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/*-----
Covance Study ID      : COV-000000106343
Program Name          : t_lb_bc_pp.sas
Purpose               : Table 15.2.4.27.1(Descriptive Statistics of Descriptive Statistics of Blood Chemistry - PP Set;
Author                : cvn_pshe
Date of Creation      : 14MAY2015

Input Data            : ADAM.ADSL, ADAM.ADLB
Output Data           :
Macros Called         :

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Modification History
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Modified by           :
Modification Date      :
Modification Description:
-----*/

proc datasets lib=work kill memtype=data nolist;
run;

%m_printto;

options notes nosource;
options mprint symbolgen;
options replace;

options notes source source2 nofullstimer validvarname=upcase missing=' ';
ods _all_ close;
ods listing;

*=====;
* START OF PROGRAM CODE                               ;
*=====;

%let tflno=T_15_02_04_27_01;

%let TFL_Part=%scan(&_SASPROGRAMFILE,-3,%str(/));

data _null_;
    tmp="&TFL_Part";
    if tmp not in ("dev" "qc") then call symput("TFL_Part", "prod");
    call symput('TFLpath', compress("&_SASPROGRAMFILE",""));
    call symput('TFLprg',reverse(scan(strip(reverse(compress("&_SASPROGRAMFILE","")),1,"/"))));
run;

*****;
* read in data ;
*****;
/*Use ADSL to get N values for column headers*/
%macro trt(period= );

%global N&period.THS;
%global N&period.MCC;
%global N&period.SAA;
proc sql;
select count(distinct usubjid) into: N&period.THS from adam.adsl(where=(trt01an = 4 and pprot&period.fl = "Y"));
select count(distinct usubjid) into: N&period.MCC from adam.adsl(where=(trt01an = 5 and pprot&period.fl = "Y"));
select count(distinct usubjid) into: N&period.SAA from adam.adsl(where=(trt01an = 3 and pprot&period.fl = "Y"));
quit;
%mend;

%trt(period=1);
%trt(period=2);
%trt(period=3);
%trt(period=4);

/*Bring in param raw value data from ADLB*/;

%macro rawval (period=, avisit=, parmcd=,parm=, num=);
data adlb_bc&period.;
    set adam.adlb(where=(anl01fl='Y' and pprot&period.fl='Y' and parmcd in ("&parmcd") and &avisit));
run;

data adlb_bc&period. ;
    set adlb_bc&period. ;
    if ablfl = 'Y' then do; avisit='Baseline'; avisitn=98; end;
    if avisit='Screening' and ablfl = '' then delete;

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else if avisit='Day -2' and ablf1='' then delete;
else if avisit='Day -1' and ablf1='' then delete;
run;

proc sort data=adlb_bc&period. ;
  by trtan trta avisitn avisit;
run;

proc means data=adlb_bc&period. noprint;
  var aval;
  by trtan trta avisitn avisit;
  output out=bpstat&period. n=n1 mean=mean1 std=sd1 median=median1 min=min1 max=max1 q1=q1 q3=q3 lclm =lci1 uclm=uci1;
run;

proc sort data=bpstat&period.;
  by avisitn avisit trta trtan;
run;

data adlb_bfq;
  set adlb_bc&period.;
  where AVALC ? '<' and paramcd in ("CRP") ;
run;

proc freq data=adlb_bfq noprint;
  table trta*trtan*avisitn*avisit*atptn*atpt / out =bfq(drop=percent);
run;

proc sort data=bfq;
  by avisitn avisit trta trtan;
run;

data bpstat&period.;
  merge bpstat&period. bfq;
  by avisitn avisit trta trtan;
  rename count=bfq;
run;

data bpstat&period.;
  set bpstat&period.;
  attrib meansd minmax n missc median quart length=$20.;

  if trtan=3 and not missing(bfq) then bfq1=strip(put(bfq, 8.)) || ' (' || strip(put(bfq*100/n1, 8.1)) || ")";
  if trtan=4 and not missing(bfq) then bfq1=strip(put(bfq, 8.)) || ' (' || strip(put(bfq*100/n1, 8.1)) || ")";
  if trtan=5 and not missing(bfq) then bfq1=strip(put(bfq, 8.)) || ' (' || strip(put(bfq*100/n1, 8.1)) || ")";

