**Creation of Chads-Vasc Score for Cardiovascular Patients**

**Cohort data table: ‘character\_2’**

%include '/…Program/Second\_cut.sas' ;

\*Congestive Heart Failure;

%LET chf = %STR ('39891', '40201', '40211', '40291', '40403', '40413', '40493', '425', '428');

\*Hypertension;

%LET hyp = %STR ('36211', '401', '402', '403', '404', '405');

\*Stroke/TIA/TE (previous stroke, transient ischemic attack, or thromboembolism);

%LET str = %STR ('36234', '43301', '43311', '43321', '43331', '43381', '43391', '43401', '43411', '43491', '435', '436', '438');

\*Vascular disease (previous MI, peripheral arterial disease or aortic plaque);

%LET vas = %STR ('410', '411', '412', '413', '414', '440', '441', '442', '443', '444', '445');

\*cpt/ICD9 proc codes;

%LET vap = %STR ('33510', '33511', '33512', '33513', '33514', '33516', '33533', '33534', '33535', '33536', '33542', '33545',

'34051', '34151', '34201', '34203', '34800', '34802', '34803', '34804', '34805', '34812', '34820', '34825', '34830', '34831', '34832', '34833', '34834',

'34900', '35081', '35082', '35091', '35092', '35102', '35103', '35131', '35132', '35141', '35142', '35151', '35152', '35331', '35341', '35351', '35355', '35361', '35363', '35371', '35372', '35381', '35450', '35452', '35454', '35456', '35459', '35470', '35471', '35472', '35473', '35474', '35480', '35481', '35482',

'35483', '35485', '35490', '35491', '35492', '35493', '35495', '35521', '35531', '35533', '35541', '35546', '35546', '35548',

'35549', '35551', '35556', '35558', '35563', '35565', '35566', '35571', '35583', '35585', '35587', '35621', '35623', '35646',

'35647', '35651', '35654', '35656', '35661', '35663', '35665', '35666', '35671', '92980', '92981', '92982', '92984',

'0066', '360\_', '361\_', '3925');

\*Diabetes mellitus;

%LET diam = %STR ('250', '3572', '3620', '36641');

\*diagnosis codes pull;

%droptd(\_01\_chadsvas);

%MACRO chads;

PROC SQL;

%connectgl;

execute(create volatile multiset table \_01\_chadsvas as (

%DO r = 1 %to 5;

%let cc\_scores=%SCAN(1\*1\*2\*1\*1,&r.,\*);

%let cc\_names\_dx=%SCAN(chf\*hyp\*str\*vas\*diam,&r.,\*);

SELECT a.enrolid, a.index\_age, a.sex, %STR(%')&cc\_names\_dx.%STR(%') AS chads\_type, &cc\_scores. AS chads\_weight

FROM character\_2 AS a

INNER JOIN second\_diag AS b

ON a.enrolid = b.enrolid

and b.diag IN (&&&cc\_names\_dx.) /\*originally there were 3 & \*/

and b.svcdate between a.fst\_rx-365 and a.fst\_rx-1

%if &r. LT 5 %then %do; UNION ALL %end;

%END;

) with data on commit preserve rows;

) BY TERADATA;

quit;

%MEND chads;

%chads;

%count(\_tdwork,\_01\_chadsvas,enrolid);

\*procedure codes pull;

%droptd(\_02\_chadsvas);

%MACRO chads2;

PROC SQL;

%connectgl;

execute(create volatile multiset table \_02\_chadsvas as (

SELECT a.enrolid, a.index\_age, a.sex, 'vap' AS chads\_type, 1 AS chads\_weight

FROM character\_2 AS a

INNER JOIN second\_proc AS b

ON a.enrolid = b.enrolid

and b.proc IN ('33510', '33511', '33512', '33513', '33514', '33516', '33533', '33534', '33535', '33536', '33542', '33545',

'34051', '34151', '34201', '34203',

'34800', '34802', '34803', '34804', '34805', '34812', '34820', '34825', '34830', '34831', '34832', '34833', '34834',

'34900', '35081', '35082', '35091', '35092', '35102', '35103',

'35131', '35132', '35141', '35142', '35151', '35152', '35331', '35341', '35351', '35355', '35361', '35363', '35371', '35372',

'35381', '35450', '35452', '35454', '35456', '35459', '35470', '35471', '35472', '35473', '35474', '35480', '35481', '35482',

'35483', '35485', '35490', '35491', '35492', '35493', '35495', '35521', '35531', '35533', '35541', '35546', '35546', '35548',

'35549', '35551', '35556', '35558', '35563', '35565', '35566', '35571', '35583', '35585', '35587', '35621', '35623', '35646',

'35647', '35651', '35654', '35656', '35661', '35663', '35665', '35666', '35671', '92980', '92981', '92982', '92984',

'0066', '360\_', '361\_', '3925')

and b.svcdate between a.fst\_rx-365 and a.fst\_rx-1

) with data on commit preserve rows;

) BY TERADATA;

quit;

%MEND chads2;

%chads2;

%count(\_tdwork,\_02\_chadsvas,enrolid);

\*75 and older;

%droptd(\_03\_chadsvas);

%MACRO chads3;

PROC SQL;

%connectgl;

execute(create volatile multiset table \_03\_chadsvas as (

SELECT enrolid, index\_age, sex, 'sev' AS chads\_type, 2 AS chads\_weight

FROM character\_2

where index\_age ge 75

) with data primary index(enrolid) on commit preserve rows;

) by teradata;

quit;

%MEND chads3;

%chads3;

%count(\_tdwork,\_03\_chadsvas,enrolid);

\*65-74;

%droptd(\_04\_chadsvas);

%MACRO chads4;

PROC SQL;

