RUG-III-HC

Resource Utilization Groups III Home Care (RUG-III-HC)

Grouping Methodology Using iCodes

2025

Canadian Institute for Health Information
Institut canadien d'information sur la santé

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For permission or information, please contact CIHI:

Canadian Institute for Health Information
495 Richmond Road, Suite 600
Ottawa, Ontario K2A 4H6
Phone: 613-241-7860
Fax: 613-241-8120
cihi.ca
copyright@cihi.ca

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How to cite this document:
Canadian Institute for Health Information. *Resource Utilization Groups III Home Care (RUG-III-HC) Grouping Methodology Using iCodes*. Ottawa, ON: CIHI; 2024.

Cette publication est aussi disponible en français sous le titre *Méthodologie des groupes d'utilisation des ressources en services à domicile, version III (RUG-III-HC), avec iCodes*.

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Introduction

Welcome to the *Resource Utilization Groups III Home Care (RUG-III-HC) Grouping Methodology Using iCodes* prepared by the Canadian Institute for Health Information (CIHI).

The RUG-III-HC methodology is used to determine how assessments submitted to CIHI's Integrated interRAI Reporting System (IRRS) are assigned to discrete groups.

Overview of the RUG-III-HC grouping methodology using iCodes

interRAI HC data source

The foundation data for the RUG-III-HC grouping methodology using iCodes is collected using the interRAI Home Care © (interRAI HC) assessment tool developed by the International Resident Assessment Instrument Corporation (interRAI) (interrai.org).

The objective of a grouping methodology is to categorize individuals into statistically and clinically similar groups. Grouping is based on different levels of acuity and supports evidence-based system- and facility-level planning, quality improvement and case mix–adjusted resource allocation.

Case Mix Index for RUG-III-HC groups

The Case Mix Index (CMI) is a value reflecting the daily relative weight of resources used by an individual within each RUG-III-HC group compared with a base resource level (the average resource use of the client population). It should be emphasized that the CMI value is not a dollar amount; rather, it is a relative value.

CIHI does not provide CMI values for the RUG-III-HC grouping methodology at this time.

RUG-III-HC methodology: IRRS version

RUG-III-HC and IRRS

This RUG-III-HC grouping methodology using iCodes material corresponds to the IRRS version of the RUG-III-HC grouping methodology.

Assumptions made for this logic

This algorithm assumes that data conforms to CIHI's IRRS data submission standards. CIHI assumes no responsibility for unexpected results arising from the use of data that does not meet CIHI's defined formats and edit specifications for IRRS data.

As with all grouping methodology, it should be acknowledged that the RUG-III-HC algorithm is not an edit routine. If inconsistent or illogical data is processed using this algorithm, inappropriate RUG-III-HC group assignment may occur.

Items included in this product (SAS code, test data, flowcharts)

a. RUG-III-HC for iCodes SAS code (PDF file)

This document is the PDF version of the introduction, SAS program code and methodology flowcharts.

b. RUG-III-HC for iCodes SAS code (text file)

The text file contains the SAS program code in machine-readable format.

The text file corresponds exactly to the information contained in the SAS code produced below.

Questions about CIHI's version of RUG-III-HC for the interRAI HC

If you have a question about the IRRS version of the RUG-III-HC grouping methodology, please submit a query through CIHI's online eQuery tool.

