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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 : 000000106326;
%put NOTE: Client Protocol ID : ZRHM-PK-05-JP;
%put NOTE: Program Name : d_2ADXP.sas;
%put NOTE: Purpose : create ADXP dataset;
%put NOTE: ;
%put NOTE: Input Data : STDLIB.ADXP SDTM.XP SDTM.SUPPXP;
%put NOTE: Output : ADAM.ADXP;
%put NOTE: Macros Called : _MPRINTTO _MTOTPER _MPERALL;
%put NOTE: ;
%put NOTE: Programmed by : cvn_jhardman;
%put NOTE: Creation Date : 2014-01-03;
%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: 14Jan2014 JMH 1) Amended code to pick up
unschedleds and set ANL01FL to missing;
%put NOTE: 14Jan2014 KB 2) Amended update 1;
%put NOTE: 14Apr2014 KB 3) Removed ASTDAY ASTDT and ASTDTM;
%put NOTE: 14Apr2014 KB 4) Amended APERIOD to use ADAY;
%put NOTE: 14Apr2014 KB 5) Amended drop of DTYPE and PARAMTYP;
%put NOTE: 14Apr2014 KB 6) Added PARAMNs for BRONCHO and DOSE;
%put NOTE: 14Apr2014 KB 7) Amended derivation of PARCAT1;
%put NOTE: 14Apr2014 KB 8) Added in derived FEVFVC;
%put NOTE: 14Apr2014 KB 9) Amended derivation of PARAM and
PARAMCD;
%put NOTE: 14Apr2014 KB 10) Removed SDTM variables for DFEVFVC;
%put NOTE: 14Apr2014 KB 11) Added in XPALL;
%put NOTE: 14Apr2014 KB 12) Amended ABLFL;
%put NOTE: 14Apr2014 KB 13) Amended ANL01FL in case of XPSTAT
equal to not done;
%put NOTE: 14Apr2014 KB 14) Added TRTSTMF to scramble macro;
%put NOTE: 14Apr2014 KB 15) Added XPMETHOD to drop;
%put NOTE: 06Aug2014 KB 16) Added EXNOTRFL to keep;
%put NOTE: 06Aug2014 KB 17) Amended format issue;
%put NOTE: 06Aug2014 KB 18) Removed XPCLSIG from keep as it
does not exist;
%put NOTE: 21Sep2014 KB 19) Amended ABLFL;
%put NOTE:
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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 ucpdgr: nicogr: targr:
        enrfl scrffl complfl saffl randfl trt: tr01: tr02: dthfl
enfl exfl fupfl anal: EXNOTRFL; /* 16) KB 06Aug2014 */
run;

proc sort data = adsl;
    by usubjid;
run;

*****;
* pick up SUPPXP ;
*****;

/* SDTM.SUPPXP is not currently available, uncomment later */
/*proc transpose data = sdtm.suppxp out = suppxp(drop = _:) prefix = v;*/
/*    var qval;*/
/*    by usubjid idvarval;*/
/*    id qnam;*/
/*    idlabel qlabel;*/
/*run;*/
/**/
/*data suppxp2(drop = vxpcsig);*/
/*    set suppxp;*/
/*    format xpseq 8. xpclsig $2.;*/
/*    xpseq = input(idvarval,best.);*/
/*    if vxpcsig = 'NCS' then xpclsig = 'N';*/
/*    else if vxpcsig = 'CS' then xpclsig = 'Y';*/
/*run;*/
/**/
/*proc sort data = suppxp2;*/
/*    by usubjid xpseq;*/
/*run;*/

*****;
* calculate FEV1/FVC ;
*****;

proc sort data = sdtm.xp out = xp;
    by usubjid xpcat visitnum;

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run;

/*data ratio(drop = fev1 fvc);*/
/*  merge xp(where = (xptestcd = 'FEV1MEAS') rename = (xpstresn =
fev1)) */
/*          xp(where = (xptestcd = 'FVCMEAS') rename = (xpstresn = fvc)
keep = usubjid xpcat visitnum xptestcd xpstresn);*/
/*  by usubjid xpcat visitnum;*/
/*  xptestcd = 'FEV1FVC';*/
/*  xptest = 'Check calculated ratio between FEV1/FVC';*/
/*  xpstresn = round((fev1 / fvc),0.01);*/
/*  xpstresc = left(trim(put(xpstresn,5.2)));*/
/*  xporres = trim(xpstresc);*/
/*  xporresu = ' ';*/
/*  xpstresu = ' ';*/
/*  xpseq=.;*/
/*run;          */

