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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_2ADLB.sas;
%put NOTE: Purpose : create ADLB dataset;
%put NOTE: ;
%put NOTE: Input Data : STDLIB.ADLB SDTM.LB SDTM.SUPPLB
ADAM.ADSL;
%put NOTE: Output : ADAM.ADLB;
%put NOTE: Macros Called : _MPRINTTO _MTOTPER _MPERALL _SCRAMBLE;
%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: 11Jan2014 KB 1) Added pregnancy data;
%put NOTE: 11Jan2014 KB 2) Added occult blood to PARAMNs ;
%put NOTE: 13Jan2014 KB 3) Added warnings at the end of the
PARCAT1 and PARCAT1N derivations;
%put NOTE: 13Jan2014 KB 4) Amended formats of AVALC and ATM;
%put NOTE: 13Jan2014 KB 5) Coded EOS;
%put NOTE: 13Jan2014 KB 6) Added COTININE to variables where
ANL01FL is set to null;
%put NOTE: 13Jan2014 KB 7) Added warning to check for other
unscheduled results;
%put NOTE: 13Jan2014 KB 8) Added in PARAMCDs of HBAGU and HCABU
for qualitative results;
%put NOTE: 14Apr2014 KB 9) Removed format of LBSEQ;
%put NOTE: 14Apr2014 KB 10) Amended LBCAT for alcohol test and
added drug screen;
%put NOTE: 14Apr2014 KB 11) Added format to AVISITN ;
%put NOTE: 14Apr2014 KB 12) Amended format of ATM;
%put NOTE: 14Apr2014 KB 13) Amended ABLFL;
%put NOTE: 14Apr2014 KB 14) Amended update 8;
%put NOTE: 14Apr2014 KB 15) Amended sorting by key variables;
%put NOTE: 14Apr2014 KB 16) Amended ANL01FL to check for ATPT
of unscheduled;
%put NOTE: 14Apr2014 KB 17) Removed changing of unscheduleds;
%put NOTE: 14Apr2014 KB 18) Amended EOS and AEOSFL;

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%put NOTE: 14Apr2014    KB    19) Added derived parameters;
%put NOTE: 14Apr2014    KB    20) Removed SDTM variables for derived
parameters;
%put NOTE: 14Apr2014    KB    21) Added PARCAT1 to sorting and merge;
%put NOTE: 14Apr2014    KB    22) Added TRTSTMF to scramble macro;
%put NOTE: 14Apr2014    KB    23) Added HIV12AG to PARAMCDs;
%put NOTE: 14Apr2014    KB    24) Amended error in log with input for
LBORRES;
%put NOTE: 16Apr2014    KB    25) Amended derived parameters and
added potassium and sodium;
%put NOTE: 22Apr2014    KB    26) Amended ANRIND for ! results;
%put NOTE: 23Apr2014    KB    27) Added AQLFL to keep;
%put NOTE: 23Apr2014    KB    28) Amended PARAMN for HBSAGC and
HCABC;
%put NOTE: 23Apr2014    KB    29) Amended casing of CANNOT BE TESTED
result;
%put NOTE: 23Apr2014    KB    30) Added HIV12AG and OMCHC to blank
ANL01FL;
%put NOTE: 23Apr2014    KB    31) Removed derivation of subject 128
day 4 platelets as CANNOT BE TESTED result;
%put NOTE: 23Apr2014    KB    32) Amended SHIFT1 in case of missing
results;
%put NOTE: 06Aug2014    KB    33) Added NICOGR2 & EXNOTRFL variables;
%put NOTE: 06Aug2014    KB    34) Added tox grading;
%put NOTE: 06Aug2014    KB    35) Amended format issue;
%put NOTE: 06Aug2014    KB    36) Amended sorting by key variables;
%put NOTE: 06Aug2014    KB    37) Removed LBSPCCND from keep as no
longer exists;
%put NOTE: 06Aug2014    KB    38) Added units to platelets for not
done test;
%put NOTE: 07Aug2014    KB    39) Amended addition of pregnancy data;
%put NOTE: 07Aug2014    KB    40) Added condition of NOT DONE to
derived section;
%put NOTE: 08Aug2014    KB    41) Amended lengths;
%put NOTE: 21Sep2014    KB    42) Amended ABLFL;
%put NOTE: 21Sep2014    KB    43) Removed D from the derived
PARAMCDs;
%put NOTE: 21Sep2014    KB    44) Added ACLSIG;
%put NOTE: 21Sep2014    KB    45) Added clinical significance in to
SHIFT1;
%put NOTE: 22Sep2014    KB    46) Amended subject 128 baselines for
OPLAT;
%put NOTE: 23Sep2014    KB    47) Amended format of ABLFL;
%put NOTE: 21Oct2014    KB    48) Amended derived parameters to
include toxicity grading;
%put NOTE: 22Oct2014    KB    49) Added LBFAST for derived
parameters;
%put NOTE: ;
%put NOTE:
=====;
options notes source source2 nofullstimer validvarname=upcase missing='
';
ods _all_ close;
ods listing;

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*=====;
* 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 NICOGR2 NICOGR2N targr1 targrln /*
33) KB 06Aug2014 */
    enrfl scrfl complfl saffl pprotfl randfl trt: trt01: tr01:
trt02: tr02: dthfl enfl exfl fupfl anal: EXNOTRFL; /* 33) KB 06Aug2014 */
run;

*****;
* bring in SUPPLB ;
*****;

proc transpose data=sdtm.supplb out=supplb(drop = _:);
    var qval;
    by usubjid idvarval;
    id qnam;
    idlabel qlabel;
run;

data supplb2(drop = idvarval LBSAMPLE);
    set supplb;
    format /*lbseq 8.*/ LBSAMP $2.; /* 9) KB 14Apr2014 */
    lbseq = input(idvarval, best.);
    lbsamp=lbsample;
run;

proc sort data=supplb2;
    by usubjid lbseq;
run;

