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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 ;
%_mprintto;
%put NOTE:
=====;
%put NOTE: Covance Study Number : 000000106324;
%put NOTE: Client Protocol ID   : ZRHR-REXC-03-EU;
%put NOTE: Program Name        : d_2ADXT.sas;
%put NOTE: Purpose              : create ADXT dataset;
%put NOTE: ;
%put NOTE: Input Data           : STDLIB.ADXT SDTM.XT ADAM.ADSL;
%put NOTE: Output               : ADAM.ADXT;
%put NOTE: Macros Called        : _MPRINTTO;
%put NOTE: ;
%put NOTE: Programmed by        : cvn_kbooth;
%put NOTE: Creation Date        : 2014-05-05;
%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: 16May2014  KB        1) Used propcase for parcat;
%put NOTE: 16May2014  KB        2) Only kept non-rejected;
%put NOTE: 16May2014  KB        3) Amended PARAMCDs;
%put NOTE: 16May2014  KB        4) Removed ABLFL for per puff
parameters;
%put NOTE: 16May2014  KB        5) Added in check for minutes in time;
%put NOTE: 19May2014  KB        6) Amended ANL01FL for filter analysis;
%put NOTE: 19May2014  KB        7) Amended for propcase of PARCATs;
%put NOTE: 19May2014  KB        8) Amended PARAM for PFEQ;
%put NOTE: 19May2014  KB        9) Amended AWLO and AWHI derivation;
%put NOTE: 27May2014  KB        10) Amended issue with PARAMN;
%put NOTE: 27May2014  KB        11) Added in averages per visit per-
cigarette parameters;
%put NOTE: 28May2014  KB        12) Amended update 2;
%put NOTE: 28May2014  KB        13) Amended PARAMNs ;
%put NOTE: 28May2014  KB        14) Amended DTYPEs for averages;
%put NOTE: 28May2014  KB        15) Removed baselines from visits not
equal to day 0;
%put NOTE: 01Jun2014  KB        16) Added format of BEST. to AVISITN;
%put NOTE: 27Jul2014  KB        17) Added EXNOTRFL EXFL and ENFL;
%put NOTE: 06Aug2014  KB        18) Amended key variables;
%put NOTE: 06Aug2014  KB        19) Added VIAL_NUM to code;
%put NOTE: 14Sep2014  KB        20) Amended ABLFL;
%put NOTE: 15Sep2014  KB        21) Added new parameters for filter
analysis over each day;

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%put NOTE: 16Sep2014    KB           22) Dropped variables no longer needed;
%put NOTE: 16Sep2014    KB           23) Removed variables from summary;
%put NOTE: 16Sep2014    KB           24) Removed windows for filter
analysis;
%put NOTE: 17Sep2014    KB           25) Amended formats of variables to
amend file size;
%put NOTE: 17Sep2014    KB           26) Removed section regarding creation
of split files;
%put NOTE: ;
%put NOTE:
=====;
options notes source source2 nofullstimer validvarname=upcase missing='
';
ods _all_ close;
ods listing;

*=====;
* START OF PROGRAM CODE                                     ;
*=====;
*****;
* bring in ADSL ;
*****;

data adsl;
    set adam.adsl;
    keep studyid usubjid subjid: siteid age sex: race height weightb1
bmi ucpdgr1 ucpdgrln nicogr1 nicogrln targr1 targrln cob1
        enrfl scrffl complfl saffl fasfl pprotfl randfl trt: trt01:
tr01: dthfl EXFL ENFL EXNOTRFL; /* 17) KB 27Jul2014 */
run;

/* 12) START KB 28May2014 */
DATA REJECT;
    SET SDTM.SUPPXT(WHERE=(QNAM IN ('FILESTAT')));

    XTSEQ=INPUT(IDVARVAL,BEST.);

    KEEP USUBJID QNAM XTSEQ QVAL QLABEL;
RUN;

PROC SORT DATA=REJECT;
    BY USUBJID XTSEQ;
RUN;

PROC TRANSPOSE DATA=REJECT OUT=REJECT2(DROP=_:);
    BY USUBJID XTSEQ;
    VAR QVAL;
    ID QNAM;
    IDLABEL QLABEL;
RUN;

PROC SORT DATA=REJECT2;
    BY USUBJID XTSEQ;
RUN;

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DATA REJECT2A;
    MERGE SDTM.XT REJECT2;
    BY USUBJID XTSEQ;

