Finding Hospital Inpatient Stays in PIT

This document presents one logical approach; it is not study specific. Users should assess whether the code in this document fits their particular need. Please consult with the study PI, Office of Community Care, CREEK, and/or VIReC regarding study-specific questions.

Revision History

Author(s)	Date	Description
Erin Beilstein-Wedel Megan Vanneman	15March2021	Original
Erin Beilstein-Wedel Megan Vanneman	19July2021	Revised to advise against using Place of Service for PIT Institutional Claims

Introduction

This document focuses on identifying claims for acute hospital inpatient stays (excludes skilled nursing facilities, home health, hospice, residential psychiatric, etc.). Appendix A presents code pairs that may be useful in identifying these other types of care.

Data for hospital inpatient stays can be found in both the Institutional and Professional claim tables in the PIT schema. This separation of data is caused by the claims process, which uses two different claim forms depending on the care setting and who is submitting the claim. The research question should inform whether data is needed from only the Institutional or Institutional and Professional tables (e.g., if only length of stay is needed, pulling from just the Institutional table is appropriate, but if diagnoses and procedures are needed, a fuller picture might be gained by pulling from both the Institutional and Professional tables).

Three data points may be used to categorize the type of encounter: type of bill (ToB), revenue code, and place of service (PoS). ToB and revenue code can be found on Institutional claims, while there is a PoS field in both Institutional and Professional claims tables.[1] The PIT Institutional and Professional tables contain data on many different types of encounters. Using values in these three fields (ToB, revenue code, and PoS) allows us to classify the type of encounter for which a claim is submitted.

- *Type of Bill:* Four-digit code that identifies the location (e.g., hospital, nursing facility) and type of bill (e.g., admit through discharge, replacement, interim). This field can be found on PIT.PITInstitutionalClaim. A full breakdown of ToB codes can be found here.
- *Revenue Code:* Four-digit 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. This field can be found on PIT.PITInstitutionalClaimDetails. A full breakdown of revenue code values can be found here. Revenue codes 100 through 249 are generally considered inpatient. Although it is beyond the scope of this document, revenue codes can additionally be used to differentiate

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[1] We recommend against using POS field on Institutional claims as the CMS UB92 forms do not contain a POS field and it is unclear how this variable is being populated in PIT.

between different types of inpatient stays (e.g. 114, 124, 134, 144, 154 for psychiatric inpatient stays).

- *Place of Service:* Two-digit codes representing the setting care was received in. This field can be found on the PIT.PITProfessionalClaimDetails. A full breakdown of PoS codes can be found [here].

The values of each code type that indicate a claim is for an acute inpatient stay are listed in Table 1. To identify hospital inpatient claims in the Institutional tables, the query presented in this document relies on the type of bill variable (values starting with 11x, 12x, 41x, 42x, and 44x). Notably, on Institutional claims there is little disagreement between these ToB values and revenue codes (values 100 through 249) (0.06% disagreement in Table 2). Although some Institutional claims in PIT have a non-NULL PoS value, it is unreliable and often missing. There is high agreement between ToB on Institutional claims and PoS on corresponding claims in the Professional table. Type of Bill values starting with 12x designate services received during an inpatient stay and may overlap with a claim having a ToB starting with 11x (Table 3).

Table 1. Inpatient Code Values

Code Type	Inpatient-related Values
Type of Bill	11x, 12x, 41x, 42x, and 44x
Revenue Code	100-249
Place of Service	21

Table 2. Agreement between Type of Bill and Inpatient Revenue Code in the PIT Institutional table

N Claims	% Claims	Has Inpatient Revenue Code	Has Inpatient Type of Bill
3723684	93.69%	No	No
1638	0.04%	Yes	No
862	0.02%	No	Yes
248181	6.24%	Yes	Yes

Table 3. Distribution of Place of Service Codes for Professional Claims that coincide with Institutional Inpatient Claims

N Professional Claims	% Professional Claims	PoS code category
80	0.00%	No PoS code
334458	20.19%	Other
1603191	96.77%	Inpatient

[Appendix B] contains the code used to generate Table 2 and Table 3.

