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-- copy and paste this into MS SQL Server Management Studio

-- | PURPOSE: Identify claims with Total Knee Replacements (TKAs) in the window 2022-04-01 - 2022-10-01, get primary DX, check for hypertension

-- | PROGRAMMER: Erin Beilstein-Wedel

-- | BACKGROUND: For VINCI training hour

-- | CREATED: 20230917

-- | SERVER: RB03

-- | INPUT(S): NA

-- | OUTPUT (FINAL): NA

-- |

-- | UPDATE # Date reason

-- | 1)

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use ORD\_Rosen\_202210029D;

go

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1) Find all cases of TKA in CDS

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 1.1) DIM with Procedure Codes (no SIDs)

\*/

drop table if exists #dim\_tka\_proc\_codes

create table #dim\_tka\_proc\_codes (

 proc\_code varchar(10)

 ,code\_type varchar(10)

 ,description varchar(200)

 ,hip\_knee varchar(5)

)

-- ICD procedure codes

insert into #dim\_tka\_proc\_codes values

('0SRC069', 'ICD10PCS','Replacement of Right Knee Joint with Oxidized Zirconium on Polyethylene Synthetic Substitute, Cemented, Open Approach','Knee')

,('0SRC06A', 'ICD10PCS','Replacement of Right Knee Joint with Oxidized Zirconium on Polyethylene Synthetic Substitute, Uncemented, Open Approach','Knee')

,('0SRC06Z', 'ICD10PCS','Replacement of Right Knee Joint with Oxidized Zirconium on Polyethylene Synthetic Substitute, Open Approach','Knee')

,('0SRC0J9', 'ICD10PCS','Replacement of Right Knee Joint with Synthetic Substitute, Cemented, Open Approach','Knee')

,('0SRC0JA', 'ICD10PCS','Replacement of Right Knee Joint with Synthetic Substitute, Uncemented, Open Approach','Knee')

,('0SRC0JZ', 'ICD10PCS','Replacement of Right Knee Joint with Synthetic Substitute, Open Approach','Knee')

,('0SRD069', 'ICD10PCS','Replacement of Left Knee Joint with Oxidized Zirconium on Polyethylene Synthetic Substitute, Cemented, Open Approach','Knee')

,('0SRD06A', 'ICD10PCS','Replacement of Left Knee Joint with Oxidized Zirconium on Polyethylene Synthetic Substitute, Uncemented, Open Approach','Knee')

,('0SRD06Z', 'ICD10PCS','Replacement of Left Knee Joint with Oxidized Zirconium on Polyethylene Synthetic Substitute, Open Approach','Knee')

,('0SRD0J9', 'ICD10PCS','Replacement of Left Knee Joint with Synthetic Substitute, Cemented, Open Approach','Knee')

,('0SRD0JA', 'ICD10PCS','Replacement of Left Knee Joint with Synthetic Substitute, Uncemented, Open Approach','Knee')

,('0SRD0JZ', 'ICD10PCS','Replacement of Left Knee Joint with Synthetic Substitute, Open Approach','Knee')

;

-- CPT Code

insert into #dim\_tka\_proc\_codes values

('27447','CPT', 'TOTAL KNEE ARTHROPLASTY ARTHROPLASTY, KNEE, CONDYLE AND PLATEAU; MEDIAL AND LATERAL COMPARTMENTS WITH OR WITHOUT PATELLA RESURFACING (TOTAL KNEE ARTHROPLASTY)','Knee' )

;

--or, using the dims

select distinct icd10procedurecode, 'ICD10PCS' as code\_type, icd10proceduredescription, 'knee' as hip\_knee

into #dim\_tka\_proc\_codes\_fromDIMs

from cdwwork.dim.icd10procedure i

join cdwwork.dim.icd10proceduredescriptionversion descr

 on i.icd10proceduresid = descr.icd10proceduresid

where i.ICD10ProcedureCode like '0srdc06j%'

union

select distinct cptcode, 'CPT' , concat(CPTName,' - ',cptdescription), 'knee'

from cdwwork.dim.cpt c

where c.cptcode = '27447'

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 1.2) Header table

 Identify claims with the statuses we want, in the time frame we want.

