for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
CREATININE	N	*null*	SR_PLS	14682-9	LOINC has different units from most others, expected units are: mol/volume (e.g., micromoles/L).
CREATININE	N	*null*	BLOOD	21232-4	
CREATININE	N	*null*	SR_PLS	2160-0	
CREATININE	N	*null*	SR_PLS	35203-9	
CREATININE	N	*null*	BLOOD	38483-4	
CREATININE	N	*null*	SR_PLS	44784-7	
CREATININE	N	*null*	BLOOD	59826-8	

- Note:
  - LOINC codes 11041-1, 11042-9, 51619-5, and 51620-3 are not included, as component is "Creatinine^pre dialysis" or "Creatinine^post dialysis".
  - LOINC 54052-6 is not included, as system is "^Patient".

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as CREATININE only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to MG/DL.
- SOC will provide guidance on how to convert results with other units; until then MS_Result_N = Orig_Result, and MS_Result_unit is equal to the units in the source data.

9. MS_Result_unit

MS_Result_unit is "MG/DL."

10. Orig_Result_unit

- Records where the original result units are a function of time (e.g., "G/24 H" or "ML/MIN") are not included.
- For any records with an Orig_Result_unit of "mmol/l" (or any variation of this), MS_Result_N is converted to MG/DL using the following equation: MS_Result = Orig_Result* 0.0113.

11. Example

A CREATININE result of "12,000 ng/ml" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	12,000
Orig_Result_unit	ng/ml
Std_Result_unit	NG/ML
MS_Result_N	1.2
MS_Result_unit	MG/DL

I. GLUCOSE (GLUCOSE)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	GLUCOSE	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	F=fasting R=random	Fast_ind is populated either "F" or "R" for glucose tests. If the test name, LOINC, notes, or other factors indicate it is a fasting test, then Fast_Ind = "F"; Otherwise, Fast_Ind = "R." A value of "X" is not a valid option for this test.
Specimen_Source	BLOOD=blood PLASMA=plasma SERUM=serum SR_PLS=serum/plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	*See below*	Numeric result in MG/DL.
MS_Result_unit	MG/DL	Milligrams per deciliter.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "GLUCOSE."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

- Value for all records is either "F" or "R" for glucose tests.
    - If the test name, LOINC, notes, or other factors indicate it is a fasting test, then FAST_IND = F. Otherwise, FAST_IND = R.
- A value of "X" is not a valid option for this test.

5. Specimen_Source

- Allowable values are “BLOOD”, “PLASMA”, “SERUM”, “SR_PLS”, or “UNK.”
- If other specimen sources are found for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
GLUCOSE	N	*null*	SR_PLS	10450-5	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	BLOOD	14743-9	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	SR_PLS	14749-6	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	14770-2	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	SR_PLS	14771-0	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	BLOOD	15074-8	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	SR_PLS	1554-5	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	BLOOD	1556-0	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	BLOOD	1557-8	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	SR_PLS	1558-6	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	SR_PLS	17865-7	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	BLOOD	2339-0	Random or not specified test (Fast_ind=R)

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
GLUCOSE	N	*null*	BLOOD	2340-8	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	2341-6	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	SR_PLS	2345-7	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	32016-8	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	SR_PLS	35184-1	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	SR_PLS	35211-2	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	39480-9	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	39481-7	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	41604-0	Fasting test (Fast_ind=F)
GLUCOSE	N	*null*	BLOOD	41651-1	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	41652-9	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	41653-7	Random or not specified test (Fast_ind=R)
GLUCOSE	N	*null*	BLOOD	51596-5	Random or not specified test (Fast_ind=R)

- Note:
  - LOINC code 2351-5 is not included, as this is a test for urine blood glucose.
  - LOINC code 47995-6 is not included, as this is a test for cord blood glucose.

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as GLUCOSE only has numeric results.

8. MS_Result_N

Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to MG/DL.

9. MS_Result_unit

MS_Result_unit is “MG/DL.”

10. Orig_Result_unit

- Records where the original result units are "U/L" or "IU/L" are not included.
- For any records with an Orig_Result_unit of "mmol/l" (or any variation of this), MS_Result_N is converted to MG/DL using the following equation:
  MS_Result = Orig_Result* 0.0556.

11. Example

A GLUCOSE result of "0.15 g/dl" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	0.15
Orig_Result_unit	g/dl
Std_Result_unit	G/DL
MS_Result_N	150
MS_Result_unit	MG/DL

J. HEMOGLOBIN (HGB)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	HGB	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	*See below*	Numeric result in G/DL.
MS_Result_unit	G/DL	Grams per deciliter.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "HGB."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

- Allowable values are "BLOOD" or "UNK."
- If other specimen sources are found for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
HGB	N	*null*	BLOOD	14775-1	
HGB	N	*null*	BLOOD	20509-6	
HGB	N	*null*	BLOOD	24360-0	HGB and HCT panel, only the HGB results are included, e.g., those with units "g/dl" instead of "%".
HGB	N	*null*	BLOOD	30313-1	
HGB	N	*null*	BLOOD	30350-3	
HGB	N	*null*	BLOOD	30351-1	
HGB	N	*null*	BLOOD	30352-9	
HGB	N	*null*	BLOOD	55782-7	
HGB	N	*null*	BLOOD	59260-0	
HGB	N	*null*	BLOOD	718-7	

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as HGB only has numeric results.