1. PIT Institutional Claims
   1.1. The first query gets the ToB values that indicate inpatient stays. These ToB values, along with a date range will be used to limit the claims pulled from the Institutional tables.

```
drop table if exists #tmp_dim_inpatTOB
/* use this list to limit to Institutional claims to inpatient (excludes SNFs, home
health, Christian science, and non-inpatient intermediate care) */

select distinct
        PITBillTypeSID
        ,PITBillTypeCode
        ,FacilityType
        ,BillClassification
        ,ClassificationType
        ,PITBillTypeFrequency
into #tmp_dim_inpatTOB
from cdwwork.NDim.PITBillType
where len(pitbilltypecode) = 3
and (
        (PITBillTypeCode like '1[12]%' )
        or (PITBillTypeCode like '4[124]%' )
)
```

1.2. The second query pulls Institutional Claims that have an inpatient ToB value stored in #tmp_dim_inpatTOB (code in section 1.1)

```
-- declared variables

/* Date range of interest */
declare @startdate      date='2018-10-01'
declare @enddate        date='2019-10-01'

drop table if exists #Institutional
select distinct
        claim.PITpatientSID ,claim.PITClaimSID
        ,claim.[PITInstitutionalClaimSID]
        ,claim.StatementFromDate
        ,claim.StatementToDate
        ,claim.drgnumber
        ,claim.dischargedate
        ,claim.inpatient
        ,claim.dischargereason
        ,claim.admissiondate
        ,claim.PITAdmissionSourceSID
        ,tob.FacilityType
        ,tob.pitbilltypecode
        ,tob.pitbilltypefrequency
        ,pit.ClaimID
into #Institutional
from  cdwwork.pit.PITInstitutionalClaim as claim
-- including only  inpatient TOB
inner join #tmp_dim_inpatTOB as tob on claim.PITBillTypeSID=tob.PITBillTypeSID
inner join cdwwork.pit.pitclaim as pit on claim.pitclaimsid=pit.pitclaimsid
where  claim.statementfromdate >= @startdate /*claim starts or is after this date */
              and claim.StatementFromDate < @enddate /* claim starts before this date
*/
              and claim.[CurrentFlag] = 'Y'
              and pit.claimstatus='Accepted'
              and pit.currentflag='Y'
```

2. PIT Professional Claims

If inpatient data from Professional claims are needed, there is no exact match via a SID value to the Institutional tables. Professional claims are pulled separately and then combined with the

Institutional claims. To pull Professional claims we use PoS values, which are contained in CDWWork.NDim.PITPlaceofService.

Table 4. Values for place of service from NDIM.PITPlaceofService that may be considered inpatient

Place of Service Code	Place of Service Description
21	Inpatient Hospital

2.1. The first SQL query selects claims from the PIT.PITProfessionalDetails table that fall within a date range of interest

```sql
-- declared variables

/* Date range of interest */
declare @startdate          date='2018-10-01'
declare @enddate            date='2019-10-01'

-- PITProfessional
select
        p.PITClaimSID
        ,p.ClaimStatus
        ,p.PITpatientSID
        ,picd.[ServiceFromDate]
        ,picd.[ServiceToDate]
        ,picd.PITProfessionalClaimDetailssid
        ,picd.IsCurrentFlag
        ,picd.[PaidAmount]
        ,picd.[PayFlag]
        ,picd.[ModifierCode]
        ,place.pitplaceofservice
        ,place.pitplaceofservicecode
        ,case when pitplaceofservicecode in (21) then 'Inpatient'
          when pitplaceofservicecode is null or pitplaceofservicecode in
        (10,27,28,29,30,35,36,37,38,39,40,43,44,45,46,47,48,59,63,64,99) then
        'Unknown'
else 'Other'    end as setting_type
into #tmp_professionalclaims
from    CDWWORK.PIT.PITProfessionalClaimDetails     as picd
left outer join CDWWORK.PIT.PITProfessionalClaim    as ppc on
picd.pitclaimsid=ppc.pitclaimsid
left outer join CDWWORK.PIT.PITClaim as p    on picd.PITClaimSID=p.PITClaimSID
left outer join CDWWork.NDim.PITPlaceOfService      as place on
picd.pitplaceofservicesid=place.pitplaceofservicesid

where
        p.CurrentFlag='Y'
        and p.ClaimStatus='accepted'
        and picd.IsCurrentFlag='Y'
        and picd.PayFlag='Y'
        -- Dates of interest
        and picd.ServiceFromDate >= @startdate
        and     picd.ServiceFromDate < @enddate
-- limiting to inpatient or unknown PoS
        and (PITPlaceOfService is null or PITPlaceOfServiceCode in (21,
10,27,28,29,30,35,36,37,38,39,40,43,44,45,46,47,48,59,63,64,99) )
```

2.2. If you know you are only interested in Inpatient or Unknown PoS, then delete records with 'Other' here. Table 3 (above) shows the distribution of the categorized PoS in the Professional table when merged to Institutional inpatient claims. 14.49% of Professional claims that align with inpatient Institutional claims do not have an inpatient PoS value.

```sql
-- Keep only Professional claims with Inpatient or Unknown PoS

delete from #tmp_professionalclaims where setting_type = 'Other'
```

