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MHS GENESIS Immunization Table BDE 2.4
for the
MHS Data Repository (MDR)
(Version 1.00.05)

Current Specification

Revision History

Version	Date	Originator	Para/Tbl/Fig	Description of Change
1.00.00	02/16/2018	C. Kangas	Initial Document	Baseline
1.00.01	11/15/2018	C. Kangas	Table 5	Added additional fields
1.00.02	01/14/2019	C. Kangas	Table 5	Updated field widths
1.00.03	07/31/2019	C. Kangas	Table 5	Updated business rule for ADMIT_FACILITY and ADMIT_NURSE_UNIT.
1.00.04	07/07/2020	C. Kangas	Table 5	Added Result Status
1.00.05	12/28/2020	C. Kangas	Table 4 and Table 5	Added Orderable Display and Orderable Mnemonic

MDR Genesis Immunization Table

I. BACKGROUND

This specification describes the process required to create the Military Health System (MHS) Data Repository (MDR) Genesis Immunization table based on data received from Cerner PowerInsight Enterprise Data Warehouse (PI-EDW) feeds to the MDR.

II. SOURCES

The source data files used to create the MDR Genesis Immunization table are extracted from the MHS Genesis PI-EDW. The transfer of the raw source extracts is handled by the Solution Delivery Division (SDD) for loading into the MDR for further processing according to routine MDR operations. The primary source file used to build the table are identified in Table 1. The format of the raw MHS Genesis feeds to the MDR is described in the DHMSM Interface Control Document (ICD) ####-####.

Table 1: PI-EDW Source Table

Source Table	Raw Data Feed	Feed Description
Clinical Events	wh_cln_clinical_event.txt	This table contains lab results, vital signs, immunizations, and other patient care documentation data.

III. TRANSMISSION (FILES AND FREQUENCY)

Source files are provided according to the frequency described in the table below.

Table 2: Frequency of Source Files

Source File	Frequency
MHS Genesis PI-EDW feeds	Weekly

IV. ORGANIZATION AND BATCHING

Source Data: The first step in MDR processing is to batch records received from MHS Genesis. Raw data batches are stored in /mdr/raw/genesis according to routine MDR operating procedures.

Output Products: The MDR Genesis Immunization processor outputs a single SAS data set containing all years of immunizations. The processor performs merges and field derivations, and must incorporate updates to immunization records across raw data extracts. Table 3 contains the location and name of the output product. The preparation of the output is described in subsequent sections of this document.

Table 3: MDR Genesis Immunization Processor Output Product

MDR Immunization Processor	File Naming Convention	Member Name
MDR Immunization SAS data set	/mdr/pub/genesis/imm/	immunization.sas7bdat

Archival of files is also required, so that corresponding "apub" and other processing files (i.e. log, aprod, etc) are also loaded into the MDR according to routine operating procedures.

V. RECEIVING FILTERS

Remove any immunization records for test patients.

VI. UPDATE PROCESSES

The raw feeds for the clinical events data type containing the immunization information represent either insert or update records. These records shall be used to maintain the master MDR immunizations dataset. From the Clinical Events data, immunization records are selected where the EVENT_CLASS_REF field = 228. All other clinical events records are excluded from further processing.

The primary key for the Clinical Events table is the CLINICAL_EVENT_KEY field. During the extraction of the raw immunization records, de-duplication of records, or anytime a clinical event key collision occurs between incoming data and existing master data, the processor de-duplicates data by selecting the record with the most recent value of the Update Date (UPDT_DT_TM) for any multiple of records with the same primary key (CLINICAL_EVENT_KEY).

Once the dataset has been updated, the processor assigns many other internally-derived variables as described in Table 5.

VII. FIELD TRANSFORMATIONS AND FILE TYPES

This section of this functional specification describes the data merges that are necessary to append many of the fields in the MDR Genesis Immunization data. The merges required to prepare the MDR Genesis Immunization File are described in Table 4.

Table 4: Additional File Merges

Merge	Date and Key Matching	Purpose
Longitudinal VM	Admission Date, EDIPN	DEERS LVM adds many useful MHS specific demographic fields.
Medication Administration	event_sk	This table stores immunization related med administration fields.
MDR Genesis Person	person_sk	This table stores patient demographics.
MDR Genesis Personnel	personnel_sk	This table stores the values for provider such as Provider EDIPN.
MDR Genesis Location	location_sk	This table stores values describing the care location.
Encounter	encounter_sk	This table stores key fields related to the immunization encounter.
Orders	order_sk	This table stores fields related to the immunization ordered.

