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*****;
* Project          : ZRHM-REXA-07-JP
*
* Program name     : t1502040602_ZRHM-REXA-07_V1.sas
*
* Author           : M. SUN
*
* Date created     : 06/16/2015
*
* Purpose          : Table 15.2.4.6.2 Descriptive Statistics of Exhaled CO (ppm)  FAS
*
* Revision History :
*
* Date      Author      Ref      Revision (Date in YYYYMMDD format)
*
*****;

%let prgname=T1502040602_ZRHM_REXA_07_JP_V1;

options mprint mlogic symbolgen;
ods escapechar='^';

options sasautos=("W:\pmp07\macros" sasautos) notes;
%init(delivery=9);
%titlecsv(prgname=&prgname., version=5);
%put &endpoint;

options missing="";

%macro t_desc_ms_1(par=,pop=,period=,chg=,sec=,dec=1);

%let dec1=%eval(&dec+1);
%let dec2=%eval(&dec+2);

proc sort data=adam.adbx(keep=usubjid paramcd param APUPER avisitn avisit ATPTN ATPT epoch aval
&chg ablf1 BLOQFL AULQFL anl02f1 base basetype TRTP) out=_adbx;
where paramcd="&PAR" AND ANL02FL='Y' and
((apuper>0 and ablf1 ne 'Y' and epoch ne 'BASELINE') or ablf1='Y');
by usubjid;
run;

DATA _adbx;
  SET _adbx;
  IF TRTP='SA' and basetype='TIME MATCHED DAY 1 (1)' THEN basetype='TIME MATCHED DAY 1 (2)';
  DROP TRTP;
run;

%do i=1 %to 4; /* for 4 period*/

data _pop1 _pop2 _pop3 _pop4;
  set adam.ads1;
  if %if &pop=fas %then &pop.fl; %else &pop&i.fl; ='Y';
  if trt01p='THSm2.2' then output _pop1;
  else if trt01p='mCC' then output _pop2;
  else if trt01p='SA' then output _pop3;
  output _pop4;
  keep usubjid;
run;

data _adbx&i;
  set _adbx;
  if _n_=1 then call symputx("para",param);
  if APUPER=&i and ablf1 ne 'Y' then output;
  if ablf1='Y' then do;
    apuper=&i;
    avisitn=100;
    atptn=0;
    if &i=1 and basetype ne 'TIME MATCHED DAY 0 (1)' then output;
  end;
run;

data _adbx&i;
  set _adbx&i;
  if aval ne 0 then logaval=log(AVAL);
  else logaval=10;
run;

proc sort data=_adbx&i;
  by usubjid APUPER basetype avisitn atptn;
run;

proc sort data=_adbx&i out=nolog(keep=usubjid APUPER basetype avisitn atptn) nodupkey;
  by usubjid APUPER basetype avisitn atptn;
  where aval=0;
run;

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data _adbx&i;
  merge _adbx&i nolog(in=z);
  by usubjid APUPER basetype avisitn atptn;
  if z then nolog=1;
  else nolog=0;
run;

%do j=1 %to 4; /* for 4 groups, including total*/

%global totn&i&j;
data _null_;
  set _pop&j end=eof;
  if eof then call symputx("totn&i&j",_n_);
run;

%let canotlog=0;
%put &canotlog;
data _data&j;
  merge _pop&j(in=x) _adbx&i(in=y);
  by usubjid;
  if x;
  length atime $40;
  if avisitn=100 then atime='Baseline';
  else atime=propcase(atpt);

  if aval=0 then call symputx('canotlog',1);
run;

proc sort data=_data&j out=forlog&j;
  by apuper basetype avisitn atptn atime nolog;
run;

data forlog&j;
  set forlog&j;
  by apuper basetype avisitn atptn atime nolog;
  if last.atime and nolog=1;
  keep apuper basetype avisitn atptn atime;
run;