    IF FILESTAT='REJECTED' THEN DELETE;
    DROP FILESTAT;
RUN;
/* 12) END KB 28May2014 */

data xt;
    set /*sdtm.xt*/REJECT2A(where=(xttestcd in ('NI' 'VI' 'DI' 'QMI'
'QCI' 'II' 'DFI' 'WI' 'PMI' 'PCI' 'RMI' 'RCI') AND XTSTAT NE 'NOT
DONE')); /* 11) KB 27May2014 */ /* 12) KB 28May2014 */
    keep usubjid xtrefid xttestcd xtcac xtscat visitnum visit xtdtc
xtstdtc xtendtc xtstresn;
run;

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

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

data npc2;
    set npc(drop=xttestcd);
    by usubjid xtrefid descending xtstresn;
    length xttestcd $8 xttest $40;
    format dtype $10.;

    if first.xtrefid and first.xtstresn;

    xttestcd='NPC';
    xttest='Total number of puffs';

    dtype='SUM';
run;

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

proc sort data=totals;
    by usubjid xtrefid xttestcd xtcac xtscat visitnum visit xtdtc xtstdtc
xtendtc;
run;

proc summary data=totals noprint;

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        by usubjid xtrefid xttestcd xtcat xtscat visitnum visit xtdtc xtstdtc
xtendtc;
        var xtstresn;
        output out=totals2(drop=_) sum=sum;
run;

data totals3;
    set totals2;
    length xttest $40;
    format dtype $10.;

    dtype='SUM';

    if xttestcd='DFI' then do;
        xttestcd='TDFI';
        xttest='Total smoking duration';
    end;
    else if xttestcd='DI' then do;
        xttestcd='TDI';
        xttest='Total puff duration';
    end;
    else if xttestcd='II' then do;
        xttestcd='TII';
        xttest='Total inter puff interval';
    end;
    else if xttestcd='PCI' then xttestcd='TPCI';
    else if xttestcd='PMI' then xttestcd='TPMI';
    else if xttestcd='QCI' then xttestcd='TQCI';
    else if xttestcd='QMI' then xttestcd='TQMI';
    else if xttestcd='RCI' then xttestcd='TRCI';
    else if xttestcd='RMI' then xttestcd='TRMI';
    else if xttestcd='VI' then do;
        xttestcd='TVOL';
        xttest='Total puff volume';
    end;
    else if xttestcd='WI' then do;
        xttestcd='TWI';
        xttest='Total work';
    end;

    rename sum=xtstresn;
run;

/* Only keep certain sums */
data totals4;
    set totals3(where=(xttestcd in ('TDFI' 'TVOL' 'TII' 'TDI' 'TWI')));
run;

/* Calculate averages */
data avg;
    set totals3(where=(xttestcd in ('TVOL' 'TDI' 'TQMI' 'TQCI' 'TII'
'TWI' 'TPMI' 'TPCI')) drop=xttest);
run;

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data npc3;
    set npc2;

    rename xtstresn=npc;
    keep usubjid xtrefid xtstresn visitnum visit;
run;

proc sort data=npc3;
    by usubjid xtrefid visitnum visit;
run;

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

data avg2;
    merge avg npc3;
    by usubjid xtrefid visitnum visit;
    length xttest $40;
    format dtype $10.;

    aval=xtstresn/npc;

    dtype=/'RATIO'/'AVERAGE'; /* 14) KB 28May2014 */

    if xttestcd='TDI' then do;
        xttestcd='AVGDI';
        xttest='Average puff duration';
    end;
    if xttestcd='TII' then do;
        xttestcd='AVGII';
        xttest='Average inter puff interval';
    end;
    if xttestcd='TPCI' then do;
        xttestcd='AVGPCI';
        xttest='Average Peak pressure drop';
    end;
    if xttestcd='TPMI' then do;
        xttestcd='AVGPMI';
        xttest='Average pressure drop';
    end;
    if xttestcd='TQCI' then do;
        xttestcd='AVGQCI';
        xttest='Average Peak flow';
    end;
    if xttestcd='TQMI' then do;
        xttestcd='AVGQMI';
        xttest='Average flow';
    end;
    if xttestcd='TVOL' then do;
        xttestcd='AVGVI';
        xttest='Average puff volume';
    end;
    if xttestcd='TWI' then do;

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        xttestcd='AVGWI';
        xttest='Average Work';
    end;

    drop xtstresn npc;
    rename aval=xtstresn;
run;