SAS code for the RUG-III-HC grouping methodology

The SAS code presented on the following pages is also available as a machine-readable text file.

```
/*=============================================================================*/
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/*    use of the Work.                                                         */
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/*    of the Province of Ontario and the applicable laws of Canada, without regard */
/*    to principles of conflicts of laws.                                      */
/*                                                                             */
/*=============================================================================*/
```

```
/*=============================================================================================*/
/*  RUG-III-HC grouping methodology using iCodes for interRAI HC                               */
/*  IRRS LTCF Version 2025-2026                                                                */
/*=============================================================================================*/
/* Program:  RUG-III-HC grouping methodology using iCodes for interRAI HC.sas                  */
/*                                                                                             */
/* Purpose:  SAS codes for grouping interRAI HC data using interRAI iCodes                     */
/*                                                                                             */
/* Created:  March 29, 2017                                                                    */
/*                                                                                             */
/* Revised:                                                                                    */
/*           September 3, 2024                                                                 */
/*              - Modification to instrumental ADL calculation for all non-private             */
/*                care settings                                                                */
/*                                                                                             */
/*           October 20, 2022                                                                  */
/*              - Modification to instrumental ADL calculation for assessments                 */
/*                in a hospital setting                                                        */
/*                                                                                             */
/*           May 15, 2019                                                                      */
/*              - Correction to mood and behaviour variable value range description            */
/*              - 'CIHI_' prefix of output variables dropped                                   */
/*                    i.e. aR3H and aNR3H                                                      */
/*                                                                                             */
/* Notes:    Grouping methodology sas code provided by interRAI                                */
/*                                                                                             */
/* APPLIES TO:       interRAI HC                                                               */
/* DESCRIPTION:      RUG-III-HC is a resource-intensity (case-mix) measurement                 */
/*                   system designed for use in home care programs                             */
/* REFERENCES:       FOR DETAILS, SEE ARTICLE BY BJORKGREN, FRIES, SHUGARMAN                   */
/*                   - TESTING A RUG-III BASED CASE-MIX SYSTEM FOR HOME CARE                   */
/*                   Canadian J.  Aging, 19 (Supp.  2):106-125, (Fall) 2000.                   */
/* INTERPRETATION:   See article above for basic description.  This code is based              */
/*                   on RUG-III originally developed for use in nursing homes with             */
/*                   the MDS Version 2.0 assessment form.  The code here crosswalks            */
/*                   the RUG-III-HC system, designed for the MDS-HC V2.0 instrument            */
/*                   to the interRAI Suite interRAI HC (Home Care).  In doing so               */
/*                   fewer iCODE items are missing than for the MDS-HC V2.0.                   */
/* INPUT VARIABLES:  The interRAI HC Version 2.0 variables required by the SAS                 */
/*                   code for interRAI RUG-III/HC classification are given below.              */
/*                   For each variable, the interRAI 'iCODE' item and label are                */
/*                   given.  Specification of these 'iCODES' and links to specific             */
/*                   items in the interRAI HC are available in the iCODE MATRIX,               */
/*                   available from interRAI.                                                  */
/*                                                                                             */
/*                   Before execution of RUG-III HC classification using the SAS               */
/*                   code, all 58 iCODE items must be scanned for valid values as              */
/*                   given in the list below.  Note that this version uses                     */
/*                   ICD-10-CA codes.                                                          */
/*                                                                                             */
/*=============================================================================================*/
```

```
/*=====================================================================*/
/* MACRO create_sCPS_scale                                             */
/* - code from InterRAI                                                */
/*=====================================================================*/
%MACRO create_sCPS_scale;

/*note: if iC1 = 5 then iC2a and iD1 are missing */
/* if iC1 ne 5 then no items should be missing */

**  CREATE IMPAIRMENT COUNTS  **;
xcps1 = 0;                                      **  IMPAIRMENT COUNT  **;
   if iC1 in (1,2,3)                            then xcps1 = xcps1 + 1;
   if iD1 in (1,2,3,4)                          then xcps1 = xcps1 + 1;
   if iC2a = 1                                  then xcps1 = xcps1 + 1;

xcps2 = 0;        **  SEVERE IMP COUNT  **;
   if  iC1 = 3                                  then xcps2 = xcps2 + 1;
   if  iD1 in (3,4)                             then xcps2 = xcps2 + 1;

**  COMPUTE CPS SCALE  **;
if iC1 = 5                                      then sCPS = 6;
   else if iC1 = 4 then do;
       if iG2j in (6,8)                         then sCPS = 6;
          else if iG2j in (0,1,2,3,4,5)         then sCPS = 5;
   end;
   else if (iC1 > = 0 and iC1 < 4) then do;
       if xcps1 in (2,3) then do;
          if xcps2 = 2                          then sCPS = 4;
             else if xcps2 = 1                  then sCPS = 3;
             else if xcps2 = 0                  then sCPS = 2;
        end;
        else if xcps1 = 1                       then sCPS = 1;
        else if xcps1 = 0                       then sCPS = 0;
   end;

 %MEND create_sCPS_scale;
```

```
/*=====================================================================*/
/* Macro to RUN the RUG-III-HC grouping methodology using iCodes       */
/*=====================================================================*/
%MACRO RUG_III_HC_grouper;

/* include the macro to create sCPS scale */
%create_sCPS_scale;

**  VARIABLE VALUE CHECK                                                **;
if (iC1 = 5 or (iE3a in (0,1,2,3) and iE3b in (0,1,2,3)   and iE3c in (0,1,2,3)
   and iE3d in  (0,1,2,3)         and iE3e in (0,1,2,3)   and iE3f in (0,1,2,3)))
   and (iG1aa in (0,1,2,3,4,5,6,8) or iG1ab in (0,1,2,3,4,5,6,8))
   and (iG1da in (0,1,2,3,4,5,6,8) or iG1db in (0,1,2,3,4,5,6,8))
   and (iG1ea in (0,1,2,3,4,5,6,8) or iG1eb in (0,1,2,3,4,5,6,8))
   and iG2g in  (0,1,2,3,4,5,6,8) and iG2h in (0,1,2,3,4,5,6,8)
   and iG2i in  (0,1,2,3,4,5,6,8) and iG2j in (0,1,2,3,4,5,6,8)
   and iI1e in  (0,1,2,3)         and iI1f in (0,1,2,3)   and iI1i in (0,1,2,3)
   and iI1q in  (0,1,2,3)         and iI1t in (0,1,2,3)
   and iJ2h in  (0,1,2,3,4)       and iJ2i in (0,1,2,3,4) and iJ2j in (0,1,2,3,4)
   and iJ2n in  (0,1,2,3,4)       and iJ2q in (0,1,2,3,4) and iJ2r in (0,1,2,3,4)
   and iJ6c in  (0,1)             and iK2a in (0,1)       and iK2c in (0,1)
   and iK3  in  (0,1,2,3,4,5,6,7,8,9)
   and iL1  in  (0,1,2,3,4,5)     and iL4  in (0,1)
   and iL5  in  (0,1)             and iL7  in (0,1,2,3,4)
   and iN2a in  (0,1,2,3)         and iN2b in (0,1,2,3)   and iN2d in (0,1,2,3)
   and iN2e in  (0,1,2,3)         and iN2f in (0,1,2,3)   and iN2g in (0,1,2,3)
   and iN2h in  (0,1,2,3)         and iN2i in (0,1,2,3)   and iN2j in (0,1,2,3)
   and iN2k in  (0,1,2,3)         and iN2n in (0,1,2,3)
   and (0 <=iN3eb <=999)     and (0 <=iN3fb <=999)      and (0 <=iN3gb <=999)
   and sCPS in  (0,1,2,3,4,5,6)   then do;


length  x_iadls  x_meal   x_mmed  x_phon
      x_adlsum x_intake x_bedmb x_trans  x_toilt x_eatng
      x_th_min x_reh
      x_cpal   x_sept   x_coma
      x_spec   x_clin   x_ext   x_ext_ct x_behav 3.;
```

```
/*-------------------------------------------------------------------------------*/
/* Step I.  Initialize needed variables.                                         */
/*-------------------------------------------------------------------------------*/

** Initialize clinical category indicators                                      **;
x_reh  = 0;
x_ext    = 0;
x_spec   = 0;
x_clin   = 0;
x_impair = 0;
x_behav  = 0;



/*-------------------------------------------------------------------------------*/
/*  Step II. Calculate RUG-III/HC IADL Index.                                    */
/*-------------------------------------------------------------------------------*/
/*             Impaired Cognition, Behavior Problems, and Reduced Physical      */
/*             Function RUG-III/HC categories.  The IADL index requires         */
/*             scoring conversion for 3 different ADLs and then summation.      */
/*          The crosswalk from the MDS-HC equates the following levels:         */
/*  H1aa, H1da, H1ea  are changed to iG1aa, iG1da, iG1ea as follows:            */
/*  H1aa                       iG1aa                                             */
/*  0 (independent)            0       (independent)                             */
/*  1 (some help)              1,2,3,4 (help, supervision, limited, extensive)*/
/*  2 (full help)              5       (maximal assistance)                      */
/*  3 (by others)              6       (total dependence)                        */
/*  8 (activity did not occur) 8       (activity did not occur)                  */
/*  For RUG-III/HC we count the number of these three at the level 'full help'*/
/*    or more on the RAI-HC which corresponds to iG1aa of 5 or more             */
/*                                                                              */
/*  IADL performance items are not collected in non-private home settings.      */
/*  When deriving outcome measures for those assessed in hospital,              */
/*  performance items are substituted by capacity items.                        */
/*                                                                              */
/*  H1ab, H1db, H1eb  are changed to iG1ab, iG1db, iG1eb as follows:            */
/*  H1ab, H1db, H1eb           iG1ab, iG1db, iG1eb                               */
/*  0 (independent)            0       (independent)                             */
/*  1 (some help)              1,2,3,4 (help, supervision, limited, extensive)*/
/*  2 (full help)              5       (maximal assistance)                      */
/*  3 (by others)              6       (total dependence)                        */
/*-------------------------------------------------------------------------------*/

x_iadls = .;
if iA38a in (1)    /* Private home, condo, apartment, assisted living setting */
then do;

if iG1aa in (0,1,2,3,4)        then x_meal = 0;
       else if iG1aa in (5,6,8)       then x_meal = 1;

if iG1da in (0,1,2,3,4)        then x_mmed = 0;
       else if iG1da in (5,6,8)       then x_mmed = 1;

if iG1ea in (0,1,2,3,4)        then x_phon = 0;
       else if iG1ea in (5,6,8)       then x_phon = 1;
end;
```

```
else
if iA38a in (2,3,4) /* hospital, residential care or other settings */
then do;
       if iG1ab in (0,1,2,3,4)
        then x_meal = 0;
       else if iG1ab in (5,6)       then x_meal = 1;
       if iG1db in (0,1,2,3,4)        then x_mmed = 0;
       else if iG1db in (5,6)       then x_mmed = 1;
       if iG1eb in (0,1,2,3,4)        then x_phon = 0;
       else if iG1eb in (5,6)       then x_phon = 1;
end;
x_iadls = x_meal + x_mmed + x_phon;
```

```
/*-------------------------------------------------------------------------*/
/* Step III. Calculate RUG-III ADL Index.                                  */
/*          The ADL index is required for use in splitting the Rehabilitation,*/
/*             Special Care, Clinically Complex, Impaired Cognition, Behavior */
/*             Problems, and Reduced Physical Function RUG-III clinical    */
/*             categories.  The ADL index requires scoring conversion for  */
/*             4 different ADLs and then summation.                        */
/*-------------------------------------------------------------------------*/
/* ADD calculation of ADL sum HERE */
x_adlsum = .;

** ADL scoring conversion for Bed mobility                                  ;
IF      ( iG2i = 0  OR  iG2i = 1  OR iG2i = 2 )              THEN x_bedmb = 1;
ELSE IF ( iG2i = 3 )                                         THEN x_bedmb = 3;
ELSE IF ( iG2i = 4 )                                         THEN x_bedmb = 4;
ELSE IF ( iG2i = 5  OR  iG2i = 6  OR iG2i = 8 )              THEN x_bedmb = 5;

** ------------------------------                                          ;
** ADL scoring conversion for Transfer                                     ;
IF      ( iG2g = 0  OR  iG2g = 1  OR iG2g = 2 )              THEN x_trans = 1;
ELSE IF ( iG2g = 3 )                                         THEN x_trans = 3;
ELSE IF ( iG2g = 4 )                                         THEN x_trans = 4;
ELSE IF ( iG2g = 5  OR  iG2g = 6  OR iG2g = 8 )              THEN x_trans = 5;

** ------------------------------                                          ;
** ADL scoring conversion for Toilet Use                                   ;
IF      ( iG2h = 0  OR  iG2h = 1  OR iG2h = 2 )              THEN x_toilt = 1;
ELSE IF ( iG2h = 3 )                                         THEN x_toilt = 3;
ELSE IF ( iG2h = 4 )                                         THEN x_toilt = 4;
ELSE IF ( iG2h = 5  OR  iG2h = 6  OR iG2h = 8 )              THEN x_toilt = 5;

** ------------------------------                                          ;
** Code parenteral\enteral intake level--used for Eating scoring conversion and;
** later for Special Care and Clinically Complex qualification.           ;
**    x_intake = 1 if (1) 51% or more of total calories are received     ;
**                 through parenteral/enteral intake (iK5) or (2) 26% to 50%  ;
**                 of total calories received through parenteral/enteral      ;
**                 intake (iK5) and fluid intake is 501 or more cc per day    ;
**                 (iK2b).                                                    ;
**           NOTE: The interRAI HC does not have any measure of intake,       ;
**                 so assume that x_intake=1 in the following code            ;
**    x_intake = 0 if parenteral/enteral intake is at a lower level (including ;
**                 none).                                                     ;

x_intake = 1;

** ADL scoring conversion for Eating                                        ;
IF      ( iK3  = 6  OR  iK3  = 7 OR  iK3 = 8 ) OR (iK3 = 5  AND  x_intake = 1 )
                                                        THEN x_eatng = 3;
ELSE IF ( iG2j = 0  OR  iG2j = 1 OR  iG2j = 2 )              THEN x_eatng = 1;
ELSE IF ( iG2j = 3 )                                         THEN x_eatng = 2;
ELSE IF ( iG2j = 4  OR  iG2j = 5  OR iG2j = 6 OR  iG2j = 8 )   THEN x_eatng = 3;

** ------------------------------                                          ;
** Sum the converted ADL scores to x_adlsum;                               ;
x_adlsum = x_bedmb + x_trans + x_toilt + x_eatng;
```

```
/*-------------------------------------------------------------------------*/
/* Step IV. Determine Rehab and Rehab nursing variables needed for         */
/*             Rehab categories.                                           */
/*           Variables needed to determine Rehab clinical hierarchy        */
/*             qualification for Standard rehab classification             */
/*              - Total minutes of rehab therapy received (x_th_min)       */
/*              - Total number of days of rehab received (x_th_day)        */
/*              - Number of types of rehab therapy (x_th_ty3) received     */
/*                   at 3+ days each                                       */
/*              - Number of types of rehab therapy (x_th_ty5) received     */
/*                   at 5+ days each                                       */
/*-------------------------------------------------------------------------*/

** ------------------------------                                          ;
** Determine x_th_min -- the number of minutes of rehab therapy received.  ;

x_th_min = 0;

** Add speech therapy minutes                                             ;
IF (  iN3gb > 0 )                 THEN x_th_min = x_th_min + iN3gb;

** Add occupational therapy minutes                                       ;
IF (  iN3fb > 0 )                 THEN x_th_min = x_th_min + iN3fb;

** Add physical therapy minutes                                           ;
IF (  iN3eb > 0 )                 THEN x_th_min = x_th_min + iN3eb;


if x_th_min >= 120 then x_reh= 1;
** ------------------------------                                          ;



/*-------------------------------------------------------------------------*/
/* Step V.  Test Extensive Care qualification.                             */
/*-------------------------------------------------------------------------*/
**                                                                         ;
** ------------------------------                                          ;
** Determine qualification for Extensive Care.                             ;
**                                                                         ;
** Check for required Extensive Care clinical indicators.                  ;
   ** ------------------------------                                       ;
   ** Resident qualifies for Extensive Care category on the basis of clinical   ;
   ** indicators.                                                          ;
   **    Qualifications                                                    ;
   **       Parenteral/IV feedings (iK3) OR IV medication (iN2d) OR        ;
   **       suctioning (iN2g) OR tracheostomy care (iN2h) OR               ;
   **       ventilator or respirator (iN2j).                               ;
   ** ------------------------------                                       ;

IF (  iK3  = 7 OR iK3  = 8  OR
      iN2d = 2 OR iN2d = 3  OR
      iN2g = 2 OR iN2g = 3  OR
      iN2h = 2 OR iN2h = 3  OR
      iN2j = 2 OR iN2j = 3)
  THEN   x_ext = 1;
```

```
/*-----------------------------------------------------------------------------*/
/* Step VI.  Test Special Care qualification.                                  */
/*-----------------------------------------------------------------------------*/

x_cpal=0;

** Code Cerebral Palsy from ICD-10 CA Code                                     ;
** ICD-10 CA CODES for cerebral palsy: G80.x                                   ;
IF SUBSTR(iI2abb,1,3)= 'G80' THEN x_cpal=1;
IF SUBSTR(iI2bbb,1,3)= 'G80' THEN x_cpal=1;
IF SUBSTR(iI2cbb,1,3)= 'G80' THEN x_cpal=1;
IF SUBSTR(iI2dbb,1,3)= 'G80' THEN x_cpal=1;
IF SUBSTR(iI2ebb,1,3)= 'G80' THEN x_cpal=1;
IF SUBSTR(iI2fbb,1,3)= 'G80' THEN x_cpal=1;


x_sept=0;

** Code Septicemia from ICD-10 CA Code                                        ;
** CIHI is providing guidance to use A40. or A41. for coding sepsis using     ;
** ICD-10 CA however the RUG-III HC interRAI HC sas code and flow charts      ;
** documents include a broader list of ICD-10 CA sepsis codes.               ;
** ICD-10 CA CODES for septicemia: A40 A41 R65 B00.7 A02.1 A22.7 A24.1 A26.7  ;
**                                 A32.7 A42.7 B37.7                         ;
IF SUBSTR(iI2abb,1,3) in ('A40', 'A41', 'R65') THEN x_sept=1;
IF SUBSTR(iI2bbb,1,3) in ('A40', 'A41', 'R65') THEN x_sept=1;
IF SUBSTR(iI2cbb,1,3) in ('A40', 'A41', 'R65') THEN x_sept=1;
IF SUBSTR(iI2dbb,1,3) in ('A40', 'A41', 'R65') THEN x_sept=1;
IF SUBSTR(iI2ebb,1,3) in ('A40', 'A41', 'R65') THEN x_sept=1;
IF SUBSTR(iI2fbb,1,3) in ('A40', 'A41', 'R65') THEN x_sept=1;


IF SUBSTR(iI2abb,1,5) in ('B00.7', 'A02.1', 'A22.7', 'A24.1', 'A26.7',
                          'A32.7', 'A42.7', 'B37.7')              THEN x_sept=1;
IF SUBSTR(iI2bbb,1,5) in ('B00.7', 'A02.1', 'A22.7', 'A24.1', 'A26.7',
                          'A32.7', 'A42.7', 'B37.7')              THEN x_sept=1;
IF SUBSTR(iI2cbb,1,5) in ('B00.7', 'A02.1', 'A22.7', 'A24.1', 'A26.7',
                          'A32.7', 'A42.7', 'B37.7')              THEN x_sept=1;
IF SUBSTR(iI2dbb,1,5) in ('B00.7', 'A02.1', 'A22.7', 'A24.1', 'A26.7',
                          'A32.7', 'A42.7', 'B37.7')              THEN x_sept=1;
