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/*-----
Covance Study ID      : COV-000000106343
Program Name          : d_2adxt.sas
Purpose               : Program to create ADXT dataset
Author                : cvn_pshe
Date of Creation      : 1MAY2015

Input Data            : ADAM.ADSL, SDTM.XT, DTM.SUPPXT,
Output Data           : ADAM.ADXT
Macros Called         : m_printto,%m_totper, m_perall, m_logchk, m_attrib_adam

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``` ----- Modification History ----- ```

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Modified by          :
Modification Date    :
Modification Description:
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options notes nosource;
proc datasets lib=work nolist memtype=data kill; quit;
* macro to save output and log to appropriate areas ;
%m_printto;
options notes source source2 nofullstimer validvarname=upcase missing=' ' mprint symbolgen;
ods _all_ close;
ods listing;

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

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libname sdtm "/cvn/projects/prj/data/000000106343/datasets/sdtm/sdtmx";
*****;
* bring in ADSL ;
*****;
data adsl;
    set adam.adsl;
    keep studyid usubjid subjid: siteid age sex: race height weightbtl bmi ucpdgr1 ucpdgr1n /*nicogr1 nicogr1n targr1 targr1n*/
    enrfl scrffl complfl /*FSAFBFL FSAFAFL*/ SAFBFL SAFAFL fasfl pprot1fl pprot2fl pprot3fl pprot4fl randfl trt: dthfl exfl enfl exn
otrfl;
run;

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* get xt and suppxt data;
data xt;
    length xttestcd $8 xttest $80;
    set sdtm.xt;
run;

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proc sort data = xt;
    by usubjid xtrefid;
run;

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DATA SUPPXT;
    SET SDTM.SUPPXT;
    where QNAM in ('FILESTAT' 'KIT_NUM' 'VIAL_NUM' 'FILTNUM' 'SODENUM' 'SOSHNUM');
RUN;

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data _null_;
    set SUPPXT;
    if idvar not in("XTREFID" "XTSEQ") then put "WAR" "NING: Unexpected value " qnam= idvar=;
run;

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data refxt01;
    set SUPPXT;
    where idvar = "XTREFID";
/* length xtrefid $25;*/
    xtrefid = idvarval;
run;

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proc sort data = refxt01;
    by usubjid xtrefid;
run;

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proc transpose data = refxt01 out = refxt02(drop=_name_ _label_);
    by usubjid xtrefid;
    var qval;
    id qnam;
    idlabel qlabel;
run;

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data seqxt01;
  set SUPPXT;
  where idvar = "XTSEQ";
  xtseq = input(idvarval, best.);
run;

proc sort data = seqxt01;
  by usubjid xtseq;
run;

proc transpose data = seqxt01 out = seqxt02(drop=_name_ _label_);
  by usubjid xtseq;
  var qval;
  id qnam;
  idlabel qlabel;
run;

data xt;
  merge xt (in=a) refxt02;
  by usubjid xtrefid;
/* if a;*/
run;

proc sort data = xt;
  by usubjid xtseq;
run;

data xt;
  merge xt (in=a)seqxt02;
  by usubjid xtseq;
/* if a;*/
  if upcase(compress(filestat)) ne 'REJECTED';
run;

data xta;
  set xt (where=(xttestcd in ('NI' 'VI' 'DI' 'QMI' 'QCI' 'II' 'DFI' 'WI' 'PMI' 'PCI' 'RMI' 'RCI' 'PN' 'POSQCI' 'SPI')));
  keep usubjid xtrefid xttestcd xtcat xtscat visitnum visit xtdtc xtstdtc xtendtc xtstresn xtdy xtstdy;
run;

/* Total number of puffs */
data npc;
  set xta(where=(xttestcd='NI'));
run;

proc sort data=npc;
  by usubjid xtrefid visitnum descending xtstresn;
run;

data npc;
  set npc;
  by usubjid xtrefid visitnum descending xtstresn;
  format dtype $10. calc BEST32. xttest $80.;
  if first.visitnum;
  calc=round(xtstresn,1/10**10);
  xttestcd='NPC';
  xttest='Total number of puffs';
  dtype='SUM';
  drop xtstresn;
run;