*****;
* bring in LB ;
*****;

*select relevant safety data only ;
*leave urine volume with biomarker data;
proc sort data = sdtm.lb out = /*lb*/LB1(where = (lbcat in ('HAEMATOLOGY'
'CLINICAL CHEMISTRY' 'SEROLOGY' 'URINALYSIS' 'COTININE SCREENING'
/*'ALCOHOL BREATH TEST'*/'ALCOHOL TEST' /*'PREGNANCY
TESTING'*/'PREGNANCY' 'DRUG SCREEN') and lbtestcd ne 'UVOL'))); /* 1) KB
11Jan2014 */ /* 10) KB 14Apr2014 */ /* 34) KB 06Aug2014 */ /* 39) KB
07Aug2014 */
    by usubjid lbseq;
run;

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/* 34) START KB 06Aug2014 */
PROC SORT DATA=SOURCE.TOXGRADE OUT=TOXGRADE (WHERE= (LBCAT NE
'BIOMARKERS')));
  BY LBCAT LBSCAT LBNAM LBSPEC LBTESTCD LBTEST LBORRESU LBSTRESU;
RUN;

DATA TOXGRADE2;
  SET TOXGRADE;
  LENGTH LBCAT2 $18 LBSCAT2 $14 LBNAM2 $28 LBSPEC2 /*$14*/$11 LBTEST2
$39 LBORESU2 LBSRESU2 $7; /* 41) KB 08Aug2014 */

  LBCAT2=LBCAT;
  LBSCAT2=LBSCAT;
  LBNAM2=LBNAM;
  LBSPEC2=LBSPEC;
  LBORESU2=LBORRESU;
  LBSRESU2=LBSTRESU;
  LBTEST2=LBTEST;

  DROP LBCAT LBSCAT LBNAM LBSPEC LBORRESU LBSTRESU LBTEST;
  RENAME LBCAT2=LBCAT LBSCAT2=LBSCAT LBNAM2=LBNAM LBSPEC2=LBSPEC
LBORESU2=LBORRESU LBSRESU2=LBSTRESU LBTEST2=LBTEST;
RUN;

PROC SORT DATA=LB1;
  BY LBCAT LBSCAT LBNAM LBSPEC LBTESTCD LBTEST LBORRESU LBSTRESU;
RUN;

DATA LB;
  MERGE LB1 (IN=A) TOXGRADE2 (IN=B);
  BY LBCAT LBSCAT LBNAM LBSPEC LBTESTCD LBTEST LBORRESU LBSTRESU;
  IF A AND B THEN TOXFLAG=1;
RUN;
/* 34) END KB 06Aug2014 */

/* 44) START KB 21Sep2014 */
PROC SORT DATA=LB;
  BY USUBJID LBSEQ;
RUN;

DATA LB2AB;
  MERGE LB (IN=A) SUPPLB2;
  BY USUBJID LBSEQ;
  IF A;
RUN;
/* 44) END KB 21Sep2014 */

/* 19) START KB 14Apr2014 */
DATA LBDERIVED (WHERE= (LBTESTCD NE ''));
  SET /*LB*/LB2AB; /* 44) KB 21Sep2014 */
  LENGTH LBTESTCD2 $8 LBSTRESU2 /*$200*/$7; /* 41) KB 08Aug2014 */
  FORMAT PARAMTYP DTYPE $20. ACLSIG $3. AFASTFL $1.; /* 44) KB
21Sep2014 */ /* 49) KB 22Oct2014 */

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        IF LBTESTCD IN ('BASO' 'PLAT' 'WBC' 'ALB' 'EOS' 'LYM' 'MONO' 'NEUT'
        'RBC' 'K' 'SODIUM' 'MCHC') AND LBSTAT NE 'NOT DONE' THEN DO; /* 25) KB
16Apr2014 */ /* 40) KB 07Aug2014 */
        IF LBTESTCD='PLAT' AND LBORRES='CANNOT BE TESTED' THEN DELETE; /* 31)
KB 23Apr2014 */
        LBTESTCD2=COMPRESS('/' 'D' || '/' LBTESTCD); /* 43) KB 21Sep2014 */
        PARAMTYP='DERIVED';
        DTYPE='FUNCTION';
        IF LBTESTCD='ALB' THEN DO;
            LBSTRESN2=LBSTRESN*10;
            LBSTRESC2=STRIP(PUT(LBSTRESN2,BEST.));
            LBSTRESU2='g/L';
            LBSTNRLO2=LBSTNRLO*10;
            LBSTNRHI2=LBSTNRHI*10;
        END;
        ELSE IF LBTESTCD='BASO' THEN DO;
            LBSTRESN2=/*LBSTRESN*/LBSTRESN/1000; /* 25) KB 16Apr2014 */
            LBSTRESC2=/*LBSTRESC*/STRIP(PUT(LBSTRESN2,BEST.)); /* 25) KB
16Apr2014 */
            LBSTRESU2='G/L';
            LBSTNRLO2=/*LBSTNRLO*/LBSTNRLO/1000; /* 25) KB 16Apr2014 */
            LBSTNRHI2=/*LBSTNRHI*/LBSTNRHI/1000; /* 25) KB 16Apr2014 */
        END;
        ELSE IF LBTESTCD IN ('EOS' 'LYM' 'MONO' 'NEUT' 'WBC') THEN DO;
            LBSTRESN2=/*LBSTRESN*/LBSTRESN/1000; /* 25) KB 16Apr2014 */
            LBSTRESC2=/*LBSTRESC*/STRIP(PUT(LBSTRESN2,BEST.)); /* 25) KB
16Apr2014 */
            LBSTRESU2='G/L';
            LBSTNRLO2=/*LBSTNRLO*/LBSTNRLO/1000; /* 25) KB 16Apr2014 */
            LBSTNRHI2=/*LBSTNRHI*/LBSTNRHI/1000; /* 25) KB 16Apr2014 */
        END;
        IF LBTESTCD='PLAT' THEN DO;
            LBSTRESN2=/*LBSTRESN*/LBSTRESN*10; /* 25) KB 16Apr2014 */
            LBSTRESC2=/*LBSTRESC*/STRIP(PUT(LBSTRESN2,BEST.)); /* 25) KB
16Apr2014 */
            LBSTRESU2='G/L';
            LBSTNRLO2=/*LBSTNRLO*/LBSTNRLO*10; /* 25) KB 16Apr2014 */
            LBSTNRHI2=/*LBSTNRHI*/LBSTNRHI*10; /* 25) KB 16Apr2014 */
        END;
        ELSE IF LBTESTCD='RBC' THEN DO;
            LBSTRESN2=/*LBSTRESN*/LBSTRESN/100; /* 25) KB 16Apr2014 */
            LBSTRESC2=/*LBSTRESC*/STRIP(PUT(LBSTRESN2,BEST.)); /* 25) KB
16Apr2014 */
            LBSTRESU2='T/L';
            LBSTNRLO2=/*LBSTNRLO*/LBSTNRLO/100; /* 25) KB 16Apr2014 */
            LBSTNRHI2=/*LBSTNRHI*/LBSTNRHI/100; /* 25) KB 16Apr2014 */
        END;
/* 25) START KB 16Apr2014 */
        ELSE IF LBTESTCD IN ('K' 'SODIUM') THEN DO;
            LBSTRESN2=INPUT(LBORRES,BEST.);
            LBSTRESC2=STRIP(LBORRES);
            LBSTRESU2=STRIP(LBSTRESU);
            LBSTNRLO2=LBORNRO;