8. MS_Result_N

Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to G/DL.

9. MS_Result_unit

MS_Result_unit is “G/DL” for all records.

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - % (or GM%, VOLUME%)
  - FL
  - MCL
  - MEQ/L
  - MM/HR
  - MMHG

- PG
- X10(3)/MCL (or X10(6)/MCL, K/MM3)

11. Example

An HGB result of "152 gm/l" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	152
Orig_Result_unit	gm/l
Std_Result_unit	G/L
MS_Result_N	15.2
MS_Result_unit	G/DL

K. HEMOGLOBIN, GLYCOSYLATED (HGBA1C)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	HGBA1C	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	*See below*	Numeric result as an integer with up to one decimal place.
MS_Result_unit	PERCENT	Percent.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "HGBA1C."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

- Allowable values are "BLOOD" or "UNK."
- If other specimen sources are found for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
HGBA1C	N	*null*	BLOOD	17855-8	
HGBA1C	N	*null*	BLOOD	17856-6	
HGBA1C	N	*null*	BLOOD	4548-4	
HGBA1C	N	*null*	BLOOD	4549-2	
HGBA1C	N	*null*	BLOOD	59261-8	
HGBA1C	N	*null*	BLOOD	62388-4	
HGBA1C	N	*null*	BLOOD	71875-9	

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as HGB only has numeric results.

8. MS_Result_N

Numeric result as an integer with up to one decimal place. For example, if the original result value is "5.1%" then MS_Result_N is "5.1" and not "0.051."

9. MS_Result_unit

MS_Result_unit is "PERCENT."

10. Orig_Result_unit

- All records where the original result units are "G/DL" (e.g., GM/DL, g/dl) or "MG/DL" (e.g., mg/dL, mg/dl) are not included.
- For any records with an Orig_Result_unit of "mmol/mol" (or any variation of this), MS_Result_N is converted to a percentage using the following equation: HGBA1c % = (Orig_Result/10.929) + 2.15, where HGBA1c % is the MS standard unit. Please see this link for more details: http://www.diabetes.org.uk/Professionals/Publications-reports-and-resources/Tools/Changes-to-HbA1c-values/
- For all other records, MS_Result_N is populated by multiplying Orig_Result by a conversion factor of 1.

11. Example

An HGBA1C result of "6.5 % total HGB" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	6.5
Orig_Result_unit	% total HGB
Std_Result_unit	PERCENT TOTAL HGB
MS_Result_N	6.5
MS_Result_unit	PERCENT

L. INTERNATIONAL NORMALIZED RATIO, PROTHROMBIN (INR)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	INR	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood PPP=platelet poor plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	*See below*	Numeric result as an integer with up to one decimal place.
MS_Result_unit	*null*	
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "INR."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PPP", or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
INR	N	*null*	BLOOD	34714-6	
INR	N	*null*	BLOOD	46418-0	
INR	N	*null*	PPP	6301-6	

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as INR only has numeric results.

8. MS_Result_N

MS_Result_N is populated by multiplying Orig_Result by a conversion factor of 1. It is a numeric result as an integer, with up to one decimal place.

9. MS_Result_unit

Value for all records is *null*, as INR results are unitless ratios.

10. Orig_Result_unit

- If Orig_Result_unit equals the following, the record is not included:
  - PROTHROMBIN
  - seconds (or sec, SEC, Seconds, SECONDS)
  - %
  - MG/DL
  - X10(3)/MCL (or K/UL)

11. Example

An INR result of "1.5 ratio" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	1.5
Orig_Result_unit	ratio
Std_Result_unit	*null*
MS_Result_N	1.5
MS_Result_unit	*null*

M. LIPASE (LIPASE)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	LIPASE	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood PLASMA=plasma SERUM=serum SR_PLS=serum/plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	*See below*	Numeric result in U/L.
MS_Result_unit	U/L	Units per liter.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "LIPASE."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
LIPASE	N	*null*	SR_PLS	2572-6	
LIPASE	N	*null*	SR_PLS	3040-3	

7. MS_Result_C

Not applicable for this test. Value for all records is *null*, as LIPASE only has numeric results.

8. MS_Result_N

Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to U/L.

9. MS_Result_unit

MS_Result_unit is "U/L" for records where the original result unit contains any permutation/abbreviation of "Units/Liter" or "International Units/Liter" (i.e., Units/L, UL, U L, u/l, IU/L, iu/l, UNITS, etc.).

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - %
  - MG/DL

11. Example

A LIPASE result of "90 U L" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	90
Orig_Result_unit	U L
Std_Result_unit	U/L
MS_Result_N	90
MS_Result_unit	U/L

12. Comments

The most abnormal lipase results are usually obtained from patients during emergency department visits and hospitalizations. Because the vast majority of the lipase results in the MSDD currently are from ambulatory health care encounters, patients with the most abnormal lipase result values are underrepresented.

N. PLATELETS (PLATELETS)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	PLATELETS	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	*See below*	Numeric result in K/UL.
MS_Result_unit	K/UL	One thousand per microliter. One thousandper microliter is equivalent to one billion per liter (i.e., K/UL = 10*9/L). One microliter is equivalent to one cubic millimeter (i.e., UL = MM*3).
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "PLATELETS."