/* Smoking Intensity */
data smint;
    merge totals4(where=(xttestcd='TVOL')) totals4(where=(oldcd='TDFI'))
    keep=xtstresn xttestcd usubjid xtrefid xtcats xtscat visitnum visit
    rename=(xtstresn=tdfi xttestcd=oldcd));
    by usubjid xtrefid visitnum visit;
run;

data smint2;
    set smint;
    format dtype $10.;

    smint=xtstresn/tdfi;

    xttest='';
    xttestcd='';

    xttestcd='SMINT';
    xttest='Smoking Intensity';

    dtype='RATIO';

    drop xtstresn tdfi oldcd;
    rename smint=xtstresn;
run;

/* Puffing Time Index */
data pti;
    merge totals4(where=(xttestcd='TDI')) totals4(where=(oldcd='TDFI'))
    keep=xtstresn xttestcd usubjid xtrefid xtcats xtscat visitnum visit
    rename=(xtstresn=tdfi xttestcd=oldcd));
    by usubjid xtrefid visitnum visit;
run;

data pti2;
    set pti;
    format dtype $10.;

    pti=(100*xtstresn)/tdfi;

    xttest='';
    xttestcd='';

    xttestcd='PTI';
    xttest='Puffing Time Index';

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        dtype='RATIO';

        drop xtstresn tdfi oldcd;
        rename pti=xtstresn;
run;

/* Puff Frequency */
data pfreq;
    merge totals4(where=(xttestcd='TDFI')) npc3;
    by usubjid xtrefid visitnum visit;
run;

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

    pfeq=np/(xtstresn/60);

    xttest='';
    xttestcd='';

    xttestcd='PFEQ';
    xttest=/'Puffing Frequency'/'Puff Frequency'; /* 8) KB 19May2014 */

    dtype='RATIO';

    drop xtstresn npc;
    rename pfeq=xtstresn;
run;

/* Set per-cigarette parameters together from npc2 totals4 and avg2 */
data all;
    set npc2 totals4 avg2 smint2 pti2 pfreq2;
    format paramtyp /*$20.*/$10.; /* 25) KB 17Sep2014 */
    length xtstresc $200;

    paramtyp='DERIVED';

    if index(xttest,'Total') then do;
        xtstresc=compress(put(xtstresn,8.3));
    end;
    else if index(xttest,'Average') or xttestcd in ('SMINT' 'PFEQ' 'PTI')
then do;
        xtstresc=compress(put(xtstresn,8.4));
    end;

run;

/* 11) START KB 27May2014 */
PROC SORT DATA=ALL;
    BY USUBJID XTTESTCD XTTEST XTCAT XTDTC VISITNUM VISIT;
RUN;

PROC SUMMARY DATA=ALL NOPRINT;

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        BY USUBJID XTTESTCD XTTEST XTCAT XTDTN VISITNUM VISIT;
        VAR XTSTRESN;
        OUTPUT OUT=ALLAVG(DROP=_) MEAN=MEAN;
RUN;

DATA ALLAVG2;
    SET ALLAVG;
    LENGTH XTSTRESC $200;
    FORMAT PARAMTYP /*$20.*/$10. DTYPE $10.; /* 25) KB 17Sep2014 */

    PARAMTYP='DERIVED';
    DTYPE='AVERAGE';

    XTTESTCD=COMPRESS('A'||XTTESTCD);

    XTSTRESC=COMPRESS(PUT(MEAN,8.4));

    RENAME MEAN=XTSTRESN;
RUN;
/* 11) END KB 27May2014 */

*****;
* bring in XT ;
*****;
data xt2;
    length XTTEST $40 XTSTRESC $200;
    set /*sdtm.xt*/REJECT2A all ALLAVG2(IN=AVG); /* 11) KB 27May2014 */
/* 12) KB 28May2014 */
    format paramcd $8. parcat1 $35. parcat2 $25. param /*$200.*/$80.
    avisit /*$40.*/$10. paramn parcat1n parcat2n 8. aval AVISITN best. /*
16) KB 01Jun2014 */ /* 25) KB 17Sep2014 */
    avalc /*$200.*/$20. adt astdt aendt date9. ablfl $2. avalu
/*$20.*/$10. astdtm aendtm datetime13.; /* 25) KB 17Sep2014 */
    * parameter variables ;

    paramcd = strip(xttestcd);
    param = strip(xttest);
    parcat1=strip(PROPCASE(xtcat)); /* 1) KB 16May2014 */
    parcat2=strip(PROPCASE(xtscat)); /* 1) KB 16May2014 */