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        LBSTNRHI2=LBORNRI;
    END;
    ELSE IF LBTESTCD='MCHC' THEN DO;
        LBSTRESN2=LBSTRESN;
        LBSTRESC2=STRIP(LBSTRESC);
        LBSTRESU2='g/dL';
        LBSTNRLO2=LBSTNRLO;
        LBSTNRHI2=LBSTNRHI;
    END;
/* 25) END KB 16Apr2014 */
END;

DFLAG=1; /* 43) KB 21Sep2014 */
ACLSIG=LBCLSIG; /* 44) KB 21Sep2014 */
LBTOXGR2=LBTOXGR; /* 48) KB 21Oct2014 */
AFASTFL=LBFAST; /* 49) KB 22Oct2014 */

KEEP STUDYID USUBJID LBTEST LBCAT LBSCAT LBSTAT LBREASND VISITNUM
VISIT LBDTC LBTPT LBTPTNUM LBTESTCD2 LBSTRESN2 LBSTRESC2 LBSTRESU2
LBSTNRLO2 LBSTNRHI2 PARAMTYP DTYPE LBNRIND DFLAG ACLSIG LBTOXGR2 TOXFLAG
AFASTFL; /* 43) KB 21Sep2014 */ /* 44) KB 21Sep2014 */ /* 48) KB
21Oct2014 */ /* 49) KB 22Oct2014 */
    RENAME LBTESTCD2=LBTESTCD LBSTRESN2=LBSTRESN /*LBSTRESC2=LBSTRESC*/
    LBSTRESU2=LBSTRESU LBSTNRLO2=LBSTNRLO LBSTNRHI2=LBSTNRHI
    LBTOXGR2=LBTOXGR; /* 41) KB 08Aug2014 */ /* 48) KB 21Oct2014 */
RUN;

DATA LBDERIVED2;
    SET /*LB*/LB2AB LBDERIVED; /* 44) KB 21Sep2014 */
RUN;

PROC SORT DATA=LBDERIVED2;
    BY USUBJID LBSEQ;
RUN;
/* 19) END KB 14Apr2014 */

* check parameters and units to SAP;
* all original and standardised units match so only keep 1 set of data ;
proc sort data = lb out=lbchk(keep = lbcat lbscat lbtestcd lbtest
lborresu lbstresu) nodupkey;
    by lbcat lbscat lbtestcd lbtest lborresu lbstresu;
run;

* check for unscheduled observations;
proc sort data = lb(where = (index(upcase(visit),'UNSCHEDULED')) out =
uns nodupkey;
    by usubjid visitnum visit lbtpt lbtptnum lbdtc;
run;

* combine with supplb ;
data lb2;
    /*merge*/SET /*lb*/LBDERIVED2(in = a) /*supplb2*/; /* 19) KB
14Apr2014 */ /* 44) KB 21Sep2014 */
/*    by usubjid lbseq;*/ /* 44) KB 21Sep2014 */

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/*      if a;*/          * some may be biomarker data so exclude; /* 44) KB
21Sep2014 */

      format paramcd $8. parcat1 $40. avisit $40. paramn parcatln AVISITN
8. aval atptn best. param $60. /* 11) KB 14Apr2014 */
/*avalc*/ anrind anrlo anrhi atpt $50. AVALC $200. /* 4) KB
13Jan2014 */
      adt date9. adtm datetime13. atm /*time5.*//*TIME8.*/TIME5.
/*ablfl*/ bloqfl aulqfl aqlfl $2. avalu atoxgr $20.; /* 4) KB 13Jan2014
*/ /* 12) KB 14Apr2014 */ /* 27) KB 23Apr2014 */ /* 42) KB 21Sep2014
*/

      * parameter variables ;
      if lbcat = 'CLINICAL CHEMISTRY' then parcatln = 1;
      else if lbcat = 'HAEMATOLOGY' then parcatln = 2;
      else if lbcat = 'URINALYSIS' then do;
          if lbtestcd not in ('AMPHET' 'BARB' 'BNZDZPN' 'CANNAB'
'COCAINE' 'ETHANOL' 'OPIATE' 'PREGTEST') then parcatln = 3;
          else parcatln = 4;
      end;
      else if lbcat in ('COTININE SCREENING' 'SEROLOGY') then parcatln =
4;