IF SUBSTR(iI2ebb,1,5) in ('B00.7', 'A02.1', 'A22.7', 'A24.1', 'A26.7',
                          'A32.7', 'A42.7', 'B37.7')              THEN x_sept=1;
IF SUBSTR(iI2fbb,1,5) in ('B00.7', 'A02.1', 'A22.7', 'A24.1', 'A26.7',
                          'A32.7', 'A42.7', 'B37.7')              THEN x_sept=1;
```

```
** ------------------------------                                              ;
** Check for required Special Care clinical indicators                         ;
         ** ------------------------------                                     ;
         ** Resident qualifies for Special Care category on the basis of       ;
         ** clinical indicators.                                              ;
         **    Qualifications (any one sufficient)                            ;
         **       1. Stage 3  or 4 pressure ulcer (iL1) (Note: Do not have    ;
         **          count of ulcers),                                        ;
         **             AND                                                   ;
         **          turning and positioning (iN2n).                          ;
         **       2. Feeding tube (iK3) WITH parenteral/enteral intake       ;
         **          (x_intake) AND aphasia (iJ2j).                           ;
         **       3. Major skin problems (iL4) or Skin tears or cuts (iL5),  ;
         **          with wound care (iN2k)                                   ;
         **       4. Respiratory therapy for 7 days (iN3ia) -- MISSING ON     ;
         ** interRAI HC                                                       ;
         **       5. Cerebral palsy (x_cpal) AND ADL score of 10 or more     ;
         **          (x_adlsum).                                              ;
         **       6. Fever (iJ2q)                                            ;
         **             AND                                                   ;
         **          vomiting (iJ2n) OR weight loss (iK2a) OR tube feeding    ;
         **          (iK3) WITH high parenteral/enteral intake (x_intake)     ;
         **          OR pneumonia (iI1q) OR dehydrated (iK2c).                ;
         **       7. Multiple sclerosis (iI1f) AND ADL score of 10 or more   ;
         **          (x_adlsum).                                              ;
         **       8. Quadriplegia (iI1i) AND ADL score of 10 or more         ;
         **          (x_adlsum).                                              ;
         **       9. Radiation therapy (iN2f).                               ;

IF (      ( (iL1 = 3 OR iL1 = 4) AND (iN2n = 2 OR iN2n = 3) )
      OR  ( (iK3 = 6 OR (iK3=5 AND x_intake = 1)) AND
            (iJ2j = 2 OR iJ2j = 3 OR iJ2j = 4) )
      OR  ( (iL4 = 1 OR iL5 = 1) AND (iN2k = 2 OR iN2k = 3) )

      OR  (x_cpal=1 AND x_adlsum >= 10)
      OR  ( (iJ2q =2 OR iJ2q = 3 OR iJ2q = 4)
              AND
            ( (iJ2n =2 OR iJ2n = 3 OR iJ2n = 4)
               OR    iK2a = 1
               OR  (iK3 = 6 OR (iK3=5 AND x_intake = 1))
               OR   (iI1q = 1 OR iI1q = 2 OR iI1q = 3 OR iK2c=1) )  )
      OR  (  (iI1f = 1 OR iI1f = 2 OR iI1f = 3)  AND  x_adlsum >= 10)
      OR  (  (iI1i = 1 OR iI1i = 2 OR iI1i = 3)  AND  x_adlsum >= 10)
      OR  (  iN2f = 2 OR iN2f =3)  )
  THEN
         x_spec = 1;
```

```
/*-----------------------------------------------------------------------------*/
/* Step VII. Test Clinically Complex qualification.                            */
/*-----------------------------------------------------------------------------*/

** -------------------------------                                             ;
** Calculate x_coma indicating whether the resident is comatose with qualifiers ;
**       x_coma = 1 if resident is comatose (iC1 = 5) and not awake most of the;
**                  time (iS3=1,2, or 3) and ADL dependent (iG2i, iG2g, iG2j,  ;
**                  and iG2h all have values of 6 or 8).                       ;
**              = 0 otherwise.                                                 ;

x_coma = 0;

IF (  iC1 = 5
        AND  ( iG2i = 6  OR  iG2i = 8)
        AND  ( iG2g = 6  OR  iG2g = 8)
        AND  ( iG2j = 6  OR  iG2j = 8)
        AND  ( iG2h = 6  OR  iG2h = 8) )
  THEN
          x_coma = 1;
```

```
** ------------------------------                                              ;
** Check for Clinically Complex qualification.                                 ;
         ** Resident qualifies for Clinically Complex category on the basis of  ;
         ** clinical indicators.                                               ;
         ** ----------------------------                                       ;
         **    Qualifications (any one sufficient)                            ;
         **       1. Feeding tube (iK3) WITH high parenteral/enteral          ;
         **          intake (x_intake).                                       ;
         **       2. Comatose (iC1=5) AND not awake (iS3) AND                 ;
         **          ADL dependent (iG2i, iG2g, iG2j, iG2h).                  ;
         **       3. Septicemia (x_sept).                                     ;
         **       4. Burns--second or third degree (not available separately) ;
         **       5. Dehydration (iK2c).                                      ;
         **       6. Hemiplegia/hemiparesis (iI1e) and ADL score of           ;
         **          10 or more (x_adlsum).                                   ;
         **       7. Internal bleeding (iJ2r).                                ;
         **       8. Pneumonia (iI1q).                                        ;
         **       9. End stage disease (iJ6c).                                ;
         **      10. Chemotherapy (iN2a).                                     ;
         **      11. Dialysis (iN2b).                                         ;
         **      12. Physician order changes (iN8) on 4 or more days          ;
         **          AND physician visits (iN7) on 1 or more days.            ;
         **      13. Physician order changes (iN8) on 2 or more days          ;
         **          AND physician visits (iN7) on 2 or more days.            ;
         **      14. Diabetes (iI1t) AND injections (not available) on 7 days ;
         **          AND physician order changes (iN8) on 2 or more           ;
         **          days.   (Eventually, get insulin injections from drug list;
         **      15. Transfusions (iN2i).                                     ;
         **      16. Oxygen therapy (iN2e).                                   ;
         **      17. Infection on foot (m6b) OR open lesion on foot (m6c)     ;
         **             AND                                                   ;
         **          application of dressings to foot (m6f)                   ;
         **        Replaced by Foot problems that limit/prevent walking (iL7) ;
         **                                                                   ;

IF (     (iK3=6)  OR  (iK3 = 5  AND  x_intake = 1)
      OR    x_coma = 1
      OR    x_sept = 1
      OR    iK2c = 1
      OR  ( ( iI1e = 1 OR iI1e = 2 OR iI1e = 3)  AND  x_adlsum >= 10)
      OR  (  iJ2r = 2 OR iJ2r = 3 OR iJ2r = 4)
      OR  (  iI1q = 1 OR iI1q = 2 OR iI1q = 3)
      OR    iJ6c = 1
      OR  ( iN2a = 2 OR iN2a = 3)
      OR  ( iN2b = 2 OR iN2b = 3)

      OR  (iI1t = 1 OR iI1t = 2 OR iI1t = 3)

      OR  ( iN2i = 2 OR iN2i = 3)
      OR  ( iN2e = 2 OR iN2e = 3)
      OR  ( iL7 = 2 OR iL7 = 3) )
  THEN
         x_clin = 1;
```

```
/*-----------------------------------------------------------------------------*/
/* Step VIII. Test Cognitive Impairment qualification.                         */
/*-----------------------------------------------------------------------------*/
**                                                                             ;
** Note  Use interRAI Cognitive Performance Scale (sCPS)                       ;

** Be sure to run sCPS code before running this program                        ;

** -------------------------------                                            ;
** Determine Cognitive Impairment qualification.                              ;
**    Qualification if Cognitive Performance Scale is 3 or more.              ;
/* %create_sCPS_scale; */
IF      sCPS >= 3  THEN   x_impair = 1;
ELSE                      x_impair = 0;
```

```
/*-----------------------------------------------------------------------------*/
/* Step IX. Test Behavior Problems qualification.                              */
/*-----------------------------------------------------------------------------*/

** -------------------------------                                            ;
** Check for Behavior Problems qualification.                                 ;
         ** -------------------------------                                   ;
         ** Behavior Problems Qualifications (any one sufficient)             ;
         **       1. Wandering occurred on 1 or more days (iE3a).            ;
         **       2. Verbally abusive behavior occurred on 1 or more         ;
         **          days (iE3b).                                            ;
         **       3. Physically abusive behavior occurred on 1 or            ;
         **          more days (iE3c).                                       ;
         **       4. Socially inappropriate/disruptive behavior              ;
         **          occurred on 1 or more days (iE3d).                      ;
         **       5. Resident resisted care on 1 or more days (iE3e).        ;
         **       6. Sexually inapprop. Behav 1 or more days (iE3f)          ;
         **       7. Hallucinations (iJ2i).                                  ;
         **       8. Delusions (iJ2h).                                       ;

IF (     (iE3a = 2  OR  iE3a = 3)
     OR  (iE3b = 2  OR  iE3b = 3)
     OR  (iE3c = 2  OR  iE3c = 3)
     OR  (iE3d = 2  OR  iE3d = 3)
     OR  (iE3e = 2  OR  iE3e = 3)
     OR  (iE3f = 2  OR  iE3f = 3)
     OR  (iJ2i = 2 OR iJ2i = 3 OR iJ2i = 4)
     OR  (iJ2h = 2 OR iJ2h = 3 OR iJ2h = 4) )
   THEN
         x_behav = 1;
```

```
/*-------------------------------------------------------------------------------*/
/* Step X. Classify into RUG-III/HC Groups                                       */
/*-------------------------------------------------------------------------------*/
** NOTE: THE ADL INDEX USED TO DERIVE THE RUG-III/HC SYSTEM BASED ON THE       ;
**          RAI-HC DID NOT HAVE THE ADL SUPPORT ITEMS, AND THUS RANGED FROM    ;
**          4-15 (RATHER THAN 4-18).  ON ALL INTERRAI SUITE INSTRUMENTS, THE   ;
**          ADL INDEX (x_adlsum) INCORPORATES SUPPORT CONCEPTS AND CAN RANGE   ;
**          FROM 4-18.  HOWEVER, TO REMAIN CONSISTENT WITH THE DERIVATION WORK ;
**          WE CONSIDER EQUIVALENT ALL INDEX VALUES FROM 15-18.                ;



** ------------------------------                                              ;
** Classify into Rehab Groups **                                              ;
** All final splits based on ADL sum (x_adlsum) and iADL index (x_iadls).     ;

IF x_reh = 1  THEN DO;

   IF      (11 <= x_adlsum  AND  x_adlsum <= 18)   THEN aR3H = 'RB0';
   ELSE IF ( 4 <= x_adlsum  AND  x_adlsum <= 10)   THEN DO;
          IF x_iadls > 1                           THEN aR3H = 'RA2';
          ELSE                                          aR3H = 'RA1';
   END;
END;


** ------------------------------                                              ;
** Classify into Extensive Care Groups **                                     ;
**                                                                            ;
** To be classified as Extensive Care a resident must qualify on the          ;
**     basis of having Extensive Care clinical indicators (x_ext = 1)  and    ;
**     an ADL sum of 7 or more                                                ;
**                                                                            ;
**     Note that residents who have Extensive Care clinical indicators but    ;
**     have too low an ADL score (6 or less) are classified as Special Care   ;
**     rather than Extensive Care. (THIS IS DONE HERE TO REMAIN COMPATIBLE     ;
**     WITH THE RUG-III V5.20 SPECIFICATION - EARLIER VERSIONS MOVED THESE     ;
**     OBSERVATIONS TO THE CLINICALLY COMPLEX CATEGORY, AS WELL, THE COUNT     ;
**     USED TO SPLIT THE EXTENSIVE CARE CATEGORY IS MODIFIED FROM THE          ;
**     ORIGINAL.)                                                             ;
**                                                                            ;
** Split into Extensive Care groups is based on a count (x_ext_ct) of other   ;
**    hierarchy category qualifications plus existence of                     ;
**    parenteral/IV feeding (iK3) and IV medications (iN2d)                   ;

ELSE IF  (x_ext = 1  AND  x_adlsum >=7)  THEN DO;

   x_ext_ct = x_spec + x_clin + x_impair;
   IF   iK3 = 8        THEN    x_ext_ct = x_ext_ct + 1;
   IF   iN2d in (2,3)  THEN    x_ext_ct = x_ext_ct + 1;

   IF      (4 <= x_ext_ct  AND  x_ext_ct <= 5)    THEN aR3H= 'SE3';
   ELSE IF (2 <= x_ext_ct  AND  x_ext_ct <= 3)    THEN aR3H= 'SE2';
   ELSE IF (0 <= x_ext_ct  AND  x_ext_ct <= 1)    THEN aR3H= 'SE1';
END;
```

```
** ------------------------------                                              ;
** Classify into Special Care Groups **                                        ;
**                                                                            ;
** To be classified as Special Care an assessment must satisfy one of the     ;
**    two following conditions                                                ;
**    1. The resident has both Special Care clinical indicators (x_spec = 1)  ;
**       and an ADL sum of 7 or more.                                         ;
**    2. The resident has both Extensive Care indicators (x_ext = 1) and      ;
**       was not already classified as Extensive care (i.e., an ADL sum of 6  ;
**       or less).                                                            ;
**                                                                            ;
**    Note that assessments assigned Special Care clinical indicators         ;
**    and a low ADL score (6 or less) are classified as Clinically Complex    ;
**    rather than Special Care.                                               ;
**                                                                            ;
** Split into Special Care groups is based on ADL sum, slightly different than ;
**    RUG-III.                                                                ;

ELSE IF  ((x_spec = 1  AND  x_adlsum >= 7)  OR  x_ext = 1)  THEN DO;

   IF      (14 <= x_adlsum  AND  x_adlsum <= 18)   THEN aR3H= 'SSB';
   ELSE IF ( 4 <= x_adlsum  AND  x_adlsum <= 13)   THEN aR3H= 'SSA';
END;


** ------------------------------                                              ;
** Classify into Clinically Complex Groups  **                                 ;
** To be classified as Clinically Complex an assessment must satisfy one of    ;
**    the two following conditions                                            ;
**    1. Assigned the Clinically Complex clinical indicator (x_clin = 1),     ;
**    2. Assigned theh Special Care indicator (x_spec = 1) and was not already ;
**       classified as Special Care (i.e., an ADL sum of 6 or less).          ;
**                                                                            ;
** Assignment of Clinically Complex groups is based on ADL and IADL sum.      ;

ELSE IF  (x_clin = 1  OR  x_spec = 1)  THEN DO;

   IF      (11 <= x_adlsum  AND  x_adlsum <= 18)  THEN aR3H= 'CC0';
   ELSE IF ( 6 <= x_adlsum  AND  x_adlsum <= 10)  THEN aR3H= 'CB0';
   ELSE IF ( 4 <= x_adlsum  AND  x_adlsum <= 5)   THEN DO;
             IF x_iadls >= 1                      THEN aR3H= 'CA2';
             ELSE                                      aR3H= 'CA1';
   END;
END;
```

```
** ------------------------------                                                ;
** Classify into Impaired Cognition Groups **                                   ;
**                                                                              ;
** To be classified as Impaired Cognition the assessment must be assigned      ;
**    the impaired cognition indicator (x_impair = 1) and an ADL sum of 10     ;
**     or less.                                                                 ;
**                                                                              ;
** Assignment of Impaired Cognition groups is based on ADL and iADL sum        ;
**    (Note: nursing rehabilitation is not used to define groups)               ;

ELSE IF  (x_impair = 1  AND  4 <= x_adlsum  AND  x_adlsum <= 10)  THEN DO;

   IF      ( 6 <= x_adlsum  AND  x_adlsum <= 10)  THEN aR3H= 'IB0';
   ELSE IF ( 4 <= x_adlsum  AND  x_adlsum <=  5)  THEN DO;
             IF x_iadls >= 1                      THEN aR3H= 'IA2';
             ELSE                                      aR3H= 'IA1';
   END;
END;


** ------------------------------                                                ;
** Classify into Behavioral Problems Groups **                                  ;
**                                                                              ;
** To be classified as Behavior Problems the resident has Behavior             ;
**    Problems indicators (x_behav = 1)  and an ADL sum of 10 or less           ;
**                                                                              ;
** Split into Behavior Problems groups is based on ADL sum and IADL sum        ;
**   (Note: nursing rehabilitation is not used to define groups)                ;

ELSE IF  (x_behav = 1  AND  4 <= x_adlsum  AND  x_adlsum <= 10)  THEN DO;

   IF      ( 6 <= x_adlsum  AND  x_adlsum <= 10)  THEN aR3H= 'BB0';
   ELSE IF ( 4 <= x_adlsum  AND  x_adlsum <=  5)  THEN DO;
             IF x_iadls >= 1                      THEN aR3H= 'BA2';
             ELSE                                      aR3H= 'BA1';
   END;
END;
```

```
** ------------------------------                                                ;
** Classify into Reduced Physical Functions Groups **                           ;
**    Assessments are classified in the Reduced Physical Functions category     ;
**    if a previous hierarchical classification has not been made               ;
**                                                                              ;

** Group assignment for the Reduced Physical Functions category is based on ADL;
**  and IADL sum                                                                ;
**    (Note: nursing rehabilitation is not used to define groups)               ;

ELSE  IF     (11 <= x_adlsum  AND  x_adlsum <= 18)  THEN aR3H= 'PD0';
ELSE  IF     ( 9 <= x_adlsum  AND  x_adlsum <= 10)  THEN aR3H= 'PC0';
ELSE  IF     ( 6 <= x_adlsum  AND  x_adlsum <=  8)  THEN aR3H= 'PB0';
**  BELOW FOR 4<=x_adlsum<=5;
ELSE   DO;
             IF x_iadls >= 1                        THEN aR3H= 'PA2';
             ELSE                                        aR3H= 'PA1';
       END;

** RUG-III/HC CLASSIFICATION COMPLETE                                           ;

** NOW ADD NUMERICAL GROUP IDENTIFIERS  **;
** NOTE THAT THESE ARE DIFFERENT THAN PREVIOUS RUG-III/HC VERSIONS, BUT NOW  **;
**   CAN BE SORTED TO PUT RUG-III/V2 GROUPS IN THEIR LOGICAL ORDER           **;

length aNR3H 3.;
IF      aR3H = 'RB0' THEN aNR3H =  111 ;
ELSE IF aR3H = 'RA2' THEN aNR3H =  121 ;
ELSE IF aR3H = 'RA1' THEN aNR3H =  122 ;
ELSE IF aR3H = 'SE3' THEN aNR3H =  210 ;
ELSE IF aR3H = 'SE2' THEN aNR3H =  220 ;
ELSE IF aR3H = 'SE1' THEN aNR3H =  230 ;
ELSE IF aR3H = 'SSB' THEN aNR3H =  310 ;
ELSE IF aR3H = 'SSA' THEN aNR3H =  320 ;
ELSE IF aR3H = 'CC0' THEN aNR3H =  411 ;
ELSE IF aR3H = 'CB0' THEN aNR3H =  421 ;
ELSE IF aR3H = 'CA2' THEN aNR3H =  431 ;
ELSE IF aR3H = 'CA1' THEN aNR3H =  432 ;
ELSE IF aR3H = 'IB0' THEN aNR3H =  510 ;
ELSE IF aR3H = 'IA2' THEN aNR3H =  521 ;
ELSE IF aR3H = 'IA1' THEN aNR3H =  522 ;
ELSE IF aR3H = 'BB0' THEN aNR3H =  610 ;
ELSE IF aR3H = 'BA2' THEN aNR3H =  621 ;
ELSE IF aR3H = 'BA1' THEN aNR3H =  622 ;
ELSE IF aR3H = 'PD0' THEN aNR3H =  710 ;
ELSE IF aR3H = 'PC0' THEN aNR3H =  720 ;
ELSE IF aR3H = 'PB0' THEN aNR3H =  730 ;
ELSE IF aR3H = 'PA2' THEN aNR3H =  741 ;
ELSE IF aR3H = 'PA1' THEN aNR3H =  742 ;
ELSE                      aNR3H =  .  ;

end;

** END OF RUG-III/HC SAS CODE  **;

%MEND RUG_III_HC_grouper;
```

```
/*=====================================================================*/
/*  Main macro for RUG-III-HC grouping using iCodes                    */
/*=====================================================================*/
/* Before running the macro, users need to update following            */
/* input and output datasets:                                          */
/*    %LET datain  =.;                                                 */
/*    %LET dataout =.;                                                 */
/*                                                                     */
/* Include following statement to run the grouping methodology:        */
/*    %RUN_RUG_III_HC_grouper (datain=, dataout=);                     */
/*                                                                     */
/*=====================================================================*/

%MACRO RUN_RUG_III_HC_grouper (datain, dataout);

data &dataout.;
set &datain.;

%RUG_III_HC_grouper;

run;


title "Volume by RUG_III_HC grouper";
proc freq data= &dataout.;
table aR3H * aNR3H / missing list out= FREG_RUG_III_HC_grouper;
run;

%MEND RUN_RUG_III_HC_grouper;


/*=====================================================================*/
/* END OF PROGRAM                                                      */
/*=====================================================================*/
```

