Categorizing Claims in the Consolidated Data Set (CDS)
Inpatient vs Outpatient

This document presents one logical approach; it is not study specific. Users should assess whether the code in this document fits their particular study needs. Please consult with the study principal investigator (PI), Access and Community Care Engagement Network Team (ACCENT), Health Economics Resource Center (HERC) and/or VA Information Resource Center (VIReC) regarding study-specific questions as appropriate.

Revision History

Author(s)	Date	Description
Erin Beilstein-Wedel Megan Vanneman	2024November25	Original
Erin Beilstein-Wedel	2024November29	• Updated table reference from 6 to 5 as reported by Greg Greenberg • Added commas to Table 6 • Clarified that while there are a large number of professional cute inpatient claims without a corresponding institutional claim, the percentage is small.
Erin Beilstein-Wedel	2024December13	• Corrected SQL code in Appendix B for Bill_Type 43x; was previously grouped in '2. Inpatient Other', has been moved to '3. Outpatient' to match Table 2.

Caution

The Integrated Veteran Care, Consolidated Data Set (IVC_CDS schema) and tables within are built for operational purposes. This means that the data available in tables and table structures may change over time. As such, it is important to check if the data structure is as expected and fields contain expected values before proceeding to use the data for research. Information about the CDS claims tables can be found in the VIReC data reviews here and, specifically for Plexis claims, here.

Introduction

This document describes different methods for delineating inpatient and outpatient claim submissions. Claims are only submitted after care has been rendered. Professional claims may contain information for multiple dates of care; institutional claims may be submitted before a patient is discharged. Dental claims are not examined.

Sometimes researchers incorrectly equate institutional claims with inpatient stays and professional claims with outpatient visits when the division of claim types is more complex. Institutional claims are submitted

by facilities, and they can include outpatient services rendered at hospitals. Professional claims are submitted by individuals or groups of individuals for professional services rendered, and they can include care given while a patient is admitted to an inpatient setting such as anesthesia. Categorizing claims into inpatient and outpatient is generally only necessary when a research group wants information (e.g., diagnoses, procedures, costs) from certain types of care; categorizing claims may not be necessary for all projects. Understanding the setting in which care was received can also help answer questions such as "how many patients were admitted?"

<u>Inpatient (acute and other)</u>

Inpatient stays may generally be thought of in two ways: 1) when a patient is in any bed outside of their home or 2) when a patient is in an acute care facility (or other specific type of care). How data points available in the CDS claims tables should be used depends on which of these classifications meet the goal of the study.

To identify claims specifically for acute hospital stays, one may choose to only rely on institutional claims. This is because institutional claims are submitted by the facility where the patient is admitted and contain information related to the whole stay not included on professional claims such as principal diagnosis, ICD procedure codes, discharge date, and patient discharge status. Additionally, institutional records also contain an indication for "continuing care"— when a patient is still in a facility; this makes it possible to combine claims into "stays".

To identify claims for admitted patients regardless of care type, both professional and institutional claims should be used. By using both professional and institutional claims, one can gain the broadest view on care received while an inpatient. Oftentimes, institutional and professional claims are submitted for the same inpatient stay. However, this does not always occur – for example a) when the facility bills Medicare, Medicaid, or private insurance for part of a stay or b) the facility is delayed in submitting a claim. Thus, sometimes only institutional *or* professional claims related to a particular inpatient stay are present in the CDS claims tables.

The research question should inform whether only institutional or institutional and professional claims are needed (e.g., if only length of stay is needed, pulling from just Institutional claims is appropriate, but if all diagnoses and procedures are needed, a fuller picture might be gained by pulling both institutional and professional claims).

<u>Outpatient</u>

In this document, outpatient claims are considered claims that indicate care was received while the patient was not admitted to a facility. Note that we include emergency room as outpatient.

Data Points for Classifying Claims into Care Settings

The starting point for classifying claims into inpatient and outpatient data is CDS_claim_header, which contains bill type in the Bill_Type field and place of service in the Place_Of_Service_ID field. In the CDS datasets, bill type is only populated for institutional claims, while place of service codes are only found on professional claims. Two additional fields from CDS_Claim_Line table can also assist in understanding the setting of care: Place_Of_Service_ID and Revenue_Code.

To identify all claims for outpatient care or all claims for care received while an inpatient, both bill type and place of service codes should be used. Claims specifically for acute hospital stays (or other specific admission types) can be identified using bill type and revenue codes.