    if UPCASE(parcat1)='FILTER ANALYSIS' then parcat1n=1; /* 7) KB
19May2014 */
    else if UPCASE(parcat1)='VISUAL INSPECTION OF TOBACCO PLUG' then
parcat1n=2; /* 7) KB 19May2014 */
    else if UPCASE(parcat1)='TOPOGRAPHY' then parcat1n=3; /* 7) KB
19May2014 */

    if UPCASE(parcat2)='ANALYSIS FULL FILTER' then parcat2n=1; /* 7) KB
19May2014 */
    else if UPCASE(parcat2)='ANALYSIS MOUTHPIECE' then parcat2n=2; /* 7)
KB 19May2014 */
    else if UPCASE(parcat2)='ANALYSIS PLA + HAT' then parcat2n=3; /* 7)
KB 19May2014 */

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    else if UPCASE(parcat2)='EXTRACTION' then parcat2n=4; /* 7) KB
19May2014 */

    if parcat2 not in ('' /*'EXTRACTION'*/'Extraction') then
param=strip(propcase(parcat2))||' '||strip(param); /* 1) KB 16May2014 */
    if index(param,'Pla') then param=tranwrd(param,' Pla',' PLA');

    if paramcd='ABUVTABS' then do;
        if parcat2n=1 then paramcd='*FABUCTAB'/'FABUVTAB'; /* 3) KB
16May2014 */
        else if parcat2n=2 then paramcd='*MABUCTAB'/'MABUVTAB'; /* 3)
KB 16May2014 */
        else if parcat2n=3 then paramcd='*PABUCTAB'/'PABUVTAB'; /* 3)
KB 16May2014 */
    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='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;

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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='/*'FABUCTAB'*/'FABUVTAB' then paramn=35; /* 10) KB
27May2014 */
else if paramcd='FNICO' then paramn=34;
else if paramcd='FNMUVABS' then paramn=36;
else if paramcd='MNICOF' then paramn=37;
else if paramcd='/*'MABUCTAB'*/'/*'MABUVTAB'*/'MNICO' then paramn=38;
/* 10) KB 27May2014 */ /* 13) KB 28May2014 */
else if paramcd='/*'MNICO'*/'MABUVTAB' then paramn=39; /* 13) KB
28May2014 */
else if paramcd='MNMUVABS' then paramn=40;
else if paramcd='PNICOF' then paramn=41;
else if paramcd='/*'PABUCTAB'*/'/*'PABUVTAB'*/'PNICO' then paramn=42;
/* 10) KB 27May2014 */ /* 13) KB 28May2014 */
else if paramcd='/*'PNICO'*/'PABUVTAB' then paramn=43; /* 13) KB
28May2014 */
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;
/* 11) START KB 27May2014 */
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='AAVGQMI' 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='APTI' THEN PARAMN=65;
ELSE IF PARAMCD='APFEQ' THEN PARAMN=66;
/* 11) END KB 27May2014 */
else if paramcd='HSTALL' then paramn=99;

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* analysis variables ;

aval = xtstresn;
avalc = propcase(xtstresc, '.');
if not missing(aval) then do;
    avalc=trim(left(put(aval, best32.)));
    aval=input(avalc,best32.);
end;
valu = strip(xtstresu);
if paramtyp='DERIVED' then do;
    if paramcd in ('TVOL' 'AVGVI' 'ATVOL' 'AAVGVI') then
avalu=strip('mL'); /* 11) KB 27May2014 */
    else if paramcd in ('AVGDI' 'TDI' 'TII' 'AVGII' 'TDFI' 'AAVGDI'
'ATDI' 'ATII' 'AAVGII' 'ATDFI') then avalu=strip('s'); /* 11) KB
27May2014 */
    else if paramcd in ('AVGQMI' 'AVGQCI' 'SMINT' 'AAVGQMI' 'AAVGQCI'
'ASMINT') then avalu=strip('mL/s'); /* 11) KB 27May2014 */
    else if paramcd in ('TWI' 'AVGWI' 'ATWI' 'AAVGWI') then
avalu=strip('mJ'); /* 11) KB 27May2014 */
    else if paramcd in ('AVGPMI' 'AVGPCI' 'AAVGPMI' 'AAVGPCI') then
avalu=strip('mmWg'); /* 11) KB 27May2014 */
    else if paramcd/*=*/ IN ('PTI' 'APTI') then avalu=strip('%'); /*
11) KB 27May2014 */
    else if paramcd/*=*/ IN ('PFEQ' 'APFEQ') then
avalu=strip('puffs/min'); /* 11) KB 27May2014 */
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 ('FNMUUVABS' 'PNMUUVABS' 'MNMUUVABS') then
param=strip(param)||' '||strip('(per filter)');
end;