/* 8) START KB 14Apr2014 */
PROC SORT DATA=XP(WHERE=(XPTTESTCD='FEV1FVC' AND NOT MISSING (XPSTRESN)
AND XPSTAT NE 'NOT DONE')) OUT=XPA NODUPKEY;
    BY USUBJID XPSCAT VISITNUM;
RUN;

DATA XP1A;
    SET XPA;

    PRESENT=1;

    KEEP USUBJID XPSCAT PRESENT VISITNUM;
RUN;

PROC SORT DATA=XP;
    BY USUBJID XPSCAT VISITNUM;
RUN;

DATA XPPRESENT;
    MERGE XP XP1A;
    BY USUBJID XPSCAT VISITNUM;
RUN;

DATA RATIO(DROP = FEV1 FVC PRESENT);
    MERGE XPPRESENT(WHERE = (XPTTESTCD = 'FEV1MEAS' AND PRESENT NE 1)
RENAME = (XPSTRESN = FEV1))
        XPPRESENT(WHERE = (XPTTESTCD = 'FVCMEAS' AND PRESENT NE 1)
RENAME = (XPSTRESN = FVC) KEEP = USUBJID XPCAT VISITNUM XPTTESTCD XPSTRESN
PRESENT);
    BY USUBJID XPCAT VISITNUM;
    XPTTESTCD = 'DFEV1FVC';
    XPTTEST = 'Ratio between FEV1/FVC (Derived)';
    XPSTRESN = ROUND((FEV1 / FVC),0.01);
    XPSTRESC = LEFT(TRIM(PUT(XPSTRESN,5.2)));
    XPORRES = TRIM(XPSTRESC);
    XPORRESU = ' ';

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        XPSTRESU ='RATIO';
        XPSEQ=.;

RUN;
    /* 8) END KB 14Apr2014 */
    *****;
    * Add to XP;
    *****;

data xp2;
    set xp /*ratio*/RATIO; /* 8) KB 14Apr2014 */
run;

    *****;
    * bring in XP    ;
    *****;
proc sort data = xp2;
    by usubjid xpseq;
run;

data xp3;
    SET/*merge*/ xp2 /*suppxp2*/;
    by usubjid xpseq;
    format paramcd $8. param $80. parcat1 avisit $40. avisitn paramn 8.
    aval best. avalc desc $200. avalu paramtyp dtype $20. /*ablfl $1.*/ adtm
    /*astdtm*/ datetime13. /* 3) KB 14Apr2014 */ /* 19) KB 21Sep2014 */
    adt /*astdt*/ date9.; /* 3) KB 14Apr2014 */

    * parameters ;
    if index(/*xpcat*/XPSCAT,'WITH ') then do; /* 9) KB 14Apr2014 */
        paramcd = 'W' || trim(compress(xptestcd,'1'));
        param = trim(xptest) || ' (with bronchodilator)';
    end;
    else do;
        paramcd = trim(compress(xptestcd,'1'));
        param = trim(xptest);
    end;

    if paramcd = 'WBRONCHO' then paramn = 1;
    else if paramcd = 'WDOSE' then paramn = 2;
    else if paramcd = 'WFVCPRED' then paramn = 3;
    else if paramcd = 'WFVCMEAS' then paramn = 4;
    else if paramcd = 'WFVCPCT' then paramn = 5;
    else if paramcd = 'WFEVMEAS' then paramn = 6;
    else if paramcd = 'WFEVPRED' then paramn = 7;
    else if paramcd = 'WFEVPCT' then paramn = 8;
    else if paramcd = 'WFEVFVC' then paramn = 9;
    else if paramcd = 'WINTP' then paramn = 10;
    else if paramcd = 'WFEVFC' then paramn = 11;
    else if paramcd = 'FVCPRED' then paramn = 12;
    else if paramcd = 'FVCMEAS' then paramn = 13;
    else if paramcd = 'FVCPCT' then paramn = 14;
    else if paramcd = 'FEVMEAS' then paramn = 15;
    else if paramcd = 'FEVPRED' then paramn = 16;

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        else if paramcd = 'FEVPCT' then paramn = 17;
        else if paramcd = 'FEVFVC' then paramn = 18;
/*      else if paramcd = 'FEVFC' then paramn = 20;*/
ELSE IF PARAMCD = 'DFEVFVC' THEN PARAMN=20; /* 8) KB 14Apr2014 */
        else if paramcd = 'INTP' then paramn = 19;
ELSE IF PARAMCD='BRONCHO' THEN PARAMN=21; /* 6) KB 14Apr2014 */
ELSE IF PARAMCD='DOSE' THEN PARAMN=22; /* 6) KB 14Apr2014 */
ELSE IF PARAMCD='XPALL' THEN PARAMN=30; /* 11) KB 14Apr2014 */