3. Combining Institutional and Professional Claims
Using MemberID (SSN) from the SVeteran.PITPatient table, we can identify which Professional claims fall within the date range on the Institutional inpatient claims.

```sql
-- combining institutional claims with professional claims via MemberID where
servicefromdate falls between statementfromdate and statemenetodate
;with prof as (
select
        pat.MemberID
        , p.*
from #tmp_professionalclaims as p
inner join CDWWork.SVeteran.PITPatient as pat on
p.PITPatientSID=pat.PITPatientSID
)
select distinct
        pat.MemberID
        , pat.PatientICN
        , i.PITClaimSID as institutional_pitclaimsid
        , p.PITClaimSID as professional_pitclaimSID
        , i.FacilityType
        , i.PITBillTypeCode
        , i.StatementFromDate
        , i.StatementToDate
        , i.AdmissionDate
        , p.ServiceFromDate
        , p.ServiceToDate
        , PITPlaceOfServiceCode
        , p.setting_type
into #Combined_inpatient
from #Institutional as i
inner join CDWWork.SVeteran.PITPatient as pat on
i.PITPatientSID=pat.PITPatientSID
left outer join prof as p on pat.MemberID=p.MemberID and p.servicefromdate >=
i.StatementFromDate and
                p.servicefromdate <= i.StatementToDate
```

Appendix A

A list of ToB and PoS code sets for other potential types of inpatient stays is presented below. They are a place to start and have not been tested; please contact VIReC and/or a program office and use your best judgement before wholesale applying them.

Type of Care	Type of Bill codes	Place of Service code

| Residential Psychiatric | ```
PITBillTypeCode
,FacilityType
,BillClassification
,ClassificationType
,PITBillTypeFrequency
from cdwwork.NDim.PITBillType
where len(pitbilltypecode) = 3
and (
        PITBillTypeCode like '1[12]%'
        or PITBillTypeCode like '4[124]%'
)
``` | 51, 55, 56 |
| Skilled Nursing / Nursing Home | ```
select distinct
PITBillTypeCode
,FacilityType
,BillClassification
,ClassificationType
,PITBillTypeFrequency
from cdwwork.NDim.PITBillType
where len(pitbilltypecode) = 3
and (
        (PITBillTypeCode like '1[5678]%' )
        or (PITBillTypeCode like '2[12345678]%' )
)
and BillClassification not in ('%Outpatient', ' Freestanding
Birthing Center  ',' Ambulatory Surgery Center (ASC)   ')
``` | 31,32, 33 |
| Hospice | ```
select distinct
PITBillTypeCode
,FacilityType
,BillClassification
,ClassificationType
,PITBillTypeFrequency
from cdwwork.NDim.PITBillType
where len(pitbilltypecode) = 3
and PITBillTypeCode like '8[12]%'
``` | 34 |

Appendix B

```
/* Date range of interest */
declare @startdate   date='2018-10-01'
declare @enddate     date='2019-10-01'

/************************************************************************//*
INSTITUTIONAL CLAIMS FOR FY18
*//************************************************************************/

drop table if exists #instclaim
;with instclaim as (
select distinct
       claim.PITClaimSID
       ,claim.[PITInstitutionalClaimSID]
       ,claim.StatementFromDate
       ,claim.StatementToDate
       ,claim.drgnumber
       ,year(claim.statementfromdate) as CY
       ,claim.dischargedate
       ,claim.inpatient
       ,claim.dischargereason
```

```sql
        ,claim.admissiondate
        ,claim.PITAdmissionSourceSID
        ,tob.FacilityType
        ,tob.pitbilltypecode
        ,tob.pitbilltypefrequency
        ,tob.BillClassification
        ,pit.ClaimID
         claim.PITPatientSID
from  cdwwork.pit.PITInstitutionalClaim as claim
        -- including all TOB, but only showing inpatient TOB
left outer join CDWWork.NDim.PITBillType as tob on
claim.PITBillTypeSID=tob.PITBillTypeSID
where
        claim.statementfromdate >= @startdate
        and claim.StatementFromDate < @enddate
        and claim.[CurrentFlag] = 'Y'
        and pit.claimstatus='Accepted'
        and pit.currentflag='Y'
)
,details as (
select i.*, details.RevenueCode, details.ServiceUnits , details.drg ,
details.pitinstitutionalclaimdetailssid, case when details.RevenueCode like '01%' or
details.RevenueCode like '02[0-4]%' then 1 else 0 end as bed_stay
from instclaim as i
left outer join CDWWork.pit.PITInstitutionalClaimDetails as details on
i.PITClaimSID=details.PITClaimSID
)
select * into #instclaim from details