/* Volume, puff duration, inter puff interval, smoking duration, total work*/
data totals;
  set xta (where=(xttestcd ne 'NI'));
run;

proc sort data=totals;
  by usubjid xtrefid xttestcd xtcat xtscat visitnum visit xtdtc xtstdtc xtendtc xtdy xtstdy;
  where xtstresn ne .;
run;

proc summary data=totals noprint;
  by usubjid xtrefid xttestcd xtcat xtscat visitnum visit xtdtc xtstdtc xtendtc xtdy xtstdy;
  var xtstresn;
  output out=totals2(drop=_) sum=sum;
run;

data sum;

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set totals2 (rename=(xttestcd=xttestcd2 ));
length xttestcd $8 xttest $80;
format dtype $10. calc BEST32. ;
dtype='SUM';
calc=round(sum,1/10**10);

if xttestcd2='DFI' then do;
    xttestcd='TDFI';
    xttest='Total smoking duration';
end;
else if xttestcd2='DI' then do;
    xttestcd='TDI';
    xttest='Total puff duration';
end;
else if xttestcd2='II' then do;
    xttestcd='TII';
    xttest='Total inter puff interval';
end;
else if xttestcd2='VI' then do;
    xttestcd='TVOL';
    xttest='Total puff volume';
end;
else if xttestcd2='WI' then do;
    xttestcd='TWI';
    xttest='Total work';
end;
else if xttestcd2='QCI' then do;
    xttestcd='QCI';
    xttest='';
end;
else if xttestcd2='QMI' then do;
    xttestcd='QMI';
    xttest='';
end;
else if xttestcd2='PMI' then do;
    xttestcd='PMI';
    xttest='';
end;
else if xttestcd2='PCI' then do;
    xttestcd='PCI';
    xttest='';
end;
else delete;
drop sum xttestcd2;
run;

/* Calculate averages */
data npc2;
    set npc;
    rename calc=npc;
    keep usubjid xtrefid calc visitnum visit;
run;

proc sort data=npc2;
    by usubjid xtrefid visitnum visit;
run;

proc sort data=sum;
    by usubjid xtrefid visitnum visit;
run;

data avg;
    merge sum (in=a) npc2;
    by usubjid xtrefid visitnum visit;
    if a;
    length xttest2 $80 xttestcd2 $8;
    format dtype $10. CALC1 BEST32.;

    if xttestcd='TDFI' then delete;

    if nmiss(calc, npc)=0 then calc1=round(calc/npc,1/10**10);

    dtype='AVERAGE';

    if xttestcd='TDI' then do;
        xttestcd2='AVGDI';
        xttest2='Average puff duration';
    end;

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if xttestcd='TII' then do;
    xttestcd2='AVGII';
    xttest2='Average inter puff interval';
end;
if xttestcd='PCI' then do;
    xttestcd2='AVGPCI';
    xttest2='Average Peak pressure drop';
end;
if xttestcd='PMI' then do;
    xttestcd2='AVGPMI';
    xttest2='Average pressure drop';
end;
if xttestcd='QCI' then do;
    xttestcd2='AVGQCI';
    xttest2='Average Peak flow';
end;
if xttestcd='QMI' then do;
    xttestcd2='AVGQMI';
    xttest2='Average flow';
end;
if xttestcd='TVOL' then do;
    xttestcd2='AVGVI';
    xttest2='Average puff volume';
end;
if xttestcd='TWI' then do;
    xttestcd2='AVGWI';
    xttest2='Average Work';
end;

drop calc npc xttestcd xttest;
rename calc1=calc xttestcd2=xttestcd xttest2=xttest;
run;

/* Smoking Intensity */
data ratio;
    merge sum(where=(xttestcd in ('TVOL', 'TDI')))
          sum(where=(oldcd='TDFI') keep=calc xttestcd usubjid xtrefid /*xtcat xtscat*/ visitnum visit rename=(calc=tdfi xttestcd=old
cd));
    by usubjid xtrefid visitnum visit;
run;

data ratio2;
    set ratio;
    length xttest2 $80 xttestcd2 $8;
    format dtype $10. calc1 BEST32.;

    calc1=round(calc/tdfi,1/10**10);

    dtype='RATIO';
    if xttestcd='TVOL' then do;
        xttestcd2='SMINT';
        xttest2='Smoking Intensity';
        calc1=round(calc/tdfi,1/10**10);
    end;

    if xttestcd='TDI' then do;
        xttestcd2='PTI';
        xttest2='Puffing Time Index';
        calc1=round(100*calc/tdfi,1/10**10);
    end;
drop calc xttestcd xttest tdfi oldcd;
rename calc1=calc xttestcd2=xttestcd xttest2=xttest;
run;