- *Bill Type:* Four-digit numeric code identifying the location (e.g., hospital, nursing facility) and type of bill (e.g., admit through discharge, replacement, interim); the first digit (a leading 0) is ignored and excluded. The third digit in bill type codes represents the frequency code or bill sequence. In this document an 'x' is used to represent all possible third digits.
  The Bill_type field on CDWWork.ivc_cds.CDS_Claim_Header contains bill type values. A full breakdown of bill type codes can be found here and here.
- *Revenue Code:* Four-digit numeric code, often starting with 0, that represents ancillary services received during a procedure (CPT or ICD) such as supplies, room and board, or technology help. These values can be found in the Revenue_Code field on CDWWork.ivc_cds.CDS_Claim_Line. A full breakdown of revenue code values can be found here. Broadly construed, revenue codes 0100 through 0249 are generally considered inpatient. Although it is beyond the scope of this document, revenue codes can additionally be used to differentiate between types of inpatient stays.[1]
- *Place of Service:* Two-digit numeric code representing the setting care was received in. The Place_of_service_ID field can be found on CDWWork.ivc_cds.CDS_Claim_header and CDWWork.ivc_cds.CDS_Claim_Line. A full breakdown of place of service values can be found here.

Using Data Points to Categorize Claims Into Inpatient and Outpatient Care Settings

Values for each type of code (bill type, revenue, and place of service) are grouped into Acute Inpatient, Inpatient (other), Outpatient, and Other in Table 1. Categorization of bill type values below was determined from ResDAC documentation and correspondence with VIReC. Please read all three sections (Acute Inpatient, Inpatient (other), and Outpatient) to ensure accurate classification of claims for your study.

Acute Inpatient

To identify acute inpatient claims in the CDS schema, the query presented in this document relies on the bill type variable (values of 11x and 41x). Bill type values starting with 41 identify stays at religious nonmedical hospitals[2].

Professional acute inpatient claims can be identified via claims with a place of service value of 21.

Inpatient (Other)

Bill type code values of 12x, 15x, 16x, 17x, 18x, 21x-28x, 42x, 44x[3], 45x-48x, 51x-58x, 61x-68x, 81x, 82x can be used to identify claims for services received while an inpatient and stays in non-acute facilities. Because

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[1] Revenue codes starting with '018' (e.g., '0181', '0182', etc.) correspond with Leave of Absence charges, and researchers should consider whether they want to count these as acute inpatient care or not.
[2] Religious Nonmedical Health Care Institutions | CMS
[3] Check for revenue codes < 0250 to determine if claim is inpatient.

these bill type values encompass a broad range of facility types research studies should consider whether or not to use revenue codes on the claim to ensure the claim meets study criteria.

Bill Type values of 12x and 42x designate services received during an inpatient stay and may overlap with other inpatient claim types, including acute.

Professional inpatient non-acute claims can be found using place of service values 04, 09, 13, 14, 16, 31, 32, 33, 34, 51, 52, 54, 55, 56, and 61.

Outpatient

To identify institutional outpatient claims, the query presented in this document relies on the type of bill variable (values starting with 13x, 14x, 23x, 3x, 43x, 71x, 72x, 73x, 74x, 75x, 76x, 77x, 79x 83x, 84x, 85x, 86x, 89x).

Professional outpatient claims can be found using place of service values 01, 02, 03, 05, 07, 10, 11, 12, 17, 18, 19, 20, 22, 23, 24, 27, 49, 50, 53, 57, 58, 60, 62, 65, 66, 71, 72, and 81. Additionally, groups should consider whether to include and how to categorize place of service values of 06, 08, 15, 25, 26, 41, 42, 99. Place of service values of 'xx' are specific to the ivc_cds.claim_header dataset and indicate multiple place of service values at the line-level of the claim. All other place of service values are unassigned; the CPTs on the claim can be compared against BETOS v2 categories to classify the claim as outpatient or other. For example, laboratory services are identified with codes T1A-T1H in BETOS v1 and TA-TX in BETOS v2.