 May seem unnecessary, but Claim status isn't on the cds\_claim\_procedure table, and the iscurrent value isn't on any of the other tables.

 Remember statuses are assigned at both the header and line level.

 For CCRS, it is the highest line-level status that gets assigned to the header.

 We have two cohorts, only one for TKAs so I use a distinct so as not to get duplicate records

\*/

drop table if exists #claim\_header\_in\_dates

select distinct ClaimSID

 , patient\_icn as PatientICN

into #claim\_header\_in\_dates

from src.ivc\_cds\_cds\_claim\_header as cds

inner join src.ivc\_cds\_cds\_claim\_status as stat on cds.claim\_status\_id=convert(varchar,stat.status\_id) --this conversion dramatically improves performance. VINCI is looking into changing the column in the table itself

where coalesce(Discharge\_Date, service\_end\_date) >= '2022-04-01' --Capture claims for discharges in the window.

 and coalesce(Discharge\_Date, service\_end\_date) < '2022-10-01' --Coalesce because professional claims don't have discharge dates, but we can use the service\_end instead

 and Service\_Start\_Date < '2022-10-01' -- service dates on claim must be before 2022-10-01, allows SQL to use the partition

 and claim\_form\_type in ('I','P') -- institutional or professional claims only

 and stat.Status\_Description in ('APPROVED', 'PENDING', 'BILL SENT', 'PAID', 'CREDIT', 'TO BE PAID', 'CANCELLED', 'SUSPENDED', 'NO ACTION') -- keep claims with statuses we want

 and cds.IsCurrent not in ('R' /\* reversed \*/

 ,'D' /\* deleted \*/

 )

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 1.3) Get lines with TKA procedures (CPT).

\*/

drop table if exists #claim\_line\_tka\_CPT

-- get claims with THA/TKA CPTs

select distinct head.claimsid

 , line.line\_number

 , line.Procedure\_code

 , line.Service\_Start\_Date

into #claim\_line\_tka\_CPT

from #claim\_header\_in\_dates as head

inner join src.ivc\_cds\_cds\_claim\_line as line on head.claimsid=line.claimsid

inner join src.ivc\_cds\_cds\_claim\_status as stat on line.line\_status\_id= stat.status\_id

inner join #dim\_tka\_proc\_codes as tha on line.procedure\_code=tha.proc\_code -- DIM table with TKA procedure codes

 and tha.code\_type = 'cpt' -- only CPT codess are in the claim\_lines table

where line.Service\_Start\_Date < '2022-10-01' -- service dates on claim must be before 2022-10-01

and line.service\_end\_date > = '2022-04-01' -- last service on claim must have ended on or after 2019-10-01

and stat.Status\_Description in ('APPROVED', 'PENDING', 'BILL SENT', 'PAID', 'CREDIT', 'TO BE PAID', 'CANCELLED', 'SUSPENDED', 'NO ACTION') -- keep claims with statuses we want

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 1.4) Get ICD procedure codes on the claim (ICD-10 PCS).

\*/

drop table if exists #claim\_procedure\_tka\_icdP

select distinct head.claimsid, cproc.Procedure\_Code,cproc.Procedure\_Date

into #claim\_procedure\_tka\_icdP

from #claim\_header\_in\_dates as head

inner join Src.IVC\_CDS\_CDS\_Claim\_Procedure as cproc on head.claimsid=cproc.claimsid

inner join #dim\_tka\_proc\_codes as tha on cproc.procedure\_code=tha.proc\_code -- DIM table with TKA procedure codes

where cproc.Procedure\_Date > = '2022-04-01' -- last service on claim must have ended on or after 2019-10-01

and cproc.Procedure\_Date < '2022-10-01' -- service dates on claim must be before 2022-10-01

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 1.5) Combine the line and claim procedures with the header, keeping only headers we want.