Merge	Date and Key Matching	Purpose
Code Value Reference	Multiple	This table stores lookup values for other codes such as the facility description.
Code Value Outbound Reference	Multiple	This table stores code value reference (lookup) descriptions specific to the DoD.
DMISID Index	FY, DMISID and DENRSITE	This join is used to add enrollment region information.
Omni-CAD	ADMIT_DT_TM, DEERSZIP, DSVCAGG	This join is used to add residence region information.

Business rules for each of the appended fields that result from the file merges and formats are described in the body of Table 5.

VIII. RECORD LAYOUT AND CONTENT

The MDR Genesis Immunization data is stored as one SAS dataset. The dataset file name is immunization.sas7bdat. The dataset is prepared according to the derivation rules listed in Table 5.

Table 5: MDR Genesis Immunization SAS Data Set

Field	SAS Name	Format	Related Source Field	Business Rule
MHS Genesis Person ID	PERSON_SK	$100	person_sk	No transformation.
Immunization Name	IMMUNIZATION	$60	event_code_ref	Match to code_value_ref table where event_code_ref matches the code_value_ref and code_set=72 and health_system_id=18635 and retrieve desc_description.
Immunization CVX Code	CVX	$13	event_code_ref	Match to code_value_out_ref table where event_code_ref matches the code_value_ref and contributor_source_ref = 18024127 and health_system_source_id=18635 and retrieve alias.
MHS Genesis Personnel ID	PERFORMED_ PRSNL	$100	performed_prsnl	No transformation.
MHS Genesis Encounter ID	ENCOUNTER_SK	$100	encounter_sk	No transformation.
MHS Genesis Order ID	ORDER_SK	$100	order_sk	No transformation.
MHS Genesis Clinical Event Key	CLINICAL_ EVENT_ KEY	N(8)	clinical_event_key	No transformation.
MHS Genesis Event ID	EVENT_SK	$100	event_sk	No transformation.
Sequence	CLINICAL_SEQ	N(8)	clinical_seq	No transformation.
Data Entry Method	DATA_ENTRY_ METHOD	$33	data_entry_method_ ref	Match to code_value_ref table where data_entry_method_ ref matches the code_value_ref and code_set= 29520 and health_system_id=18635 and retrieve desc_description.
Contributor System	CONTRIBUTOR_ SYSTEM	$60	contributor_system_ref	Match to code_value_ref table where contributor_system_ref matches the code_value_ref and code_set= 89 and health_system_id=18635 and retrieve desc_description.
Health System Source	HEALTH_SYSTEM_ SOURCE_ID	N(8)	health_system_source_ id	No transformation.
Result Status	RESULT_STATUS	$40	result_status_ref	Match to code_value_out table where result_status_ref matches the code_value_ref, and code_set = 8, and health_system_id = %mhs_hssi to retrieve desc_description.

Field	SAS Name	Format	Related Source Field	Business Rule
MDR Genesis Person Table Merge				
Medical Record Number	MRN	$40	N/A	No transformation.
EDIPN	EDIPN	$10	N/A	No transformation.
Patient Social Security Number	PATSSN	$9	N/A	No transformation.
Sponsor Social Security Number	SPONSSN	$9	N/A	No transformation.
Patient Date of Birth	DOB	Date/Time	N/A	No transformation.
Patient Gender	GENDER	$1	N/A	No transformation.
Test Patient Indicator	TEST_RECORD_IND	N(8)	N/A	No transformation.
MDR Genesis Personnel Table Merge				
Provider EDIPN	PROV_EDIPN	$10	N/A	No transformation.
Provider NPI	PROV_NPI	$100	N/A	No transformation.
Provider Skill Type	SKILL_TYPE	$1	N/A	No transformation.
Medication Administration Table Merge				
Date Given	DATE_GIVEN	Date/Time	start_dt_tm	Converted to local time.
Dosage	DOSAGE	N(8)	dosage	No transformation.
Dosage Unit	DOSAGE_UNIT	$60	dosage_unit_ ref	Match to code_value_ref table where dosage_unit_ref matches the code_value_ref and code_set= 54 and health_system_id=18635 and retrieve desc_description.
Lot Number	SUBSTANCE_LOT_ NBR	$100	substance_lot_nbr	No transformation.
Manufacturer Code	SUBSTANCE_ MANUFACTURER	$60	substance_ manufacturer_ref	Match to code_value_ref table where substance_manufacturer_ref matches the code_value_ref and code_set= 221 and health_system_id=18635 and retrieve desc_description.
Route of Administration	ROUTE	$31	route_ref	Match to code_value_ref table where route_ref matches the code_value_ref and code_set= 4001 and health_system_id=18635 and retrieve desc_description.
Site of Administration	SITE	$22	site_ref	Match to code_value_ref table where site_ref matches the code_value_ref and code_set= 97 and health_system_id=18635 and retrieve desc_description.
Immunization Type	IMMUNIZATION_ TYPE	$9	immunization_type_ref	Match to code_value_ref table where immunization_type_ref matches the code_value_ref and code_set= 30260 and health_system_id=18635 and retrieve desc_description.
Strength Dose	STRENGTH	N(8)	strength_unit	No transformation.
Strength Dose Unit	STRENGTH_UNIT_R EF	$40	strength_unit_ref	
Administering Personnel	ADMIN_PRSNL	$100	admin_prsnl	No transformation.
Update Datetime	UPDT_DT_TM	Date/Time	updt_dt_tm	No transformation.
Encounter Table Merge				
Financial Number	FIN	$40	formatted_financial_ number	No transformation.