Table 1. Inpatient (any) vs Acute Inpatient vs Outpatient Bill Type, Revenue, and Place of Service Code Values

Category	Bill Type Code starts with (claim_form_type = 'I')	Revenue Code	Place of Service (claim_form_type = 'P')
Inpatient Acute	11x – Hospital Part A 41x – Religious nonmedical Part A	0100-0249, excluding values listed in Inpatient (other)	21 – Inpatient Hospital
Inpatient (Other) ⁺	12x –Hospital Part B 15x & 16x – Intermediate Care 17x – Subacute Inpatient 18x – Swing Bed 21x, 22x, 24x-28x – SNF 42x, 44x⁺, 45x-48x – Religious Nonmedical 51x*-58x* – Religious Nonmedical 61x-68x – Intermediate Care 81x – Hospice 82x – Hospice	0022 – Skilled Nursing PPS 0023 – Home Health PPS 0024 – Inpatient Rehabilitation Facility PPS 018x – Leave of Absence 0220, 0222, 0229 – Special Charges 0235 – Nursing Charges: Hospice	04 – Homeless Shelter 09 – Prison/Correctional Facility 13 – Assisted Living Facility 14 – Group Home 16 – Temporary Lodging 31 – Skilled Nursing Facility 32 – Nursing Facility 33 – Custodial Care Facility 34 – Hospice 51 – Inpatient Psychiatric Facility 52 – Psychiatric Facility-Partial Hospitalization 54 – Intermediate Care Facility/ Individuals with Intellectual Disabilities 55 – Residential Substance Abuse Treatment Facility 56 – Psychiatric Residential Treatment Center

‡ Include codes from Inpatient Acute row if you want all inpatient	‡Check for revenue codes < 0250 to determine if claim is inpatient *claims with a bill type starting with '5' are unusual; as of 10/11/2024 there were only 2 in CDS		61 – Comprehensive Inpatient Rehabilitation Facility
Outpatient	13x – Outpatient Hospital 14x – Labs 23x – SNF Outpatient 3x – Home Health 43x – Religious nonmedical outpatient 71x – Rural Health clinic 72x – ESRD 73x – Free-standing clinic 74x, 75x – Rehab facility 76x – Community mental health center 77x – Free-standing Provider-based Federally Qualified Health Center (FQHC) (room and board revenue codes are not allowed) 79x – Clinic; Other 83x – Ambulatory Surgery Center 85x – Critical Access Hospital Outpatient 86x – Community mental health facility 89x – Other Special Facility	0250 and greater	01 – Pharmacy 02 – Telehealth Provided Other than in Patient's Home 03 – School 05 – Indian Health Service Free-standing Facility 07 – Tribal 638 Free-standing Facility 10 – Telehealth Provided in Patient's Home 11 – Office 12 – Home 17 – Walk-in Retail Health Clinic 18 – Place of Employment-Worksite 19 – Off Campus-Outpatient Hospital 20 – Urgent Care Facility 22 – On Campus-Outpatient Hospital 23 – Emergency Room – Hospital 24 – Ambulatory Surgical Center 27 – Outreach Site/ Street 49 – Independent Clinic 50 – Federally Qualified Health Center 53 – Community Mental Health Center 57 – Non-residential Substance Abuse Treatment Facility 58 – Non-residential Opioid Treatment Facility 60 – Mass Immunization Center 62 – Comprehensive Outpatient Rehabilitation Facility 65 – End-Stage Renal Disease Treatment Facility 66 – PACE 71 – Public Health Clinic 72 – Rural Health Clinic 81 – Independent Laboratory

Other/unknown	84x – Free Standing Birthing Center		06 – Indian Health Service Provider-based Facility 08 – Tribal 638 Provider-based Facility 15 – Mobile Unit 25 – Birthing Center 26 – Military Treatment Facility 41 – Ambulance – Land 42 – Ambulance – Air or Water 99 – Other Place of Service XX – ivc_cds specific; indicates there is more than one place of service at the claim line level.

Overlap of Inpatient and Outpatient Care Settings in Claim Submissions[4]

Classification of claims as presented in the tables below is based on the header bill type, header place of service, and line revenue codes. A breakdown of place of service values at the line-level for claims with a header place of service value of 'XX' can be found in Appendix A. Appendix B contains the code used to generate Table 2 – Table 6.

Most claim header submissions have either a bill type or place of service code (< 0.02% are missing these values as shown in Table 2). Table 3 presents the count of claim submissions in each category (Acute Inpatient, Inpatient (other), Outpatient, and Other). Outpatient claims comprise the largest portion of submissions (84.11%) followed by Acute Inpatient (13.34%) in the CDS tables (Table 3).