%put &canotlog;
proc sort data=_data&j;
  by apuper basetype avisitn atptn atime;
run;

proc means data = _data&j noprint;
  where aval>.;
  by apuper basetype avisitn atptn atime;
  var aval;
  output out=temp&j n=n mean=mean std=std median=median min=min max=max q1=q1 q3=q3 lclm=lclm uclm=uclm;
run;

proc means data = _data&j noprint;
  where logaval>.;
  by apuper basetype avisitn atptn atime;
  var logaval;
  output out=templog&j mean=logmean std=logstd lclm=loglclm uclm=loguclm;
run;

proc freq data=_data&j noprint;
  tables apuper*basetype*avisitn*atptn*atime/out=tempBL0&j(rename=(count=blcount));
  where BLOQFL='Y';
run;

proc freq data=_data&j noprint;
  tables apuper*basetype*avisitn*atptn*atime/out=tempaul&j(rename=(count=auccount));
  where AULQFL='Y';
run;

data _res&j.1;
merge temp&j templog&j tempBL0&j(where=(blcount>0)) tempaul&j(where=(auccount>0)) forlog&j(in=z);
  by apuper basetype avisitn atptn atime;
  length col&j.1 $20 stat $40;
  ord=1; stat='n'; col&j.1 = put(n, 8.); output;
  if 0<n<&totn&i&j then do;
    ord=2; stat='Missing, n (%)'; col&j.1 = put(&totn&i&j-n, 8.)||' ('||strip(put((&totn&i&j-n)/&totn&i&j*100, 5.1))|
|')'; output;
  end;
  ord=3; stat='BLOQ, n (%)';
  if blcount>0 then col&j.1 = put(blcount, 8.)||' ('||strip(put(blcount/&totn&i&j*100, 5.1))||')';
  else col&j.1=''; output;
  if auccount>0 then do;
    ord=4; stat='AL0Q, n (%)'; col&j.1 = put(auccount, 8.)||' ('||strip(put(auccount/&totn&i&j*100, 5.1))||')'; output;
  end;

  geomean = exp(logmean); /* Ratio of geometric mean */
  geoLCL = exp(loglclm); /* 95% CI lower bound */

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geoUCL = exp(loguclm); /* 95% CI upper bound */
CVperc=100*sqrt(exp(logstd**2)-1);

ord=5; stat='Geometric Mean (CV%)';
col&j.1=strip(put(round(geomean,1E-&dec1), 8.&dec1))||' ('||strip(put(round(ceil(CVperc*100)/100,0.01), 8.2)) ||')';
if z then col&j.1='NC'; output;
ord=6; stat='95% CI of Geometric Mean'; col&j.1=strip(put(round(floor(geoLCL*1E&dec1)/1E&dec1,1E-&dec1), 8.&dec1))||', '||strip(put(round(ceil(geoUCL*1E&dec1)/1E&dec1,1E-&dec1), 8.&dec1));
if z then col&j.1='NC'; output;

ord=7; stat='Median'; col&j.1 =put(round(median,1E-&dec1), 8.&dec1); output;
ord=8; stat='Q25, Q75'; col&j.1 =strip(put(round(q1,1E-&dec1),8.&dec1))||', '||strip(put(round(q3,1E-&dec1), 8.&dec1)); output;
ord=9; stat='Min, Max'; col&j.1 = strip(put(round(min,1E-&dec1), 8.&dec1))||', '||strip(put(round(max,1E-&dec1), 8.&dec1)); output;
ord=10; stat='Mean (SD)';
if std > . then col&j.1 = strip(put(round(mean,1E-&dec1), 8.&dec1))||' ('||strip(put(round(ceil(std*1E&dec2)/1E&dec2, 1E-&dec2), 8.&dec2))||')';
else col&j.1 = strip(put(round(mean,1E-&dec1), 8.&dec1))||' (NA)'; output;
ord=11; stat='95% CI of Mean';
col&j.1 =strip(put(round(floor(lclm*1E&dec1)/1E&dec1,1E-&dec1), 8.&dec1))||', '||strip(put(round(ceil(uclm*1E&dec1)/1E&dec1,1E-&dec1), 8.&dec1)); output;
run;