2. Result_Type

Value for all records is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

- Allowable values are "BLOOD" or "UNK."
- If other specimen sources are found for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
PLATELETS	N	*null*	BLOOD	13056-7	
PLATELETS	N	*null*	BLOOD	24361-8	Hemogram, platelets & differential panel. Deprecated in 2011. This is an old LOINC that is no longer included. May be seen from previous years.
PLATELETS	N	*null*	BLOOD	26515-7	
PLATELETS	N	*null*	BLOOD	777-3	
PLATELETS	N	*null*	BLOOD	778-1	

- Note:
  - LOINC code 49497-1 is not included, as this is an estimate of platelets, not an exact count.

7. MS_Result_C

Value for all records is *null*, as LIPASE only has numeric results.

8. MS_Result_N

Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to K/UL.

9. MS_Result_unit

MS_Result_unit is "K/UL", indicating "thousand per microliter." One thousand per microliter is equivalent to one billion per liter (i.e., K/UL = 10*9/L). One microliter is equivalent to one cubic millimeter (i.e., UL = MM*3).

10. Orig_Result_unit

- All records with the below original result units are not included:
  - %
  - U/L
  - U/ML
  - IU/L
  - IU/ML
  - MEQ/L
- MS_Result_unit is set to “UNKNOWN” for any records where Orig_Result_unit has values that are missing a numerator or a denominator.

11. Example

A PLATELETS result of "200 X10^3/mm3" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	200
Orig_Result_unit	X10^3/mm3
Std_Result_unit	K/UL
MS_Result_N	200
MS_Result_unit	K/UL

O. PREGNANCY TEST (PG)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	PG	
Result_Type	N=numeric	
	C=character	
MS_Test_Sub_Category	BHCG	Beta human choriogonadotropin.
	HCG	Human choriogonadotropin.
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	URINE=urine	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	POSITIVE	For records where Result_Type = C, see below.
	NEGATIVE	
	BORDERLINE	
	UNDETERMINED	
	null	For records where Result_Type = N, see below.
MS_Result_N	>0	Numeric result in MIU/ML. For records where Result_Type = N, see below.
	null	For records where Result_Type = C, see below.
MS_Result_unit	MIU/ML	Million international units per milliliter. For records where Result_Type = N, see below.
	UNKNOWN	
	null	For records where Result_Type = C, see below.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "PG."

2. Result_Type

- Value for numeric records is "N."
- Value for character records is "C."

3. MS_Test_Sub_Category

Allowable values are "BHCG" and "HCG."

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", "URINE" or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
PG	N	HCG	SERUM	19080-1	
PG	N	BHCG	SERUM	20415-6	
PG	N	HCG	URINE	2107-1	LOINC has different units from most others: expected units are mol/volume (e.g., mmol/L).
PG	N	BHCG	SERUM	2111-3	
PG	N	BHCG	URINE	2114-7	
PG	N	HCG	SERUM	2117-0	
PG	N	HCG	SR_PLS	2119-6	LOINC has different units from most others: expected units are mol/volume (e.g., mmol/L).
PG	N	BHCG	SERUM	21198-7	
PG	N	HCG	URINE	25372-4	
PG	N	HCG	SR_PLS	34670-0	LOINC has different units from most others: expected units are mass/volume (e.g., ng/mL).
PG	N	BHCG	SERUM	45194-8	
PG	N	BHCG	SR_PLS	55869-2	LOINC has different units from most others: expected units are mass/volume (e.g., ng/mL).

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
PG	C	HCG	URINE	2106-3	
PG	C	BHCG	SR_PLS	2110-5	
PG	C	BHCG	URINE	2112-1	
PG	C	HCG	SERUM	2116-2	
PG	C	HCG	SERUM	2118-8	

- Note:
  - LOINC 2115-4 is not included, as LOINC is BHCG-free test.

7. MS_Result_C

- For PREGNANCY test records where Result_Type = N:
  - Value for all records is *null*, as only numeric results are expected when Result_Type = N.
- For PREGNANCY test records where Result_Type = C:
  - Allowable values are "BORDERLINE", "NEGATIVE", "POSITIVE", and "UNDETERMINED" only.
  - If Orig_Result contains a text value (e.g., "NEGATIVE"), then MS_Result_C = Orig_Result so that the result value is retained. If Orig_Result contains a numeric value that is associated with a result unit, then Result_Type = "N." This guidance may change in the future.

8. MS_Result_N

- For PREGNANCY test records where Result_Type = N:
  - Allowable values are positive numeric values converted from Orig_Result variable.
  - Values for MS_Result_N are populated using conversion factors as provided by SOC for all records where Orig_Result_unit/ Std_Result_unit can be directly converted to "MIU/ML."
- For PREGNANCY test records where Result_Type = C:
  - Values for all records is *null*.
  - If any results are associated with a result unit, then Result_Type = N, and MS_TEST_SUB_CATEGORY does not change. All other records associated with numeric original results are not included.

9. MS_Result_unit

- For PREGNANCY test records where Result_Type = N:
  - Allowable value is “MIU/ML” or “UNKNOWN” for records where the original result unit is missing or blank, “NULL”, “N/A” or “UNK.”
- For PREGNANCY test records where Result_Type = C:
  - Allowable value is *null*.