  *for <missing, n(%>;
  if trtan=3 then do;
    if &&N&period.SAA.=n1 then missc="";
    else missc=strip(put((&&N&period.SAA.- n1), 8.)) || ' (' || strip(put(((&&N&period.SAA.-n1)*100)/&&N&period.SAA, 8.1)) ||
  ");
    end;
  else if trtan=4 then do;
    if &&N&period.THS.=n1 then missc="";
    else missc=strip(put((&&N&period.THS.- n1), 8.)) || ' (' || strip(put(((&&N&period.THS.-n1)*100)/&&N&period.THS., 8.1)) ||
  ");
    end;
  else if trtan=5 then do;
    if &&N&period.MCC.=n1 then missc="";
    else missc=strip(put((&&N&period.MCC.-n1), 8.)) || ' (' || strip(put(((&&N&period.MCC.-n1)*100)/&&N&period.MCC., 8.1)) ||
  ");
    end;

  if &num =4 | &num =5 | &num =6 | &num =7 then do;
    n = left(compress(put(n1,8.)));
    IF NOT MISSING(MEDIAN1) THEN MEDIAN = LEFT(COMPRESS(PUT(ROUND(MEDIAN1,0.1),10.1)));
    IF NOT MISSING(MEAN1) AND NOT MISSING(SD1) THEN meansd = LEFT(COMPRESS(PUT(ROUND(MEAN1,0.1),10.1)))||" ("||STRIP(PUT(0.01*CEIL(SD
1/0.01),10.2))||")";
    IF NOT MISSING(MIN1) AND NOT MISSING(MAX1) THEN minmax = strip(put(min1, 10.))||", "||strip(put(max1, 10.));
    IF NOT MISSING(Q1) AND NOT MISSING(Q3) THEN QUART = LEFT(COMPRESS(PUT(ROUND(Q1,0.1),10.1)) || ', ' || LEFT(COMPRESS(PUT(ROUND(Q3
,0.1),10.1)));
    IF NOT MISSING(LCI1) AND NOT MISSING(UCI1) THEN ACI = STRIP(PUT(0.1*FLOOR(LCI1/0.1),10.1)) || ', ' || STRIP(PUT(0.1*CEIL(UCI1/0.1
),10.1));
    end;
  else if &num =3 then do;
    n = left(compress(put(n1,8.)));
    IF NOT MISSING(MEDIAN1) THEN MEDIAN = LEFT(COMPRESS(PUT(ROUND(MEDIAN1,0.1),10.1)));
    IF NOT MISSING(MEAN1) AND NOT MISSING(SD1) THEN meansd = LEFT(COMPRESS(PUT(ROUND(MEAN1,0.1),10.1)))||" ("||STRIP(PUT(0.01*CEIL(SD
1/0.01),10.2))||")";

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    IF NOT MISSING(MIN1) AND NOT MISSING(MAX1) THEN minmax = strip(put(min1, 10.))||", "||strip(put(max1, 10.));
    IF NOT MISSING(Q1) AND NOT MISSING(Q3) THEN QUART = LEFT(COMPRESS(PUT(ROUND(Q1,0.1),10.1))) || ', ' || LEFT(COMPRESS(PUT(ROUND(Q3
,0.1),10.1))));
    IF NOT MISSING(LCI1) AND NOT MISSING(UCI1) THEN ACI = STRIP(PUT(0.1*FLOOR(LCI1/0.1),10.1)) || ', ' || STRIP(PUT(0.1*CEIL(UCI1/0.1
),10.1));
    end;
    else if &num =1 | &num =2 then do;
        n = left(compress(put(n1,8.)));
        IF NOT MISSING(MEDIAN1) THEN MEDIAN = LEFT(COMPRESS(PUT(ROUND(MEDIAN1,0.001),10.3)));
        IF NOT MISSING(MEAN1) AND NOT MISSING(SD1) THEN meansd = LEFT(COMPRESS(PUT(ROUND(MEAN1,0.001),10.3)))||" ("||STRIP(PUT(0.0001*CEI
L(SD1/0.0001),10.4))||")";
        IF NOT MISSING(MIN1) AND NOT MISSING(MAX1) THEN minmax = strip(put(min1, 10.2))||", "||strip(put(max1, 10.2));
        IF NOT MISSING(Q1) AND NOT MISSING(Q3) THEN QUART = LEFT(COMPRESS(PUT(ROUND(Q1,0.001),10.3))) || ', ' || LEFT(COMPRESS(PUT(ROUND(
Q3,0.001),10.3))));
        IF NOT MISSING(LCI1) AND NOT MISSING(UCI1) THEN ACI = STRIP(PUT(0.001*FLOOR(LCI1/0.001),10.3)) || ', ' || STRIP(PUT(0.001*CEIL(UC
I1/0.001),10.3));
    end;    drop n1 mean1 sd1 median1 min1 max1 q1 q3 lci1 uci1 _type_ _freq_ blq;
run;

proc sort data=bpstat&period.;
    by trtan trta avisitn avisit;
run;

proc transpose data=bpstat&period. out=t_bpstat&period.;
    by trtan trta avisitn avisit;
    var n missc meansd minmax median quart aci blq1;
run;

data sa&period. ths&period. mcc&period.;
    length stat rawval $50;
    set t_bpstat&period. (drop=trtan rename=(name=stat col1=rawval)) ;
    if trta='SA' then output sa&period.;
    else if trta='THSm2.2' then output ths&period.;
    else if trta='mCC' then output mcc&period.;
run;