/* Puff Frequency */
data pfreq;
    merge sum(where=(xttestcd='TDFI')) npc2;
    by usubjid xtrefid visitnum visit;
run;

data pfreq2;
    set pfreq;
    format dtype $10. CALC1 BEST32.;

    if nmiss(calc, npc)=0 then calc1=round(npc/(calc/60),1/10**10);
    dtype='RATIO';
    xttestcd='PFEQ';
    xttest='Puff Frequency';

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drop calc npc;
rename calc1=calc;
run;

* remove extra records in sum dataset;
data sum;
  set sum;
  if xttestcd in ('QCI', 'QMI', 'PMI', 'PCI') then delete;
run;

/* Set per-cigarette parameters together from npc2 totals4 and avg2 */
data all;
  set npc avg sum ratio2 pfreq2;
  format paramtyp $10. avalc1 $60.xttest $80.;

  paramtyp='DERIVED';

  if index(xttest,'Total') then do;
    avalc1=strip(put(calc,BEST32.));
  end;
  else if index(xttest,'Average') or xttestcd in ('SMINT' 'PFEQ' 'PTI') then do;
    avalc1=strip(put(calc,BEST32.));
  end;
run;

/*proc sort data=all;*/
/*  by usubjid xtrefid xttestcd xttest xtcat xtdtc xtdy xtstdtc xtstdy xtendtc visitnum visit;*/
/*run;*/;

proc sort data=all;
  by usubjid /*xtrefid*/ visitnum visit /*xtdtc xtdy xtstdtc xtstdy xtendtc*/ xtcat xtscat xttestcd xttest;

proc summary data=all noprint;
  by usubjid /*xtrefid*/ visitnum visit /*xtdtc xtdy xtstdtc xtstdy xtendtc*/ xtcat xtscat xttestcd xttest;
  var calc;
  output out=allavg(drop=_) mean=mean;
run;

data allavg2;
  set allavg;
  format paramtyp $10. dtype $10. mean BEST32. avalc1 $60.;

  paramtyp='DERIVED';
  dtype='AVERAGE';

  xttestcd=compress('A' || xttestcd);

  mean=round(mean,1/10**10);
  avalc1=strip(put(mean,best32.));
  rename mean=calc;
run;

*****;
* bring in XT ;
*****;
proc sort data=xt;
  by usubjid xtseq;
run;

proc sort data=all;
  by usubjid;
run;

proc sort data=allavg2;
  by usubjid;
run;

data xt2;
  set xt all allavg2 (in=avg);
  by usubjid;
  format paramcd $8. parcat1 $60. parcat2 $200. param $80. avisit $40. paramn parcat1n parcat2n 8. aval BEST32. avisitn best.
    avalc $60. adt astdt aendt date9. avalu $20. asdtm aendtm datetime13.;

* parameter variables ;
  paramcd = strip(xttestcd);
  param = strip(xttest);

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parcat1=strip(propcase(xtcat));
parcat2=strip(propcase(xtscat));

if upcase(parcat1)='FILTER ANALYSIS' then parcat1n=1;
  else if upcase(parcat1)='VISUAL INSPECTION OF TOBACCO PLUG' then parcat1n=2;
  else if upcase(parcat1)='TOPOGRAPHY' then parcat1n=3;

if upcase(parcat2)='ANALYSIS FULL FILTER' then parcat2n=1;
  else if upcase(parcat2)='ANALYSIS MOUTHPIECE' then parcat2n=2;
  else if upcase(parcat2)='ANALYSIS PLA + HAT' then parcat2n=3;
  else if upcase(parcat2)='EXTRACTION' then parcat2n=4;

if parcat2 not in (' ' 'Extraction') then param=strip(propcase(parcat2))||' '||strip(param);
  if index(param,'Pla') then param=tranwrd(param,' Pla',' PLA');