10. Orig_Result_unit

All records where the original result units are “MOM”, "%", or “G/DL” are not included for MS_TEST_NAME = “PG” and Result_Type = “N”.

11. Example

For a test record that has a result of "12 IU/mL" for MS_TEST_NAME = “PG” and Result_Type = “N” in the source data, the variables for the SCDM Laboratory Result Table are:

Variable	Value
Modifier	EQ
Orig_Result	12
Orig_Result_unit	IU/mL
Std_Result_unit	IU/ML
MS_Result_N	12000
MS_Result_unit	MIU/ML

12. Comments

It is feasible that some numeric pregnancy results could be found in men. For example, certain tumor types have HCG or BHCG quantified (and sometimes are present in high quantities). Thus, finding men with pregnancy tests does not necessarily indicate a data error.

P. TROPONIN I CARDIAC (TROP_I)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	TROP_I	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood PLASMA=plasma SERUM=serum SR_PLS=serum/plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	*null*	
MS_Result_N	>0	Numeric result in NG/ML.
MS_Result_unit	NG/ML	Nanograms per milliliter. Nanograms per milliliter is equivalent to micrograms per liter (i.e., NG/ML = UG/L).
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "TROP_I."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

- Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."
- If other specimen sources are found for this test, please contact SOC for guidance.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
TROP_I	N	*null*	SR_PLS	10839-9	
TROP_I	N	*null*	SR_PLS	16255-2	
TROP_I	N	*null*	BLOOD	42757-5	
TROP_I	N	*null*	SR_PLS	49563-0	

7. MS_Result_C

- Value for all records is *null*, as TROP_I only has numeric results.

8. MS_Result_N

- Allowable values are positive numeric values converted from ORIG_RESULT variable.
- MS_Result_N is populated using conversion factors as provided by SOC for all records where Orig_Result_unit/Std_Result_unit can be directly converted to NG/ML.

9. MS_Result_unit

Allowable value is “NG/ML”.

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - SERUM
  - NEGATIVE

11. Example

A TROP_I result of "0.29 Ng/ml" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	0.29
Orig_Result_unit	Ng/ml
Std_Result_unit	NG/ML
MS_Result_N	0.29
MS_Result_unit	NG/ML

Q. TROPONIN T CARDIAC (TROP_T)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	TROP_T	
Result_Type	N=numeric	
	C=character	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C	NEGATIVE	For records where Result_Type = C, see below.
	POSITIVE	
	UNDETERMINED	
	null	For records where Result_Type = N, see below.
MS_Result_N	>0	For records where Result_Type = N, see below.
	null	For records where Result_Type = C, see below.
MS_Result_unit	NG/ML	Nanograms per milliliter. For records where Result_Type = N, see below.
	null	For records where Result_Type = C, see below.
Orig_Result_unit	*See below*	

1. MS_Test_Name

Value for all records is "TROP_T."

2. Result_Type

- Value for numeric records is "N."
- Value for character records is "C."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are “BLOOD”, “PLASMA”, “SERUM”, “SR_PLS”, or “UNK.”

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
TROP_T	N	*null*	BLOOD	48425-3	
TROP_T	N	*null*	BLOOD	6597-9	
TROP_T	N	*null*	SR_PLS	6598-7	
TROP_T	N	*null*	SR_PLS	67151-1	
TROP_T	C	*null*	SR_PLS	33204-9	
TROP_T	C	*null*	BLOOD	48426-1	

7. MS_Result_C

- For TROP_T test records where Result_Type = N:
  - Value for all records is *null*, as only numeric results are expected when Result_Type = N.
- For TROP_T test records where Result_Type = C:
  - Allowable text values are “NEGATIVE”, “POSITIVE”, and “UNDETERMINED” only.
  - If Orig_Result contains a text value (e.g., “POSITIVE), then MS_Result_C = Orig_Result so that the result value is retained, and Result_Type = C. This guidance may change in the future.

8. MS_Result_N

- For TROP_T test records where Result_Type = N:
  - Allowable values are positive numeric values in NG/ML (nanograms per milliliter). Nanograms per milliliter is equivalent to micrograms per liter (i.e., NG/ML = UG/L).
  - SOC will provide guidance on how to convert results with other units; until then MS_Result_N = Orig_Result and MS_Result_unit is equal to the units in the source data.
- For TROP_T test records where Result_Type = C:
  - Value for all records is *null*.

9. MS_Result_unit

- For TROP_T test records where Result_Type = N:
  - Allowable value is “NG/ML”.
- For TROP_T test records where Result_Type = C:
  - Value for all records is *null*.

10. Orig_Result_unit

- If Orig_Result_unit equals the following, then record is not included:
  - SERUM
  - NEGATIVE

11. Example

A TROP_T result of "3.5" in the source data has the variables for the SCDM Laboratory Result Table of:

Variable	Value
Modifier	EQ
Orig_Result	3.5
Orig_Result_unit	*null*
Std_Result_unit	*null*
MS_Result_N	3.5
MS_Result_unit	*null*

V. GUIDANCE BY TEST NAME (TESTS UNDER DEVELOPMENT)

The laboratory tests in this section represent tests that are a part of the SCDM, however, efforts to characterize and harmonize test results across Data Partners are ongoing. As such, many of the sections listed below are currently empty (e.g, sections for MS_Result_C, MS_Result_N, MS_Result_Unit, Example). The Clinical Data Elements Workgroup will provide additional guidance for these tests as it is available.