proc sort data=sa&period. (rename=(rawval=saval)) ;
    by avisitn avisit stat;
run;
proc sort data=ths&period. (rename=(rawval=thsva));
    by avisitn avisit stat;
run;
proc sort data=mcc&period. (rename=(rawval=mccval));
    by avisitn avisit stat;
run;

data stat_&parm._&period.;
    merge sa&period. (drop=trta ) ths&period. (drop=trta) mcc&period.;
    by avisitn avisit stat;
    if stat='N' then do; stat='n'; sort=1; end;
    else if stat='BLQ1' then do; stat='BLQ, n (%)'; sort=1.2; end;
    else if upcase(stat)='MISSC' then do; stat='Missing, n(%)'; sort=1.1; end;
    else if stat='MEANSD' then do; stat='Mean (SD)'; sort=2; end;
    else if stat='ACI' then do; stat='95% CI'; sort=3; end;
    else if stat='MEDIAN' then do; stat='Median'; sort=4; end;
    else if stat='QUART' then do; stat='Q25, Q75'; sort=5; end;
    else if stat='MINMAX' then do; stat='Min, Max'; sort=6; end;

    if &num =1 | &num =2 | &num =3 then do;
        if stat='Mean (SD)' then delete;
        else if stat='95% CI' then delete;
    end;
    order=&num;
    period=&period;
run;

%mend rawval;

%rawval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6' 'Day
6/Discharge Confinement')), parmcd=CRP,parm=crp, num=1);
%rawval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=CRP,parm=crp, num=1);
%rawval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=CRP,parm=crp, num=1);
%rawval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=CR
P, parm=crp, num=1);

%rawval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Disch
arge Confinement')),parmcd=HOMOCY,parm=homoc, num=2);
%rawval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=HOMOCY,parm=homoc, num=2);

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%rawval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60'))), parmcd=HOMOCY,parm=homoc, num=2);
%rawval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=HOMOCY,parm=homoc, num=2);

%rawval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Discharge Confinement'))),parmcd=GLUC,parm=glc, num=3);
%rawval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30'))), parmcd=GLUC,parm=glc, num=3);
%rawval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60'))), parmcd=GLUC,parm=glc, num=3);
%rawval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=GLUC,parm=glc, num=3);

%rawval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Discharge Confinement'))),parmcd=LDL,parm=ldl, num=4);
%rawval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30'))), parmcd=LDL,parm=ldl, num=4);
%rawval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60'))), parmcd=LDL,parm=ldl, num=4);
%rawval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=LDL,parm=ldl, num=4);

%rawval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Discharge Confinement'))),parmcd=HDL,parm=hdl, num=5);
%rawval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30'))), parmcd=HDL,parm=hdl, num=5);
%rawval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60'))), parmcd=HDL,parm=hdl, num=5);
%rawval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=HDL,parm=hdl, num=5);

%rawval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Discharge Confinement'))),parmcd=TRIG,parm=tg, num=6);
%rawval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30'))), parmcd=TRIG,parm=tg, num=6);
%rawval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60'))), parmcd=TRIG,parm=tg, num=6);
%rawval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=TRIG,parm=tg, num=6);

%rawval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Discharge Confinement'))),parmcd=CHOL,parm=tc, num=7);
%rawval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30'))), parmcd=CHOL,parm=tc, num=7);
%rawval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60'))), parmcd=CHOL,parm=tc, num=7);
%rawval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=CHOL,parm=tc, num=7);

/*Bring in parm raw value data to log scale from ADLB*/
%macro rawval_1 (period=, avisit=, parmcd=,parm=, num=);
data _adlb_bc&period. ;
    set adam.adlb(where=(anl01fl='Y' and pprot&period.fl='Y' and paramcd in ("%parmcd") and &avisit));
    if nmiss(aval)=0 then aval=log(aval);
run;

data _adlb_bc&period. ;
    set _adlb_bc&period. ;
    if abfl='Y' then do; avisit='Baseline'; avisitn=98; end;
    if avisit='Screening' and abfl='' then delete;
    else if avisit='Day -2' and abfl='' then delete;
    else if avisit='Day -1' and abfl='' then delete;
run;

proc sort data=_adlb_bc&period. ;
    by trtan trta avisitn avisit;
run;

proc means data=_adlb_bc&period. noprint;
    var aval;
    by trtan trta avisitn avisit;
    output out=_l_bpstat&period. mean=mean1 std=sd1 lclm=lci1 uclm=uci1 nmiss=miss;
run;

data _l_bpstat&period. ;
    set _l_bpstat&period. ;
    length gmean gcv $30 glci guci 8;
    gmean1=exp(mean1);
    if miss=0 and &num =3 then do;
        gmean=left(compress(put(gmean1,10.1)));
        if not missing(sd1) then gcv=strip(put(0.01*ceil((sqrt(exp(sd1*sd1))-1)*100)/0.01),10.2));
        if not missing(lci1) then glci=exp(lci1);
        if not missing(uci1) then guci=exp(uci1);
    end;
    if miss=0 and (&num =1 |&num =2) then do;
        gmean=left(compress(put(gmean1,10.3)));
        if not missing(sd1) then gcv=strip(put(0.0001*ceil((sqrt(exp(sd1*sd1))-1)*100)/0.0001),10.4));
    end;