IF AVG THEN PARAM=COMPBL(PARAM||' (average over visit)'); /* 11) KB
27May2014 */

* baseline flag;
IF PARCAT1 NE 'Topography' THEN DO; /* 4) KB 16May2014 */
    ablfl=xtblfl;
END; /* 4) KB 16May2014 */
if xtstat='NOT DONE' and ablfl='Y' then ablfl='';

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

* dates;

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        adt = input(xtdtc, yymmdd10.);
        asstdt=input(scan(xtstdtc,1,'T'), yymmdd10.);
        aendt=input(scan(xtendtc,1,'T'), yymmdd10.);
/* 5) START KB 16May2014 */
        IF LENGTH(XTSTDTC)>13 THEN DO;
            asttm=input(scan(xtstdtc,2,'T'), time5.);
            asstdtm=dhms(asstdt, hour(asttm), minute(asttm), 0);
        END;
        IF LENGTH(XTENDTC)>13 THEN DO;
            aentm=input(scan(xtendtc,2,'T'), time5.);
            aendtm=dhms(aendt, hour(aentm), minute(aentm), 0);
        END;
/* 5) END KB 16May2014 */

        if paramtyp='DERIVED' then do;
            xtdtc='';
            xtstdtc='';
            xtendtc='';
            visit='';
            visitnum=.;
        end;

        keep usubjid xtseq xtrefid xtgrpid param: parcat: aval: ablfl
avisit: xtstat xtreasnd xtdtc xtdy xtstdtc xtendtc xtstdy
        epoch xtspid xteval dtype adt asstdt aendt asstdtm aendtm;
run;

data suppxt;
    set sdtm.suppxt(where=(qnam in ('SODENUM' 'SOSHNUM' 'FILTNUM'
/*'FILESTAT'*/ 'VIAL_NUM'))); /* 2) KB 16May2014 */ /* 12) KB 28May2014
*/ /* 19) KB 06Aug2014 */

    xtseq=input(idvarval,best.);

    keep usubjid qnam xtseq qval qlabel;
run;

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

proc transpose data=suppxt out=suppxt2(drop=_:);
    by usubjid xtseq;
    var qval;
    id qnam;
    idlabel qlabel;
run;

proc sort data=xt2;
    by usubjid xtseq;
run;

data xt2a;
    merge xt2(IN=A) suppxt2; /* 12) KB 28May2014 */

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    by usubjid xtseq;
    IF A; /* 12) KB 28May2014 */

    /*IF FILESTAT='REJECTED' THEN DELETE; *//* 2) KB 16May2014 */ /* 12)
KB 28May2014 */
    /*    DROP FILESTAT;*/ /* 12) KB 28May2014 */
run;

*****;
* change from baseline ;
*****;

/* Making sure that ABLFL is set for the average per visit per-cigarette
parameters */
data xt2b;
    set xt2a(where=(/*paramtyp='DERIVED'*/PARAMN IN (50 51 52 53 54 55 56
57 58 59 60 61 62 63 64 65 66))); /* 11) KB 27May2014 */
run;

    /* 20) START KB 14Sep2014 */
/*proc sort data=xt2b;*/
/*    by usubjid paramn avisitn*/ /*xtrefid*//*;*/ /* 11) KB 27May2014 */
/*run;*/

DATA SV;
    SET SDTM.SV(WHERE=(VISIT=('DAY 1')));
    FORMAT DAY DATE9.;

    DAY=INPUT(SCAN(SVSTDTC,1,'T'),YYMMDD10.);
    KEEP USUBJID DAY;
RUN;

PROC SORT DATA=XT2B;
    BY USUBJID;
RUN;

PROC SORT DATA=SV;
    BY USUBJID;
RUN;

DATA XT2BA;
    MERGE XT2B(IN=A) SV;
    BY USUBJID;
    IF A;
RUN;

DATA ADSLTM;
    SET ADAM.ADSL;
    WHERE TRT01A IN ('CC' 'THS 2.2' 'SA');

    KEEP USUBJID TRTSDTM TRT01A;
RUN;

