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data a0(keep=seqnum surgerysite);
    set hr3.HIP;
    SurgerySite=1;
run;
*1. extract all records from DAD by ULI;

proc sql;
create table b1 as
select * from AHSDATA.Ahs_ip_doctor_dx(keep=inst uli admitdate admittime
disdate distime seqnum instfrom instto)
where uli in (select uli from hr3.HIP);
quit;

data a1(keep=seqnum uli admit disch datafrom instfrom instto inst);
    set b1;
    admit=dhms(input(admitdate, yymmdd10.), substr(admittime,1,2), substr(
admittime,3,2),0);
    disch=dhms(input(disdate, yymmdd10.), substr(distime,1,2), substr(dist
ime,3,2),0);
    datafrom='DAD';
    format datafrom $4.;
    format admit disch datetime20.;

run;
proc sql;
create table hr3.all_ip as
select * from a1 a left join a0 b
on a.seqnum=b.seqnum;
quit;

*2.extract records from ED of ACCS and NACRS by ULI;
    *ED: MIS code='71310';

proc sql;
    create table hr3.c1 as
    select * from AHSDATA.Ahs_ambulatory(keep= uli inst visdate vistime
disdate distime instfrom instto misprime)
    where uli in (select ULi from hr3.HIP ) and
substr(misprime,1,5)='71310';

    create table hr3.c2 as
    select * from AHSDATA.Ahs_nacrs_main(keep= uli visit_date
visit_time disp_date disp_time instfrom instto inst mis_code)
    where uli in (select ULi from hr3.HIP) and
(substr(mis_code,1,5)='71310' or substr(mis_code,1,9) in
('715130000', '715140000'));
quit;

data c11(keep=uli admit disch instfrom instto inst datafrom );
    set hr3.c1;
    admit=dhms(input(admitdate, yymmdd10.), substr(admittime,1,2), substr(
admittime,3,2),0);
    disch=dhms(input(disdate, yymmdd10.), substr(distime,1,2), substr(dist
ime,3,2),0);

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        datafrom='ED';
        if admit=. or disch=. then delete;
        format admit disch datetime20.;
RUN;

DATA c21(keep=uli admit disch instfrom instto inst datafrom );
    SET hr3.c2(keep=inst uli visit_date visit_time disp_date disp_time
instto instfrom MIS_CODE);
    admit=dhms (mdy(substr(visit_date,5,2),substr(visit_date,7,2),substr
(visit_date,1,4)),substr(visit_time,1,2),substr(visit_time,3,2),0);
    disch=dhms (mdy(substr(disp_date,5,2),substr(disp_date,7,2),substr(d
isp_date,1,4)),substr(disp_time,1,2),substr(disp_time,3,2),0);
    datafrom='ED';
    if admit=. or disch=. then delete;
    format admit disch datetime20.;
run;
data d1;
    set c11 c21;
run;
**remove duplicated in ED based on inst, ULI,instfrom, instto,
admit,disch,datafrom;
proc sort data=d1 out=hr3.all_ed nodupkey;by inst uli-- datafrom;run;
/*proc sql;
select max(disch) as maxDADdate format=datetime20. from hr3.all_ip;
select max(disch) as maxEDdate format=datetime20. from hr3.all_ed;
quit;

/*3.create an episode: ED+IP*/
/*3.1 combine ED and IP into one table*/
/*3.2 sort it by uli and admit*/
/*3.3 use 12 hrs to define an episode*/

**remove embeded ED cases;
data a3;
    set hr3.all_ip hr3.all_ed;
    if SurgerySite=. then SurgerySite=0;
    ID=_n_;*ED doesn't have SEQNUM. Therefore, we have to create an
unique ID.;
run;
proc sort;by uli admit;run;
**remove embeded ED cases, but keep DAD cases;
/*ED embeded cases: admitted ED1 then transferred to ED2.
For example:
ED1: INST=88070, ULI=110216300, admit=11OCT2003 15:30, disch=12OCT2003
00:01
ED2: INST=88044, ULI=110216300, admit=11OCT2003 19:31, disch=11OCT2003
23:31
ED2 is meaningless to determine Epi_admit Epi_disch.
/*Embeded record: admit2<=admit1 and discharge2<=discharge1*/

data a4;