Flowcharts

RUG-III-HC overview

RUG-III-HC is a case-mix system that is made up of a grouping methodology and associated CMI values. Canadian organizations that provide community-based care to seniors can apply the RUG-III-HC grouping methodology and CMI values to their assessment data. Currently, CIHI does not publish RUG-III-HC CMI values; however, jurisdictions can develop and apply RUG-III-HC CMI values to derive measures of resource use over a specified time period for a particular client or organization. Comparative and time series trending reports can be generated using RUG-III-HC to identify peers, inform resource allocation and assist with planning.

This section outlines the approach used to identify qualifying RUG-III-HC groups for interRAI HC assessments submitted to IRRS.

Calculate RUG-III-HC temporary variables

Several temporary variables are required to derive RUG-III-HC groups. The first part of this section provides a listing of the data elements used and their valid values. The second part of this section provides further details and outlines the specific criteria to derive the RUG-III-HC temporary variables.

The temporary variables are listed below.

RUG-III-HC temporary variables

x_iadls	x_trans	x_coma
x_meal	x_toilt	x_spec
x_mmed	x_eatng	x_clin
x_phon	x_th_min	x_ext
x_adlsum	x_reh	x_ext_ct
x_intake	x_cpal	x_behav
x_bedmb	x_sept	

Calculate RUG-III-HC category triggers

There are 7 RUG-III-HC categories. Each has specific criteria that trigger whether an assessment qualifies for that category, except for the last category (Reduced Physical Functions), where all assessments qualify. The third part of this section outlines the specific criteria for the RUG-III-HC category triggers.

Assign qualifying RUG-III-HC groups

Specific criteria are used to assign a qualifying RUG-III-HC group to a given IRRS interRAI HC assessment. The fourth part of this section outlines the specific criteria for the RUG-III-HC groups. A listing of all 23 RUG-III-HC groups and their hierarchical rank orders is included in this document.

IRRS RUG-III-HC Section 1

interRAI HC variables used in RUG-III-HC

Variable name (valid codes) description

Section A — Identification Information

Location of assessment

iA38a	(1, 2, 3, 4)	Location of assessment

Section C — Cognition

Cognitive skills for daily decision making

iC1	(0, 1, 2, 3, 4)	How well client made decisions about organizing the day

Memory recall ability

iC2a	(0, 1)	Short-term memory OK

Section D — Communication/Hearing patterns

Making self understood (expression)

iD1	(0, 1, 2, 3, 4)	Expressing information content — however able

Section E — Mood and Behaviour

Behavioural Symptoms

iE3a	(0, 1, 2, 3)	Wandering
iE3b	(0, 1, 2, 3)	Verbally abusive behavioural symptoms
iE3c	(0, 1, 2, 3)	Physically abusive behavioural symptoms
iE3d	(0, 1, 2, 3)	Socially inappropriate/disruptive behavioural symptoms
iE3e	(0, 1, 2, 3)	Resists care
iE3f	(0, 1, 2, 3)	Inappropriate sexual behaviour

Section G — Physical Functioning

IADL (instrumental activities of daily living)

Self-performance and difficulty — Functioning during the last 7 days

iG1aA	(0, 1, 2, 3, 4, 5, 6, 8)	Meal preparation — self performance
iG1dA	(0, 1, 2, 3, 4, 5, 6, 8)	Managing medication — self performance
iG1eA	(0, 1, 2, 3, 4, 5, 6, 8)	Phone use — self performance

ADL (activities of daily living)

Self-performance — Physical functioning during the last 3 days

iG2g	(0, 1, 2, 3, 4, 5, 6, 8)	Transfer toilet
iG2h	(0, 1, 2, 3, 4, 5, 6, 8)	Toilet use
iG2i	(0, 1, 2, 3, 4, 5, 6, 8)	Mobility in bed
iG2j	(0, 1, 2, 3, 4, 5, 6, 8)	Eating

Section I — Disease Diagnoses

Disease Diagnoses

Neurological

iI1e	(0, 1, 2, 3)	Hemiplegia/Hemiparesis
iI1f	(0, 1, 2, 3)	Multiple sclerosis
iI1i	(0, 1, 2, 3)	Quadriplegia

Infections

iI1q	(0, 1, 2, 3)	Pneumonia

Other

iI1t	(0, 1, 2, 3)	Diabetes mellitus

Other Disease Diagnoses

iI2abb	CCC.CC	ICD-10-CA Code for Cerebral Palsy/Septicemia
iI2bbb	CCC.CC	ICD-10-CA Code for Cerebral Palsy/Septicemia
iI2cbb	CCC.CC	ICD-10-CA Code for Cerebral Palsy/Septicemia
iI2dbb	CCC.CC	ICD-10-CA Code for Cerebral Palsy/Septicemia
iI2ebb	CCC.CC	ICD-10-CA Code for Cerebral Palsy/Septicemia
iI2fbb	CCC.CC	ICD-10-CA Code for Cerebral Palsy/Septicemia

Section J — Health Conditions

Problem Frequency (in LAST 3 DAYS)

iJ2h	(0, 1, 2, 3, 4)	Delusions
iJ2i	(0, 1, 2, 3, 4)	Hallucinations
iJ2j	(0, 1, 2, 3, 4)	Aphasia
iJ2n	(0, 1, 2, 3, 4)	Vomiting
iJ2q	(0, 1, 2, 3, 4)	Fever
iJ2r	(0, 1, 2, 3, 4)	GI or GU bleeding

Instability of Conditions

iJ6c	(0, 1)	End-stage disease (6 months or less to live)

Section K — Oral and Nutritional Status

Nutritional issues

iK2a	(0, 1)	Weight loss (5% or more in LAST 30 DAYS or 10% or more in LAST 180 DAYS)
iK2c	(0, 1)	Dehydrated

Mode of Nutritional Intake

iK3	(0, 1, 2, 3, 4, 5, 6, 7, 8, 9)	Mode of nutritional intake

Section L — Skin Condition

Most severe pressure ulcer

iL1	(0, 1, 2, 3, 4, 5)	Most severe pressure ulcer

Major skin problems

iL4	(0, 1)	e.g., lesions, 2nd- or 3rd- degree burns, healing surgical wounds

Skin tears or cuts

iL5	(0, 1)	Skin tears or cuts other than surgery

Foot problem

iL7	(0, 1, 2, 3, 4)	e.g., bunions, hammertoes, overlapping toes, structural problems, infection, ulcers

Section O — Treatments and procedures

Treatments and programs *(within LAST 3 DAYS)*

Treatments

iN2a	(0, 1, 2, 3)	Chemotherapy
iN2b	(0, 1, 2, 3)	Dialysis
iN2d	(0, 1, 2, 3)	IV medication
iN2e	(0, 1, 2, 3)	Oxygen therapy
iN2f	(0, 1, 2, 3)	Radiation
iN2g	(0, 1, 2, 3)	Suctioning
iN2h	(0, 1, 2, 3)	Tracheostomy care
iN2i	(0, 1, 2, 3)	Transfusions
iN2j	(0, 1, 2, 3)	Ventilator or respirator
iN2k	(0, 1, 2, 3)	Wound care

Programs

iN2n	(0, 1, 2, 3)	Turning/repositioning program

Therapy/Nursing services *(within LAST 7 DAYS)*

iN3eb	(0000–9999)	Physical therapy — total number of minutes provided in last 7 days
iN3fb	(0000–9999)	Occupational therapy — total number of minutes provided in last 7 days
iN3gb	(0000–9999)	Speech–language pathology and audiology services — total number of minutes provided in last 7 days