/*      parcat1 = trim(xpcat);*/
PARCAT1=STRIP(XPCAT); /* 7) KB 14Apr2014 */

        if xptestcd = 'FEVFC' or xptestcd='WFEVFC' OR
XPTESTCD='DFEVFVC' then do; /* 8) KB 14Apr2014 */
            paramtyp = 'DERIVED';
            dtype = 'RATIO';
        end;

        * analysis variables;
        aval = xpstresn;
        if xptestcd = 'INTP' then do;
            if index(xpstresc,'ABNORMAL') then do;
                avalc = propcase(scan(xpstresc,1,'-'));
                desc = propcase(scan(xpstresc,2,'-'));
            end;
            else avalc = propcase(xpstresc);
        end;
        else if xptestcd = 'BRONCHO' then avalc = propcase(xpstresc);
        else avalc = trim(xpstresc);
        avalu = trim(xpstresu);

/* Baseline */
/* 12) START KB 14Apr2014 */
/*      ablfl = xpblfl;*/
/*      IF VISIT='DAY -1' AND XPSTAT NE 'NOT DONE' THEN ABLFL='Y'; */ /*
19) KB 21Sep2014 */
/* 12) END KB 14Apr2014 */

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

        * dates;
/*      if length(xpdtc) gt 10 then adtm = input(xpdtc,e8601dt.);*/
        IF LENGTH(XPDTTC) GT 10 THEN ADTM =
DHMS(INPUT(SCAN(XPDTTC,1,'T'),YYMMDD10.),HOUR(INPUT(SCAN(XPDTTC,2,'T'),TIME
5.)),MINUTE(INPUT(SCAN(XPDTTC,2,'T'),TIME5.)),0); /* 17) KB 06Aug2014 */
        if not missing(adtm) then adt=datepart(adtm);
        else adt = input(xpdtc,yyymmdd10.);

        /* Dates for working out periods */
/* 3) START KB 14Apr2014 */
/*      if length(xpstdtc) gt 10 then astdtm = input(xpstdtc,e8601dt.);*/
/*      if not missing(astdtm) then astdt = datepart(astdtm);*/

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/*      else if length(xpstdtc) = 10 then astdt =
input(xpstdtc,yymmdd10.);*/
/* 3) END KB 14Apr2014 */

      keep usubjid /*xpclsig*/ xpseq param: parcat1 xpmethod aval:
/*ablfl*/ xpstat xpreasnd visit visitnum avisit: xpdtc xpdym adtm adt /*
18) KB 06Aug2014 */ /* 19) KB 21Sep2014 */
      paramtyp dtype desc epoch /*astdt*/; /* 3) KB 14Apr2014 */
run;

*****;
* Calculate changes from baseline (D0) ;
*****;
/* 19) START KB 21Sep2014 */
DATA ADSL2;
  SET ADAM.ADSL;
  FORMAT TESTDTM DATETIME16.;

  IF DTESTDTM=PTESTDTM= . THEN DELETE;

  TESTDTM=MIN(DTESTDTM,PTESTDTM);

  KEEP USUBJID TESTDTM;
RUN;

PROC SORT DATA=XP3;
  BY USUBJID;
RUN;

DATA XP3A;
  MERGE XP3 ADSL2;
  BY USUBJID;
RUN;

DATA XP3B;
  SET XP3A;
  WHERE XPSTAT NE 'NOT DONE' AND
INDEX(UPCASE(AVISIT),'UNSCHEDULED')=0 AND INDEX(PARAMCD,'XPALL')=0;

  IF ADTM= . AND ADT NE . THEN DO;
    IF ADT LE DATEPART(TESTDTM) THEN TESTBASE='Y';
  END;
  ELSE IF ADTM NE . THEN DO;
    IF ADTM<TESTDTM THEN TESTBASE='Y';
  END;

  IF TESTDTM= . AND AVISIT IN ('Screening' 'Day -1') THEN TESTBASE='Y';
RUN;

PROC SORT DATA=XP3B(WHERE=(TESTBASE='Y')) OUT=XP3C;
  BY USUBJID PARAMCD AVISITN;
RUN;

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DATA XP3D;
  SET XP3C;
  BY USUBJID PARAMCD AVISITN;
  FORMAT ABLFL $1.;

  IF LAST.PARAMCD AND LAST.AVISITN THEN ABLFL='Y';
RUN;