Field	SAS Name	Format	Related Source Field	Business Rule
Encounter Type	ENCOUNTER_ TYPE	$22	patient_type_ref	Apply format from code_value_ref where health system source ID = 18635, active_ind=1, code set=71 and retrieve desc_description
Admission Date	ADMIT_DT_TM	Date/Time	admit_dt_tm	Converted to local time.
Orders Table Merge				
Orderable Display	ORDERABLE_DISP	$200	orderable_disp	No transformation.
Orderable Mnemonic	ORDERABLE_MNE MONIC	$200	orderable_mnemonic	No transformation.
MDR Location table Merge				
DMISID	DMISID	$4	mtf	No transformation.
MEPRS Code	MEPRS4CD	$4	meprs_cd	No transformation.
MHS Genesis Facility	ADMIT_FACILITY	$50	loc_facility_desc	No transformation.
MHS Genesis Nurse Unit	ADMIT_NURSE_ UNIT	$30	unit_display	No transformation.
LVM Merge				
DEERS Alternate Care Value	ACV	$1		Fill with ACV from LVM based on EDIPN, if the Admit Date is between the begin and end date associated with the ACV, else if ACV is blank after LVM merge and bencat is ACT or GRD then set ACV to M, otherwise set to blank. If no match for the person, set to blank. Blank fill for Date Given after Jan 1, 2018.
DEERS Beneficiary Category	BENCAT	$3		Fill with DEERS beneficiary category from LVM based on EDIPN, if the Admit Date is between the begin and end date associated with the DEERS beneficiary category. If no match for the person, set to “Z”.
DEERS Common Beneficiary Category	COMBEN	$1		Fill with DEERS common beneficiary category from LVM based on EDIPN, if the Admit Date is between the begin and end date associated with the DEERS common beneficiary category. If no match for the person, set to “3”.
DEERS ZIP Code	DEERSZIP	$5		Fill with DEERS ZIP code from LVM based on EDIPN, if the Admit Date Is between the begin and end date associated with the DEERS ZIP code. If no match for the person, set to blank.
DEERS Enrollment DMIS Id	DENRSITE	$4		Fill with enrollment DMISID from LVM based on EDIPN, if the Admit Date is between the begin and end date associated with the enrollment site. If no match for the person, set to blank.
DEERS Sponsor Service Aggregate	DSVCAGG	$1		Fill with DEERS sponsor service (aggregate) from LVM based on EDIPN, if the Admit Date is between the begin and end date associated with the DEERS sponsor service (aggregate). If no match for the person, set to blank.
DEERS Sponsor Service	DSPONSVC	$1		Fill with DEERS sponsor service from LVM based on EDIPN, if the Admit Date is between the begin and end date associated with the DEERS sponsor service. If no match for the person, set to blank.
DEERS Race Code	RACE	$1		Fill with DEERS Race from LVM. If no match for the person, set to “Z”.
DEERS Ethnicity Code	ETHNIC	$1		Fill with DEERS Ethnicity Code from LVM If no match for the person, set to “Z”.