      ELSE IF LBCAT=/'ALCOHOL BREATH TEST'/'ALCOHOL TEST' AND
LBTESTCD='ETHANOL' THEN PARCAT1N=4; /* 10) KB 14Apr2014 */
      ELSE IF LBCAT=/'PREGNANCY TESTING'/'PREGNANCY' AND
LBTESTCD='PREGTEST' THEN PARCAT1N=4; /* 1) KB 11Jan2014 */ /* 39) KB
07Aug2014 */
      ELSE IF LBCAT='DRUG SCREEN' THEN PARCAT1N=4; /* 10) KB 14Apr2014
*/
      ELSE IF LBCAT IN ('HBSAG' 'HCAB' 'HIV12AG') THEN PARCAT1N=4; /*
14) KB 14Apr2014 */ /* 23) KB 14Apr2014 */
      ELSE PUT "WARN" "ING: Check LBCATs not mentioned: " LBCAT=; /* 3) KB
13Jan2014 */

      if parcatln = 1 then parcat1 = 'Clinical Chemistry';
      else if parcatln = 2 then parcat1='Hematology';
      else if parcatln = 3 then parcat1='Urinalysis';
      else if parcatln = 4 then parcat1='Safety Laboratory Entry
Criteria';
      ELSE PUT "WARN" "ING: PARCAT1Ns not accounted for: " PARCAT1N=; /* 3)
KB 13Jan2014 */

      * make urinalysis params unique from chem ;
      if lbcat = 'URINALYSIS' and lbtestcd in ('BILI' 'GLUC' 'PROT' 'RBC'
'WBC') then do;
          paramcd = 'U' || strip(lbtestcd);
          param = strip(lbtest) || ' (Urine)';
      end;
      else do;
/* 19) START KB 14Apr2014 */
/*      paramcd = lbtestcd; */
/*      param = trim(lbtest);*/
          IF LBTESTCD NOT IN ('ALB' 'K' 'BASO' 'SODIUM' 'MCHC' 'PLAT' 'WBC'
'EOS' 'LYM' 'MONO' 'NEUT' 'RBC') THEN DO;
              PARAMCD = LBTESTCD;

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        PARAM = TRIM(LBTEST);
    END;
/* 25) START KB 16Apr2014 */
/*      ELSE IF LBTESTCD IN ('K' 'SODIUM' 'MCHC') THEN DO;*/
/*          PARAMCD=COMPRESS('D' || LBTESTCD);*/
/*          PARAM=TRIM(LBTEST);*/
/*      END;*/
/* 25) END KB 16Apr2014 */
    ELSE DO;
        IF DFLAG NE 1 THEN DO; /* 43) KB 21Sep2014 */
            PARAMCD=COMPRESS('O' || LBTESTCD);
            PARAM=TRIM(LBTEST);
        END; /* 43) KB 21Sep2014 */
/* 43) START KB 21Sep2014 */
    ELSE DO;
        PARAMCD=LBTESTCD;
        PARAM=TRIM(LBTEST);
    END;
/* 43) END KB 21Sep2014 */
    END;
/* 19) END KB 14Apr2014 */
    end;
/* 19) START KB 14Apr2014 */
    IF PARAMCD NOT IN (/*'DK' 'DSODIUM'*/'OK' 'OSODIUM' ) THEN DO; /*
25) KB 16Apr2014 */
        if not missing(lbstresu) then param = strip(param) || ' (' ||
strip(lbstresu) || ')';
    END;
    ELSE DO;
        IF NOT MISSING(LBSTRESU) THEN PARAM = STRIP(PARAM) || ' (' ||
STRIP(LBORRESU) || ')';
    END;
/*      if not missing(lbstresu) then param = strip(param) || ' (' ||
strip(lbstresu) || ')';*/
/* 19) END KB 14Apr2014 */
        if lbtestcd = 'LBALL' then do;
            param = strip(param) || ' (' || strip(parcat1) || ')';
            paramcd = substr(parcat1,1,1) || strip(paramcd);
        end;
/* 14) START KB 14Apr2014 */
/* 8) START KB 13Jan2014 */
/*      IF LBTESTCD='HBSAG' AND LBORRESU NE '' THEN PARAMCD='HBSAGU';*/
/*      ELSE IF LBTESTCD='HCAB' AND LBORRESU NE '' THEN PARAMCD='HCABU';*/
        IF PARAMCD='HBSAG' AND LBSTRESU EQ '' THEN PARAMCD='HBSAGC';
        ELSE IF PARAMCD='HCAB' AND LBSTRESU EQ '' THEN PARAMCD='HCABC';
/* 8) END KB 13Jan2014 */
/* 14) END KB 14Apr2014 */
        * DO NOT CHANGE TESTCD OR PARAMN AFTER REXC-03 AS WE NEED TO BE
CONSISTENT BETWEEN STUDIES;
        * clinical chemistry ;
        if paramcd = /*'ALB'*/'DALB'/*'ALB' then paramn = 14; /* 19) KB
14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'ALP' then paramn = 5;
        else if paramcd = 'ALT' then paramn =1;