/***** change*****/

proc means data = _data&j noprint;
  where &chg>. and AVISITN>100;
  by apuper basetype avisitn atptn atime;
  var &chg;
  output out=tempc&j n=n mean=mean std=std median=median min=min max=max q1=q1 q3=q3 lclm=lclm uclm=uclm;
run;

data _res&j.2;
set tempc&j;
  by apuper basetype avisitn atptn atime;
  length col&j.2 $20 stat $40;
  ord=1; stat='n'; col&j.2 = put(n, 8.); output;
  if 0<n<&totn&i&j then do;
    ord=2; stat='Missing, n (%)'; col&j.2 = put(&totn&i&j-n, 8.)||' ('||strip(put((&totn&i&j-n)/&totn&i&j*100, 5.1))||')'; output;
  end;

  ord=7; stat='Median'; col&j.2 =put(round(median,1E-&dec1), 8.&dec1); output;
  ord=8; stat='Q25, Q75'; col&j.2 =strip(put(round(q1,1E-&dec1),8.&dec1))||', '||strip(put(round(q3,1E-&dec1), 8.&dec1)); output;
  ord=9; stat='Min, Max'; col&j.2 = strip(put(round(min,1E-&dec1), 8.&dec1))||', '||strip(put(round(max,1E-&dec1), 8.&dec1)); output;
  ord=10; stat='Mean (SD)';
  if std > . then col&j.2 = strip(put(round(mean,1E-&dec1), 8.&dec1))||' ('||strip(put(round(ceil(std*1E&dec2)/1E&dec2, 1E-&dec2), 8.&dec2))||')';
  else col&j.2 = strip(put(round(mean,1E-&dec1), 8.&dec1))||' (NA)'; output;
  ord=11; stat='95% CI of Mean';
  col&j.2 =strip(put(round(floor(lclm*1E&dec1)/1E&dec1,1E-&dec1), 8.&dec1))||', '||strip(put(round(ceil(uclm*1E&dec1)/1E&dec1,1E-&dec1), 8.&dec1)); output;
  keep apuper basetype avisitn atptn atime ord col&j.2;
run;

%end;

data _res&i;
  merge _res11 _res21 _res31 _res12 _res22 _res32;
  by apuper basetype avisitn atptn atime ord;
  period=&i;
run;

%end;

data &par;
  set _res1-_res4;
  by period apuper basetype avisitn atptn atime ord;
run;

data &par;
  set &par;
  by period apuper basetype avisitn atptn atime ord;
  length para $100;
  para="&para";
  sec=&sec;

  lagcol11=lag(col11);
  lagcol12=lag(col12);
  lagcol21=lag(col21);
  lagcol22=lag(col22);
  lagcol31=lag(col31);

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lagcol32=lag(col32);

array cols[6] col11 col12 col21 col22 col31 col32;
array lagcols[6] lagcol11 lagcol12 lagcol21 lagcol22 lagcol31 lagcol32;

if ord in (2) then do;
  if atime='Baseline' then do i=1,3,5;
    if cols[i]='' and lagcols[i]>'' then cols[i]='0';
  end;
  else do i=1 to 6;
    if cols[i]='' and lagcols[i]>'' then cols[i]='0';
  end;
end;
keep sec period apuper basetype avisitn atptn atime ord stat para col;;
run;

data &par;
set &par;
by period apuper basetype avisitn atptn atime ord;
length para $100;
para="&para";
sec=&sec;

lagcol11=lag(col11);
lagcol12=lag(col12);
lagcol21=lag(col21);
lagcol22=lag(col22);
lagcol31=lag(col31);
lagcol32=lag(col32);

array cols[6] col11 col12 col21 col22 col31 col32;
array lagcols[6] lagcol11 lagcol12 lagcol21 lagcol22 lagcol31 lagcol32;

if ord in (3) then do i=1,3,5;
  if cols[i]='' and lagcols[i]>'' then cols[i]='0';
end;
keep sec period apuper basetype avisitn atptn atime ord stat para col;;
run;

proc datasets library=work memtype=data nolist;
delete _: temp;;
run;quit;