<u>Acute Inpatient</u>

For institutional claims, there is little disagreement between bill type values and revenue codes found on the corresponding claim lines (values 0100 through 0249). Of claim submissions with acute inpatient bill type values, 7.15% did not have an inpatient revenue code at the line level (Table 4). Most institutional acute inpatient claims had a corresponding professional acute inpatient claim submission (83.03%;

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[4] The data presented in Table 2 – Table 6 was pulled on 22 November 2024.

Table 5Table 6). However, a large number of professional acute inpatient claims, but small percentage, have no corresponding institutional claim (n= 3,453,240; 3%; Table 6). An additional 1,974 claims may be identified as Acute Inpatient by looking at the place of service value at the line-level for claims with a header place of service value of 'XX' (Appendix A).

Inpatient Other

A larger proportion of claims classified as inpatient (other) via bill type do not have a corresponding inpatient revenue code (82.76%; Table 4) compared to acute inpatient claim submissions. Similarly, a greater percent of institutional inpatient (other) claim submissions did not have a corresponding professional claim submission (91.91%). However, there were fewer professional inpatient (other) claims without a corresponding institutional claim submission (n=793,631) compared to acute inpatient (Table 6).

Outpatient

A small amount of claims without an inpatient bill type of any kind had an inpatient revenue code (0.19% of institutional claim submissions; Table 4). Most professional outpatient claims do not have a matching institutional claim (78%; Table 6). Of institutional outpatient claims, 60.43% had a corresponding professional claim (Table 6).

Table 2. N claims with non-Null place of service and bill type by claim form type

	Has Bill Type	Has Place of Service	Has Neither Bill Type nor Place of Service
Institutional	34,778,453	0	30,275
Professional	0	170,004,572	477

Table 3. Count of Claim Submissions by Inpatient/Outpatient Categorization at the header level

Claim Category	N	%
Acute Inpatient	27,321,144	13.34%
Inpatient Other	2,339,410	1.14%
Outpatient	172,260,670	84.11%
Other	2,854,671	1.39%
Check Line (place of service value of 'XXX')	7,046	0.00%
Unknown Place of Service	84	0.00%
Unknown Classification	30,752	0.02%
Total	**204,813,777**	**100.00%**

Table 4. Agreement between Type of Bill and Inpatient Revenue Code for Institutional Claim Submissions

Presence of Inpatient Bill Type	Has Inpatient Revenue Code?	N Claim Submissions	% of Claim Submissions
Has inpatient Bill Type: Acute Inpatient	No	289930	0.80%

Has inpatient Bill Type: Acute Inpatient	Yes	3764740	10.44%
Has inpatient Bill Type: Inpatient Other	No	1209281	3.35%
Has inpatient Bill Type: Inpatient Other	Yes	251909	0.70%
Non- inpatient Bill Type	No	30485395	84.52%
Non- inpatient Bill Type	Yes	68918	0.19%
Total		**36,070,173**	**100.00%**

Table 5. Correspondence of Claim Classification at the Header Level between Institutional and Professional claims joined via PatientICN and Claim Dates of Service

Institutional Claim Category	Professional Claim Category	N Institutional Claim Submissions	% of claim Submissions
Acute Inpatient	Acute Inpatient	2,451,165	7.04%
Acute Inpatient	No Professional Match	501,099	1.44%
Inpatient Other	Inpatient Other	109,562	0.31%
Inpatient Other	No Professional Match	1,245,482	3.58%
Outpatient	Outpatient	21,035,002	60.43%
Outpatient	No Professional Match	9,436,005	27.11%
Other	Other	97	0.00%
Other	No Professional Match	41	0.00%
Unknown Classification	No Professional Match	30,275	0.09%
Total		34,808,728	100.00%

Table 6. Professional Claims by Category with no matching Institutional Claim When Joined via PatientICN and Claim Dates of Service

Institutional Claim Category	Professional Claim Category	N Professional Claim Submissions	% of claim Submissions
No Institutional Match	Acute Inpatient	3,453,240	3.06%
No Institutional Match	Inpatient Other	793,631	0.70%
No Institutional Match	Outpatient	105,687,831	93.70%
No Institutional Match	Other	2,854,409	2.53%
No Institutional Match	Check Line	7,046	0.01%
No Institutional Match	Unknown POS	84	0.00%
No Institutional Match	Unknown Classification	477	0.00%
Total		112,804,392	**100.00%**