DATA XT2BB;

```

```

MERGE XT2BA(IN=A) ADSLTM;
BY USUBJID;
IF A;
RUN;
/* 20) END KB 14Sep2014 */

data xt2c;
  set /*xt2b*/XT2BB; /* 20) KB 14Sep2014 */
/* 20) START KB 14Sep2014 */
  /*by usubjid paramn avisitn /*xtrefid*//*;*/ /* 11) KB 27May2014 */

  /* if (first.paramn and first.avisitn/* and first.xtrefid*/) then
ablfl2='Y';*/ /* 11) KB 27May2014 */

  /* IF AVISITN NE 100 THEN ABLFL2='';*/ /* 15) KB 28May2014 */

  IF NOT MISSING(DAY) THEN DO;
    IF ADT<DAY AND INDEX(UPCASE(AVISIT),'UNSCHED')=0 THEN ABLFL2='Y';
  END;
  ELSE IF MISSING(DAY) THEN DO;
    IF INDEX(UPCASE(AVISIT),'UNSCHED')=0 THEN ABLFL2='Y';
  END;
/* 20) END KB 14Sep2014 */

  keep usubjid paramn avisitn /*xtrefid*/ ablfl2; /* 11) KB 27May2014
*/
run;

proc sort data=xt2c(where=(ablfl2='Y'));
  by usubjid paramn avisitn /*xtrefid*/; /* 11) KB 27May2014 */
run;

proc sort data=xt2a;
  by usubjid paramn avisitn /*xtrefid*/; /* 11) KB 27May2014 */
run;

data xt3;
  merge xt2a xt2c;
  by usubjid paramn avisitn /*xtrefid*/; /* 11) KB 27May2014 */

/* if ablfl2='Y' then ablfl='Y';*/ /* 20) KB 14Sep2014 */
run;

/* 20) START KB 14Sep2014 */
PROC SORT DATA=XT3;
  BY USUBJID PARAMN AVISITN;
RUN;

DATA XT3A;
  SET XT3;
  BY USUBJID PARAMN AVISITN;
  IF LAST.AVISITN AND ABLFL2='Y' THEN ABLFL=STRIP('Y');
RUN;
/* 20) END KB 14Sep2014 */

```

```

proc sort data = /*xt3*/XT3A; /* 20) KB 14Sep2014 */
  by usubjid paramn parcat1 /*xtrefid*/; /* 11) KB 27May2014 */
run;

data base(keep = usubjid paramn base: parcat1);
  set /*xt3*/XT3A(where = (ablfl = 'Y')); /* 20) KB 14Sep2014 */
  format base best.;
  by usubjid paramn parcat1 /*xtrefid*/; /* 11) KB 27May2014 */

  if first.paramn /*and first.xtrefid*/; /* 11) KB 27May2014 */
    base = aval;
run;

data change;
  merge /*xt3*/XT3A base; /* 20) KB 14Sep2014 */
  by usubjid paramn parcat1;
  format chg pchg best.;
  if avisitn gt 100 then do;
    chg = aval - base;
    if base ne 0 then do;
      pchg=100*(chg/base);
    end;
    else do;
      pchg=100*(chg/1);
    end;
  end;
run;

proc sort data=change;
  by usubjid;
run;

/* 21) START KB 15Sep2014 */
DATA FILT;
  SET CHANGE;
  WHERE PARCAT1='Filter Analysis' AND PARCAT2 NE 'Extraction' AND
  XTSTAT NE 'NOT DONE';
  KEEP USUBJID AVISITN AVISIT PARCAT1N PARCAT1 PARCAT2N PARCAT2 AVAL
  AVALU PARAMCD PARAM PARAMN XTDTC /*XTSTDTC XTENDTC*/; /* 23) KB 16Sep2014 */
RUN;

PROC SORT DATA=FILT;
  BY USUBJID AVISITN AVISIT PARCAT1N PARCAT1 PARCAT2N PARCAT2 AVALU
  PARAMCD PARAM PARAMN XTDTC /*XTSTDTC XTENDTC*/; /* 23) KB 16Sep2014 */
RUN;

PROC SUMMARY DATA=FILT NOPRINT;
  BY USUBJID AVISITN AVISIT PARCAT1N PARCAT1 PARCAT2N PARCAT2 AVALU
  PARAMCD PARAM PARAMN XTDTC /*XTSTDTC XTENDTC*/; /* 23) KB 16Sep2014 */
  VAR AVAL;
  OUTPUT OUT=FILT2 (DROP=_:) SUM=SUM;
RUN;

```

