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%_mprintto;
options notes nosource;
proc datasets lib=work nolist memtype=data kill; quit;
%put NOTE:
=====;
%put NOTE: Covance Study Number : 000000106326;
%put NOTE: Client Protocol ID   : ZRHM-PK-05-JP;
%put NOTE: Program Name        : f_pkparam2.sas;
%put NOTE: Purpose              : Figure of secondary parameters of
nicotine group-2;
%put NOTE: ;
%put NOTE: Input Data           : ADAM.ADPP;
%put NOTE: Output               : f_15_1_2_5(pkparam);
%put NOTE: Macros Called        : _MPRINTTO;
%put NOTE: ;
%put NOTE: Programmed by        : cvn_jhardman;
%put NOTE: Creation Date        : 2014-08-12;
%put NOTE: SAS Version          : 9.3;
%put NOTE: ;
%put NOTE: == Latest Run
=====;
%put NOTE: Run by                : &sysuserid;
%put NOTE: Date/Time             :
%sysfunc(putn(%sysfunc(date()),e8601da.))T%sysfunc(putn(%sysfunc(time()),
e86011z.));
%put NOTE: ;
%put NOTE: == Modification History
=====;
%put NOTE: Date      Initials   No. Reason;
%put NOTE: 15Aug2014  JMH        1) Amended where statement;
%put NOTE: 15Aug2014  JMH        2) Amended axis limits;
%put NOTE: 22Sept14   CK         3) output excel file;
%put NOTE: 22Sept14   CK         4) move title and footnoe outside
graph;
%put NOTE: ;
%put NOTE:
=====;
options notes source source2 nofullstimer validvarname=upcase missing='
';
ods _all_ close;
ods listing;

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

/* Standard - just change the number to match the listing you're working
on. Also change the letters in the*/
/* bracket, eg ccb = current cigarette brands. Make sure to do this at
the top of the code too. */
%let tflno=F_15_01_02_05(pkparam);

/* Standard - leave this */

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

/* Standard - leave this */
data _null_;
    tmp="%TFL_Part";
    if tmp not in ("dev" "qc") then call symput("TFL_Part", "prod");
    call symput('TFLpath', compress("&_SASPROGRAMFILE",""));
run;

/* Example of basic GTL syntax */
ods _all_ close;
%let temp=/cvn/projects/prj/development/000000106326/dev/macro/;

/* Ensure ODS listing, html etc is turned off to prevent */
/* temporary or junk image files being produced */
options notes source source2 nofullstimer validvarname=upcase
nonumber nodate orientation=portrait papersize=&p_pgsz missing=' ';
ods graphics on; /* As we are effectively using ODS graphics we need to
ensure that it is turned on */
ods graphics / height=18cm width=18cm noborder noscale; /* Removes border
around the image */
ods path reset;
/* please include styles template */
%include "&temp.figtmpplt.sas";

ods rtf toc_data
file="/cvn/projects/prj/data/000000106326/TFL/&TFL_Part/&tflno..rtf"
style=t106326_g startpage=yes headery=1440 footery=1440 ;
ods escapechar='|';
ods exclude all;

proc sort data = adam.adpp(where=(PPSTAT NE 'NOT DONE' AND PPROTFL='Y'
AND analgr1 = "Group-2" and paramn in (1 2 3 5 6 8 4 7 9) and
anl01fl='Y')) out = adpp; /* 1) JMH 15Aug2014 */
    by paramn trtan;
run;

data adpp2;
    set adpp;
        if trtan=4 then trtan=1;
        else if trtan=7 then trtan=2; /*Because PK-05 is a menthol
study*/

        if paramcd='TMAX' then param=tranwrd(param,'Tmax','tmax');
        if paramcd='TLST' then param=tranwrd(param,'Tlast','tlast');
        if paramcd='LAMZ' then param=tranwrd(param,'/h','1/h');
run;

data adpp3;