Suggested Citation

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Appendix A

Count line-level Place of Service values for Claim submissions with multiple place of service codes at the line level indicator ('XX')

Line Place of Service ID	N Claim Submissions
NULL	180
01	80
02	80
03	6
04	2
06	1
07	3
08	9
09	6
1	1
10	1
11	2,985
12	1,963
13	32
14	119
15	33
16	51
17	85
18	210
19	207
2	1
20	42
21	1,974
22	2,333
23	1,598
24	283
25	17
26	29
31	31
32	27
33	17
34	16
41	55
42	27
45	2
49	11
50	12
51	86
52	9
53	49

54	2
55	5
56	3
57	250
60	4
61	13
62	4
65	12
71	8
72	61
81	252
99	835
Total	**14,122**

Appendix B

Step 1. CDS Header

The first query categorizes claim submissions based on their bill type or place of service value. *The notes below the query contain useful information.*

```
/* 1.1 )-----------------------------
            If interested in limiting by claim status, look at values in this table
*/

select *
from VINCI_IVC_CDS.ivc_cds.CDS_Claim_Status

/* 1.2 )-----------------------------
            Pull claim submissions and categorize into Inpatient (Any), Acute Inpatient or
Outpatient
*/

drop table if exists #header

select
      ClaimSID -- Primary key used to join to other CDS tables
      , ClaimID -- Claim # in source system
      , Source_Key -- Primary key in source system
      , Source_System
      , IsCurrent
      , Bill_Type, Place_of_Service_ID
      , Claim_Form_Type, Claim_Status_ID, clm_status.Status_Description
      , Admission_Date, Admission_Hour, Admission_Source_ID, Admission_Type_ID
      , Discharge_Date, Discharge_Hour, Discharge_Status_ID
      , Service_Start_Date, Service_End_Date
      , DRG_Number
      , Patient_ICN
      , case when
                          Bill_Type like '11%'
                          or Bill_Type like '41%'
                          or Place_of_Service_ID = '21'
                          then  '1. Acute Inpatient'
            when
                          Bill_Type like '1[25678]%'
                          or Bill_Type like '2[1245678]%'
                          or Bill_Type like '4[245678]%'
                          or Bill_Type like '5[12345678]%'
                          or Bill_Type like '6[12345678]%'
                          or Bill_Type like '8[12]%'
                          or Place_of_Service_ID in
('04','09','13','14','16','31','32','33','34','51','52','54','55','56','61')
                          then '2. Inpatient Other'
            when
                          Bill_Type like '1[34]%'
                          or Bill_Type like '23%'
                          or Bill_Type like '3%'
                          or Bill_Type like '43%'
                          or Bill_Type like '7[123456789]%'
```

```sql
                            or Bill_Type like '8[3569]%'
                            or Place_of_Service_ID in
('01','02','03','05','07','10','11','12','17','18','19','20','22','23','24','27','49','50','53
','57','58','60','62','65','66','71','72','81')
                            then '3. Outpatient'
                when
                            Bill_Type like '8[4]%'
                            or Place_of_Service_ID in
('06','08','15','25','26','41','42','99')
                            then '4. Other'
                when
                            Place_of_Service_ID = 'XX'
                            then '5. Check Line'
                when
                            Place_of_Service_ID not in
('04','09','13','14','16','21','31','32','33','34','51','52','54','55','56','61'

        ,'01','02','03','05','07','10','11','12','17','18','19','20','22','23','24','27','49','
50','53','57','58','60','62','65','66','71','72','81'
                            ,'06','08','15','25','26','41','42','99'
                            ,'XX')
                            then '6. Unknown POS'
                when Bill_Type is null and Place_of_Service_ID is NULL
                            then '7. Unknown Classification'
                else '8. MISSING'
                end as submission_type

into #header
from vinci_ivc_cds.ivc_cds.CDS_Claim_Header as head
left outer join vinci_ivc_cds.ivc_cds.CDS_Claim_Status as clm_status
                            on head.Claim_Status_ID=clm_status.Status_ID
where
        (head.Service_Start_Date >= 'Insert DATE' and head.Service_Start_Date < 'Insert DATE')
        and clm_status.Status_Description not in ('DENIED','VOID','REJECTED','CA - REJECT','NO
ACTION','REPLACED') -- edit to match your study's needs
        and IsCurrent='Y'
        and Claim_Form_Type in ('I','P')
```

```
/*
NOTE 1
        If querying data on A06 ivc_cds data is contained in CDWWork.ivc_cds rather than
VINCI_IVC_CDS.IVC_CDS

NOTE 2
        Service_Start_Date is the partition field for VINCI provisioned data; no partition field
exists for data on A06

NOTE 3
        IsCurrent flag is not currently correct for all claim systems and may be removed from the
table

NOTE 4
        VISTA claims may have 'XX' for PoS, indicating that there are multiple PoS values at the
line level.

NOTE 5
```