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        else if paramcd = 'AST' then paramn = 2;
        else if paramcd = 'BILDIR' then paramn = 4;
        else if paramcd = 'BILI' then paramn = 3;
        else if paramcd = 'BUN' then paramn = 11;
        else if paramcd = 'CHOL' then paramn = 13;
        else if paramcd = 'CREAT' then paramn = 9;
        else if paramcd = 'GGT' then paramn = 6;
        else if paramcd = 'GLUC' then paramn = 8;
        else if paramcd = /*'K'*//*'DK'*/'K' then paramn = 16; /* 19) KB
14Apr2014 */ /* 43) KB 21Sep2014 */
        ELSE IF PARAMCD='OK' THEN PARAMN=76; /* 25) KB 16Apr2014 */
        else if paramcd = 'CLBALL' then paramn = 99;
        else if paramcd = 'LDH' then paramn = 7;
        else if paramcd = 'PROT' then paramn = 10;
        else if paramcd = /*'SODIUM'*//*'DSODIUM'*/'SODIUM' then paramn =
15; /* 19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        ELSE IF PARAMCD='OSODIUM' THEN PARAMN=75; /* 25) KB 16Apr2014 */
        else if paramcd = 'TRIG' then paramn = 12;
        ELSE IF PARAMCD='OALB' THEN PARAMN=74; /* 19) KB 14Apr2014 */
        * haematology;
        else if paramcd = /*'BASO'*//*'DBASO'*/'BASO' then paramn = 113; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'BASOLE' then paramn = 114;
        else if paramcd = /*'EOS'*//*'DEOS'*/'EOS' then paramn = 111; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'EOSLE' then paramn = 112;
        else if paramcd = 'HCT' then paramn = 103;
        else if paramcd = 'HGB' then paramn = 102;
        else if paramcd = 'HLBALL' then paramn = 199;
        else if paramcd = /*'LYM'*//*'DLYM'*/'LYM' then paramn = 107; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'LYMLE' then paramn = 108;
        else if paramcd = 'MCH' then paramn = 116;
        else if paramcd = /*'MCHC'*//*'DMCHC'*/'MCHC' then paramn = 117; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'MCV' then paramn = 118;
        else if paramcd = /*'MONO'*//*'DMONO'*/'MONO' then paramn = 109; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'MONOLE' then paramn = 110;
        else if paramcd = /*'NEUT'*//*'DNEUT'*/'NEUT' then paramn = 105; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'NEUTLE' then paramn = 106;
        else if paramcd = /*'PLAT'*//*'DPLAT'*/'PLAT' then paramn = 115; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = /*'RBC'*//*'DRBC'*/'RBC' then paramn = 101; /* 19)
KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = /*'WBC'*//*'DWBC'*/'WBC' then paramn = 104; /*
19) KB 14Apr2014 */ /* 43) KB 21Sep2014 */
        else if paramcd = 'RDW' then paramn=119;
/* 19) START KB 14Apr2014 */
        ELSE IF PARAMCD='OBASO' THEN PARAMN=173;
        ELSE IF PARAMCD='OEOS' THEN PARAMN=171;
        ELSE IF PARAMCD='OLYM' THEN PARAMN=167;
        ELSE IF PARAMCD='ONEUT' THEN PARAMN=165;

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ELSE IF PARAMCD='OPLAT' THEN PARAMN=175;
ELSE IF PARAMCD='ORBC' THEN PARAMN=161;
ELSE IF PARAMCD='OWBC' THEN PARAMN=164;
ELSE IF PARAMCD='OMONO' THEN PARAMN=169;
/* 19) END KB 14Apr2014 */
ELSE IF PARAMCD='OMCHC' THEN PARAMN=177; /* 25) KB 16Apr2014 */
    * serology;
    else if paramcd = 'HBSAG' then paramn = 301;
    else if paramcd = 'HCAB' then paramn = 302;
    else if paramcd = 'HIV12AB' then paramn = 303;
ELSE IF PARAMCD='HIV12AG' THEN PARAMN=307; /* 23) KB 14Apr2014 */
ELSE IF PARAMCD = /*'HBSAGU'*/'HBSAGC' THEN PARAMN = /*316*/304; /*
8) KB 13Jan2014 */ /* 14) KB 14Apr2014 */ /* 28) KB 23Apr2014 */
    ELSE IF PARAMCD = /*'HCABU'*/'HCABC' THEN PARAMN = /*317*/305; /* 8)
KB 13Jan2014 */ /* 14) KB 14Apr2014 */ /* 28) KB 23Apr2014 */
    * drug screen;
    else if paramcd = 'AMPHET' then paramn = 310;
    else if paramcd = 'BARB' then paramn = 311;
    else if paramcd = 'BNZDZPN' then paramn = 312;
    else if paramcd = 'CANNAB' then paramn = 313;
    else if paramcd = 'COCAINE' then paramn = 314;
    else if paramcd = 'OPIATE' then paramn = 315;
    *cotinine screen;
    else if paramcd = 'COTININE' then paramn = 320;
    *alcohol in urine;
    else if paramcd = 'ETHANOL' then paramn = 330;
    * pregnancy test;
    else if paramcd = 'PREGTEST' then paramn = 340;
    * urinalysis;
    else if paramcd = 'BACT' then paramn = 208;
    else if paramcd = 'UBILI' then paramn = 203;
    else if paramcd = 'CASTS' then paramn = 209;
    else if paramcd = 'CRYSTALS' then paramn = 210;
    else if paramcd = 'CYCAOXA' then paramn = 211;
    else if paramcd = 'DENISTY' then paramn = 212;
    else if paramcd = 'EPIROCE' then paramn = 213;
    else if paramcd = 'EPISQCE' then paramn = 214;
    else if paramcd = 'UGLUC' then paramn = 204;
    else if paramcd = 'ULBALL' then paramn = 299;
    else if paramcd = 'MUCUS' then paramn = 215;
    else if paramcd = 'NITRITE' then paramn = 205;
    else if paramcd = 'PH' then paramn = 201;
ELSE IF PARAMCD = 'SPGRAV' THEN PARAMN = 202;
    else if paramcd = 'UPROT' then paramn = 207;
    else if paramcd = 'URBC' then paramn = 206;
    else if paramcd = 'UWBC' then paramn = 216;
    else if paramcd = 'YEAST' then paramn = 217;
ELSE IF PARAMCD = 'OCCBLD' THEN PARAMN=218; /* 2) KB 11Jan2014 */
    * Safety labs;
ELSE IF PARAMCD='SLBALL' THEN PARAMN=399;
    else put 'USER WARN' 'ING: parameter not allocated number: '
usubjid = lbcatscat = lbtestcd = ;

    * analysis variables ;

```

```

/* 19) START KB 14Apr2014 */
/*   aval = lbstresn;*/
/*   avalc = propcase(lbstresc,'.');
```

IF PARAMCD NOT IN ('OBASO' 'OEOS' 'OLYM' 'ONEUT' 'OPLAT' 'ORBC' 'OWBC' 'OMONO' 'OALB' 'OK' 'OSODIUM' 'OMCHC') THEN DO; /* 25) KB 16Apr2014 */