RUG-III-HC group listing

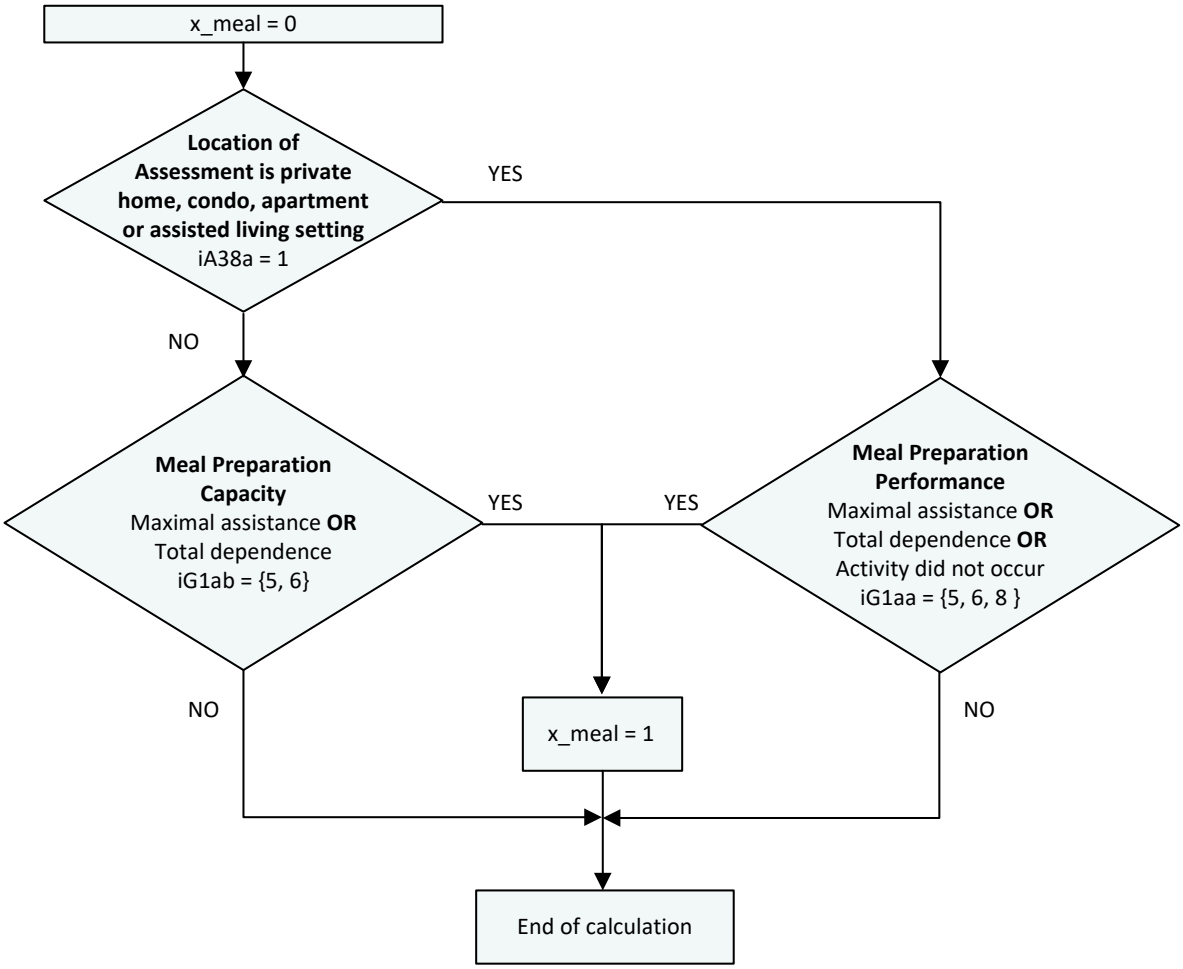
RUG-III-HC category and name	RUG-III-HC rank	RUG-III-HC group
1. Special Rehabilitation	1	1_RB
	2	1_RA2
	3	1_RA1
2. Extensive Services	4	2_SE3
	5	2_SE2
	6	2_SE1
3. Special Care	7	3_SSB
	8	3_SSA
4. Clinically Complex	9	4_CC
	10	4_CB
	11	4_CA2
	12	4_CA1
5. Impaired Cognition	13	5_IB
	14	5_IA2
	15	5_IA1
6. Behaviour Problems	16	6_BB
	17	6_BA2
	18	6_BA1
7. Reduced Physical Functions	19	7_PD
	20	7_PC
	21	7_PB
	22	7_PA2
	23	7_PA1

IRRS RUG-III-HC Section 2: Calculate RUG-III-HC temporary variables

VARIABLE: X_MEAL

x_meal (0, 1)
A temporary value for Instrumental Activities of Daily Living (IADL) related to meal preparation.

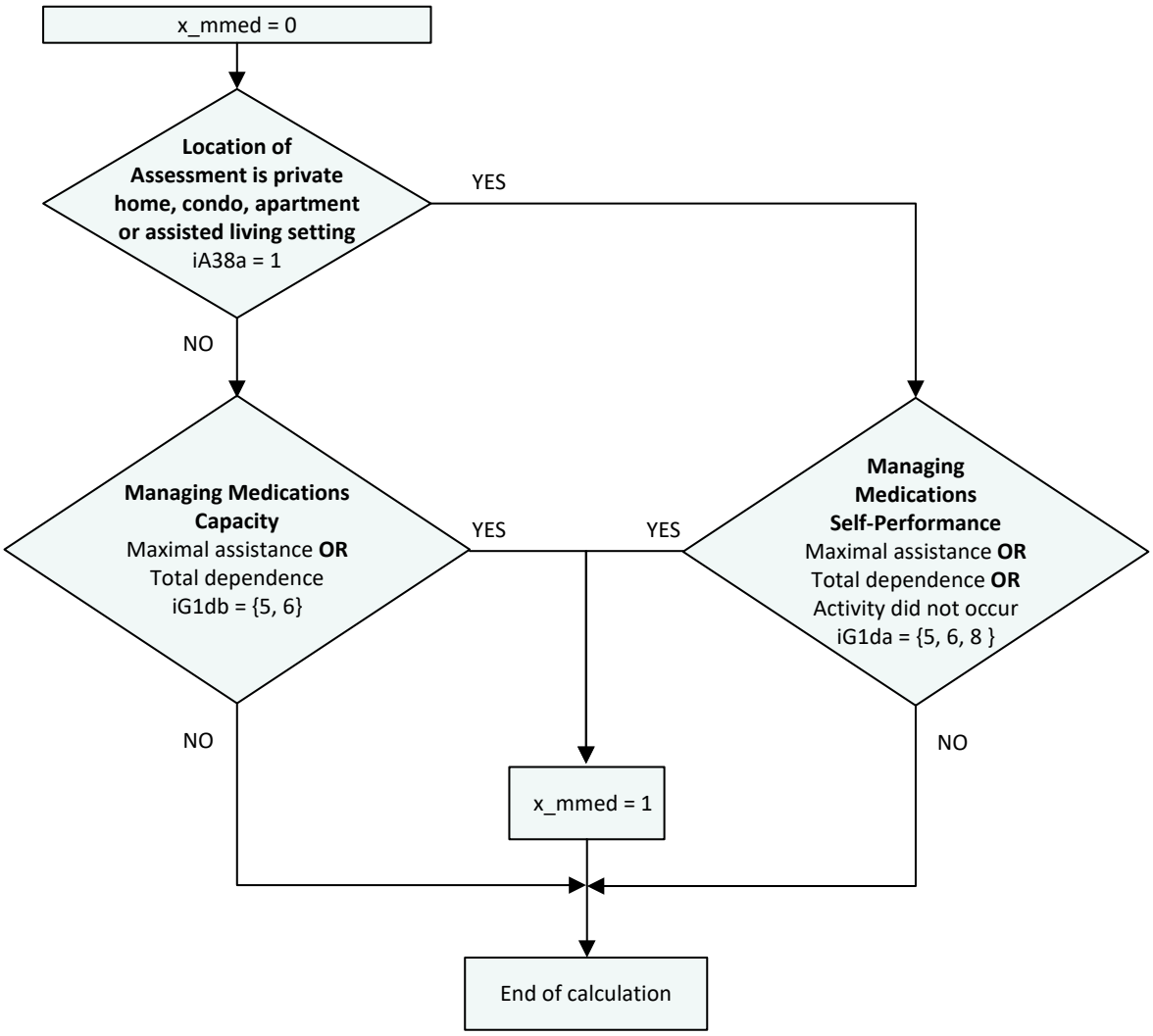
Please note: IADL performance items are collected only in assessments completed in private home, condominium, apartment or assisted living settings. When deriving x_meal for those assessed in hospital, residential care facility or other settings, performance items are substituted for capacity items.



VARIABLE: X_MMED

x_mmed (0, 1)
A temporary value for Instrumental Activities of Daily Living (IADL) related to medication management.

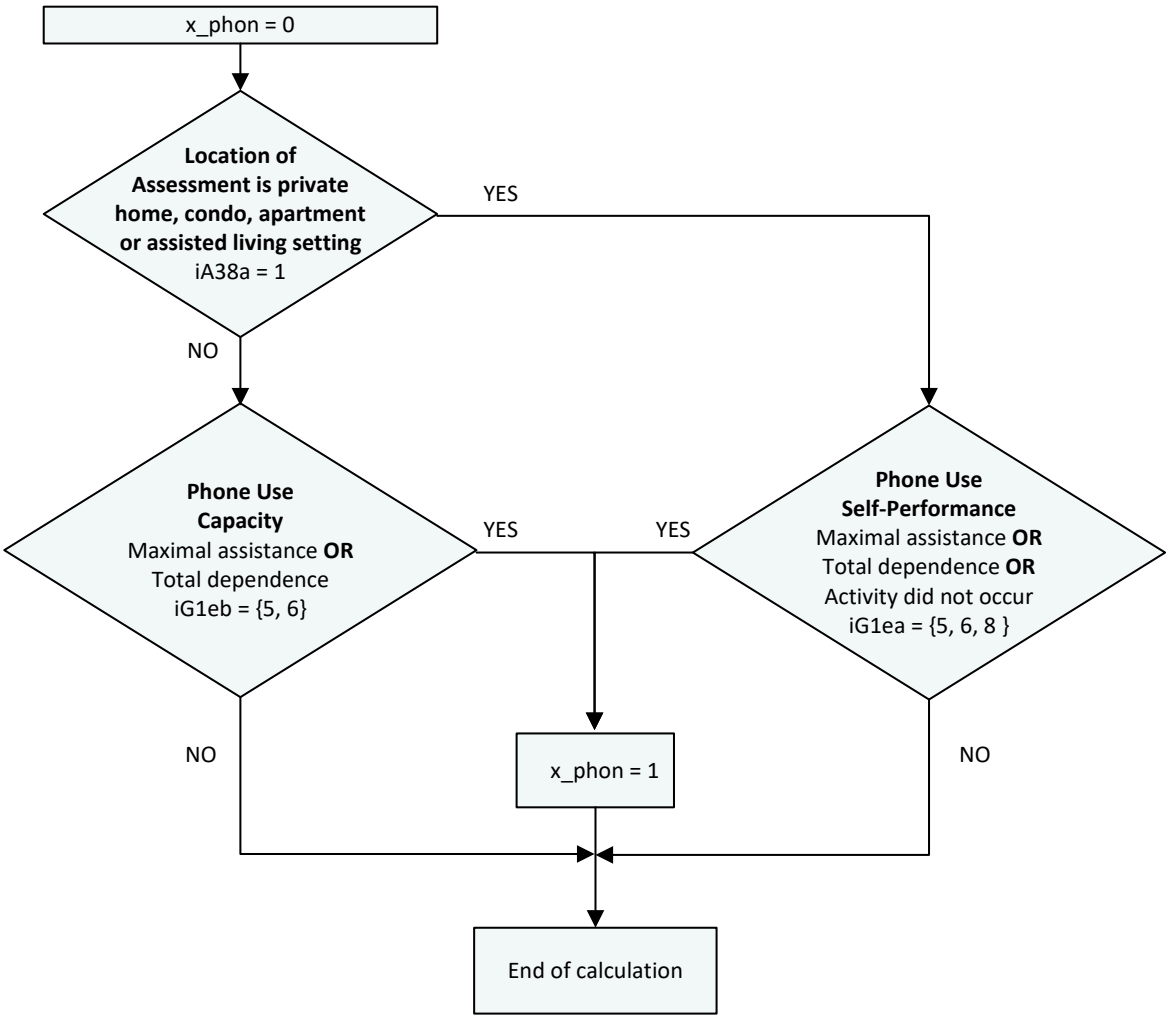
Please note: IADL performance items are collected only in assessments completed in private home, condominium, apartment or assisted living settings. When deriving x_mmed for those assessed in hospital, residential care facility or other settings, performance items are substituted for capacity items.



VARIABLE: X_PHON

x_phon (0, 1)
A temporary value for Instrumental Activities of Daily Living (IADL) related to phone use.

Please note: IADL performance items are collected only in assessments completed in private home, condominium, apartment or assisted living settings. When deriving x_phon for those assessed in hospital, residential care facility or other settings, performance items are substituted for capacity items.



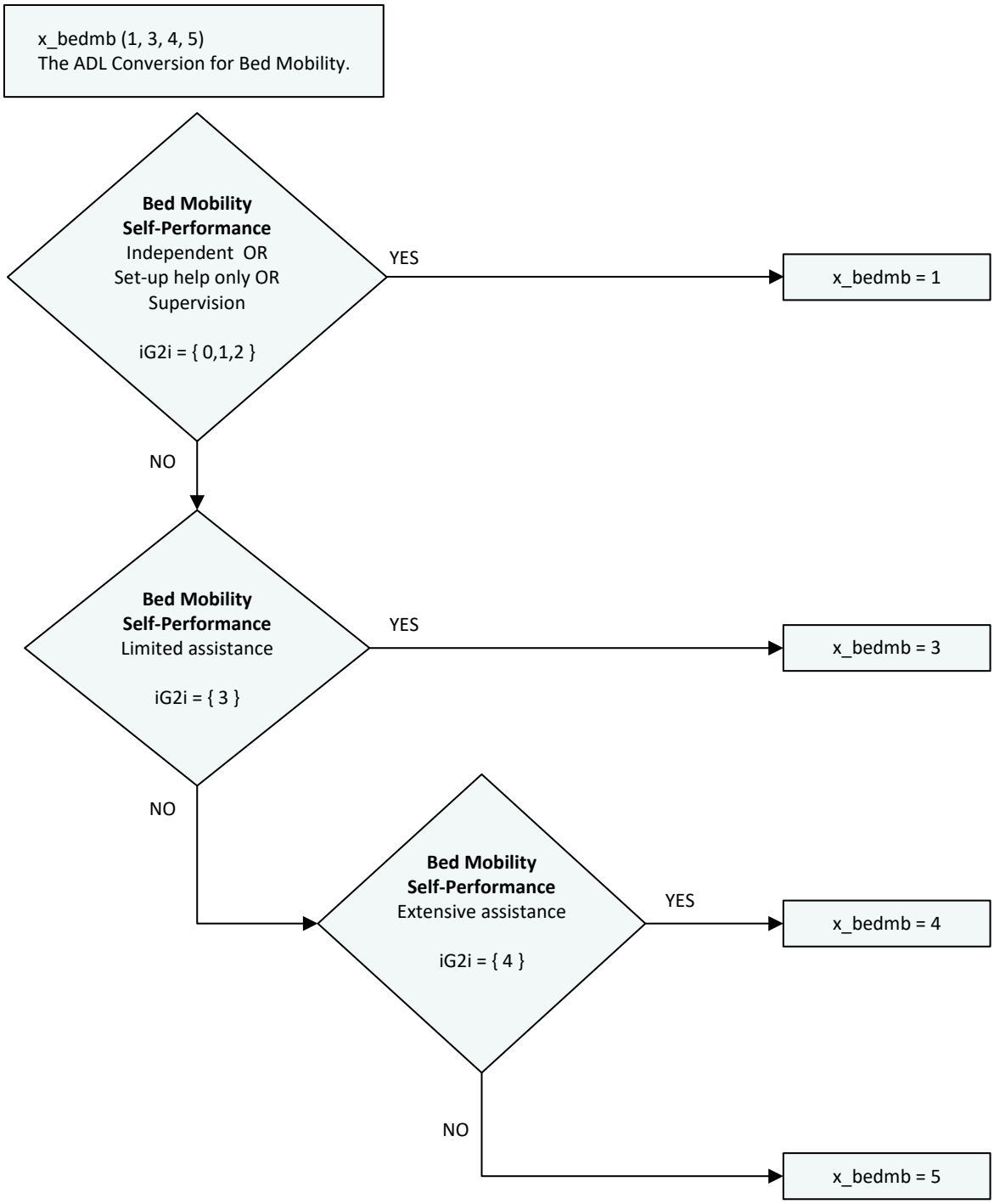
VARIABLE: X_IADLS

x_iadls (0, 1, 2, 3)
An indicator for impairment in Instrumental Activities of Daily Living (IADL) .