if paramcd='ABUVTABS' then do;
  if parcat2n=1 then paramcd='FABUVTAB';
  else if parcat2n=2 then paramcd='MABUVTAB';
  else if parcat2n=3 then paramcd='PABUVTAB';
end;
  else if paramcd='NICOAMT' then do;
  if parcat2n=1 then paramcd='FNICO';
  else if parcat2n=2 then paramcd='MNICO';
  else if parcat2n=3 then paramcd='PNICO';
end;
  else if paramcd='NICOAMTF' then do;
  if parcat2n=1 then paramcd='FNICOF';
  else if parcat2n=2 then paramcd='MNICOF';
  else if parcat2n=3 then paramcd='PNICOF';
end;
  else if paramcd='NMUVABSF' then do;
  if parcat2n=1 then paramcd='FNMUVABS';
  else if parcat2n=2 then paramcd='MNMUVABS';
  else if parcat2n=3 then paramcd='PNMUVABS';
end;

if paramcd='S.PI' then paramcd=compress(paramcd,'. ');
if PARAMCD='S_PI' THEN PARAMCD=COMPRESS(PARAMCD,'_ ');

if paramcd='NPC' then paramn=1;
  else if paramcd='TVOL' then paramn=2;
  else if paramcd='AVGVI' then paramn=3;
  else if paramcd='AVGDI' then paramn=4;
  else if paramcd='TDI' then paramn=5;
  else if paramcd='AVGQMI' then paramn=6;
  else if paramcd='AVGQCI' then paramn=7;
  else if paramcd='TII' then paramn=8;
  else if paramcd='AVGII' then paramn=9;
  else if paramcd='TDFI' then paramn=10;
  else if paramcd='TWI' then paramn=11;
  else if paramcd='AVGWI' then paramn=12;
  else if paramcd='AVGPMI' then paramn=13;
  else if paramcd='AVGPCI' then paramn=14;
  else if paramcd='SMINT' then paramn=15;
  else if paramcd='PTI' then paramn=16;
  else if paramcd='PFEQ' then paramn=17;
  else if paramcd='NI' then paramn=18;
  else if paramcd='VI' then paramn=19;
  else if paramcd='DI' then paramn=20;
  else if paramcd='QMI' then paramn=21;
  else if paramcd='QCI' then paramn=22;
  else if paramcd='II' then paramn=23;
  else if paramcd='DFI' then paramn=24;
  else if paramcd='WI' then paramn=25;
  else if paramcd='PMI' then paramn=26;
  else if paramcd='PCI' then paramn=27;
  else if paramcd='RMI' then paramn=28;
  else if paramcd='RCI' then paramn=29;
  else if paramcd='PN' then paramn=30;
  else if paramcd='POSQCI' then paramn=31;
  else if paramcd='SPI' then paramn=32;
  else if paramcd='FNICOF' then paramn=33;
  else if paramcd='FABUVTAB' then paramn=35;
  else if paramcd='FNICO' then paramn=34;
  else if paramcd='FNMUVABS' then paramn=36;
  else if paramcd='MNICOF' then paramn=37;
  else if paramcd='MNICO' then paramn=38;
  else if paramcd='MABUVTAB' then paramn=39;

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else if paramcd='MNMUVABS' then paramn=40;
else if paramcd='PNICOF' then paramn=41;
else if paramcd='PNICO' then paramn=42;
else if paramcd='PABUVTAB' then paramn=43;
else if paramcd='PNMUVABS' then paramn=44;
else if paramcd='DILU_VOL' then paramn=45;
else if paramcd='EXTR_VOL' then paramn=46;
else if paramcd='SMPL_VOL' then paramn=47;
else if paramcd='TOTL_VOL' then paramn=48;
else if paramcd='VITP_L' then paramn=49;
else if paramcd='ANPC' then paramn=50;
else if paramcd='ATVOL' then paramn=51;
else if paramcd='AAVGVI' then paramn=52;
else if paramcd='AAVGDI' then paramn=53;
else if paramcd='ATDI' then paramn=54;
else if paramcd='AAVGMI' then paramn=55;
else if paramcd='AAVGQCI' then paramn=56;
else if paramcd='ATII' then paramn=57;
else if paramcd='AAVGII' then paramn=58;
else if paramcd='ATDFI' then paramn=59;
else if paramcd='ATWI' then paramn=60;
else if paramcd='AAVGWI' then paramn=61;
else if paramcd='AAVGPMI' then paramn=62;
else if paramcd='AAVGPCI' then paramn=63;
else if paramcd='ASMINT' then paramn=64;
else if paramcd='PTI' then paramn=65;
else if paramcd='APFEQ' then paramn=66;
else if paramcd='HSTALL' then paramn=99;