```

    AVAL = LBSTRESN;
    AVALC = PROPCASE(LBSTRESC,'.');
```

END;

```

ELSE DO;
/* 24) START KB 14Apr2014 */
    IF INDEX(LBORRES,'CANNOT BE TESTED')=0 THEN DO;
        AVAL=INPUT(LBORRES,BEST.);
    END;
    ELSE DO;
        AVAL=.;
    END;
/* 24) END KB 14Apr2014 */
    AVALC=/*LBORRES*/PROPCASE(LBORRES,'.');
```

/* 29) KB 23Apr2014 */

```

END;
IF NOT MISSING(LBSTRESC2) THEN AVALC=LBSTRESC2; /* 41) KB 08Aug2014
*/
/* 19) END KB 14Apr2014 */
    if avalc = 'Tntc' then avalc = tranwrd(avalc,'Tntc','TNTC');
    avalu = strip(lbstresu);
    IF PARAMCD IN (/*'DK' 'DSODIUM'*/'OK' 'OSODIUM') THEN
AVALU=STRIP(LBORRESU); /* 25) KB 16Apr2014 */
    /*if lb_flg ne 'Normal' then atoxgr = strip(lb_flg);*/ * only
present if not normal according to SAP;
/* 34) START KB 06Aug2014 */
/*   atoxgr=propcase(lbtoxgr); */
    IF TOXFLAG=1 THEN DO;
        IF MISSING(LBTOXGR) THEN ATOXGR='0';
        ELSE IF NOT MISSING(LBTOXGR) THEN ATOXGR=PROPCASE(LBTOXGR);
    END;
/* 34) END KB 06Aug2014 */

/* 26) START KB 22Apr2014 */
    IF NOT MISSING(LBNRIND) THEN DO;
        anrind = strip(lbnrind);
    END;
    ELSE DO;
        IF LB_FLG='!' THEN ANRIND='ABNORMAL';
    END;
/* 26) END KB 22Apr2014 */
/* 19) START KB 14Apr2014 */
/*   if missing(lbstnrc) then anrlo = strip(lbstnrlo);*/
/*   else if not missing(lbstnrc) then anrlo = strip(lbstnrc);*/
/*   anrhi = strip(lbstnrhi);*/
    IF PARAMCD NOT IN (/*'DSODIUM' 'DK'*/'OSODIUM' 'OK') THEN DO; /* 25)
KB 16Apr2014 */
        IF MISSING(LBSTNRC) THEN DO;
            ANRLO = STRIP(LBSTNRLO);
            ANRHI = STRIP(LBSTNRHI);
```

```

        END;
    ELSE IF NOT MISSING(LBSTNRC) AND INDEXW(LBSTNRC,'TO')=0 THEN DO;
        ANRLO = STRIP(LBSTNRC);
        ANRHI = STRIP(LBSTNRHI);
    END;
    ELSE IF NOT MISSING(LBSTNRC) AND INDEXW(LBSTNRC,'TO') THEN DO;
        ANRLO = STRIP(SCAN(LBSTNRC,1,' '));
        ANRHI = STRIP(SCAN(LBSTNRC,3,' '));
    END;
END;
ELSE DO;
    IF MISSING(LBSTNRC) THEN DO;
        ANRLO = STRIP(LBSTNRLO);
        ANRHI = STRIP(LBSTNRHI);
    END;
    ELSE IF NOT MISSING(LBSTNRC) AND INDEXW(LBSTNRC,'TO')=0 THEN DO;
        ANRLO = STRIP(LBSTNRC);
        ANRHI = STRIP(LBSTNRHI);
    END;
    ELSE IF NOT MISSING(LBSTNRC) AND INDEXW(LBSTNRC,'TO') THEN DO;
        ANRLO = STRIP(SCAN(LBSTNRC,1,' '));
        ANRHI = STRIP(SCAN(LBSTNRC,3,' '));
    END;
    ANRHI = STRIP(LBORNHI);
END;
/* 19) END KB 14Apr2014 */

    * baseline flag;
/* 13) START KB 14Apr2014 */
/*    ablfl = lbblfl;*/
/*    IF VISIT='DAY -1' THEN ABLFL='Y'; */ /* 42) KB 21Sep2014 */
/* 13) END KB 14Apr2014 */

    *loq flags;
    if index(lbstresc,'<') then do;
        bloqfl = 'Y';
        aval = 0.5 * input(substr(lbstresc,2),best.); * following
section 11.1.5 of SAP relating to biomarkers;
        aqlfl = 'Y';
    end;
    if paramcd ne 'COTININE' and index(lbstresc,'>') then do;
        aulqfl = 'Y';
        aval = input(substr(lbstresc,2),best.);
        aqlfl = 'Y';
    end;

    * visit details ;
    avisit = propcase(visit);
    avisitn = visitnum;
    atpt = propcase(lbtpt,'-');
    atptn = lbtptnum;

/* 17) START KB 14Apr2014 */

```

```

/*      if avisit = 'Unscheduled 1.01' then do;*/
/*          avisit = 'Screening - unscheduled';*/
/*          atpt = avisit;*/
/*          atptn = avisitn;*/
/*      end;*/
/*ELSE IF INDEX(UPCASE(AVISIT),'UNSCHEDULED') THEN PUT "WARN" "ING:
Other unscheduled results present: " AVISIT=; */ /* 7) KB 13Jan2014 */
/* 17) END KB 14Apr2014 */

      * dates;
      if length(lbdtc) gt 10 then do;
/*          adtm = input(lbdtc,e8601dt.);*/
          ADM =
DHMS(INPUT(SCAN(LBDC,1,'T'),YYMMDD10.),HOUR(INPUT(SCAN(LBDC,2,'T'),TIME
5.)),MINUTE(INPUT(SCAN(LBDC,2,'T'),TIME5.)),0); /* 35) KB 06Aug2014 */
          adt = datepart(adtm);
          atm = timepart(adtm);
      end;
      else if length(lbdtc) = 10 then adt = input(lbdtc,yyymmdd10.);