A. CHOLESTEROL, HIGH DENSITY LIPOPROTEIN (CHOL_HDL)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	CHOL_HDL	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "CHOL_HDL."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are “BLOOD”, “PLASMA”, “SERUM”, “SR_PLS”, or “UNK.”

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
CHOL_HDL	N	*null*	SR_PLS	12772-0	
CHOL_HDL	N	*null*	SR_PLS	14646-4	
CHOL_HDL	N	*null*	SR_PLS	18263-4	
CHOL_HDL	N	*null*	SR_PLS	2085-9	
CHOL_HDL	N	*null*	SR_PLS	35197-3	
CHOL_HDL	N	*null*	SR_PLS	49130-8	

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

B. CHOLESTEROL, LOW DENSITY LIPOPROTEIN (CHOL_LDL)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	CHOL_LDL	
Result_Type	N=numeric	
MS_Test_Sub_Category	CLC=calculated DIRECT=direct NS=not specified	
Fast_ind	F=fasting R=random	Fast_ind is "F" or "R" for LDL Cholesterol tests.
Specimen_Source	BLOOD=blood PLASMA=plasma SERUM=serum SR_PLS=serum/plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "CHOL_LDL."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Allowable values are "CLC", "DIRECT", and "NS."

4. Fast_ind

- Allowable values are "F" and "R."
    - If the test name, LOINC, notes, or other factors indicate it is a fasting test, then Fast_Ind = F. Otherwise, Fast_Ind = R.
- A value of "X" is not a valid option for this test.

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
CHOL_LDL	N	CLC	SR_PLS	13457-7	Fasting test (Fast_ind=F) or random/not specified test (Fast_ind=R)
CHOL_LDL	N	DIRECT	SR_PLS	18262-6	
CHOL_LDL	N	CLC	SR_PLS	2089-1	Fasting test (Fast_ind=F) or random/not specified test (Fast_ind=R)
CHOL_LDL	N	NS	SR_PLS	22748-8	
CHOL_LDL	N	NS	SR_PLS	35198-1	LOINC status is discouraged.
CHOL_LDL	N	CLC	SR_PLS	39469-2	Random or not specified test (Fast_ind=R)
CHOL_LDL	N	DIRECT	SR_PLS	57698-3	Panel.
CHOL_LDL	N	DIRECT	SR_PLS	69419-0	

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

C. CHOLESTEROL, TOTAL (CHOL_TOT)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	CHOL_TOT	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood PLASMA=plasma SERUM=serum SR_PLS=serum/plasma UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "CHOL_TOT."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
CHOL_TOT	N	*null*	SR_PLS	14647-2	
CHOL_TOT	N	*null*	SR_PLS	2093-3	
CHOL_TOT	N	*null*	SR_PLS	35200-5	
CHOL_TOT	N	*null*	SR_PLS	48620-9	

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

D. D-DIMER (D_DIMER)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	D_DIMER	
Result_Type	N=numeric	
	C=character	
MS_Test_Sub_Category	DDU=d-dimer units	For records where Result_Type = N, see below.
	FEU=fibrinogen equivalent units	
	NS=not specified	
	null	For records where Result_Type = C, see below.
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source		
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "D_DIMER."

2. Result_Type

- Value for numeric records is "N."
- Value for character records is "C." Note that ranges (e.g., 50-100 mg/mL) are considered character records.

3. MS_Test_Sub_Category

- For tests where Result_Type = N:
  - Allowable values are "DDU," "FEU," and "NS." Original result units may indicate whether the sub-category is DDU or FEU. This information can sometimes be determined from the LOINC code.
- For tests where Result_Type = C:
  - Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Guidance for this field will be updated in the future.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
D_DIMER	N	NS		15129-0	Deprecated in 2011. This is an old LOINC that is no longer included. May be seen from previous years.
D_DIMER	N	NS		30240-6	Deprecated in 2011. This is an old LOINC that is no longer included. May be seen from previous years.
D_DIMER	N	NS		3246-6	
D_DIMER	N	NS		38898-3	
D_DIMER	N	DDU		48058-2	
D_DIMER	N	FEU		48065-7	
D_DIMER	N	DDU		48066-5	
D_DIMER	N	FEU		48067-3	
D_DIMER	N	NS		55398-2	FEU and DDU panel.
D_DIMER	N	FEU		71427-9	
D_DIMER	N	NS		7799-0	

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
D_DIMER	C	*null*		15179-5	
D_DIMER	C	*null*		29280-5	
D_DIMER	C	*null*		3247-4	Deprecated in 2011. This is an old LOINC that is no longer included. May be seen from previous years.

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

E. INFLUENZA VIRUS, A (INF_A)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	INF_A	Antibody test results are not included, only antigen test results.
Result_Type	C=character	
MS_Test_Sub_Category	EIA	Enzyme immunoassay.
	IF	Immunofluorescence.
	NS	Not specified.
	PCR	Probe and target amplification.
	VTC	Organism-specific culture.
Fast_ind	X=not applicable	Fast_ind is populated 'X' (not *null*).
Specimen_Source		
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "INF_A." Antibody test results are not included, only antigen test results.

2. Result_Type

Allowable value is "C."