%mend;

%t_desc_ms_1(par=CO, pop=fas,period=%str(1,2,3,4),chg=PCHG,sec=1);

%macro doreport;
data final;
set CO;
run;

proc sort data=final;
by sec basetype period apuper avisitn atptn;
run;

data final;
set final;
by sec basetype period apuper avisitn atptn;
array cols col:;
do over cols;
cols=strip(cols);
end;
if avisitn=100 and apuper=1 then do;
if basetype='TIME MATCHED DAY 1 (1)' then do;
avisitn=100.1;
atime='15 Min < T0 - Baseline';
end;
if basetype='TIME MATCHED DAY 1 (2)' then do;
avisitn=100.2;
atime='08:00 - 09:30 - Baseline';
end;
if basetype='TIME MATCHED DAY 0 (2)' then do;
avisitn=100.3;
atime='12:00 - 13:30 - Baseline';
end;
if basetype='TIME MATCHED DAY 0 (3)' then do;
avisitn=100.4;
atime='16:00 - 17:30 - Baseline';
end;
if basetype='TIME MATCHED DAY 0 (4)' then do;
avisitn=100.5;
atime='20:00 - 21:30 - Baseline';
end;
end;
end;
run;

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proc sort data=final;
  by sec period apuper avisitn atptn ord;
run;

data final;
  set final;
  by sec period apuper avisitn atptn ord;
  output;
  if first.atptn then do;
    ord=-99;
    array cols stat col:;
    do over cols;
      cols='';
    end;
    output;
  end;
run;

proc sort data=final;
  by sec period apuper avisitn atptn ord;
run;

data final;
  set final;
  by sec period apuper avisitn atptn;
  if first.atptn then pagen+1;
  /*
  if first.atptn then ctpg+1;
  if ctpg>2 or first.period then do;
    pagen+1;
    ctpg=1;
  end;
  */
run;

data final;
  set final end=eof;
  by pagen;
  if eof then call symputx("totalpage",pagen);
run;

data odata.&prgname.;
  retain pagen para apuper basetype avisitn atptn atime ord stat col11 col12 col21 col22 col31 col32;
  set final;
run;

%trtrtfg(pgmname=&outname., pgmid=1, new=0, style=, bookmark=%lowcase(&outname.));

%do i=1 %to &totalpage;

data final&i;
  set final;
  where pagen=&i;
  call symputx("period",period);
  call symputx("getpara",para);
  call symputx("sec",sec);
run;

title; footnote;
/*
title1 bold j=1 "&title1 &title2";
title2 " ";

title3 j=1 h=9pt "Parameter (units): &getpara";
title4 j=1 h=9pt "Product Use Time Period: Period &period";

footnote1 bold h=12pt "_____";
footnote2 j=1 h=9pt "Note: mCC = Menthol conventional cigarettes; SA = Smoking abstinence; THSm2.2 = Tobacco Heating Sys
tem 2.2 Menthol.";
footnote3 j=1 h=9pt "Note: * % change from baseline, where baseline is defined as the last assessment prior to first ran
domized product use "
"in mCC / THS 2.2 Menthol arms or the last assessment prior to 10 AM on Day 1 in the SA arm.";
footnote4 j=1 h=9pt " ";
footnote5 h=9pt j=1 "&APPENDIX.";
footnote6 h=9pt j=1 "Study ID:ZRHM-REXA-07-JP          Program: &prgname..sas          Status: &repversion./&fdate.
Page: &i. of &totalpage";
*/