\*/

drop table if exists #claim\_header\_w\_TKA

select head.ClaimSID, head.PatientICN

 , line.line\_number as line\_number

 , line.Procedure\_code as line\_procedure\_code

 , line.service\_start\_date as line\_service\_start\_date

 , icd.Procedure\_Code as procedure\_code, icd.Procedure\_Date as Procedure\_date

into #claim\_header\_w\_TKA

from #claim\_header\_in\_dates as head

left outer join #claim\_line\_tka\_CPT as line on head.ClaimSID=line.ClaimSID

left outer join #claim\_procedure\_tka\_icdP as icd on head.ClaimSID=icd.ClaimSID

where line.ClaimSID is not null -- keeping only claim headers that have a TKA

or icd.ClaimSID is not null

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 1.6) cleaning up tables we don't need anymore

\*/

drop table if exists

 #claim\_procedure\_tka\_icdP

 ,#claim\_line\_tka\_CPT

 ,#claim\_header\_in\_dates

 ,#dim\_tka\_proc\_codes

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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2) What is the primary diagnosis for the procedure?

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 2.1) For procedures found on claim line, get line DX

\*/

drop table if exists #claim\_w\_line\_primary\_dx

select distinct tka.\*, line\_dx.icd as procedure\_primary\_diagnosis

into #claim\_w\_line\_primary\_dx

from #claim\_header\_w\_TKA as tka

left outer join Src.IVC\_CDS\_CDS\_claim\_line\_icd\_detail as line\_dx

 on tka.claimsid=line\_dx.claimsid -- composite key claimsid + line\_number (also nonclustered unique index)

 and tka.line\_number = line\_dx.line\_number

 and line\_procedure\_code is not null -- only pull for CPT procedures (ICD procedures do not have DX in this table)

 and line\_dx.qualifier = 'P' -- where diagnosis is primary for the line

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 2.2) For ICD procedures, get primary DX from claim\_diagnosis. This may not necessarily be the primary DX for the TKA.

\*/

drop table if exists #claim\_w\_primary\_dx\_for\_line\_and\_claim

select distinct tka.\*, dx.icd as claim\_primary\_diagnosis

into #claim\_w\_primary\_dx\_for\_line\_and\_claim

from #claim\_w\_line\_primary\_dx as tka

left outer join Src.IVC\_CDS\_CDS\_claim\_diagnosis as dx

 on tka.claimsid=dx.claimsid

 and primary\_ind = 'P' --primary

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 2.3) cleaning up tables we don't need anymore

\*/

drop table if exists

 #claim\_w\_line\_primary\_dx

 ,#claim\_header\_w\_TKA

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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3) Do any of these people have hypertension in the year prior to their surgery?

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 3.1) Distinct values of ICN and procedure date.

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drop table if exists #pat\_tka

select distinct patienticn, coalesce(Procedure\_date, line\_service\_start\_date) as tka\_date

into #pat\_tka

from #claim\_w\_primary\_dx\_for\_line\_and\_claim

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 3.2)

\*/

-- ICD 10 DX

drop table if exists #dim\_hypertension

create table #dim\_hypertension (code varchar(50), descrip varchar(250), risktype varchar(50) )

-- Hypertension icd codes

insert into #dim\_hypertension values ('I10','Essential (primary) hypertension','Hypertension')

insert into #dim\_hypertension values ('I110','Hypertensive heart disease with heart failure','Hypertension')

insert into #dim\_hypertension values ('I119','Hypertensive heart disease without heart failure','Hypertension')

insert into #dim\_hypertension values ('I120','Hyp chr kidney disease w stage 5 chr kidney disease or ESRD','Hypertension')

insert into #dim\_hypertension values ('I129','Hypertensive chronic kidney disease w stg 1-4/unsp chr kdny','Hypertension')

insert into #dim\_hypertension values ('I130','Hyp hrt & chr kdny dis w hrt fail and stg 1-4/unsp chr kdny','Hypertension')

insert into #dim\_hypertension values ('I1310','Hyp hrt & chr kdny dis w/o hrt fail, w stg 1-4/unsp chr kdny','Hypertension')

insert into #dim\_hypertension values ('I1311','Hyp hrt and chr kdny dis w/o hrt fail, w stg 5 chr kdny/ESRD','Hypertension')