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    if not missing(lci1) then glci=exp(lci1);
    if not missing(uci1) then guci=exp(uci1);
end;
run;

data l_bpstat&period.;
    set l_bpstat&period.;
    attrib meansd aci length=$20.;
    if miss=0 and &num =3 then do;
        if not missing(gcv) then meansd=left(trim(gmean)) || ' (' || left(trim(gcv))||')';
        else gmeancv=left(trim(gmean));
        if not missing(glci) and not missing(guci) then aci = strip(strip(put(0.1*floor(glci/0.1),10.1)) || ', ' || strip(put(0.1*ceil(gu
ci/0.1),10.1)));
    end;
    if miss=0 and (&num =1 |&num =2) then do;
        if not missing(gcv) then meansd=left(trim(gmean)) || ' (' || left(trim(gcv))||')';
        else gmeancv=left(trim(gmean));
        if not missing(glci) and not missing(guci) then aci = strip(strip(put(0.001*floor(glci/0.001),10.3)) || ', ' || strip(put(0.001*c
eil(guci/0.001),10.3)));
    end;
    drop mean1 sd1 lci1 uci1 _type_ _freq_;
run;

proc sort data=l_bpstat&period. ;
    by trtan trta avisitn avisit;
run;

proc transpose data=l_bpstat&period. out=l_t_bpstat&period. ;
    by trtan trta avisitn avisit;
    var meansd aci;
run;

data l_sa&period. l_ths&period. l_mcc&period.;
    length stat rawval $50;
    set l_t_bpstat&period. (drop=trtan rename=( _name_=stat col1=rawval)) ;
    if trta='SA' then output l_sa&period.;
    else if trta='THSm2.2' then output l_ths&period.;
    else if trta='mCC' then output l_mcc&period.;
run;

proc sort data=l_sa&period. (rename=(rawval=saval)) ;
    by avisitn avisit stat;
run;
proc sort data=l_ths&period. (rename=(rawval=thsva));
    by avisitn avisit stat;
run;
proc sort data=l_mcc&period. (rename=(rawval=mccval));
    by avisitn avisit stat;
run;

data stat_&parm._&period.;
    merge l_sa&period. (drop=trta ) l_ths&period. (drop=trta) l_mcc&period.;
    by avisitn avisit stat;
    if stat='MEANSD' then do; stat='Geometric Mean (CV%)'; sort=2; end;
    else if stat='ACI' then do; stat='95% CI of Geometric Mean'; sort=3; end;
    order=&num;
    period=&period;
run;

%mend rawval_1;

%rawval_1 (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6' 'D
ay 6/Discharge Confinement')), parmcd=CRP,parm=crp_1, num=1);
%rawval_1 (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=CRP,parm=crp_1, num=1);
%rawval_1 (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=CRP,parm=crp_1, num=1);
%rawval_1 (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=
CRP, parm=crp_1, num=1);

%rawval_1 (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Dis
charge Confinement')),parmcd=HOMOCY,parm=homoc_1, num=2);
%rawval_1 (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=HOMOCY,parm=homoc_1, num=2);
%rawval_1 (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=HOMOCY,parm=homoc_1, num=2);
%rawval_1 (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd
=HOMOCY,parm=homoc_1, num=2);

%rawval_1 (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Dis
charge Confinement')),parmcd=GLUC,parm=glc_1, num=3);
%rawval_1 (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=GLUC,parm=glc_1, num=3);

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%rawval_1 (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=GLUC,parm=glc_1, num=3);
%rawval_1 (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd
=GLUC,parm=glc_1, num=3);

data stat_lb ;
    set stat_crp_2 stat_crp_3 stat_crp_4 stat_crp_1_2 stat_crp_1_3 stat_crp_1_4 stat_homoc_2 stat_homoc_3 stat_homoc_4
        stat_homoc_1_2 stat_homoc_1_3 stat_homoc_1_4 stat_glc_1 stat_glc_2 stat_glc_3 stat_glc_4 stat_glc_1_1 stat_glc_1_2
        stat_glc_1_3 stat_glc_1_4 stat_ldl_2 stat_ldl_3 stat_ldl_4 stat_hdl_2 stat_hdl_3 stat_hdl_4 stat_tg_1 stat_tg_2 stat_tg_3 sta
t_tg_4
        stat_tc_1 stat_tc_2 stat_tc_3 stat_tc_4;
run;

proc sort data=stat_lb;
    by period order avisitn avisit sort;
run;