```

DATA FILT3;
  SET FILT2;
  FORMAT AVAL BEST32. AVALC /*$200.*/$20. /* 25) KB 17Sep2014 */
  PARAMTYP /*$20.*/$10. DTYPE $10. ADT /*ASTDT AENDT*/ DATE9. /*ASTDTM
AENDTM DATETIME13. ASTTM AENTM TIME5.*/; /* 23) KB 16Sep2014 */ /* 25)
KB 17Sep2014 */

  AVALC=STRIP(PUT(SUM,BEST32.));
  AVAL=INPUT(AVALC,BEST32.);

  PARAMCD=STRIP('T')||STRIP(SUBSTR(PARAMCD,1,7));
  PARAM=STRIP(PARAM)||' (total over visit)';
  PARAMN=PARAMN+34;

  PARAMTYP='DERIVED';
  DTYPE='SUM';

  ADT = INPUT(XTDTC,YMMDD10.);
/* 23) START KB 16Sep2014 */
/*   ASTDT=INPUT(SCAN(XTSTDTC,1,'T'),YMMDD10.);*/
/*   AENDT=INPUT(SCAN(XTENDTC,1,'T'),YMMDD10.);*/
/*   IF LENGTH(XTSTDTC)>13 THEN DO;*/
/*       ASTTM=INPUT(SCAN(XTSTDTC,2,'T'),TIME5.);*/
/*       ASTDTM=DHMS(ASTDT,HOUR(ASTTM),MINUTE(ASTTM),0);*/
/*   END;*/
/*   IF LENGTH(XTENDTC)>13 THEN DO;*/
/*       AENTM=INPUT(SCAN(XTENDTC,2,'T'),TIME5.);*/
/*       AENDTM=DHMS(AENDT,HOUR(AENTM),MINUTE(AENTM),0);*/
/*   END;*/
/* 23) END KB 16Sep2014 */

  FILTFL=1;

  DROP SUM XTDTC /*XTSTDTC XTENDTC*/; /* 23) KB 16Sep2014 */
RUN;

DATA CHANGEA;
  SET FILT3/*(IN=A)*/ CHANGE;
/*   IF A THEN FILTFL=1;*/
RUN;

PROC SORT DATA=CHANGEA;
  BY USUBJID PARAMCD;
RUN;
/* 21) END KB 15Sep2014 */

*****;
* Combine ADSL and XT data *;
*****;
* treatment period;
*_mtotper;

```



```

data slxt(drop = trt01: tr01:);
  merge adsl /*change*/CHANGEA(in = a); /* 21) KB 15Sep2014 */
  by usubjid;
  if a;      * only include subjects with data ;
  format aperiod trtan trtpn astday aday 8. trta trtp $40. aperiodc
$10.;
  astday = astdt - trtsdt + 1;
  aday=adt - trtsdt+1;
  * allocate tretament and period;
  %_mperall(dvar1 = astdtm, dvar2 = astdt);
  aperiodc = 'Period ' || put(aperiod,1.);
run;

/* Windows */
data slxt2;
  set slxt;
  format awlo awhi datetime13. awrange /*$80.*/$40. anl01fl $2. devn
best. devwc $10.; /* 25) KB 17Sep2014 */

  if /*parcat1='TOPOGRAPHY'*/(PARAMCD IN ('NPC' 'TVOL' 'AVGVI' 'AVGDI'
'TDI' 'AVGQMI' 'AVGQCI' 'TII' 'AVGII' 'TDFI' 'TWI' 'AVGWI' 'AVGPMI' /*
9) KB 19May2014 */
    'AVGPCI' 'SMINT' 'PTI' 'PFEQ' /*'VITP_L' 'FNMUVABS' 'MNMUVABS'
'PNMUVABS' 'FNICOF' 'MNICOF' 'PNICOF'*/) /*OR FILTFL=1*/) and xtstat ne
'NOT DONE' then do; /* 9) KB 19May2014 */ /* 21) KB 15Sep2014 */ /* 24)
KB 16Sep2014 */
    awlo=dhms(astdt,6,30,0);
    awhi=dhms(aendt,23,0,0);
    if not missing(awlo) and not missing(awhi) then do;
      awrange=strip(put(awlo,datetime13.))||'-
'||strip(put(awhi,datetime13.));
    end;
  end;

  if xtstat ne 'NOT DONE' then do;
    if astdtm<awlo then do;
      devn=floor((astdtm-awlo)/60);
      devwc=compress(put(floor((astdtm-awlo)/60),best.));
    end;
    else if aendtm>awhi 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 <= astdtm and aendtm <= awhi) and xtstat ne 'NOT DONE' then
anl01fl='Y';
  if (paramcd not in ('NPC' 'TVOL' 'AVGVI' 'AVGDI' 'TDI' 'AVGQMI'
'AVGQCI' 'TII' 'AVGII' 'TDFI' 'TWI' 'AVGWI' 'AVGPMI'

```