insert into #dim\_hypertension values ('I132','Hyp hrt & chr kdny dis w hrt fail and w stg 5 chr kdny/ESRD','Hypertension')

insert into #dim\_hypertension values ('I150','Renovascular hypertension','Hypertension')

insert into #dim\_hypertension values ('I151','Hypertension secondary to other renal disorders','Hypertension')

insert into #dim\_hypertension values ('I152','Hypertension secondary to endocrine disorders','Hypertension')

insert into #dim\_hypertension values ('I158','Other secondary hypertension','Hypertension')

insert into #dim\_hypertension values ('I159','Secondary hypertension, unspecified','Hypertension')

insert into #dim\_hypertension values ('I160','Hypertensive urgency','Hypertension')

insert into #dim\_hypertension values ('I161','Hypertensive emergency','Hypertension')

insert into #dim\_hypertension values ('I169','Hypertensive crisis, unspecified','Hypertension')

insert into #dim\_hypertension values ('I674','Hypertensive encephalopathy','Hypertension')

insert into #dim\_hypertension values ('N262','Page kidney','Hypertension')

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 3.3) get claim headers

\*/

drop table if exists #claim\_header\_in\_dates\_dx

select distinct ClaimSID

 , patient\_icn as PatientICN

 , tkas.tka\_date

into #claim\_header\_in\_dates\_dx

from src.ivc\_cds\_cds\_claim\_header as cds

inner join #pat\_tka as tkas on cds.Patient\_ICN=tkas.PatientICN -- limiting to patients we found had TKA

inner join src.ivc\_cds\_cds\_claim\_status as stat on cds.claim\_status\_id=convert(varchar,stat.status\_id) --this conversion dramatically improves performance. VINCI is looking into changing the column datatype in the table itself

where coalesce(Discharge\_Date, service\_end\_date) > = dateadd(year, -1, tkas.tka\_date) -- last service on claim must have ended on or after1 year before tka date

 and Service\_Start\_Date < tkas.tka\_date -- service dates on claim must be before tka date

 and Service\_Start\_Date < '2022-10-01' --for partition elimination - doesn't change results

 and claim\_form\_type in ('I','P') -- institutional or professional claims only

 and stat.Status\_Description in ('APPROVED', 'PENDING', 'BILL SENT', 'PAID', 'CREDIT', 'TO BE PAID', 'CANCELLED', 'SUSPENDED', 'NO ACTION') -- keep CLAIMS WITH STATUses we want

 and cds.IsCurrent not in ('R' /\* reversed \*/

 ,'D' /\* deleted \*/

 )

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 3.4) get DX at the claim

\*/

drop table if exists #hypertension

select h.\*

into #hypertension

from #claim\_header\_in\_dates\_dx as h

inner join src.ivc\_cds\_cds\_claim\_diagnosis as dx

 on h.claimsid=dx.claimsid

inner join #dim\_hypertension as hyper

 on dx.icd = hyper.code

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 3.5) merge hypertension DX onto procedure

\*/

drop table if exists #claim\_primary\_dx\_hypertension\_check

; with get\_distinct\_hypertension as ( -- making flag of 1/0 for hypertension distinct to the patient tka\_date level

 select distinct tka.patienticn, tka.tka\_date

 , case when hyper.claimsid is not null

 then 1 else 0

 end as has\_hypertension

 from #pat\_tka as tka

 left outer join #hypertension as hyper

 on tka.patienticn=hyper.patienticn

 and tka.tka\_date = hyper.tka\_date

)

select tka.\*, hyper.has\_hypertension

into #claim\_primary\_dx\_hypertension\_check

from #claim\_w\_primary\_dx\_for\_line\_and\_claim as tka

left outer join get\_distinct\_hypertension as hyper

 on tka.patienticn=hyper.patienticn

 and (tka.procedure\_date = hyper.tka\_date

 or tka.line\_service\_start\_date = hyper.tka\_date

 )

select \*

from #claim\_primary\_dx\_hypertension\_check

order by PatientICN

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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