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        set adpp2;
run;

data gmean;
    set adpp3(where=(index(param,'tmax')=0 and index(param,'tlast')=0
and index(param,'t1/2 (h)')=0));
    statval=aval;
    if statval>0 then ln_statval=log(statval);
    else if statval=0 then flag=1;
run;

proc sort data=gmean;
    by paramn avalu trtan trta flag;
run;

proc means data=gmean alpha=0.05 noprint;
    output out=gmean1b mean=mean std=std1 lclm=lcil uclm=ucil nmiss=miss;
    var ln_statval;
    by paramn param avalu trtan trta;
run;

proc means data=gmean(where=(flag=1)) noprint;
    output out=gmean1a(keep=param paramn avalu trtan trta flag) mean=mean;
    var ln_statval;
    by paramn param avalu trtan trta flag;
run;

data gmean1c;
    merge gmean1a gmean1b;
    by paramn param avalu trtan trta;
run;

data gmean2;
    set gmean1C;
    if flag ne 1 then DO;
        gmean=exp(mean);
        lclm=exp(lcil);
        uclm=exp(ucil);
    end;
    keep paramn param trtan trta gmean lclm uclm;
run;

proc sort data=adpp3;
    by paramn param avalu trtan trta;
run;

proc means data=adpp3(where=(index(param,'tmax') or index(param,'tlast')
or index(param,'t1/2 (h)')) noprint;
    output out=adpp2a median=median;
    var aval;
    by paramn param avalu trtan trta;
run;

data adpp2b;

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    set adpp2a;

    gmean=median;

    keep param paramn trta trtan gmean;
run;

data adpp2c;
    set adpp2b gmean2;
run;

proc sort data=adpp2c;
    by paramn param trtan;
run;

proc sort data=adpp3;
    by paramn param trtan;
run;

title;
footnote;

data pp_gmean; /* paging is derived normally as with RTF type TFL */

    set adpp2c adpp3;
    by paramn param trtan;
    if not missing(gmean) then do;
        geomean=round(gmean,0.01);
    end;

run;

data pp_gmean2;
    set pp_gmean;
    format trtan 8.1;

    if geomean ne . then do;
        if trta='THS 2.2 Menthol' then trtan=trtan-0.1;
        else if trta='NRT gum' then trtan=trtan+0.1;
    end;

        if paramn=6 then paramn1=7;
        else if paramn=7 then paramn1=8;
        else if paramn=8 then paramn1=9;
        else if paramn=9 then paramn1=6;

        if not missing(paramn1) then paramn=paramn1;
        drop paramn1;
run;

proc sort data=pp_gmean2;
    by paramn param trtan;
run;

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data paging;
    set pp_gmean2 end=last;
    by paramn param trtan;
    if first.paramn then ln+1;

        if ln in (1 2) then page = 1;
    else if ln in(3 4) then page = 2;
        else if ln in(5 6) then page = 3;
    else if ln in (7 8) then page=4;
    else if ln in (9) then page=5;

    if param='Cmax (ng/mL)' then plotnum=1;
    else if param='AUC(0-last) (h*ng/mL)' then plotnum=2;
    else if param='AUC(0-inf) (h*ng/mL)' then plotnum=1;
    else if param='%AUCextrap (%)' then plotnum=2;
    else if param="AUC(0-t') (h*ng/mL)" then plotnum=1;
    else if param='lambdaz (1/h)' then plotnum=2;
        else if param='tmax (min)' then plotnum=1;
    else if param='tlast (h)' then plotnum=2;
        else if param='t1/2 (h)' then plotnum=1;
        else put "WA" "RNING: Assign plotnum for : " param= ;

    if last then call symput("maxpage", compress(put(page,best.)));
    if last then call symput("plot",compress(put(plotnum,best.)));

run;

/* 2) start JMH 15Aug2014 */
PROC SORT DATA=PAGING;
    BY PARAMN PARAM;
RUN;

PROC MEANS DATA=PAGING(WHERE=(TRTAN IN(1.0 2.0))) NOPRINT;
    OUTPUT OUT=AXISLIM MAX=MAX1;
    VAR AVAL;
    BY PARAMN PARAM;
RUN;

DATA AXISLIM2;
    SET AXISLIM;
    IF PARAMN=1 THEN DO;
        MAX2=50;
        INC=10;
    END;
    ELSE IF PARAMN=2 THEN DO;
        MAX2=90;
        INC=15;
    END;
    ELSE IF PARAMN=3 THEN DO;
        MAX2=100;
        INC=20;
    END;
END;