/************************************************************************//*
PROFESSIONAL CLAIMS FOR FY18
*//************************************************************************/

drop table if exists #tmp_professionalclaims
-- PITProfessional
select
        p.PITClaimSID
        ,p.ClaimStatus
        ,p.PITpatientSID
        ,picd.[ServiceFromDate]
        ,picd.[ServiceToDate]
        ,picd.ServiceDate
        ,picd.PITProfessionalClaimDetailssid
        ,picd.IsCurrentFlag
        ,picd.[PaidAmount]
        ,picd.[PayFlag]
        ,picd.[ModifierCode]
        ,place.pitplaceofservice
        ,place.pitplaceofservicecode
        -- here we keep all PoS because it is possible that the patient received services
while they were an inpatient, but not at an inpatient PoS
        ,case when pitplaceofservicecode in (21) then 'Inpatient'
          when pitplaceofservicecode is null or pitplaceofservicecode in
(10,27,28,29,30,35,36,37,38,39,40,43,44,45,46,47,48,59,63,64,99,'') then 'Unknown'
          else 'Other'
          end as setting_type
```

```sql
into #tmp_professionalclaims
from    CDWWORK.PIT.PITProfessionalClaimDetails   as picd
left outer join CDWWORK.PIT.PITProfessionalClaim as ppc on
picd.pitclaimsid=ppc.pitclaimsid
left outer join CDWWORK.PIT.PITClaim        as p   on picd.PITClaimSID=p.PITClaimSID
left outer join CDWWork.NDim.PITPlaceOfService   as place on
picd.pitplaceofservicesid=place.pitplaceofservicesid

      where
      p.CurrentFlag='Y'
      and p.ClaimStatus='accepted'
      and picd.IsCurrentFlag='Y'
      and picd.PayFlag='Y'
      -- Dates of interest
      and picd.ServiceFromDate >= @startdate
      and    picd.ServiceFromDate < @enddate


/**************************************************************************//*
Table 2. EXAMINING ALIGNMENT BETWEEN TOB VALUES AND REVENUE CODES AND ADMISSION DATES
*//**************************************************************************/

-- Agreement between our inpatient TOB flag and bed_stay flag?
-- A: They have fairly close correspondence. Only 1% of claims have disagreement
;with consolidate as (
      select distinct pitclaimsid, max(bed_stay) as has_bed , FacilityType
      ,pitbilltypecode                  ,pitbilltypefrequency ,BillClassification
      from #instclaim
      group by pitclaimsid, FacilityType              ,pitbilltypecode
      ,pitbilltypefrequency ,BillClassification
)
, flg_inpatTOB as (
select distinct
pitclaimsid
,has_bed
,case when len(pitbilltypecode) = 3
and ((PITBillTypeCode like '1[12]%' )
           or (PITBillTypeCode like '4[124]%' ))
 then 1 else 0 end as inpatientTOB
from consolidate
)
select count(pitclaimsid) as n, has_bed, inpatientTOB
from flg_inpatTOB
group by has_bed, inpatientTOB




/**************************************************************************//*
Table 3. EXAMINING THE DISTRIBUTION OF PROFESSIONAL POS FOR INPATIENT INSTITUTIONAL
CLAIMS
*//**************************************************************************/
-- looking to see the distribution of Professional PoS for Inpatient Intuitional claims
;with prof as (
select pat.MemberID, p.* from #tmp_professionalclaims as p
inner join CDWWork.SVeteran.PITPatient as pat on p.PITPatientSID=pat.PITPatientSID
)
, inst_claims as (
select distinct PITPatientSID, PITClaimSID, StatementFromDate, StatementToDate
```

```sql
from #instclaim
where len(pitbilltypecode) = 3
and ((PITBillTypeCode like '1[12]%' )
            or (PITBillTypeCode like '4[124]%' ))
)
select
count(distinct p.pitclaimsid) as n
,p.setting_type
--,p.pitplaceofservicecode
from inst_claims as i
inner join CDWWork.SVeteran.PITPatient as pat on i.PITPatientSID=pat.PITPatientSID
left outer join prof as p on pat.MemberID=p.MemberID and p.servicefromdate >=
i.StatementFromDate and
            p.servicefromdate <= i.StatementToDate
group by setting_type--,pitplaceofservicecode
order by setting_type--, PITPlaceOfServiceCode
```