Many professional inpatient claims have a NULL Admission_Date in addition to a handful of institutional claims

Additionally, Admission_Date can be before Service_Start_Date

```
select count(claimsid) as n_subs, Status_Description
from #header_inpatient
where Admission_Date < Service_Start_Date
group by Status_Description

-- looking at alignment of servicestart and admission date
select count(ClaimSID) as n_submissions
, case when Admission_Date= Service_Start_Date then 'same'
       when Admission_Date < Service_Start_Date then 'admit before service start'
       when Admission_Date > Service_Start_Date then 'admit after service start'
       when Admission_Date is null then 'no admit'
       when Service_Start_Date is null then 'no service start date --BAD'
       else 'CHECK BAD'
       end as date_comparison
       ,Claim_Form_Type
from #header_inpatient
group by case when Admission_Date= Service_Start_Date then 'same'
       when Admission_Date < Service_Start_Date then 'admit before service start'
       when Admission_Date > Service_Start_Date then 'admit after service start'
       when Admission_Date is null then 'no admit'
       when Service_Start_Date is null then 'no service start date --BAD'
       else 'CHECK BAD'
       END
       ,Claim_Form_Type
```

NOTE 6

Service_Start_Date is NULL for a handful of FBCS (n=7) and VISTA/Fee (n=617) submissions on A06, but not in VINCI data

NOTE 7

Rows with PAID status may not be the most recent submission AND rows with the most recent modified date for a claim may not be PAID

```
drop table if exists #order_table

;with get_dups as (
       select ClaimID, count(Source_Key) as n
       from #header_inpatient
       group by ClaimID
       having count(Source_Key) > 1
)
, make_rn as (
       select gd.ClaimID, hi.ClaimSID, hi.IsCurrent, hi.Modified_Date,
hi.Status_Description
       ,ROW_NUMBER() over(partition by gd.claimid order by hi.modified_date desc) as
clm_sub_order -- most recent modification should have lower number
       from get_dups as gd
       inner join #header_inpatient as hi on gd.ClaimID=hi.ClaimID
)
, make_grp as (
              select *
              ,case when clm_sub_order=1 and Status_Description='PAID' then 'most recent
and PAID'
```

```
                                when clm_sub_order > 1 and Status_Description='PAID' then 'prior
sub and PAID'
                                when clm_sub_order =1 and Status_Description <> 'PAID' then 'most
recent and NOT PAID'
                                when clm_sub_order >1 and Status_Description <> 'PAID' then 'prior
sub and NOT PAID'
                                else 'CHECK BAD'
                                end as test
                    from make_rn
        )
        select m1.claimid, m1.clm_sub_order, m1.test as newest_sub, m2.test as second_newest_sub
        into #order_table
        from make_grp as m1
        left outer join make_grp as m2 on m1.ClaimID=m2.ClaimID and m2.clm_sub_order=2
        where m1.clm_sub_order=1

        select count(claimid) as n_claims, newest_sub, second_newest_sub
        from #order_table
        group by newest_sub, second_newest_sub

        drop table if exists #order_table

NOTE 8
        IsCurrent no longer contains values of 'D' for deleted. All eCAMS claims that were
subsequently deleted are removed entirely from CDS.

*/
```

Step 2. (Optional) Fill place of service for professional claims with 'XX'

When the PoS value on the header is shown as 'XX' there is more than one PoS value is present in FeeServiceProvided.