Field	SAS Name	Format	Related Source Field	Business Rule
DEERS HCDP Enrolled	HCDP_ENR	$3	d_mi_hcdp_pln_cvg_cd	If the Admit Date is between the begin and end date of D_MI_HCDP_PLN_CVG_CD then fill with D_MI_HCDP_PLN_CVG_CD else leave blank; see VM=6 specification, section G18 and 19 for segment and field position. If no match for the person, set to blank.
DEERS HCDP Assigned	HCDP_ASGN	$3	asg_hcdp_pln_cvg_cd	If the Admit Date is between the begin and end date of asg_hcdp_pln_cvg_cd then fill with asg_hcdp_pln_cvg_cd else leave blank.
DEERS PCM ID	PCM_ID	$18	d_mi_pcm_id	If the Admit Date is between the begin and end date of D_ELG_GRP_CD then fill with D_MI_PCM_ID else leave blank.
DEERS PCM ID Type	PCM_TYPE	$1	d_mi_pcm_id_typ_cd	If the Admit Date is between the begin and end date of D_ELG_GRP_CD then fill with D_MI_PCM_ID_TYP_CD else leave blank.
Eligibility Group	ELG_GRP	$1	d_elg_grp_cd	If the Admit Date is between the begin and end date of D_ELG_GRP_CD then fill with D_ELG_GRP_CD else leave blank; see VM=6 specification, section G18 and 19 for segment and field position.
Enrollment Group	ENR_GRP	$1	d_enr_grp_cd	If the Admit Date is between the begin and end date of D_ENR_GRP_CD then fill with D_ENR_GRP_CD else leave blank; see VM=6 specification, section G18 and 19 for segment and field position
Fields from the Omni-CAD				
T3 Residence Region	BEN_T3_REG	$2		Based on matching FY, FM and DEERSZIP; Set equal to T3_REG. If zip code not found in MDR Omni-CAD, leave blank.
T17 Residence Region	BEN_T17_REG	$2		Based on matching FY, FM and DEERSZIP; Set equal to T17_REG. If zip code not found in MDR Omni-CAD, leave blank.
Fields from the DMISID Index Table (joined by DENRSITE)				
Enrollment T3 Region	ENR_T3_REG	$2		After matching on FY and DENRSITE, set to T3_reg
Enrollment T17 Region	ENR_T17_REG	$2		After matching on FY and DENRSITE, set to T17_reg
Internally-Derived Fields				
Fiscal Month	FM	$2		Fiscal month of Date Given
Fiscal Year	FY	$4		Fiscal Year of Date Given
Fiscal Year Encounter	FY_ENC	$4		Fiscal Year of ADMIT_DT_TM
Patient Age	PATAGE	3		Derive from Patient Date of Birth and Admit Date.
Age Group	AGEGRP	$1		Derive from PATAGE
ACV Group	ACVGROUP	$2		Derive from ACV

IX. REFRESH FREQUENCY

Frequency of updates:

- Weekly

X. DATA QUALITY

It is expected that when the MDR Genesis Immunization processor is run each week, that basic quality checks are performed throughout the process. It is recommended that the SDD vendor develop a spreadsheet which tracks key characteristics of the data across processing cycles; making it relatively easy to understand how the data should generally look. SDD vendors need to review these statistics each month prior to releasing the data. Decision Support Division (DSD) (the functional proponent and the specification author) should be contacted immediately should any quality issues arise. These checks, at a minimum, should include:

- Total record counts in the data feed should have a relatively stable distribution across FY and FM. Any anomalies should immediately be investigated.
- The percentage of records 'cleaned out' each processing cycle should be similar in scope and proportion across processing cycles.
- The number of records that match when doing the Genesis Patient table merge should be consistent.
- The distribution of all categorical fields (ex. Immunization) should be consistent. The results of proc freq analyses will verify this.
- The number of null values for important fields such as EDIPN, Date Given, and Immunization CVX should be tracked across monthly updates.
- When reading in the immunization data feed, a small number of records should be printed off and manually inspected to ensure they have read in properly and the percentage of records that are deletes, inserts, and updates should be compared for consistency across processing cycles.
- Cross tabulations should be reviewed on derived elements to ensure the derivation logic works.
- A data flow tracker should be built to ensure that all records that are intended to make it into the final Immunization dataset do. In other words, all inserts, updates, and deletions should be tracked and explained in the data flow worksheet.