3. MS_Test_Sub_Category

- For sub-category EIA, Specimen_Source is NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category IF, Specimen_Source is BAL, NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category NS, Specimen_Source is BAL, NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category PCR, Specimen_Source is NPH, NPWASH, NWASH, OTHER, or UNK.

- For sub-category VTC, Specimen_Source is NPH, NPWASH, NWASH, OTHER, THRT, or UNK.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Guidance for this field will be updated in the future.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
INF_A	C	NS		31858-4	Antigen.
INF_A	C	NS		31859-2	Antigen.
INF_A	C	PCR		34487-9	RNA.
INF_A	C	PCR		38381-0	cDNA.
INF_A	C	PCR		39025-2	Hemagglutinin cDNA.
INF_A	C	PCR		39102-9	Hemagglutinin cDNA.
INF_A	C	PCR		39103-7	Neuraminidase cDNA.
INF_A	C	PCR		40981-3	Deprecated in 2011. This is an old LOINC that is no longer included. May be seen from previous years.
INF_A	C	NS		43874-7	Antigen.

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
INF_A	C	PCR		44263-2	RNA.
INF_A	C	IF		44558-5	Antigen.
INF_A	C	IF		44559-3	Antigen.
INF_A	C	IF		44560-1	Antigen.
INF_A	C	NS		44562-7	Antigen.
INF_A	C	NS		44563-5	Antigen.
INF_A	C	EIA		44564-3	Antigen.
INF_A	C	EIA		46082-4	Antigen.
INF_A	C	VTC		48310-7	
INF_A	C	PCR		53250-7	RNA.
INF_A	C	PCR		55463-4	Swine origin RNA.
INF_A	C	PCR		55464-2	Swine origin RNA.
INF_A	C	PCR		55465-9	H1 2009 pandemic RNA.
INF_A	C	EIA		5860-2	Antigen.
INF_A	C	IF		5861-0	Antigen.
INF_A	C	EIA		5862-8	Antigen.
INF_A	C	IF		5863-6	Antigen.
INF_A	C	PCR		59423-4	Hemagglutinin type RNA.
INF_A	C	PCR		61101-2	Neuraminidase RNA.

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

F. INFLUENZA VIRUS, A + B (INF_AB)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	INF_AB	Antibody test results are not included, only antigen test results.
Result_Type	C=character	
MS_Test_Sub_Category	EIA	Enzyme immunoassay.
	IF	Immunofluorescence.
	NS	Not specified.
	PCR	Probe and target amplification.
	VTC	Organism-specific culture.
Fast_ind	X=not applicable	Fast_ind is populated 'X' (not *null*).
Specimen_Source		
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "INF_AB." Antibody test results are not included, only antigen test results.

2. Result_Type

Allowable value is "C."

3. MS_Test_Sub_Category

- For sub-category EIA, Specimen_Source is NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category IF, Specimen_Source is BAL, NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category NS, Specimen_Source is BAL, NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category PCR, Specimen_Source is NPH, NPWASH, NWASH, OTHER, or UNK.

- For sub-category VTC, Specimen_Source is NPH, NPWASH, NWASH, OTHER, THRT, or UNK.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Guidance for this field will be updated in the future.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
INF_AB	C	NS		24015-0	Antigen.
INF_AB	C	NS		31860-0	Antigen.
INF_AB	C	NS		31861-8	Antigen.
INF_AB	C	NS		31862-6	Antigen.
INF_AB	C	NS		33535-6	Antigen.
INF_AB	C	NS		44566-8	Antigen.
INF_AB	C	NS		44567-6	Antigen.
INF_AB	C	PCR		48509-4	RNA.
INF_AB	C	IF		61102-0	Antigen.
INF_AB	C	PCR		62462-7	RNA.
INF_AB	C	EIA		6435-2	Antigen.
INF_AB	C	IF		6436-0	Antigen.
INF_AB	C	EIA		6437-8	Antigen.
INF_AB	C	IF		6438-6	Antigen.
INF_AB	C	EIA		6439-4	Antigen.
INF_AB	C	IF		6440-2	Antigen.
INF_AB	C	EIA		6441-0	Antigen.
INF_AB	C	IF		6442-8	Antigen.

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

G. INFLUENZA VIRUS, B (INF_B)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	INF_B	Antibody test results are not included, only antigen test results.
Result_Type	C=character	
MS_Test_Sub_Category	EIA	Enzyme immunoassay.
	IF	Immunofluorescence.
	NS	Not specified.
	PCR	Probe and target amplification.
	VTC	Organism-specific culture.
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source		
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "INF_B." Antibody test results are not included, only antigen test results.

2. Result_Type

Allowable value is "C."

3. MS_Test_Sub_Category

- For sub-category EIA, Specimen_Source is NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category IF, Specimen_Source is BAL, NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category NS, Specimen_Source is BAL, NPH, NPWASH, NSWAB, NWASH, OTHER, THRT, or UNK.
- For sub-category PCR, Specimen_Source is NPH, NPWASH, NWASH, OTHER, or UNK.