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ELSE IF PARAMN=4 THEN DO;
    MAX2=25;
    INC=5;
END;
ELSE IF PARAMN=5 THEN DO;
    MAX2=12;
    INC=2;
END;
ELSE IF PARAMN=6 THEN DO;
    MAX2=0.6;
    INC=0.1;
END;
ELSE IF PARAMN=7 THEN DO;
    MAX2=60;
    INC=10;
END;
ELSE IF PARAMN=8 THEN DO;
    MAX2=24;
    INC=4;
END;
ELSE IF PARAMN=9 THEN DO;
    MAX2=12;
    INC=2;
END;
RUN;

DATA PAGINGX;
    MERGE PAGING AXISLIM2;
    BY PARAMN PARAM;

    IF AVAL GT MAX2 THEN PUT "WA" "RNING MAX2 needs increasing for: "
paramn= param= aval= ;
RUN;
/* 2) end JMH 15Aug2014 */

proc sort data=/*paging*/PAGINGX ; /* 2) JMH 15Aug2014 */
    by page ln plotnum;
run;

proc format;
    value xaxis
                                0=" "
                                0.5=" "
                                1="THS 2.2 Menthol"
                                1.5=" "
                                2="NRT gum";

run;

/* 3) CK 22SEP2014 - START */
PROC SQL;
CREATE TABLE XLS AS
SELECT PARAM, TRTA, USUBJID, AVAL, GEOMEAN, LCLM, UCLM
FROM PAGING
ORDER BY PARAM, TRTA, USUBJID;

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QUIT;

PROC EXPORT
DATA=XLS
DBMS=XLSX
OUTFILE="/cvn/projects/prj/data/000000106326/TFL/&TFL_Part./&tflno..xlsx"
REPLACE;
SHEET=Sheet1;
/* 3) CK 22SEP2014 - END */

%macro graph();

%do i=1 %to &maxpage; /* paging can either be done through a do loop or
multiple macro calls */

data paging&i.;
  set pagingX; /* 2) JMH 15Aug2014 */
  by page ln plotnum;
  where page=&i.;
    if plotnum=1 then DO;
      gmean1=geomean;
      aval1=aval;
      lci1=lclm;
      uci1=uclm;
    end;
    else if plotnum=2 then do;
      gmean2=geomean;
      aval2=aval;
      lci2=lclm;
      uci2=uclm;
    end;
run;

proc sort data=paging&i.;
  by usubjid paramn param trtan trta;
run;

  data plot&i.;
    set paging&i.;
  run;

proc sort data=plot&i. out=paramlbl&i.(keep=param analgrln analgrl paramn
param plotnum MAX2 INC) nodupkey; /* 2) JMH 15Aug2014 */
  by paramn param;
run;

%let twoplots=0;

data _null_;
  set paramlbl&i.;
  if plotnum eq 2 then call symput('twoplots',1);

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```

        call symput("param1b1", trim(left((param))));
        call symput("analgr1n", trim(left((analgr1n))));
        call symput("analgr1", trim(left((analgr1))));
        call symput("paramn", paramn);
        call symput("plotnum", trim(left((plotnum))));
        call symput('param'||compress(plotnum),trim(left(param)));

/* 2) start JMH 15Aug2014 */
        CALL SYMPUT("MAX"||compress(plotnum),MAX2);
        CALL SYMPUT("INC"||compress(plotnum),INC);
/* 2) END JMH 15Aug2014 */
run;

proc template;
define statgraph splot /store = work.templat;

        begingraph / border=false ;
                /* 4) CK 22Sept14 */
/*      entrytitle halign=left "Figure 15.1.2.5 Secondary Pharmacokinetic
Parameters of Nicotine - Group -2 PK Population";
                entrytitle halign=left " ";

                entryfootnote halign=left " ";

%if &i=4 OR &I=5 %then %do;
        entryfootnote halign=left {unicode '25a0'x} " Median, O Original
values" ;
%end;
%else %do;
        entryfootnote halign=left {unicode '25a0'x} " Geometric Means and
95%CI, O Original values" ;
%end;

        entryfootnote halign=left "Note: NRT gum = Nicotine Replacement
Therapy gum; THS = Tobacco Heating System.";
        entryfootnote halign=left " ";
        ENTRYFOOTNOTE HALIGN=LEFT "Appendix 15.2.4.5, 15.3.3.1";
        entryfootnote halign=left "Path: &TFLpath." halign=right "(Page
&i of &maxpage)";
        entryfootnote halign=left "Program Run: &sysdate  &sysuserid
Program Status: &status"; */