DATA XP3E;
  SET XP3D(WHERE=(ABLFL='Y'));

  KEEP USUBJID PARAMCD AVISITN ABLFL;
RUN;

PROC SORT DATA=XP3A;
  BY USUBJID PARAMCD AVISITN;
RUN;

PROC SORT DATA=XP3E;
  BY USUBJID PARAMCD AVISITN;
RUN;

DATA XPBASES (DROP=TESTDTM);
  MERGE XP3A XP3E;
  BY USUBJID PARAMCD AVISITN;
RUN;
/* 19) END KB 21Sep2014 */

proc sort data = /*xp3*/XPBASES; /* 19) KB 21Sep2014 */
  by usubjid paramn avisitn;
run;

* baseline ;
data base;
  set /*xp3*/XPBASES(where = (ablfl = 'Y')); * check SDTM.XP has
VSBLFL correct to SAP ; /* 19) KB 21Sep2014 */
  format base best. basec $200.;
  base = aval;
  basec = avalc;
  bvis = visitnum; * keep to make sure only calculate change after
baseline ;

  keep usubjid paramn base basec bvis;
run;

* change ;
data change(drop = bvis);
  merge /*xp3*/XPBASES base; /* 19) KB 21Sep2014 */
  by usubjid paramn;
  format chg best. shift1 $50.;
  if avisitn gt bvis then do;
    chg = aval - base;
    if avalc ne '' then do;

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        if paramcd = 'INTP' then shift1 = trim(basec) || ' to '
||trim(avalc);
        end;
        end;
run;

proc sort data=change;
    by usubjid paramn parcat1 avisitn;
run;

data change2;
    set change;
    by usubjid paramn parcat1 avisitn;
    * determine if any unscheduled;
    format anl01fl $2.;
    if /*UPCASE(avisit) = 'UNSCHEDULED'*/INDEX(UPCASE(AVISIT),'UNSCH')
or paramcd = 'XPALL' OR XPSTAT='NOT DONE' then anl01fl = ' ';/*1) JMH
14Jan2014*/ /* 2) KB 14Jan2014 */ /* 13) KB 14Apr2014 */
        else if last.parcatl and first.avisitn = 0 then anl01fl = ' ';
        else anl01fl = 'Y';
        if anl01fl = ' ' then put 'Check reason for exclusion from
analysis: ' usubjid = param = avisit = ;
run;

*****;
* Combine ADSL and XP data *;
*****;
* find periods;
%_mtotper;

data slxp(drop = trt01: tr01: trt02: tr02: visit: /*astday astdt*/
/*paramtyp dtype*/ XPMETHOD); /* 3) KB 14Apr2014 */ /* 5) KB 14Apr2014
*/ /* 15) KB 14Apr2014 */
    merge adsl change2(in = a);
    by usubjid;
    if a;          * only include subject level data in vital signs ;
    format aperiod trtan trtpn aday 8. trta trtp $40. aperiodc $8.;
    aday = adt - trtsdt + 1;
/*    astday = astdt - trtsdt + 1;*/ /* 3) KB 14Apr2014 */
    * allocate period / treatment;
    if /*astday*/ADAY in (0 1) then aperiod=1; /* 4) KB 14Apr2014 */
    else if /*astday*/ADAY in (2 3) then aperiod=2; /* 4) KB 14Apr2014
*/
    %_mperall(dvar1 = adtm, dvar2 = adt);
    if not missing(aperiod) then do;
        aperiodc = 'Period ' ||put(aperiod, 1.);
    end;

/* 10) START KB 14Apr2014 */
    IF PARAMCD='DFEVFVC' THEN DO;
        XPDTC='';
        XPDY='';
        EPOCH='';
    END;

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/* 10) END KB 14Apr2014 */
run;

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

options replace;

data adxp;
    set stdlib.adxp slxp;
run;

proc sort data = adxp out = adam.adxp(label = 'Pulmonary Function
Analysis Dataset');
    by usubjid avisitn paramcd;
run;

options noreplace;

%_scramble(set=adxp, id=usubjid subjid subjidn age sex sexc sexn race
dthfl height weightbl bmi ucpdgr1 ucpdgrln nicogr1 /* 5) KB 12Dec2013 */
            nicogrln targr1 targrln analgr1 analgrln, dates=trtsdtm
trtsdt trtsday trtedtm trtedt trteday,
            nullc=trtp trta trtseqp trtseqa TRTSTMF, nulln=trtpn
trtan trtseqpn trtseqan, nullcc=/*4*/5, nullnc=4); /* 14) KB 14Apr2014 */

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

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