```

        'AVGPCI' 'SMINT' 'PTI' 'PFEQ' /*'NICOAMTF' 'NMUVABSF'*/ 'VITP_L'
'FNMUVABS' 'MNMUVABS' 'PNMUVABS' 'FNICOF' 'MNICOF' 'PNICOF') OR FILTFL NE
1) then anl01fl=' '; /* 6) KB 19May2014 */ /* 21) KB 15Sep2014 */

```

```

proc sort data = slxt2;
    by usubjid paramn avisit xtrefid;
run;

```

```

data slxt3(drop=ablfl2 FILTFL); /* 22) KB 16Sep2014 */
    set slxt2;
    by usubjid paramn avisit xtrefid;

```

```

        if /*first.xtrefid and*/ upcase(index(avisit,'UNSCH'))=0 and (paramcd
in (/*'NPC' 'TVOL' 'AVGVI' 'AVGDI' 'TDI' 'AVGQMI' 'AVGQCI' 'TII'
'AVGII'*/ /* 11) KB 27May2014 */
        /*'TDFI' 'TWI' 'AVGWI' 'AVGPMI' 'AVGPCI' 'SMINT' 'PTI' 'PFEQ'*/
/*'NICOAMTF' 'NMUVABSF'*/ 'VITP_L' 'FNMUVABS' 'MNMUVABS' 'PNMUVABS'
'FNICOF' 'MNICOF' 'PNICOF'
        'ANPC' 'ATVOL' 'AAVGVI' 'AAVGDI' 'ATDI' 'AAVGQMI' 'AAVGQCI'
'ATII' 'AAVGII' 'ATDFI' 'ATWI' 'AAVGWI' 'AAVGPMI' 'AAVGPCI' 'ASMINT'
'APTI' 'APFEQ') OR FILTFL=1) and xtstat ne 'NOT DONE' then anl02fl='Y';
/* 6) KB 19May2014 */ /* 21) KB 15Sep2014 */
run;

```

```

/* 25) START KB 17Sep2014 */
/*CHECKING THAT INPUT OF AVALC IS SAME AS AVAL*/
DATA SLXT3A;
    SET SLXT3;
    FORMAT CHECK BEST32.;

    IF INDEX(AVALC,'NA')=0 THEN DO;
    CHECK=INPUT(AVALC,BEST32.);
    END;

```

```

    IF CHECK NE AVAL THEN PUT "WARN" "ING: Check AVALs";
RUN;
/* 25) END KB 17Sep2014 */

```

```

*****;
* create output dataset ;
*****;

```

```

options replace;

```

```

data adxt;
    set stdlib.adxt slxt3;
    format aval base chg pchg best32.;
run;

```

```

proc sort data = adxt out = adam.adxt(label = 'Smoking Profile Analysis
Dataset');
/*    by usubjid avisitn astdtm paramcd;*/
    BY USUBJID PARCAT1 AVISITN PARAMCD XTREFID XTGRPID XTSPID VIAL_NUM
ASTDTM; /* 18) KB 06Aug2014 */

```

```

run;

/* 26) START KB 17Sep2014 */
/*data adam.ADXTTOPP adam.ADXTTOPC adam.ADXTFIL adam.ADXTVIS;*/
/*      set adam.adxt;*/
/*      if parcat1='Filter Analysis' then output adam.ADXTFIL;*/
/*      else if parcat1='Visual Inspection Of Tobacco Plug' then output
adam.ADXTVIS;*/
/*      else if parcat1='Topography' and index(upcase(param),'PUFF') then
output adam.ADXTTOPP;*/
/*      else if parcat1='Topography' and index(upcase(param),'PUFF')=0
then output adam.ADXTTOPC;*/
/*run;*/
/* 26) END KB 17Sep2014 */

options noreplace;
proc printto; run;
*=====;
* END OF PROGRAM CODE                               ;
*=====;

```