proc report data=final&i headskip headline nowd split='~' style=[outputwidth=100%] style(header column)=[protectspecial
chars=off];
%if &sec=1 %then %do;
  column pagen apuper basetype avisitn atptn atime ord stat ("^R/RTF'\brdrb\brdrs ' THSm2.2~(N=&&totn&period.1)" col11 c
ol12) ("^R/RTF'\brdrb\brdrs ' mCC~(N=&&totn&period.2)" col21 col22)
  ("^R/RTF'\brdrb\brdrs ' SA~(N=&&totn&period.3)" col31 col32);

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define pagen /order order=internal noprint;
define apuper /order order=internal noprint;
define basetype /order order=internal noprint;
define avisitn /order order=internal noprint;
define atptn /order order=internal noprint;
define atime /order "Timepoint" style(column)=[cellwidth=8% just=l] style(header)=[just=l];
define ord /order order=internal noprint;
define stat /display "Statistic" style(column)=[cellwidth=17% just=l vjust=b] style(header)=[just=l];
define col11 /display "Value" style(column)=[cellwidth=10% just=c vjust=b];
define col12 /display "% Change(*)" style(column)=[cellwidth=10% just=c vjust=b];
define col21 /display "Value" style(column)=[cellwidth=10% just=c vjust=b];
define col22 /display "% Change(*)" style(column)=[cellwidth=10% just=c vjust=b];
define col31 /display "Value" style(column)=[cellwidth=10% just=c vjust=b];
define col32 /display "% Change(*)" style(column)=[cellwidth=10% just=c vjust=b];
%end;
%else %do;
column pagen apuper avisitn atptn atime ord stat col11 col21 col31;
define pagen /order order=internal noprint;
define apuper /order order=internal noprint;
define basetype /order order=internal noprint;
define avisitn /order order=internal noprint;
define atptn /order order=internal noprint;
define atime /order "Timepoint" style(column)=[cellwidth=11% just=l] style(header)=[just=l];
define ord /order order=internal noprint;
define stat /display "Statistic" style(column)=[cellwidth=17% just=l vjust=b] style(header)=[just=l];
define col11 /display "THSm2.2-(N=&&totn&period.1)" style(column)=[cellwidth=9% just=c vjust=b];
define col21 /display "mCC-(N=&&totn&period.2)" style(column)=[cellwidth=9% just=c vjust=b];
define col31 /display "SA-(N=&&totn&period.3)" style(column)=[cellwidth=9% just=c vjust=b];
%end;

COMPUTE before pagen;
LINE @1 " ";
ENDCOMP;

COMPUTE after atptn;
LINE @1 " ";
ENDCOMP;

compute before _page_ /style=[fontweight=bold fontsize=3.75];
line @1 "&title1 &title2";
line @1 " ";
line @1 "Parameter (units): &getpara";
line @1 " ^R/RTF'\brdrb\brdrs\brdrw30\brsp20\b ' ";
endcomp;

compute after _page_ /style=[fontsize=1.75];
line @1 "Note: mCC = Menthol conventional cigarettes; SA = Smoking abstinence; THSm2.2 = Tobacco Heating System 2.2 Menthol.";
line @1 "Note: % * change from baseline, where baseline is defined as the last assessment prior to first randomized product use "
"in mCC / THS 2.2 Menthol arms or the last assessment prior to 10 AM on Day 1 in the SA arm.";
line @1 'Note: NC=Not calculated';
line @1 " ";
line @1 "&APPENDIX.";
line @1 "Study ID:ZRHM-REXA-07-JP Program: &fprgname..sas Status: &repversion./&fdate. Page: &i. of &totalpage";
endcomp;

run;

%end;

ods listing;
ods rtf close;
%mend;

%doreport;

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