- For sub-category VTC, Specimen_Source is NPH, NPWASH, NWASH, OTHER, THRT, or UNK.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Guidance for this field will be updated in the future.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
INF_B	C	EIA		46083-2	Antigen.
INF_B	C	EIA		44575-9	Antigen.
INF_B	C	EIA		5864-4	Antigen.
INF_B	C	EIA		5866-9	Antigen.
INF_B	C	IF		44572-6	Antigen.
INF_B	C	IF		44571-8	Antigen.
INF_B	C	IF		44573-4	Antigen.
INF_B	C	IF		5865-1	Antigen.
INF_B	C	IF		5867-7	Antigen.
INF_B	C	NS		44576-7	Antigen.
INF_B	C	NS		43895-2	Antigen.
INF_B	C	NS		44577-5	Antigen.
INF_B	C	NS		31863-4	Antigen.
INF_B	C	NS		31864-2	Antigen.
INF_B	C	PCR		40982-1	RNA.
INF_B	C	PCR		53251-5	RNA.
INF_B	C	VTC		38382-8	

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

H. INFLUENZA VIRUS, NON-SPECIFIED (INF_NS)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	INF_NS	Antibody test results are not included, only antigen test results.
Result_Type	C=character	
MS_Test_Sub_Category	NS=not specified	
	PCR=probe and target amplification	
	VTC=organism-specific culture	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source		
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "INF_NS." Antibody test results are not included, only antigen test results.

2. Result_Type

Allowable value is "C."

3. MS_Test_Sub_Category

- For sub-category NS, Specimen_Source is UNK.
- For sub-category PCR, Specimen_Source is NPH, NPWASH, NWASH, OTHER, or UNK.
- For sub-category VTC, Specimen_Source is NPWASH, NWASH, OTHER, SPUTUM, THRT, or UNK.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Guidance for this field will be updated in the future.

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
INF_NS	C	PCR		49521-8	
INF_NS	C	PCR		49524-2	
INF_NS	C	NS		54240-7	Antigen.
INF_NS	C	PCR		54243-1	RNA.
INF_NS	C	NS		54244-9	
INF_NS	C	VTC		6601-9	
INF_NS	C	VTC		6602-7	
INF_NS	C	VTC		6603-5	
INF_NS	C	VTC		6604-3	

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

I. SODIUM (SODIUM)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	SODIUM	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is populated 'X' for all tests (not *null*)
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "SODIUM."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
SODIUM	N	*null*	BLOOD	2947-0	
SODIUM	N	*null*	SR_PLS	2951-2	
SODIUM	N	*null*	BLOOD	32717-1	
SODIUM	N	*null*	BLOOD	39791-9	
SODIUM	N	*null*	BLOOD	39792-7	
SODIUM	N	*null*	BLOOD	41657-8	
SODIUM	N	*null*	SR_PLS	42570-2	
SODIUM	N	*null*	SR_PLS	44783-9	
SODIUM	N	*null*	BLOOD	74353-4	Panel.

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

J. THYROID STIMULATING HORMONE (TSH)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	TSH	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	X=not applicable	Fast_ind is "X" for all tests (not *null*).
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM=serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "TSH."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

Not applicable for this test. Value for all records is "X."

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
TSH	N	*null*	SR_PLS	11579-0	
TSH	N	*null*	SR_PLS	11580-8	
TSH	N	*null*	SR_PLS	14297-6	
TSH	N	*null*	SR_PLS	24348-5	Panel.
TSH	N	*null*	SR_PLS	27975-2	
TSH	N	*null*	BLOOD	29575-8	
TSH	N	*null*	BLOOD	3015-5	
TSH	N	*null*	SR_PLS	3016-3	
TSH	N	*null*	SR_PLS	55462-6	

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

K. TRIGLYCERIDES (TRIG)

Variable	Value(s)	Guideline/Comments
MS_Test_Name	TRIG	
Result_Type	N=numeric	
MS_Test_Sub_Category	*null*	
Fast_ind	F=fasting	Fast_ind is "F" or "R" for Triglycerides tests.
	R=random	
Specimen_Source	BLOOD=blood	
	PLASMA=plasma	
	SERUM =serum	
	SR_PLS=serum/plasma	
	UNK=unknown or missing	
LOINC	*See below*	Populate if available.
MS_Result_C		
MS_Result_N		
MS_Result_unit		
Orig_Result_unit		

1. MS_Test_Name

Value for all records is "TRIG."

2. Result_Type

Allowable value is "N."

3. MS_Test_Sub_Category

Not applicable for this test. Value for all records is *null*.

4. Fast_ind

- Allowable values are "F" and "R."
    - If the test name, LOINC, notes, or other factors indicate it is a fasting test, then Fast_Ind = F. Otherwise, Fast_Ind = R.
- A value of "X" is not a valid option for this test.

5. Specimen_Source

Allowable values are "BLOOD", "PLASMA", "SERUM", "SR_PLS", or "UNK."

6. LOINC

MS_Test_Name	Result_Type	MS_Test_Sub_Category	Specimen_Source	LOINC	Comments
TRIG	N	*null*	SR_PLS	14927-8	Random or not specified test (Fast_ind=R)
TRIG	N	*null*	SR_PLS	1644-4	Fasting test (Fast_ind=F)
TRIG	N	*null*	SR_PLS	17081-1	Fasting test (Fast_ind=F)
TRIG	N	*null*	SR_PLS	2571-8	Random or not specified test (Fast_ind=R)
TRIG	N	*null*	SR_PLS	3048-6	Fasting test (Fast_ind=F)
TRIG	N	*null*	SR_PLS	30524-3	Fasting test (Fast_ind=F)
TRIG	N	*null*	SR_PLS	35217-9	Random or not specified test (Fast_ind=R)
TRIG	N	*null*	SR_PLS	47210-0	Fasting test (Fast_ind=F)

7. MS_Result_C

Guidance for this field will be updated in the future.