/*Bring in sbp and dbp percent change data from ADVS*/
%macro pchgval (period=, avisit=, parmcd=,parm=, num=);
data adlb_bc&period.;
    set adam.adlb(where=(anl01fl='Y' and pprot&period.fl='Y' and parmcd in ("&parmcd") and &avisit));
    if (parmcd = 'CRP' or parmcd = 'HOMOCY' or parmcd = 'GLUC') and mmiss(aval)=0 then aval=log(aval);
run;

data adlb_bc&period. ;
    set adlb_bc&period. ;
    if ablf1 ='Y' then do; avisit='Baseline'; avisitn=98; end;
    if avisit='Screening' and ablf1 =' ' then delete;
    else if avisit='Day -2' and ablf1 =' ' then delete;
    else if avisit='Day -1' and ablf1 =' ' then delete;
run;

proc sort  data=adlb_bc&period. ;
    by trtan trta avisitn avisit;
run;

proc means data=adlb_bc&period.  noprint;
    var pchg;
    by trtan trta avisitn avisit;
    output out=pbpstat&period. n=n1 mean=mean1 std=sd1 median=median1 min=min1 max=max1 q1=q1 q3=q3 lclm =lci1 uclm=uci1;
run;

data pbpstat&period.;
    set pbpstat&period.;
    attrib meansd minmax n missc median quart length=$20.;

    *for <missing, n(%>;
    if trtan=3 then do;
        if &&N&period.SAA.=n1 then missc="";
        else missc=strip(put((&&N&period.SAA.- n1), 8.)) || ' (' || strip(put(((&&N&period.SAA.-n1)*100)/&&N&period.SAA, 8.1)) ||
")";
        end;
    else if trtan=4 then do;
        if &&N&period.THS.=n1 then missc="";
        else missc=strip(put((&&N&period.THS.- n1), 8.)) || ' (' || strip(put(((&&N&period.THS.-n1)*100)/&&N&period.THS., 8.1)) ||
")";
        end;
    else if trtan=5 then do;
        if &&N&period.MCC.=n1 then missc="";
        else missc=strip(put((&&N&period.MCC.-n1), 8.)) || ' (' || strip(put(((&&N&period.MCC.-n1)*100)/&&N&period.MCC., 8.1)) ||
")";
        end;

if &num =4 | &num =5 |&num =6 | &num =7 then do;
    n = left(compress(put(n1,8.)));
    IF NOT MISSING(MEDIAN1) THEN MEDIAN = LEFT(COMPRESS(PUT(ROUND(MEDIAN1,0.1),10.1)));
    IF NOT MISSING(MEAN1) AND NOT MISSING(SD1) THEN meansd = LEFT(COMPRESS(PUT(ROUND(MEAN1,0.1),10.1)))||" ("||STRIP(PUT(0.01*CEIL(SD
1/0.01),10.2))||")";
    IF NOT MISSING(MIN1) AND NOT MISSING(MAX1) THEN minmax = strip(put(min1, 10.))||", "||strip(put(max1, 10.));
    IF NOT MISSING(Q1) AND NOT MISSING(Q3) THEN QUART = LEFT(COMPRESS(PUT(ROUND(Q1,0.1),10.1))) || ', ' || LEFT(COMPRESS(PUT(ROUND(Q3
,0.1),10.1)));
    IF NOT MISSING(LCI1) AND NOT MISSING(UCI1) THEN ACI = STRIP(PUT(0.1*FLOOR(LCI1/0.1),10.1)) || ', ' || STRIP(PUT(0.1*CEIL(UCI1/0.1
),10.1));
    end;
    else if &num =3 then do;
        n = left(compress(put(n1,8.)));
        IF NOT MISSING(MEDIAN1) THEN MEDIAN = LEFT(COMPRESS(PUT(ROUND(MEDIAN1,0.1),10.1)));
        IF NOT MISSING(MEAN1) AND NOT MISSING(SD1) THEN meansd = LEFT(COMPRESS(PUT(ROUND(MEAN1,0.1),10.1)))||" ("||STRIP(PUT(0.01*CEIL(SD
1/0.01),10.2))||")";