2.1. Pull line-level PoS values

```
/* 2.1 )-----------------------------
                Get line-level place of service values (because VISTA can have multiple
place of service values per header)
*/

drop table if exists #header_line_level_pos

select head.ClaimSID -- Primary key used to join to other CDS tables
        , line.Line_Number, line.Place_Of_Service_ID as line_Place_Of_Service_ID,
line.Service_End_Date as line_Service_End_Date, line.Service_Start_Date as
line_Service_Start_Date
        , case when
                                line.Place_of_Service_ID = '21'
                                then  '1. Acute Inpatient'
                when
                                line.Place_of_Service_ID in
('04','09','13','14','16','21','31','32','33','34','51','52','54','55','56','61')
                                then '2. Inpatient non-Acute'
                when
                                line.Place_of_Service_ID in
('01','02','03','05','07','10','11','12','17','18','19','20','22','23','24','27','49','5
0','53','57','58','60','62','65','66','71','72','81')
                                then '3. Outpatient'
                when
                                line.Place_of_Service_ID in
('06','08','15','25','26','41','42','99')
                                then '4. Other'
                when
                                line.Place_of_Service_ID = 'XX'
                                then '5. Check Line'
                when
                                line.Place_of_Service_ID not in
('04','09','13','14','16','21','31','32','33','34','51','52','54','55','56','61'

        ,'01','02','03','05','07','10','11','12','17','18','19','20','22','23','24','27',
'49','50','53','57','58','60','62','65','66','71','72','81'
                                ,'06','08','15','25','26','41','42','99'
                                ,'XX')
                                then '6. Unknown POS'
                when line.Place_of_Service_ID is NULL
                                then '7. Unknown Classification'
                else '8. MISSING'
                end as submission_type

into #header_line_level_pos
from #header as head
left outer join VINCI_IVC_CDS.IVC_CDS.CDS_Claim_Line as line
                on head.ClaimSID=line.ClaimSID
where head.Claim_Form_Type='P'
```

```
        and head.submission_type='5. Check Line' -- PoS for all lines can be pulled by
excluding this criteria
```

2.2. Combing Professional lines with Claim submission header information

```
/* 2.2 )----------------------------
                A possible way to add line information to the header table
*/

drop table if exists #updated_w_line_pos
; with together as (
                select  ClaimSID, ClaimID, Source_Key, Source_System, IsCurrent,
Claim_Form_Type, Claim_Status_ID, Status_Description
                , Bill_Type, Place_of_Service_ID
                , Admission_Date, Admission_Hour, Admission_Source_ID,
Admission_Type_ID, Discharge_Date, Discharge_Hour, Discharge_Status_ID,
Service_Start_Date, Service_End_Date, DRG_Number, Patient_ICN, submission_type
                from #header
                where submission_type <> '5. Check Line'

                UNION

                select  h.ClaimSID, h.ClaimID, h.Source_Key, h.Source_System,
h.IsCurrent, h.Claim_Form_Type, h.Claim_Status_ID, h.Status_Description
                , h.Bill_Type, line.line_Place_of_Service_ID -- USING LINE VALUE
                , h.Admission_Date, h.Admission_Hour, h.Admission_Source_ID,
h.Admission_Type_ID, h.Discharge_Date, h.Discharge_Hour, h.Discharge_Status_ID,
h.Service_Start_Date, h.Service_End_Date, h.DRG_Number, h.Patient_ICN
                , line.submission_type -- USING LINE VALUE
                from #header as h
                inner join #header_line_level_pos as line
                            on h.ClaimSID=line.ClaimSID
                where h.submission_type = '5. Check Line'
                and line.line_Place_Of_Service_ID is not null

)
select *
into #updated_w_line_pos
from together
```

Step 3. (Optional) Align Institutional and Professional claim submission header data