* analysis variables ;
aval = xtstresn;
IF INDEX(XTSTRESC,'NA')=0 THEN DO;
    avalc = propcase(xtstresc, '.');
END;
ELSE AVALC=LEFT(TRIM(XTSTRESC));
IF NOT MISSING(PARAMTYP) THEN DO;
    AVALC=STRIP(AVALC1);
    AVAL=INPUT(AVALC,BEST32.);
END;

avalu = strip(xtstresu);
if paramtyp='DERIVED' then do;
    if paramcd in ('TVOL' 'AVGVI' 'ATVOL' 'AAVGVI') then avalu=strip('mL');
    else if paramcd in ('AVGDI' 'TDI' 'TII' 'AVGII' 'TDFI' 'AAVGDI' 'ATDI' 'ATII' 'AAVGII' 'ATDFI') then avalu=strip('s');
    else if paramcd in ('AVGMI' 'AVGQCI' 'SMINT' 'AAVGMI' 'AAVGQCI' 'ASMINT') then avalu=strip('mL/s');
    else if paramcd in ('TWI' 'AVGWI' 'ATWI' 'AAVGWI') then avalu=strip('mJ');
    else if paramcd in ('AVGPMI' 'AVGPCI' 'AAVGPMI' 'AAVGPCI') then avalu=strip('mmWg');
    else if paramcd in ('PTI' 'PTI') then avalu=strip('%');
    else if paramcd in ('PFEQ' 'APFEQ') then avalu=strip('puffs/min');
end;

if avalu ne '' then do;
    param=strip(param)||' ('||strip(avalu)||)';
end;
else if avalu='' then do;
    if paramcd in ('FNICO' 'PNICO' 'MNICO') then param=strip(param)||' '||strip('(mg/mL)');
    else if paramcd in ('FNICOF' 'PNICOF' 'MNICOF') then param=strip(param)||' '||strip('(mg/filter)');
    else if paramcd in ('FNMUVABS' 'PNMUVABS' 'MNMUVABS') then param=strip(param)||' '||strip('(per filter)');
end;

if avg then param=compbl(param)||' (average over visit)';

* visit details ;
avisit = propcase(visit);
avisitn = visitnum;

* dates;

if length(xtdtc)>=10 then adt = input(scan(xtdtc,1,"T"),yymmdd10.);
if length(xtstdtc)>=10 then astdt = input(scan(xtstdtc,1,"T"),yymmdd10.);
if index(xtstdtc,"T") then do;
    asttm = input(scan(xtstdtc,2,"T"),time8.);
    astdtm = dhms(astdt,0,0,asttm);
end;
if length(xtendtc)>=10 then aendt = input(scan(xtendtc,1,"T"),yymmdd10.);
if index(xtendtc,"T") then do;
    aentm = input(scan(xtendtc,2,"T"),time8.);
    aendtm = dhms(aendt,0,0,aentm);

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end;

if paramtyp='DERIVED' and paramn in (50:66) then do;
    ASTDTM =.; XTDTTC =''; XTDY=.; XTSTDTC=''; XTEBDTC=''; XTSTDY=.; ADT=.; ADY=.; ASTDT=.; AENDTM=.; ASTDAY=.;
end;

keep usubjid xtseq xtrefid xtgrpid param: parcat: aval: avisit: xtstat xtreasnd xtdtc xtdy xtstdtc xtendtc
    xtstdy epoch xteval xtspid xteval dtype adt asdt aendt asdtm aendtm asttm KIT_NUM VIAL_NUM /*FILTNUM*/ SODENUM SOSHNUM ;
run;

*****;
* Combine ADSL and XT data *;
*****;
* treatment period;
%m_totper;

data xt3;
    merge adsl xt2(in=a);
    by usubjid;
    if a; * only include subjects with data ;
    format aperiod trtan trtpn astday aday 8. trta trtp $40. aperiodc $10.;
    if nmiss(astdt,trtsdt)=0 then astday = asdt - trtsdt + 1;
    if nmiss(adt,trtsdt)=0 then aday=adt - trtsdt+1;
* allocate tretament and period;
    %m_perall(dvar1 = asdtm, dvar2 = asdt);
    aperiodc = 'Period ' || put(aperiod,1.);
run;

data xt3;
    set xt3;
    if (avisitn < 101 or (avisitn = 101 and (. < asdtm < trtsdtm))) and xtstat^='NOT DONE' then bl = 1;
    else bl=.;
    if avisitn>=101 and bl^=1 then bl=0;

proc sort data=xt3;
    by usubjid paramn descending bl descending XTDTTC descending XTSTDTC descending XTENDTC descending avisitn xtrefid xtseq;
run;