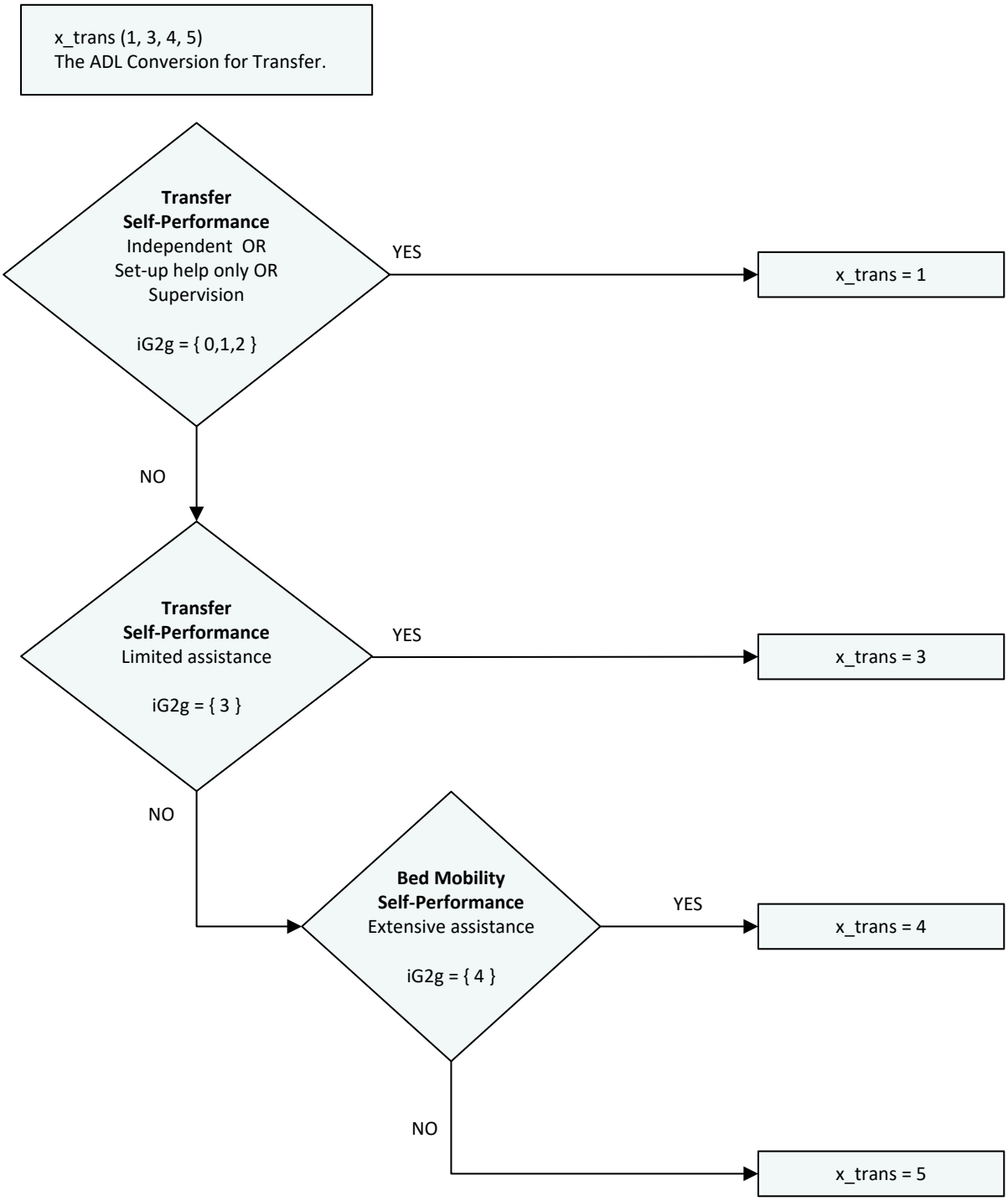
Please note: IADL performance items are collected only in assessments completed in private home, condominium, apartment or assisted living settings. When deriving x_meal, x_mmed and x_phon measures for those assessed in hospital, residential care facility or other settings, performance items are substituted for capacity items.

x_iadls = x_meal + x_mmed + x_phon

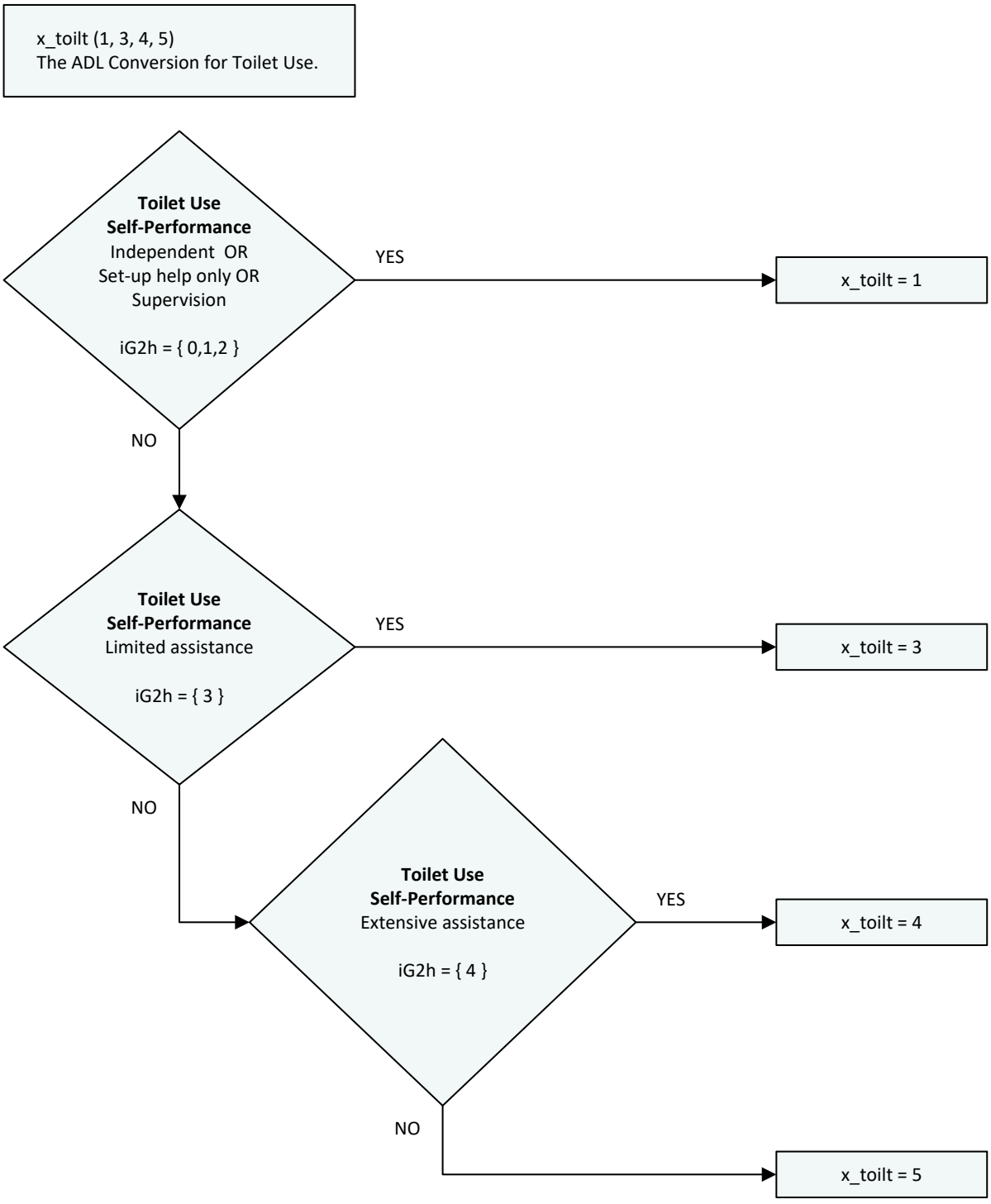
VARIABLE: X_ADLSUM (1 OF 6)



VARIABLE: X_ADLSUM (2 OF 6)

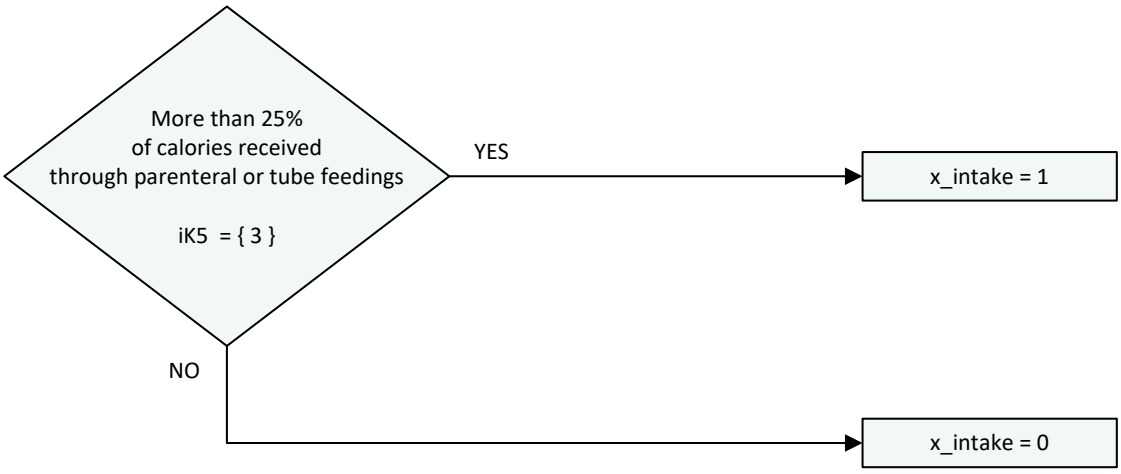


VARIABLE: X_ADLSUM (3 OF 6)

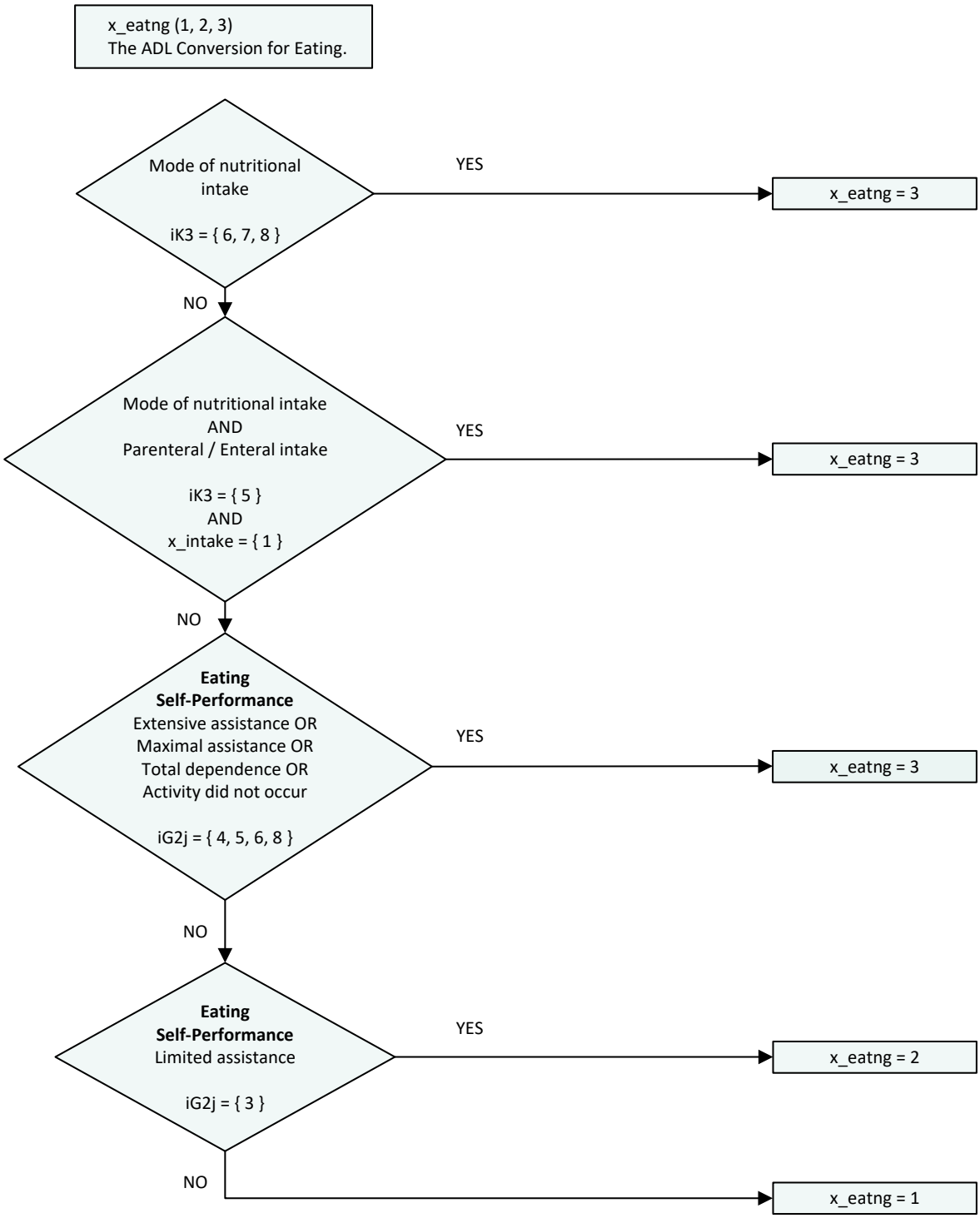


VARIABLE: X_ADLSUM (4 OF 6)

x_intake (0, 1)
Indicator for Parenteral / Enteral intake of calories and fluids.