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    IF NOT MISSING(MIN1) AND NOT MISSING(MAX1) THEN minmax = strip(put(min1, 10.))||", "||strip(put(max1, 10.));
    IF NOT MISSING(Q1) AND NOT MISSING(Q3) THEN QUART = LEFT(COMPRESS(PUT(ROUND(Q1,0.1),10.1))) || ', ' || LEFT(COMPRESS(PUT(ROUND(Q3
,0.1),10.1))));
    IF NOT MISSING(LCI1) AND NOT MISSING(UCI1) THEN ACI = STRIP(PUT(0.1*FLOOR(LCI1/0.1),10.1)) || ', ' || STRIP(PUT(0.1*CEIL(UCI1/0.1
),10.1));
    end;
    else if &num =1 | &num =2 then do;
        n = left(compress(put(n1,8.)));
        IF NOT MISSING(MEDIAN1) THEN MEDIAN = LEFT(COMPRESS(PUT(ROUND(MEDIAN1,0.001),10.3)));
        IF NOT MISSING(MEAN1) AND NOT MISSING(SD1) THEN meansd = LEFT(COMPRESS(PUT(ROUND(MEAN1,0.001),10.3)))||" ("||STRIP(PUT(0.0001*CEI
L(SD1/0.0001),10.4))||")";
        IF NOT MISSING(MIN1) AND NOT MISSING(MAX1) THEN minmax = strip(put(min1, 10.2))||", "||strip(put(max1, 10.2));
        IF NOT MISSING(Q1) AND NOT MISSING(Q3) THEN QUART = LEFT(COMPRESS(PUT(ROUND(Q1,0.001),10.3))) || ', ' || LEFT(COMPRESS(PUT(ROUND(
Q3,0.001),10.3))));
        IF NOT MISSING(LCI1) AND NOT MISSING(UCI1) THEN ACI = STRIP(PUT(0.001*FLOOR(LCI1/0.001),10.3)) || ', ' || STRIP(PUT(0.001*CEIL(UC
I1/0.001),10.3));
    end;
    drop n1 mean1 sd1 median1 min1 max1 q1 q3 lci1 uci1 _type_ _freq_;
run;

proc sort data=pbpstat&period.;
    by trtan trta avisitn avisit;
run;

proc transpose data=pbpstat&period. out=t_pbpstat&period.;
    by trtan trta avisitn avisit;
    var n missc meansd minmax median quart aci;
run;

data psa&period. pths&period. pmcc&period.;
    length stat pchg $50;
    set t_pbpstat&period. (drop=trtan rename=(name=stat col1=pchg)) ;
    if trta='SA' then output psa&period.;
    else if trta='THSm2.2' then output pths&period.;
    else if trta='mCC' then output pmcc&period.;
run;

proc sort data=psa&period. (rename=(pchg=sapchg));
    by avisitn avisit stat;
run;
proc sort data=pths&period. (rename=(pchg=thspchg));
    by avisitn avisit stat;
run;
proc sort data=pmcc&period. (rename=(pchg=mccpchg));
    by avisitn avisit stat;
run;

data stat_&parm._&period.;
    merge psa&period. (drop=trta) pths&period. (drop=trta) pmcc&period.;
    by avisitn avisit stat;
    if stat='N' then do; stat='n'; sort=1; end;
    else if upcase(stat)='MISSC' then do; stat='Missing, n(%)'; sort=1.1; end;
    else if stat='MEANSD' then do; stat='Mean (SD)'; sort=2; end;
    else if stat='ACI' then do; stat='95% CI'; sort=3; end;
    else if stat='MEDIAN' then do; stat='Median'; sort=4; end;
    else if stat='QUART' then do; stat='Q25, Q75'; sort=5; end;
    else if stat='MINMAX' then do; stat='Min, Max'; sort=6; end;

    if &num =1 | &num =2 | &num =3 then do;
        if stat='Mean (SD)' then do; stat='Geometric Mean (CV%)'; sapchg=''; thspchg=''; mccpchg=''; end;
        else if stat='95% CI' then do; stat='95% CI of Geometric Mean'; sapchg=''; thspchg=''; mccpchg=''; end;
    end;
    order=&num;
    period=&period;
run;
%mend;

%pchgval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6' 'Da
y 6/Discharge Confinement')), parmcd=CRP,parm=chgcrp, num=1);
%pchgval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=CRP,parm=chgcrp, num=1);
%pchgval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=CRP,parm=chgcrp, num=1);
%pchgval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=C
RP, parm=chgcrp, num=1);

%pchgval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Disc
harge Confinement')),parmcd=HOMOCY,parm=chghomoc, num=2);
%pchgval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=HOMOCY,parm=chghomoc, num=2);
%pchgval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=HOMOCY,parm=chghomoc, num=2);
%pchgval(period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=H

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OMOCY,parm=chghomoc, num=2);

%pchgval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Disc
harge Confinement'))),parmcd=GLUC,parm=chggglc, num=3);
%pchgval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=GLUC,parm=chggglc, num=3);
%pchgval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=GLUC,parm=chggglc, num=3);
%pchgval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=
GLUC,parm=chggglc, num=3);

%pchgval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Disc
harge Confinement'))),parmcd=LDL,parm=chglldl, num=4);
%pchgval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=LDL,parm=chglldl, num=4);
%pchgval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=LDL,parm=chglldl, num=4);
%pchgval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=
LDL,parm=chglldl, num=4);

%pchgval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Disc
harge Confinement'))),parmcd=HDL,parm=chghdl, num=5);
%pchgval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=HDL,parm=chghdl, num=5);
%pchgval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=HDL,parm=chghdl, num=5);
%pchgval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=
HDL,parm=chghdl, num=5);