** set up baseline flag base and change**;
data xt4;
    set xt3;
    by usubjid paramn descending bl descending XTDTTC descending XTSTDTC descending XTENDTC descending avisitn xtrefid xtseq;
    format ablf1 $2.;
    retain base;
    if first.paramn then base=.;
    if bl=1 and first.bl then do; ablf1='Y'; base=aval; end;
    if bl=0 and base^=. and aval^=. then do;
        chg=aval-base;
        if base not in (., 0) then pchg=(chg/base)*100;
        if base=0 then pchg=chg*100;
    end;
run;

data xt4;
    set xt4;
    format asper 8. asperc $40.;

    if avisitn < 101 then asper=1;
    else if 101<=avisitn<=106 then asper=2;
    else if 106<avisitn<=191 then asper=3;
    else if avisitn>191 then asper=4;

    if asper=1 then asperc= 'Pre-Randomization Period';
    else if asper=2 then asperc='Confinement Period';
    else if asper=3 then asperc='Ambulatory Period';
    else if asper=4 then asperc='Safety Follow-up Period';
    if TRTPN=97 or TRTPN= 98 then do;ASPER=1;ASPERC='Pre-Randomization Period'; end;

    if 101<=avisitn<=106 then apuper=1;
    else If 106<avisitn<=131 then apuper=2;
    else if 131<avisitn<=161 then apuper=3;
    else if 161<avisitn<=191 then apuper=4;

    if apuper=1 then apuperc= 'Period 1';
    else if apuper=2 then apuperc='Period 2';
    else if apuper=3 then apuperc='Period 3';
    else if apuper=4 then apuperc='Period 4';

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    if TRTPN=97 | TRTPN=98 then do; APUPER=.; APUPERC = ''; end;
run;

/* Windows */
data slxt2;
    set xt4;
    format awlo awhi datetime13. awrange $40.;

    if /*paramcd in ('NPC' 'TVOL' 'AVGVI' 'AVGDI' 'TDI' 'AVGQMI' 'AVGQCI' 'TII' 'AVGII' 'TDFI' 'TWI' 'AVGWI' 'AVGPMI'
        'AVGPCI' 'SMINT' 'PTI' 'PFEQ' 'VITP_L' 'FNMUUVABS' 'MNMUVABS' 'PNMUUVABS' 'FNICOF' 'MNICOF' 'PNICOF') and xtstat ne 'NOT DONE' a
nd */ astdt ^=.
    and parcat1='Topography' and aval^=. then do;
/*     if avisit in ('Day 0') then do;*/
/*         awlo=dhms (astdt,6,30,0);*/
/*         awhi=dhms(astdt,23,0,0);*/
/*     end;
/*     else if trta in ('THSm2.2' 'mCC') and avisit in ('Day 1','Day 4') then do;*/
/*         awlo=dhms (astdt,6,30,0);*/
/*         awhi=dhms(astdt,23,0,0);*/
/*     end;*/
/*     else if trta in ('THSm2.2' 'mCC') and avisit in ('Day 30', 'Day 60', 'Day 90' ) then do;*/
/*         if ASTTM< (8*60*60 + 30*60) then do;*/
/*             awlo=dhms(astdt,8,30,0);*/
/*             awhi=dhms(astdt,12,45,0);*/
/*         end;*/
/*         else if ASTTM> (9*60*60 + 30*60) then do;*/
/*             awlo=dhms(astdt,9,30,0);*/
/*             awhi=dhms(astdt,13,45,0);*/
/*         end;*/
/*         else if (8*60*60 + 30*60)<= ASTTM<=(9*60*60 + 30*60) then do;*/
/*             awlo=astdt*24*60*60+asttm;*/
/*             awhi=astdt*24*60*60 +asttm+4*60*60 +15*50;*/
/*         end;*/
/*     end;*/
    if avisitn<130 then do;
        awlo=(astdt*86400)+(6.5*60*60);
        awhi=(astdt*86400)+(23*60*60);
    end;
    else if avisitn in (130, 160, 190) then do;
        If .<ASTTM<"08:30"t then do; AWLO=(astdt*86400)+(8.5*60*60); AWHI = AWLO + (4*60*60) + (15*60); end;
        else if ASTTM>"09:30"t then do; AWLO=(astdt*86400)+(9.5*60*60); AWHI = AWLO + (4*60*60) + (15*60); end;
        else if "08:30"t<= ASTTM<="09:30"t then do; AWLO=astdtm; AWHI = AWLO + (4*60*60) + (15*60); end;
        end;
    end;