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set a3;
by uli admit;
retain L_disch ;

a1=lag(disch);
embed=0;

if first.uli then do;
    a1=.;
    l_disch=.;
end;

if not first.uli then
do;
    if L_disch>a1 then L_disch=l_disch;
    else L_disch=a1;
    if intck('minute',l_disch,disch)<0 then embed=1;
end;
format a1 L_disch datetime20.;
run;
data a41;
    set a4;
    if datafrom='ED' and embed=1 then delete;
    drop a1 L_disch;
run;
/*1416 1% removed*/
proc sort ;by uli admit;run;
/*proc sql;
create table x1 as
select * from a41
group by ULI
having max(embed)=1;
quit;*/

data a42;
    set a41;
    by uli admit;
    retain L_disch ;

    a1=lag(disch);
    transfer=0;
    overlap=0;
    if first.uli then do;
        a1=.;
        l_disch=.;
    end;

    if not first.uli then
    do;
        if L_disch>a1 then L_disch=l_disch;
        else L_disch=a1;
        dif=intck('minute',l_disch,admit);
        if dif<=720 then transfer=1;
    end;

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        if dif<0 then overlap=1;
    end;
    format a1 L_disch datetime20.;
run;
proc sort ;by uli admit;run;

data hr3.a6;
    set a42;
    retain Episode_ID;
    if transfer=0 then Episode_ID=ID;
    else if transfer=1 then Episode_ID=Episode_ID;
run;

proc sql;
create table hr3.a7 as
select * from hr3.a6
group by episode_id
having max(surgerysite)=1;

quit;
/*NOTE: A patients may have 2 surgeries in one episode!*/
        *The next program is used to pull those special cases
out;

        /*proc sql;
        create table c1 as
        select * from hr3.a7
        where surgerysite=1

        group by episode_id
        having count(surgerysite)>1;

        create table hr3.Special_1EPI2Surg as
        select * from hr3.a7
        where episode_id in (select episode_id from c1);
        quit;

        proc sort data=hr3.Special_1EPI2Surg;
        by episode_id admit;run;*/

*determine the Episode admission and Episode instfrom;
proc sort data=hr3.a7;
by episode_id admit;run;
data a71(keep=episode_id uli epi_admit epi_instfrom) a73(keep=episode_id
seqnum surgerysite embed);
    set hr3.a7;
    by episode_id admit;
    if first.episode_id then
        do;
            epi_admit=admit;
            epi_instfrom=instfrom;

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        end;
        if first.episode_id then output a71;

        format epi_admit    datetime20.;
        if surgerysite=1 then output a73;
run;
/*a73 has all surgical records and is MASTER table*/
/*a71 is the table with Episode admission, Episode INSTFROM.
If a patient has 2 surgeries in ONE episode,we set the episode_admission
and episode_instfrom same for both surgeries!*/

data e1;
    set hr3.a7;
    if datafrom='DAD';
run;
proc sort ;
by episode_id disch;run;

*determine the Episode discharge and Episode instto using DAD only;

data  a72(keep=episode_id epi_instto epi_disch) ;
    set e1;
    by episode_id disch;
    if last.episode_id then
        do;
            epi_instto=instto;
            epi_disch=disch;
        end;
    format  epi_disch    datetime20.;
    if last.episode_id then output a72;
run;
*a72 is the table with Episode discharge, Episode INSTTO.;

proc sql;
create table a8 as
select * from a73 a left join a72 b
on a.episode_id =b.episode_id;

create table hr3.a81 as
select * from a8 a left join a71 b
on a.episode_id =b.episode_id;
quit;
/*hr3.a81 has both Episode admission and discharge info.*/

proc sql;
create table  hr3.a10 as
select * from hr3.HIP a inner join hr3.a81(keep=seqnum epi_admit
epi_disch epi_instfrom epi_instto episode_id embed) b
on a.seqnum=b.seqnum;
quit;

/*For embedding cases, we used hospital admission as 1st presentation
time.
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For example, patient A stayed in subacute for 1 year. He had surgery during the 1 year stay.
He was transferred to surgical hospital and then transferred back.
We use the admission of surgical site as episode admission instead of subacute admission as episode admission*/

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data hr3.hip_episode;  
    set hr3.a10;  
    if embed=1 then epi_admit=admit;  
run;  
/*proc freq data=hr3.hip_episode;  
table fiscal_yr;  
run;*/
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