%pchgval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Disc
harge Confinement'))),parmcd=TRIG,parm=chgtg, num=6);
%pchgval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=TRIG,parm=chgtg, num=6);
%pchgval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=TRIG,parm=chgtg, num=6);
%pchgval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=
TRIG,parm=chgtg, num=6);

%pchgval (period=1, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 1' 'Day 2' 'Day 3' 'Day 4' 'Day 5' 'Day 6/Disc
harge Confinement'))),parmcd=CHOL,parm=chgtc, num=7);
%pchgval (period=2, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 30')), parmcd=CHOL,parm=chgtc, num=7);
%pchgval (period=3, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 60')), parmcd=CHOL,parm=chgtc, num=7);
%pchgval (period=4, avisit=%str(avisit in ('Screening' 'Day -2' 'Day -1' 'Day 0' 'Day 90' 'Day 91/Discharge Ambulatory' )), parmcd=
CHOL,parm=chgtc, num=7);

data stat_lbpchg;
    set stat_chgcrp_2 stat_chgcrp_3 stat_chgcrp_4 stat_chghomoc_2 stat_chghomoc_3 stat_chghomoc_4 stat_chggglc_1 stat_chggglc_2
        stat_chggglc_3 stat_chggglc_4 stat_chglldl_2 stat_chglldl_3 stat_chglldl_4 stat_chghdl_2 stat_chghdl_3 stat_chghdl_4 stat_chgtg_1
        stat_chgtg_2 stat_chgtg_3 stat_chgtg_4 stat_chgtc_1 stat_chgtc_2 stat_chgtc_3 stat_chgtc_4;
run;

proc sort data=stat_lbpchg;
    by period order avisitn avisit sort stat;
run;

proc sort data=stat_lb ;
    by period order avisitn avisit sort stat;
run;

data stat;
    merge stat_lb (drop=trta) stat_lbpchg;
    by period order avisitn avisit sort stat;
    length param $100 ths mcc sa $8;

    if period =1 then do; ths="&&N1THS"; mcc="&&N1MCC"; sa="&&N1SAA"; end;
    if period =2 then do; ths="&&N2THS"; mcc="&&N2MCC"; sa="&&N2SAA"; end;
    if period =3 then do; ths="&&N3THS"; mcc="&&N3MCC"; sa="&&N3SAA"; end;
    if period =4 then do; ths="&&N4THS"; mcc="&&N4MCC"; sa="&&N4SAA"; end;

    if sapchg='0' then sapchg='';
    if thspchg='0' then thspchg='';
    if mccpchg='0' then mccpchg='';

    if order=1 then param='C Reactive Protein (mg/L)';
    else if order=2 then param='Homocysteine (umol/L)';
    else if order=3 then param='Glucose (mg/dL)';
    else if order=4 then param='LDL Cholesterol (mg/dL)';
    else if order=5 then param='HDL Cholesterol (mg/dL)';
    else if order=6 then param='Triglycerides (mg/dL)';
    else if order=7 then param='Cholesterol (mg/dL)';
    if sort=. then delete;
    if stat='BLOQ, n (%)' and saval='' and mccval='' and thsval='' then delete;

    if stat='BLOQ, n (%)' then do;
        if saval='' then saval='0';
        if mccval='' then mccval='0';

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        if thsval='' then thsval='0';
    end;

    if stat='Missing, n(%)' and avisit='Baseline' then do;
        if saval='' then saval='0';
        if mccval='' then mccval='0';
        if thsval='' then thsval='0';
    end;
else if stat='Missing, n(%)' and avisit ^= 'Baseline' then do;
    if saval='' then saval='0';
    if mccval='' then mccval='0';
    if thsval='' then thsval='0';
    if sapchg='' then sapchg='0';
    if mccpchg='' then mccpchg='0';
    if thspchg='' then thspchg='0';
end;
if stat='Missing, n(%)' and avisit='Baseline' then do;
    if saval='0' and mccval='0' and thsval='0' then delete;
end;
else if stat='Missing, n(%)' and avisit ^= 'Baseline' then do;
    if saval='0' and mccval='0' and thsval='0' and sapchg='0' and mccpchg='0' and thspchg='0' then delete;
end;
run;

* output dataset*;
proc sql noprint;
create table tflds.&tfldno as
select period, param as parameter, avisit as timepoint, stat, thsval, thspchg, mccval, mccpchg, saval, sapchg
from stat
order by period, order, param, avisitn, sort;
quit;

proc sort data=stat;
    by period order avisitn sort;
run;

data paging;
    set stat;
    by period order avisitn sort;
    if first.avisitn then ln=1;
    else ln+1;
    if ln=1 then page+1;
    call symput("page",compress(put(page,best.)));
run;

data paging;
    set paging;
    by page;
    if first.page then param=param;
    else param='';
run;
options number nodate orientation=landscape papersize=Letter /*papersize=&p_pgsize*/ missing=' ';
ods escapechar='$';
%let linetop = \brdrt\brdrs\brdrw30; * needs to be 1.5pt so calculated in twips (1/20 pt) ;
%let linebot = \brdrb\brdrs\brdrw30;
%macro outrtf(blankn=, halfblnk=);