    if nmiss (awlo, awhi) =0 then awrange=strip(put(awlo,datetime13.))||'-'||strip(put(awhi,datetime13.));

RUN;

data slxt2;
    set slxt2;
    format anl01fl $2. devn best. devwc $10.;

    if xtstat ne 'NOT DONE' then do;
        if astdtm<awlo and nmiss(astdtm,awlo) =0 then do;
            devn=floor((astdtm-awlo)/60);
            devwc=compress(put(floor((astdtm-awlo)/60),best.));
        end;
        else if aendtm>awhi and nmiss(aendtm,awhi)=0 then do;
            devn=ceil((aendtm-awhi)/60);
            devwc=compress(put(ceil((aendtm-awhi)/60),best.));
        end;
    end;

    IF NOT MISSING(DEVWC) THEN DO;
        IF INDEX(DEVWC,'-')=0 THEN DEVWC=CATS(CATS('+',DEVWC),' min');
        ELSE IF INDEX(DEVWC,'-') THEN DEVWC=CATS(DEVWC,' min');
    END;

    if awlo ^=. and awlo <= astdtm and aendtm <= awhi then anl01fl='Y';
/*     if paramcd not in ('NPC' 'TVOL' 'AVGVI' 'AVGDI' 'TDI' 'AVGQMI' 'AVGQCI' 'TII' 'AVGII' 'TDFI' 'TWI' 'AVGWI' 'AVGPMI' */
/*         'AVGPCI' 'SMINT' 'PTI' 'PFEQ' 'VITP_L' 'FNMUUVABS' 'MNMUVABS' 'PNMUUVABS' 'FNICOF' 'MNICOF' 'PNICOF') then anl01fl= '';*/
/**/
/*     IF AVALC='NA' THEN ANL01FL='';*/
run;

proc sort data = slxt2;
    by usubjid paramcd avisitn xtrefid xtdtc xtstdtc xtendtc xtseq;

```

```

run;

data slxt3;
  format anl02f1 $2.;
  set slxt2;
  by usubjid paramcd avisitn xtrefid xtdtc xtstdtc xtendtc xtseq;
/*   if substr(avisit,1,11) ^="Unscheduled" and paramcd in ('VITP_L' 'FNMUVABS' 'MNMUVABS' 'PNMUVABS' 'FNICOF' 'MNICOF' 'PNICOF' 'AN
PC' 'ATVOL' */
/*   'AAVGVI' 'AAVGDI' 'ATDI' 'AAVGQMI' 'AAVGQCI' 'ATII' 'AAVGII' 'ATDFI' 'ATWI' 'AAVGWI' 'AAVGPMI' 'AAVGPCI' 'ASMINT' 'APTI' 'AP
FEQ') */
/*   and xtstat ne 'NOT DONE' then do;*/
/*   if first.xtrefid then anl02f1='Y';   */
/*/*   IF AVALC='NA' THEN ANL02FL='';*/*/
/*   end;*/;
  if _n_ =1 then delete;
  if first.xtrefid then anl02f1='Y';
  if ablf1='Y' then do; chg=.; pchg=.; end;
  if TRTSDT=. then do; ablf1=''; base=.; end;
run;

*****;
* create output dataset ;
*****;
options replace;

proc sort data = slxt3 out=adx;
  by USUBJID AVISITN PARAMN XTREFID XTSEQ VIAL_NUM ASTDTM;
run;

%m_chglength(inds=adx,varlist=XTREFID PARCAT2, lenlist= $20 $1);

%m_attrib_adam (dset=ADXT);

data adam.adx (label="Smoking Profile Analysis Dataset");
  set adx;
run;

options noreplace;

proc printto; run;

%m_logchk;
*=====;
* END OF PROGRAM CODE ;
*=====;

```