/* 46) START KB 22Sep2014 */
/*      IF PARAMCD='OPLAT' AND AVALU='' THEN PARAM=STRIP(PARAM)||'
(')||STRIP('10^4/uL')||')';*/ /* 38) KB 06Aug2014 */
      IF PARAMCD='OPLAT' AND AVALU='' THEN DO;
          PARAM=STRIP(PARAM)||' (')||STRIP('10^4/uL')||')';
          AVALU=STRIP('10^4/uL');
          AVALUFL=1;
      END;
/* 46) END KB 22Sep2014 */

/* 44) START KB 21Sep2014 */
      IF NOT MISSING(LBCLSIG) AND MISSING(ACLSIG) THEN DO;
          ACLSIG=LBCLSIG;
      END;
/* 44) END KB 21Sep2014 */

      IF MISSING(AFASTFL) AND NOT MISSING(LBFAST) THEN AFASTFL=LBFAST; /*
49) KB 22Oct2014 */

      keep usubjid lbseq lbrefid param: parcat: aval: /*ablfl*/ avisit:
adt: atm lbstat lbreasnd lbdtc lbdy atoxgr anrind /* 42) KB 21Sep2014 */
          anrlo anrhi lbfast bloqfl aulqfl lbclsig /*lbspcnd*/ atpt: epoch
lbsamp DTYPE AQLFL TOXFLAG ACLSIG AVALUFL AFASTFL; /* 19) KB 14Apr2014
*/ /* 27) KB 23Apr2014 */ /* 34) KB 06Aug2014 */ /* 37) KB 06Aug2014
*/ /* 44) KB 21Sep2014 */ /* 46) KB 22Sep2014 */ /* 49) KB 22Oct2014
*/
run;

*****;
* change from baseline ;
*****;
/* 42) 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=LB2;
  BY USUBJID;
RUN;

DATA LB2A;
  MERGE LB2 ADSL2;
  BY USUBJID;
RUN;

DATA LB2B;
  SET LB2A;
      WHERE LBSTAT NE 'NOT DONE' AND
INDEX(UPCASE(AVISIT), 'UNSCHEDULED')=0 AND INDEX(PARAMCD, 'LBALL')=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=LB2B(WHERE=(TESTBASE='Y')) OUT=LB2C;
  BY USUBJID PARAMCD AVISITN;
RUN;

DATA LB2D;
  SET LB2C;
  BY USUBJID PARAMCD AVISITN;
  FORMAT ABLFL /*$2.*/$1.; /* 47) KB 23Sep2014 */

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

DATA LB2E;
  SET LB2D(WHERE=(ABLFL='Y'));

  KEEP USUBJID PARAMCD AVISITN ABLFL;
RUN;

PROC SORT DATA=LB2A;
  BY USUBJID PARAMCD AVISITN;

```

```

RUN;

PROC SORT DATA=LB2E;
  BY USUBJID PARAMCD AVISITN;
RUN;

DATA LBBASES (DROP=TESTDTM);
  MERGE LB2A LB2E;
  BY USUBJID PARAMCD AVISITN;
RUN;
/* 42) END KB 21Sep2014 */

proc sort data = /*lb2*/LBBASES; /* 42) KB 21Sep2014 */
  by usubjid paramn PARCAT1 avalu; /* 21) KB 14Apr2014 */
run;

data base(keep = usubjid paramn avalu base: bvis btoxgr bnrind PARCAT1
BLBCLSIG); /* 21) KB 14Apr2014 */ /* 45) KB 21Sep2014 */
  set /*lb2*/LBBASES(where = (ablfl = 'Y')); /* 42) KB 21Sep2014 */
  format base best. basec $20. bnrind $50. btoxgr $20.;
  base = aval;
  basec = avalc;
  bvis = avisitn;
  btoxgr = PROPCASE(strip(atoxgr));
  bnrind = anrind;
  BLBCLSIG=ACLSIG; /* 45) KB 21Sep2014 */
run;

data change(drop = bvis BLBCLSIG); /* 45) KB 21Sep2014 */
  merge /*lb2*/LBBASES base; /* 42) KB 21Sep2014 */
  by usubjid paramn PARCAT1 avalu; /* 21) KB 14Apr2014 */
  format chg best. shift1 shift2 $50.;
  if avisitn gt bvis then do;
    chg = aval - base;

/* 45) START KB 21Sep2014 */
/*      if not missing(bnrind) then shift1 = propcase(strip(bnrind))
|| ' to ' ||propcase(strip(anrind));*/
    IF NOT MISSING(BNRIND) THEN DO;
      IF NOT MISSING(BLBCLSIG) AND NOT MISSING(ACLSIG) THEN SHIFT1
= PROPCASE(STRIIP(BNRIND)) || ', ' || STRIP(BLBCLSIG) || ' to '
||PROPCASE(STRIIP(ANRIND)) ||', ' || STRIP(ACLSIG);
      ELSE IF NOT MISSING(BLBCLSIG) AND MISSING(ACLSIG) THEN
SHIFT1=PROPCASE(STRIIP(BNRIND)) || ', ' || STRIP(BLBCLSIG) || ' to '
||PROPCASE(STRIIP(ANRIND));
      ELSE IF MISSING(BLBCLSIG) AND NOT MISSING(ACLSIG) THEN
SHIFT1=PROPCASE(STRIIP(BNRIND)) || ' to ' ||PROPCASE(STRIIP(ANRIND)) || ',
' || STRIP(ACLSIG);
      ELSE IF MISSING(BLBCLSIG) AND MISSING(ACLSIG) THEN
SHIFT1=PROPCASE(STRIIP(BNRIND)) || ' to ' ||PROPCASE(STRIIP(ANRIND));
    END;
/* 45) END KB 21Sep2014 */

```