Depending on your study needs, you may want to align the institutional and professional claims by date of service. The query below creates a table with PatientICN in the first column followed by institutional claim information and then professional claim information. It is beyond the scope of this document, but another way to do accomplish a similar task would to be stack the claims and create a stay-number indicator.

```
/* 3 )-----------------------------
             combining institutional header and professional header records together via
Patient_ICN and dates
*/

drop table if exists #combined_inst_prof
; with only_inst as (
             select  *
             from #header
             where Claim_Form_Type='I'
)
, only_prof as (
             select  *
             from #header
             where Claim_Form_Type='P'  -- Use #updated_w_line_pos if you replaced
header PoS values of 'XX' with line-level information
)

select coalesce(inst.patient_icn, prof.Patient_icn) as Patient_ICN
      ,inst.Claim_Form_Type as inst_claim_type
      , inst.ClaimSID as inst_claimsid, inst.Service_Start_Date as
inst_service_start_date, inst.Service_End_Date as inst_service_end_date,
inst.Admission_Date as inst_admission_date, inst.Status_Description as inst_status,
inst.Source_System as inst_source_system
      , inst.submission_type as inst_subtype
      , prof.Claim_Form_Type as prof_claim_type
      , prof.ClaimSID as prof_claimsid, prof.Service_Start_Date as
prof_Service_Start_Date, prof.Service_End_Date as prof_Service_End_Date,
prof.Admission_Date as prof_Admission_Date, prof.Status_Description as prof_status,
prof.Source_System as prof_source_system
      , prof.Place_of_Service_ID
      , prof.submission_type as prof_subtype
into #combined_inst_prof
from only_inst as inst
full join only_prof as prof
             on inst.Patient_ICN=prof.Patient_ICN
             and (
                          (prof.service_start_date >= inst.Service_Start_Date
                                 and prof.Service_End_Date <=
inst.Service_End_Date
                          )
                          OR (prof.service_start_date >= inst.Admission_Date
                                 and prof.Service_End_Date <=
inst.Service_End_Date)
                   )
             and prof.submission_type=inst.submission_type
```

After the script above has run, the code below can be used to recreate the tables in this document. Depending on if you chose to incorporate place of service values from the line-level you may need to change the source (from) table.

Table 2. N claims with non-Null place of service and bill type by claim form type

```sql
    select count(*) as n, Claim_Form_Type
    , case when Bill_Type is not null then 1 else 0 end as has_bill_type
    , case when Place_of_Service_ID is not null then 1 else 0 end as has_place_of_service
    from #header
    group by Claim_Form_Type
    , case when Bill_Type is not null then 1 else 0 end
    , case when Place_of_Service_ID is not null then 1 else 0 end
    order by Claim_Form_Type
```

Table 3. Count of Claim Submissions by Inpatient/Outpatient Categorization at the header level

```sql
    select count(*) as n, submission_type
    from #header
    group by submission_type
    order by submission_type
```

Table 4. Agreement between Type of Bill and Inpatient Revenue Code for Institutional Claim Submissions

```sql
    /*-----------------------------
            Examine the revenue codes being classified as inpatient
    */

    select count(claimsid) as n, revenue_code
    from VINCI_IVC_CDS.ivc_cds.CDS_Claim_Line as line
                        where ( line.Revenue_Code like '[0][1]%'
                                    OR line.Revenue_Code like '1[0-9][0-9]'
                                    OR line.Revenue_Code like '02[0-4]%'
                        )
                        and line.Claim_Form_Type='I'
    group by Revenue_Code
    order by revenue_code

    /* Table 4. )-----------------------------

    */

    drop table if exists #check_rev_code_overlap

    select  count(head.claimsid) as n, submission_type, max(case when line.Revenue_Code is not
    null then 1 else 0 end) as has_inpat_revenue_code
    into #check_rev_code_overlap
    from #header as head
    left outer join VINCI_IVC_CDS.ivc_cds.CDS_Claim_Line as line
                    on head.claimsid=line.ClaimSID
                        and ( line.Revenue_Code like '[0][1]%'
                                    OR line.Revenue_Code like '1[0-9][0-9]'
                                    OR line.Revenue_Code like '02[0-4]%'
                        )
```

```
                                 and line.Claim_Form_Type='I' -- only looking for institutional
    claim lines
    where head.Claim_Form_Type='I'
    group by submission_type,   case when line.Revenue_Code is not null then 1 else 0 end


    /* Table 4. )----------------------------
              Output
    */
    select *
    from #check_rev_code_overlap
    order by submission_type, has_inpat_revenue_code
```

Table 5. Correspondence of Claim Classification at the Header Level between Institutional and Professional claims
joined via PatientICN and Claim Dates of Service

```
select count(distinct coalesce(inst_claimsid, prof_claimsid)) as n,
inst_subtype, prof_subtype
from #combined_inst_prof
where inst_claim_type is not null
group by inst_subtype, prof_subtype
    order by inst_subtype , prof_subtype
```

Table 6. Professional Claims by Category with no matching Institutional Claim When joined via PatientICN and Claim
Dates of Service

```
    select count(distinct coalesce(inst_claimsid, prof_claimsid)) as n,
    inst_subtype, prof_subtype
    from #combined_inst_prof
    where inst_claim_type is null
    group by inst_subtype, prof_subtype
    order by inst_subtype desc , prof_subtype
```