8. MS_Result_N

Guidance for this field will be updated in the future.

9. MS_Result_unit

Guidance for this field will be updated in the future.

10. Orig_Result_unit

Guidance for this field will be updated in the future.

11. Example

Examples will be provided in the future.

VI. APPENDICES

A. APPENDIX A: SCDM LABORATORY STANDARD ABBREVIATIONS TABLE

SCDM: Laboratory Standard Abbreviations Table		
Description: The SCDM Laboratory Standard Abbreviations Table depicts standard abbreviations for common laboratory units.		
Unit Type	**Standard abbreviation**	**Definition / Comments / Guideline**
Billion	BIL	Billion is often written as "10*9".
Cells	CELL	
Cubic Millimeter	MM3	One cubic millimeter of blood is equivalent to one microliter. Cubic millimeter is often written as "MM*3" or "CU MM".
Decigram	DG	
Deciliter	DL	
Gram	G	
International Units	IU	Do not confuse "1U" (one unit) or "/U" (per unit) with "IU" (international units).
Liter	L	
Micro-international units	UIU	
Microgram	UG	Microgram is often written as "MCG".
Microliter	UL	Do not confuse "UL" (microliter) with "U/L" (units per liter).
Microunits	UU	
Milligram	MG	
Milli-international units	MIU	
Milliliter	ML	
Millimoles	MMOL	
Million	MIL	Million is often written as "10*6".
Milli-unit	MU	
Moles	MOL	
Nanogram	NG	
Nanoliter	NL	
Percent	PERCENT	
Ratio	RATIO	
Thousand	K	Thousand is often written as "10*3".
Units	U	

B. APPENDIX B: CPT CODES

SCDM: Laboratory CPT Information Table

Description: The SCDM Laboratory CPT Information Table lists CPT codes that are associated with each MS_Test_Name. Because CPT codes are mostly used for billing, are not associated with actual laboratory results, and are not sufficiently granular to be routinely useful in assigning MS_Test_Names, a CPT code by itself does not suggest that the record should be included in the laboratory result table. CPT codes may be useful for rule-outs. ***Therefore, this table is intended to be supplemental information only and does not represent a complete list of CPT codes for each laboratory test.[1] This list is not routinely updated.***

MS_Test_Name	CPT Code	Comments
ALP	80050	Panel.
ALP	80053	Panel.
ALP	80076	Panel.
ALP	84075	
ALT	80050	Panel.
ALT	80053	Panel.
ALT	80076	Panel.
ALT	84460	
ANC	85048	
BILI_TOT	80050	Panel.
BILI_TOT	80053	Panel.
BILI_TOT	80076	Panel.
BILI_TOT	82247	
CHOL_HDL	80061	Panel.
CHOL_HDL	83718	
CHOL_LDL	83721	
CHOL_TOT	80061	Panel.
CHOL_TOT	82465	
CK	82550	
CK_MB	82553	
CK_MBI	82550	
CK_MBI	82553	
CREATININE	80047	Panel.
CREATININE	80048	Panel.
CREATININE	80050	Panel.
CREATININE	80053	Panel.
CREATININE	80069	Panel.

MS_Test_Name	CPT Code	Comments
CREATININE	82565	
CREATININE	82575	
D_DIMER	85362	
D_DIMER	85378	
D_DIMER	85379	
D_DIMER	85362	
D_DIMER	85378	
D_DIMER	85379	
GLUCOSE	80047	Panel.
GLUCOSE	80048	Panel.
GLUCOSE	80050	Panel.
GLUCOSE	80053	Panel.
GLUCOSE	80069	Panel.
GLUCOSE	82947	
GLUCOSE		CPT code and panels for glucose do not differentiate between random and fasting.
HGB	80050	Panel.
HGB	80053	Panel.
HGB	83026	
HGB	85018	
HGB	85025	Panel.
HGB	85027	Panel.
HGBA1C	83036	
HGBA1C	83037	
INR	85610	This code is for prothrombin time but includes INR.
LIPASE	83690	
PLATELETS	80050	Panel.
PLATELETS	80053	Panel.
SODIUM	80047	Panel.
SODIUM	80048	Panel.
SODIUM	80050	Panel.
SODIUM	80051	Panel.
SODIUM	80053	Panel.
SODIUM	80069	Panel.
TRIG	80061	Panel.
TRIG	84478	
TRIG		CPT code and panels for triglycerides do not differentiate between fasting and non-fasting.
TROP_I	84484	

MS_Test_Name	CPT Code	Comments
TROP_T	84512	
TROP_T	84484	
TSH	80050	Panel.
TSH	84443	

NOTES:

[1] Regenstrief Institute, the organization that has developed and maintains the LOINC system, has completed a partial mapping of LOINC to CPT codes. The mapping is publicly available on the US National Library of Medicine's webpage at the following link (valid as of February 17, 2015):
http://www.nlm.nih.gov/research/umls/mapping_projects/loinc_to_cpt_map.html .