```

        IF NOT MISSING(BNRIND) AND MISSING(ANRIND) THEN SHIFT1=''; /* 32)
KB 23Apr2014 */
        IF TOXFLAG=1 THEN DO; /* 34) KB 06Aug2014 */
            if missing(btoxgr) and not missing(basec) then do;
                if missing(atoxgr) then shift2 = 'Normal to Normal';
                else if not missing(atoxgr) then shift2 = 'Normal to '
|| ' ' || strip(atoxgr);
            end;
            else if not missing(btoxgr) then do;
                if missing(atoxgr) then shift2 = strip(btoxgr) || ' to
Normal';
                else if not missing(atoxgr) then shift2 = strip(btoxgr)
|| ' to ' || strip(atoxgr);
            end;
        END; /* 34) KB 06Aug2014 */
    end;
run;

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

data change2;
    set change;
    by usubjid paramn avisitn atptn;
    format anl01fl $2.;

    * determine if any unscheduled;
    if index(upcase(avisit),'UNSCHEDULED') OR
INDEX(UPCASE(ATPT),'UNSCHE') or index(paramcd,'LBALL') then anl01fl = '
'; /* 16) KB 14Apr2014 */
    else if last.atptn and first.atptn = 0 then anl01fl = ' ';
    else anl01fl = 'Y';
    if anl01fl = ' ' then put 'Check reason for exclusion from
analysis: ' usubjid = param = avisit = atpt =;
    if paramcd in ('HBSAG' 'HCAB' /*'HBSAGU' 'HCABU'*/'HBSAGC' 'HCABC'
'HIV12AB' 'AMPHET' 'BACT' 'BARB' 'BNZDZPN' 'CANNAB' 'CASTS' 'COCAINE'
'CRYSTALS' /* 8) KB 13Jan2014 */ /* 14) KB 14Apr2014 */
'CYCAOXA' 'DENISTY' 'EPIROCE' 'EPISQCE' 'ETHANOL' 'MUCUS'
'OPIATE' 'PREGTEST' 'UWBC' 'YEAST' 'COTININE' 'HIV12AG') then anl01fl =
' '; /* 6) KB 13Jan2014 */ /* 12) KB 23Apr2014 */
    IF PARAMCD IN ('OALB' 'OBASO' 'OEOS' 'OLYM' 'ONEUT' 'OPLAT' 'ORBC'
'OWBC' 'OMONO' 'OK' 'OSODIUM' 'OMCHC') THEN ANL01FL=' '; /* 19) KB
14Apr2014 */ /* 25) KB 16Apr2014 */ /* 30) KB 23Apr2014 */

    IF AVALUFL=1 THEN AVALU=''; /* 46) KB 22Sep2014 */
    DROP AVALUFL; /* 46) KB 22Sep2014 */
run;

* end of exposure flag;
proc sort data = change2 out = eos(where = (not missing(avalc)));
    by usubjid paramn avisitn atptn adtm;
run;

```

```

data eos2(keep = usubjid paramn avisitn /*atptn*/ aeosfl /*EOS*/); /* 18)
KB 14Apr2014 */
    set eos;
    format aeosfl $2. /*EOS 8.*;/; /* 5) KB 13Jan2014 */ /* 18) KB
14Apr2014 */
    by usubjid paramn AVISITN; /* 18) KB 14Apr2014 */
    if last.paramn AND LAST.AVISITN then do; /* 18) KB 14Apr2014 */
        aeosfl = 'Y';
        /*EOS=AVAL;*/ /* 5) KB 13Jan2014 */ /* 18) KB 14Apr2014 */
        output;
    end;
run;

```

```

*merge back onto data;
data lb3;
    merge change2 eos2;
    by usubjid paramn avisitn /*atptn*/; /* 18) KB 14Apr2014 */
run;

```

```

/* 18) START KB 14Apr2014 */
DATA EOS3(KEEP = USUBJID PARAMN EOS);
    SET EOS;
    FORMAT EOS BEST.;
    BY USUBJID PARAMN;
    IF LAST.PARAMN THEN DO;
        EOS=AVAL;
        OUTPUT;
    END;
RUN;

```

```

DATA LB4;
    MERGE LB3 EOS3;
    BY USUBJID PARAMN;
RUN;
/* 18) END KB 14Apr2014 */

```

```

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

```

```

data sllb(drop = trt01: tr01: tr02: trt02: astday TOXFLAG); /* 6) KB
06Aug2014 */
    merge adsl /*lb3*/LB4(in = a); /* 18) KB 14Apr2014 */
    by usubjid;
    if a;          * only include subjects with data ;
    format aperiod trtan trtpn aday astday 8. trta trtp $40. aperiodc
$8.;
    aday = adt - trtsdt + 1;
    astday = adt - trtsdt + 1;
    if astday in (0 1) then aperiod=1;
    else if astday in (2 3) then aperiod=2;
    * allocate tretament and period;

```

```

        %_mperall(dvar1 = adtm, dvar2 = adt);

if not missing(aperiod) then do;
    aperiodc = 'Period ' || put(aperiod,1.);
end;

IF PARAMTYP='DERIVED' THEN LBDTC=''; /* 20) KB 14Apr2014 */

run;

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

options replace;

data adlb(drop=LBSAMP);/* Dropped from code for now, uncomment when/if
needed */
    set stdlib.adlb sllb;
run;

proc sort data = adlb out = adam.adlb(label = 'Laboratory Analysis
Dataset');
/*    by usubjid avisitn atptn parcatln paramn;*/
    /*BY USUBJID AVISITN PARAMCD; *//* 15) KB 14Apr2014 */
    BY USUBJID AVISITN ATPTN PARAMCD; /* 36) KB 06Aug2014 */
run;

options noreplace;
%_scramble(set=adlb, id=usubjid subjid subjidn age sex sexc sexn race
dthfl height weightbl bmi ucpdgr1 ucpdgrln nicogr1
        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); /* 22) KB 14Apr2014 */

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

```