/* needs to be wrapped by an extra layout lattice to be able to set plots
side by side or one on top of the other */
        layout lattice / columns=1 rows=2 columngutter=2px
columndatarange=union rowdatarange=union;

        cell;
        cellheader;
                entry halign=left " ";
                entry halign=left "Parameter: &param1.";
                entry halign=left " ";
        endcellheader;

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        layout overlay / cycleattrs=true
                                xaxisopts=(label=" "
linearopts=(tickvaluelist=(1 2)                                viewmin=0.8
viewmax=2.2))

        yaxisopts=(LINEAROPTS=(TICKVALUESEQUENCE=(START=0 END=&MAX1
INCREMENT=&INC1) VIEWMIN=0 VIEWMAX=&MAX1) label="&param1.") /* 2) JMH
15Aug2014 */
                                cycleattrs=true;

                                seriesplot x=trtan y=aval1 / primary=true
group=subjid display=(markers)

        markerattrs=graphdatal(symbol=circle color=black)
lineattrs=(color=black pattern=solid);
                                scatterplot x=trtan y=gmean1 / yerrorlower=lci1
yerrorupper=uci1 markerattrs=graphdatadefault(symbol=squarefilled

        color=black);

        endlayout;
        endcell;

%if &twoplots. eq 1 %then %do;

        cell;
        cellheader;
                entry halign=left " ";
                entry halign=left "Parameter: &param2.";
                entry halign=left " ";
        endcellheader;
        layout overlay /
                                xaxisopts=(label=" "
linearopts=(tickvaluelist=(1 2)                                viewmin=0.8
viewmax=2.2))

        yaxisopts=(LINEAROPTS=(TICKVALUESEQUENCE=(START=0 END=&MAX2
INCREMENT=&INC2) VIEWMIN=0 VIEWMAX=&MAX2) label="&param2.") /* 2) JMH
15Aug2014 */
                                cycleattrs=true;

                                seriesplot x=trtan y=aval2 / primary=true
group=subjid display=(markers)

        markerattrs=graphdatal(symbol=circle color=black)
lineattrs=(color=black pattern=solid);
                                scatterplot x=trtan y=gmean2 / yerrorlower=lci2
yerrorupper=uci2 markerattrs=graphdatadefault(symbol=squarefilled

        color=black);

        endlayout;

```

```

        endcell;

%end;

endLayout;

        endgraph;
    end;
run;

ods select all;

/* 4) CK 22SEP2014 - START */
ODS ESCAPECHAR='^';
ODS RTF PREPAGE="^S={outputwidth=100% just=1 font_size=12pt
font_weight=bold background=white foreground=black
font_face=arial}^R/RTF'\QL' Figure 15.1.2.5 Pharmacokinetic Parameters of
Nicotine - Group -2 PK Population";
/* 4) CK 22SEP2014 - END */
        proc sgrender data=plot&i. template=splot; /* applies the above
template to the specified data */
            format trtan xaxis.;
        run;

/* 4) CK 22SEP2014 - START */
ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt background=white
foreground=black font_face=arial}^R/RTF'\QL'";
%IF &i=4 OR &i=5 %THEN %DO;
    ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt
background=white foreground=black font_face=arial}^R/RTF'\QL' ^{unicode
'25a0'x} Median, O Original values";
%END;
%ELSE %DO;
    ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt
background=white foreground=black font_face=arial}^R/RTF'\QL' ^{unicode
'25a0'x} Geometric Means and 95%CI, O Original values";
%END;
ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt background=white
foreground=black font_face=arial}^R/RTF'\QL' Note: NRT gum = Nicotine
Replacement Therapy gum; THS = Tobacco Heating System.";
ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt background=white
foreground=black font_face=arial}^R/RTF'\QL'";
ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt background=white
foreground=black font_face=arial}^R/RTF'\QL' Appendix 15.2.4.5,
15.3.3.1";
ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt background=white
foreground=black font_face=arial}^R/RTF'\QL' Path: &TFLpath.
(Page &i of &maxpage)";
ODS RTF TEXT="^S={outputwidth=100% just=1 font_size=9pt background=white
foreground=black font_face=arial}^R/RTF'\QL' Program Run: &sysdate
&sysuserid Program Status: &status";
/* 4) CK 22SEP2014 - END */

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```
ods exclude all;

%end;

%mend graph;

%graph;

proc printto;
run;

ods rtf close;
ods listing;
ods select all;

*=====;
*  END OF PROGRAM CODE                      ;
*=====;
```