VARIABLE: X_ADLSUM (5 OF 6)

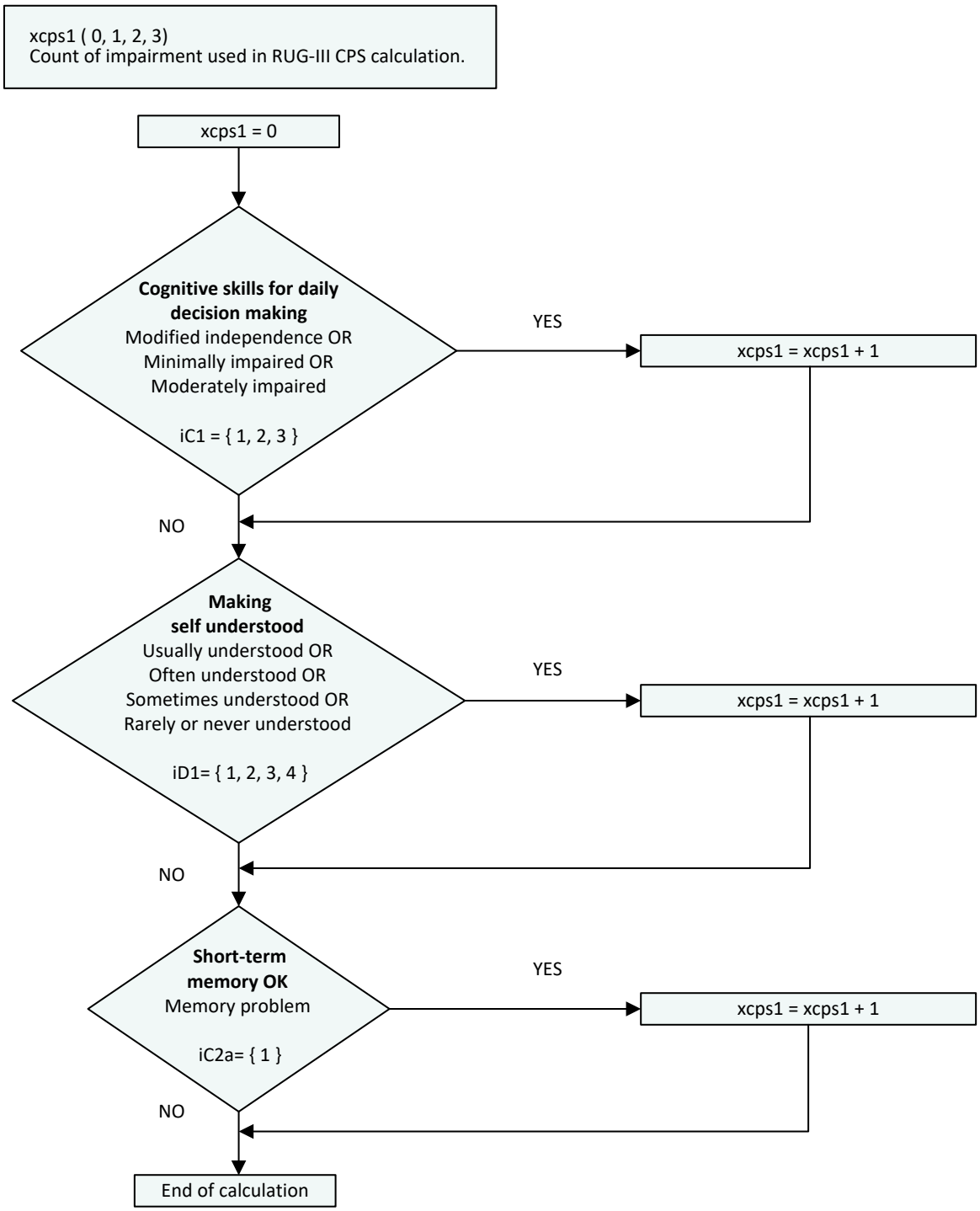


VARIABLE: X_ADLSUM (6 OF 6)

x_adlsum (4 to 18)
The Activities Of Daily Living (ADL) score used within RUG-III.

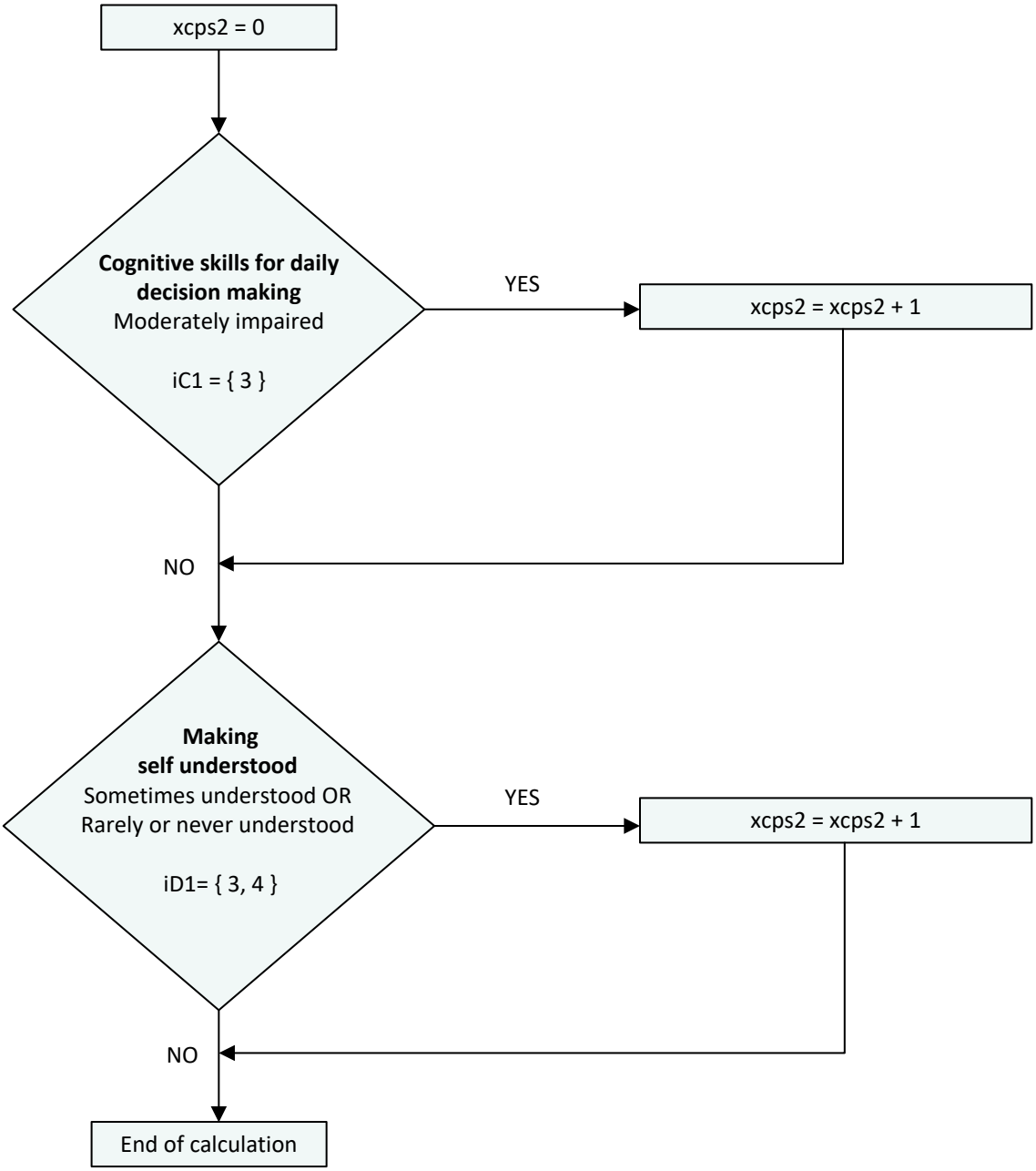
x_adlsum = x_bedmb + x_trans + x_toilt + x_eatng

VARIABLE: SCPS (1 OF 3)

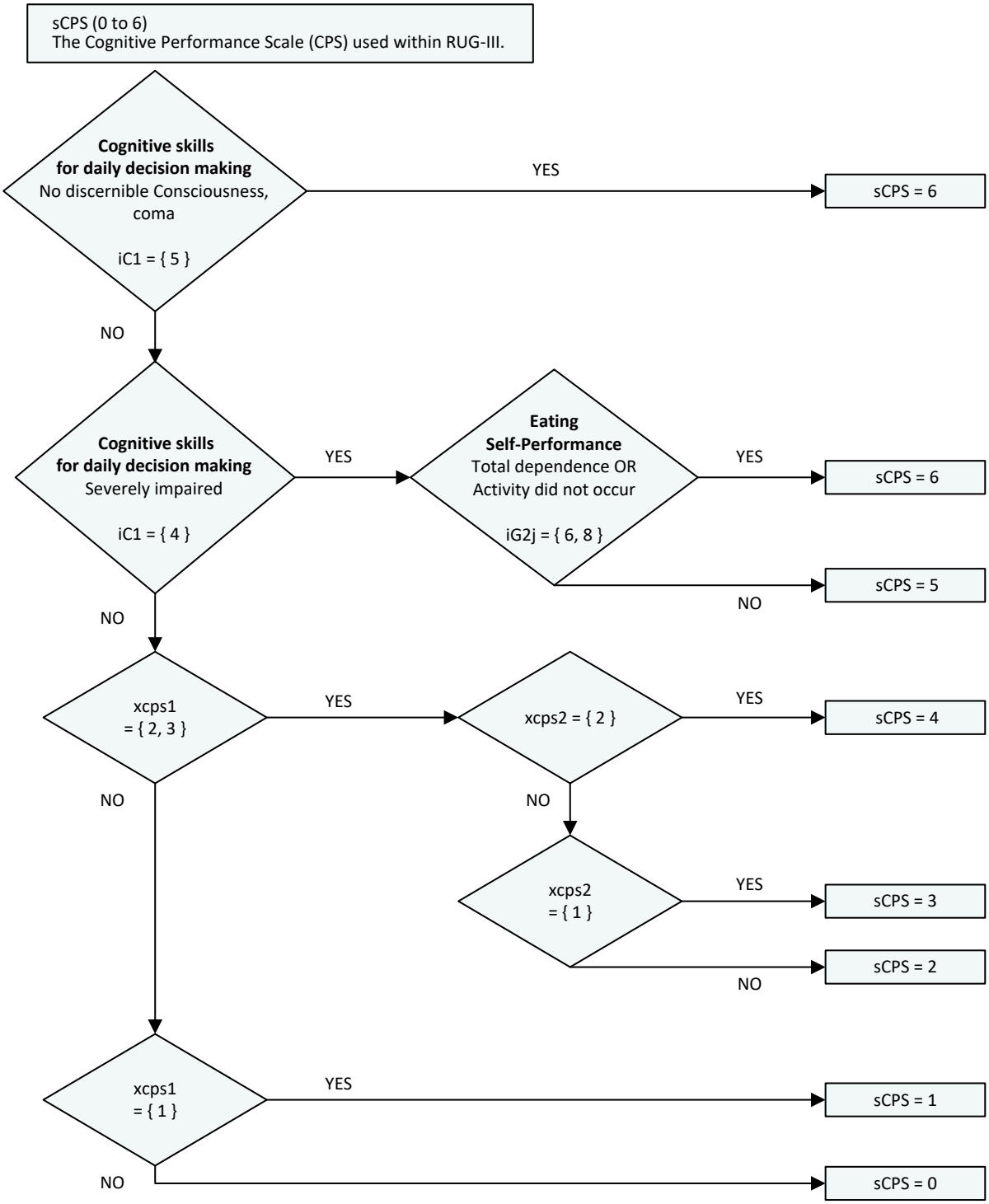


VARIABLE: SCPS (2 OF 3)