%connectgl;

execute(create volatile multiset table \_04\_chadsvas as (

SELECT enrolid, index\_age, sex, 'six' AS chads\_type, 1 AS chads\_weight

FROM character\_2

where index\_age between 65 and 74

) with data primary index(enrolid) on commit preserve rows;

) by teradata;

quit;

%MEND chads4;

%chads4;

%count(\_tdwork,\_04\_chadsvas,enrolid);

\*sex;

%droptd(\_05\_chadsvas);

%MACRO chads5;

PROC SQL;

%connectgl;

execute(create volatile multiset table \_05\_chadsvas as (

SELECT enrolid, index\_age, sex, 'fem' AS chads\_type, 1 AS chads\_weight

FROM character\_2

where sex=2

) with data primary index(enrolid) on commit preserve rows;

) by teradata;

quit;

%MEND chads5;

%chads5;

%count(\_tdwork,\_05\_chadsvas,enrolid);

\*stacking datasets;

%droptd(union\_chad);

proc sql;

%connectgl;

execute(create volatile multiset table union\_chad as (

select distinct a.enrolid, a.index\_age, a.sex, a.chads\_type, a.chads\_weight

from \_01\_chadsvas a

union

select distinct b.enrolid, b.index\_age, b.sex, b.chads\_type, b.chads\_weight

from \_02\_chadsvas b

union

select distinct c.enrolid, c.index\_age, c.sex, c.chads\_type, c.chads\_weight

from \_03\_chadsvas c

union

select distinct d.enrolid, d.index\_age, d.sex, d.chads\_type, d.chads\_weight

from \_04\_chadsvas d

union

select distinct e.enrolid, e.index\_age, e.sex, e.chads\_type, e.chads\_weight

from \_05\_chadsvas e

) with data primary index(enrolid) on commit preserve rows;

) by teradata;

quit;

%count(\_tdwork,union\_chad,enrolid);

proc print data=\_tdwork.union\_chad (obs=20);

run;

\*merging with total cohort;

%droptd(\_cohort\_chadsvas);

proc sql;

%connectgl;

execute(create volatile multiset table \_cohort\_chadsvas as (

select a.enrolid, a.fst\_rx, a.rx\_cohort, a.index\_age, a.age\_cat,

a.pop, a.sex, a.region, a.period\_start, a.period\_stop,

a.warfarin, a.apixaban, a.rivaroxaban, a.dabigatran,

a.fstG\_flag, a.G0249\_1,

b.chads\_type, b.chads\_weight

, case when b.chads\_type='chf' then 1 else 0 end as chf

, case when b.chads\_type='dia' then 1 else 0 end as dia

, case when b.chads\_type='hyp' then 1 else 0 end as hyp

, case when b.chads\_type='sev' then 1 else 0 end as sev

, case when b.chads\_type='fem' then 1 else 0 end as fem

, case when b.chads\_type='six' then 1 else 0 end as six

, case when b.chads\_type='str' then 1 else 0 end as str

, case when b.chads\_type='vap' then 1 else 0 end as vap

, case when b.chads\_type='vas' then 1 else 0 end as vas

, case when b.chads\_type='vap' or b.chads\_type='vas' then 1 else 0 end as vat

,case when b.chads\_weight is NULL then 0 else b.chads\_weight end as chads\_weight\_2

from character\_2 a

left join union\_chad b

on a.enrolid=b.enrolid

) with data primary index(enrolid) on commit preserve rows;

) by teradata;

quit;

%count(\_tdwork,\_cohort\_chadsvas,enrolid);

proc sort data=\_tdwork.\_cohort\_chadsvas;

by enrolid;

run;

proc print data=\_tdwork.\_cohort\_chadsvas (obs=200);

by enrolid;

run;

\*patient level;

%droptd(\_freq\_chadsvas);

proc sql;

%connectgl;

execute(create volatile multiset table \_freq\_chadsvas as (

select distinct enrolid, rx\_cohort, age\_cat, sum(chads\_weight\_2) as chads\_sum

, max(chf) as chf, max(dia) as dia, max(hyp) as hyp, max(sev) as sev

, max(fem) as fem, max(six) as six, max(str) as str, max(vap) as vap, max(vas) as vas, max(vat) as vat

group by enrolid, rx\_cohort, age\_cat

from \_cohort2\_chadsvas

) with data primary index(enrolid) on commit preserve rows;

) by teradata;

quit;

%count(\_tdwork,\_freq\_chadsvas,enrolid);

proc print data=\_tdwork.\_freq\_chadsvas(obs=200);

run;

\*final table;

%droptd(\_final\_);

proc sql;

%connectgl;

execute(create volatile multiset table \_final\_ as (

select a.enrolid, a.fst\_rx, a.rx\_cohort, a.index\_age, a.age\_cat,

a.pop, a.sex, a.region, a.period\_start, a.period\_stop,

a.warfarin, a.apixaban, a.rivaroxaban, a.dabigatran,

a.fstG\_flag, a.G0249\_1,

b.chads\_sum,

b.chf, b.dia, b.hyp, b.sev, b.fem, b.six, b.str, b.vap, b.vas, b.vat

, case when b.chads\_sum=0 then 0

when b.chads\_sum=1 then 1

when b.chads\_sum=2 then 2

when b.chads\_sum>2 then 3

end as chads\_cat

from character\_2 a

left join \_freq\_chadsvas b

on a.enrolid=b.enrolid

) with data primary index(enrolid) on commit preserve rows;

) by teradata;

quit;

%count(\_tdwork,\_final\_,enrolid);

proc tabulate data=\_tdwork.\_final\_;

var chf dia hyp sev fem six str vap vas vat;

class warfarin dabigatran rivaroxaban apixaban;

Table warfarin dabigatran rivaroxaban apixaban, chf dia hyp sev fem six str vap vas vat;

run;