%if &halfblnk=N %then %let halfblnk=;
%else %if &halfblnk=Y %then %let halfblnk=\-;

ods path stdlib.t106343 (read) ;
ods results off;
ods rtf toc_data file="/cvn/projects/prj/data/000000106343/TFL/&TFL_Part./Tables/&tfldno..rtf" style=t106343 startpage=yes headery=14
40 footery=1440 ;
ods noproctitle;
%do i=1 %to &page;

title ;
footnote;
ods proclabel = ' ';

data comp;
    set paging end=eof;
    where page=&i;

/* Amend title as needed */
_firtitl="Table 15.2.4.27.1 Descriptive Statistics of hs-CRP (mg/L), homocysteine (umol/L), blood glucose (mg/dL),
LDL (mg/dL), HDL (mg/dL), TG (mg/dL), and TC (mg/dL) - PP Set";

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_upcas=(length("Path: &TFLpath.")-length(compress("Path:&TFLpath.",'ABCDEFGHIJKLMNOPQRSTUVWXYZ')))/2;
len=&blankn.-length(" (Page &i of &page)");
if eof then do;
call symput('_FSRTITL', trim(left(_firtitl)));
call symput('_blankn', compress(put(len,best.)));
call symput('perid', strip(put(period, best8.)));
call symput('N3', strip(sa));
call symput('N4', strip(th));
call symput('N5', strip(mcc));
end;

drop _firtitl _upcas len;

run;

ods proclabel = ' ';
ods listing close;

* most set up in template others below;
* title arial 12pt bold with 12pt paragraph space below;
* all headers to be arial 11pt bold;
* data arial 10pt;
* headers to be central, text values left aligned and numeric centered around decimal point;
proc report data = comp headline headskip nowd split = '#' %if &i=1 %then %do; contents=' ' %end; %else %do; contents='' %end;;
column period order page avisitn param avisit stat
("THSm2.2#(N=&N4)&linebot" thsval thspchg) ("mCC#(N=&N5)&linebot" mccval mcpchg) ("SA#(N=&N3)&linebot" saval sapchg);

define period / order order = internal noprint;
define order / order order = internal noprint;
define page / order order = internal noprint;
define avisitn / order order=internal noprint;

define param / "Parameter (units)" style={just=left cellwidth=2.9cm} style(header)={just=left} ;
define avisit / group "Timepoint" style={just=left cellwidth=3.0cm} style(header)={just=left} ;
define stat / display "Statistic" style={just=left cellwidth=3cm} style(header)={just=left} ;
define thsval / display "Raw value" style={just=c cellwidth=2.2cm} ;
define thspchg / display "% Change(*)" style={just=c cellwidth=2.2cm} ;
define mccval / display "Raw value" style={just=c cellwidth=2.2cm} ;
define mcpchg / display "% Change(*)" style={just=c cellwidth=2.2cm} ;
define saval / display "Raw value" style={just=c cellwidth=2.2cm} ;
define sapchg / display "% Change(*)" style={just=c cellwidth=2.2cm} ;

break after page / page;

compute after avisitn;
line " ";
endcomp;

compute before page / style={protectspecialchars=off};
line "&linetop";
endcomp;

compute before _page_ / style={just=left protectspecialchars=off};
line "\b\fs24\sa24&_FSRTITL." ; * \b = bold, \fs24 is font size 12pt, \sa24 is space after 12pt;
line " ";
line "Product Use Time Period: Period &perid.";
line "&linebot";
endcomp;

compute after _page_ / style={just=left protectspecialchars=off pretext="&linetop."};
line 'Note: mCC = Menthol conventional cigarettes; SA = Smoking abstinence; THSm2.2 = Tobacco Heating System 2.2 Menthol.';
line "Note: 'Missing' percentages are based on the number of subjects indicated in the column header (N), while 'BLOQ' percentage
s are based on the number of subjects being summarized (n).";
line 'Note: * % change from baseline, where baseline is defined as the last assessment prior to first randomized product use in m
CC / THS 2.2 Menthol arms or the';
line 'last assessment prior to 10 AM on Day 1 in the SA arm.';
line ' ';
line "Appendix 15.3.1.2, 15.3.1.5, 15.3.1.7, 15.3.1.11, 15.3.6.10, and 15.3.6.11";
line "Study ID:ZRHM-REXA-08-US Program:&TFLprg Status: &status" &_blankn.*"\-\" "&sysdate" &_blankn.*"\-\" "(Page &i of &pag
e)";
endcomp;

run;

%end;

ods rtf close;
ods results on;
ods path sasHELP.tmplmst (read);

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```
%mend ;

%outtrtf(blankn=36, halfblnk=N);

ods listing close;

proc printto ; run;
%m_logchk;
*=====;
*  END OF PROGRAM CODE                      ;
*=====;
```