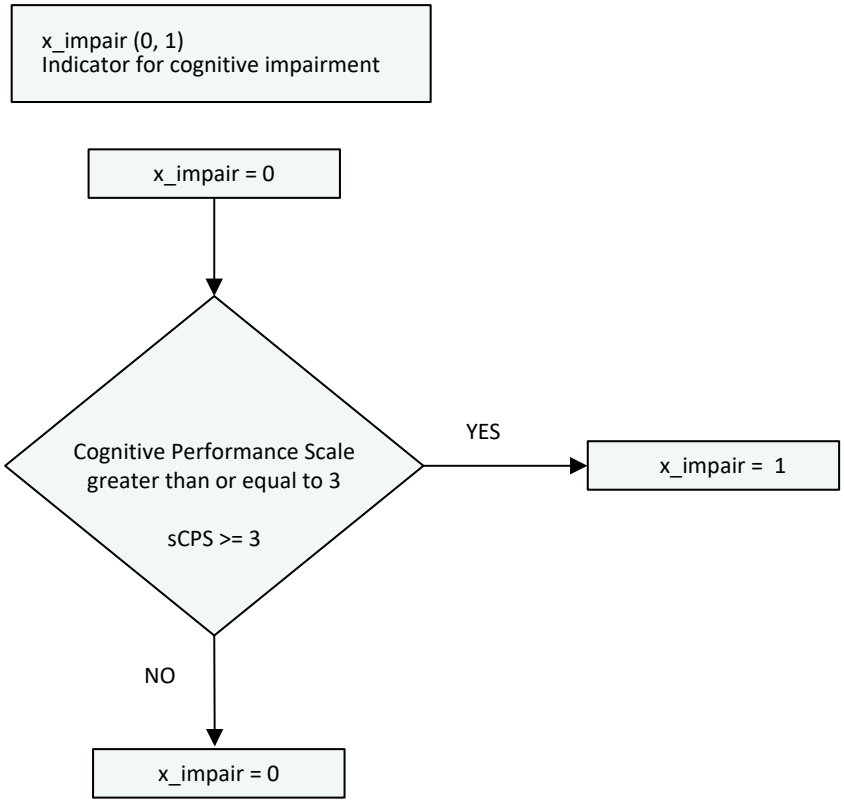
xcps2 (0, 1, 2)
Count of Severe impairment used in RUG-III CPS calculation.



VARIABLE: SCPS (3 OF 3)



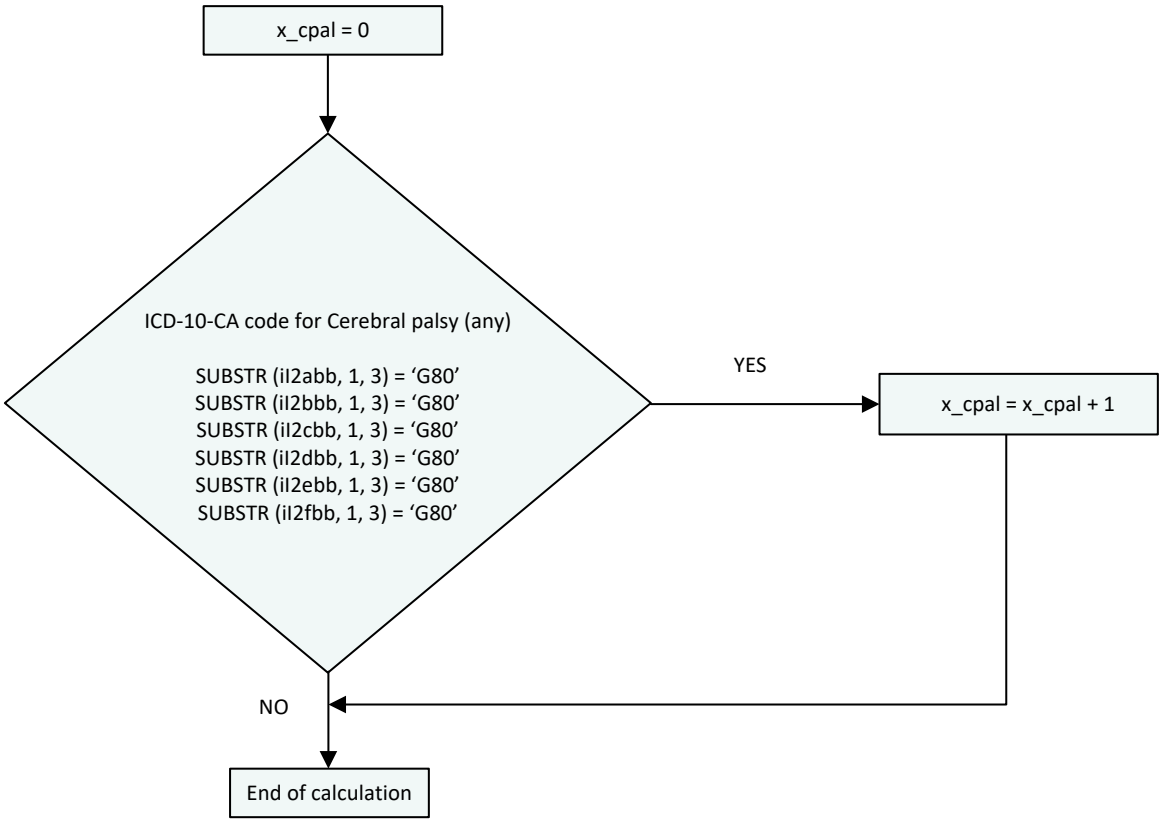
VARIABLE: X_IMPAIR



VARIABLE: X_CPAL

x_cpal (0, 1)
Indicator for Cerebral palsy.

Multiple disease diagnoses can be submitted for an assessment. Check all disease diagnoses values in section iI2.



VARIABLE: X_TH_MIN

x_th_min (0 or more)
The total number of minutes of physical, occupational and speech therapy in the 7 day look back period from the last assessment.

Total minutes of rehab therapy =
Total minutes of speech therapy +
Total minutes of occupational therapy +
Total minutes of physical therapy

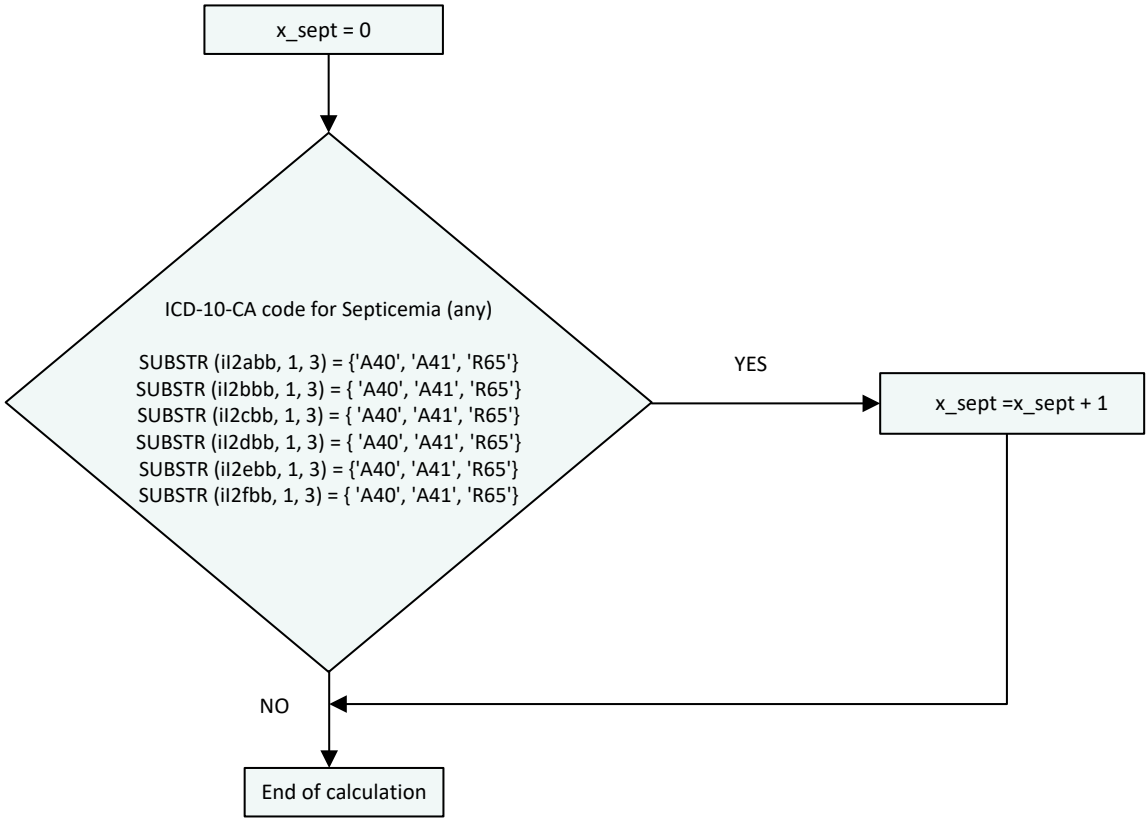
x_th_min = iN3gb + iN3fb + iN3eb

VARIABLE: X_SEPT (1 OF 2)

x_sept (0, 1)
Indicator for Septicemia

Please note CIHI is providing guidance to use A40. or A41. for coding sepsis using ICD-10 CA however the RUG-III-HC sas code and flow charts documents include a broader list of ICD-10 CA sepsis codes.

Multiple disease diagnoses can be submitted for an assessment. Check all disease diagnoses values in section iI2.

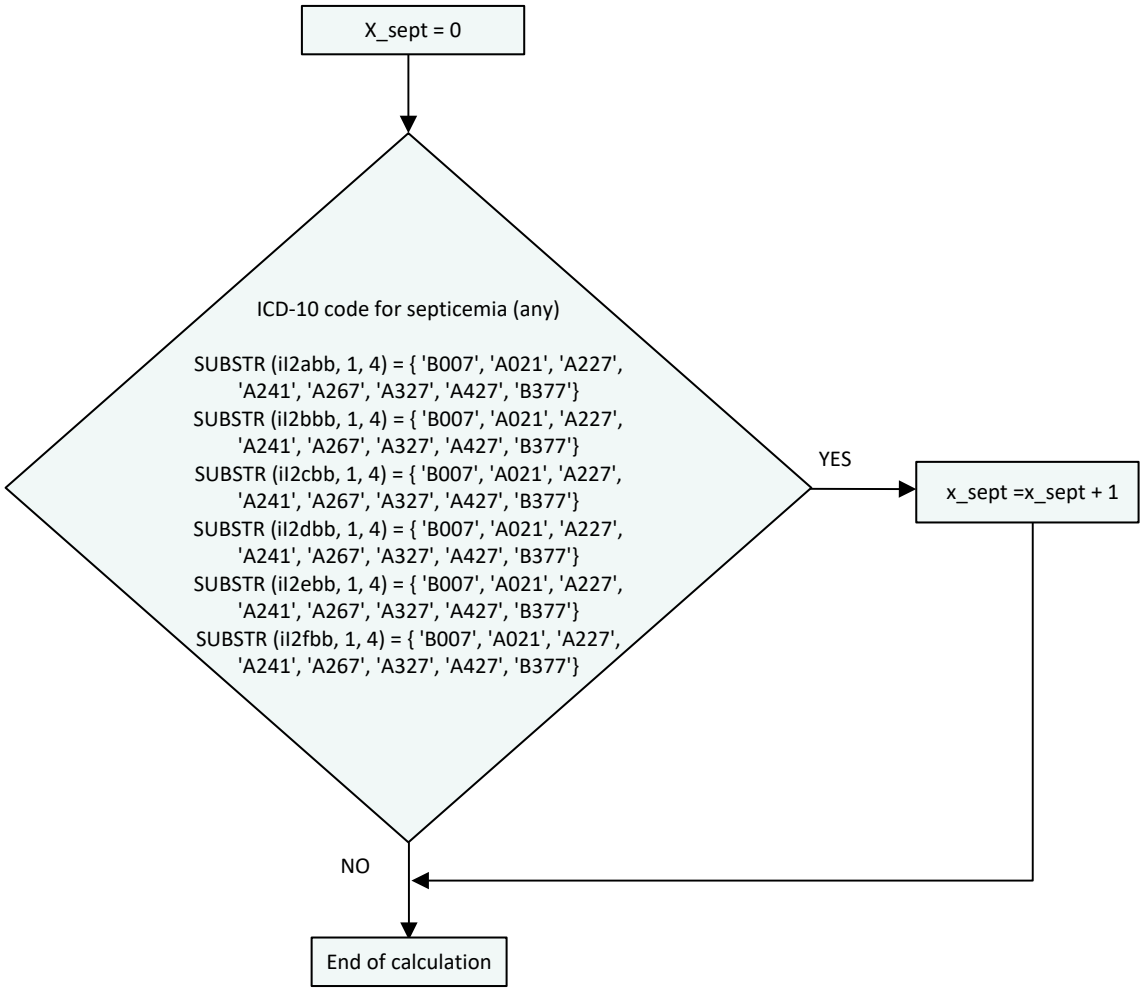


VARIABLE: X_SEPT (2 OF 2)

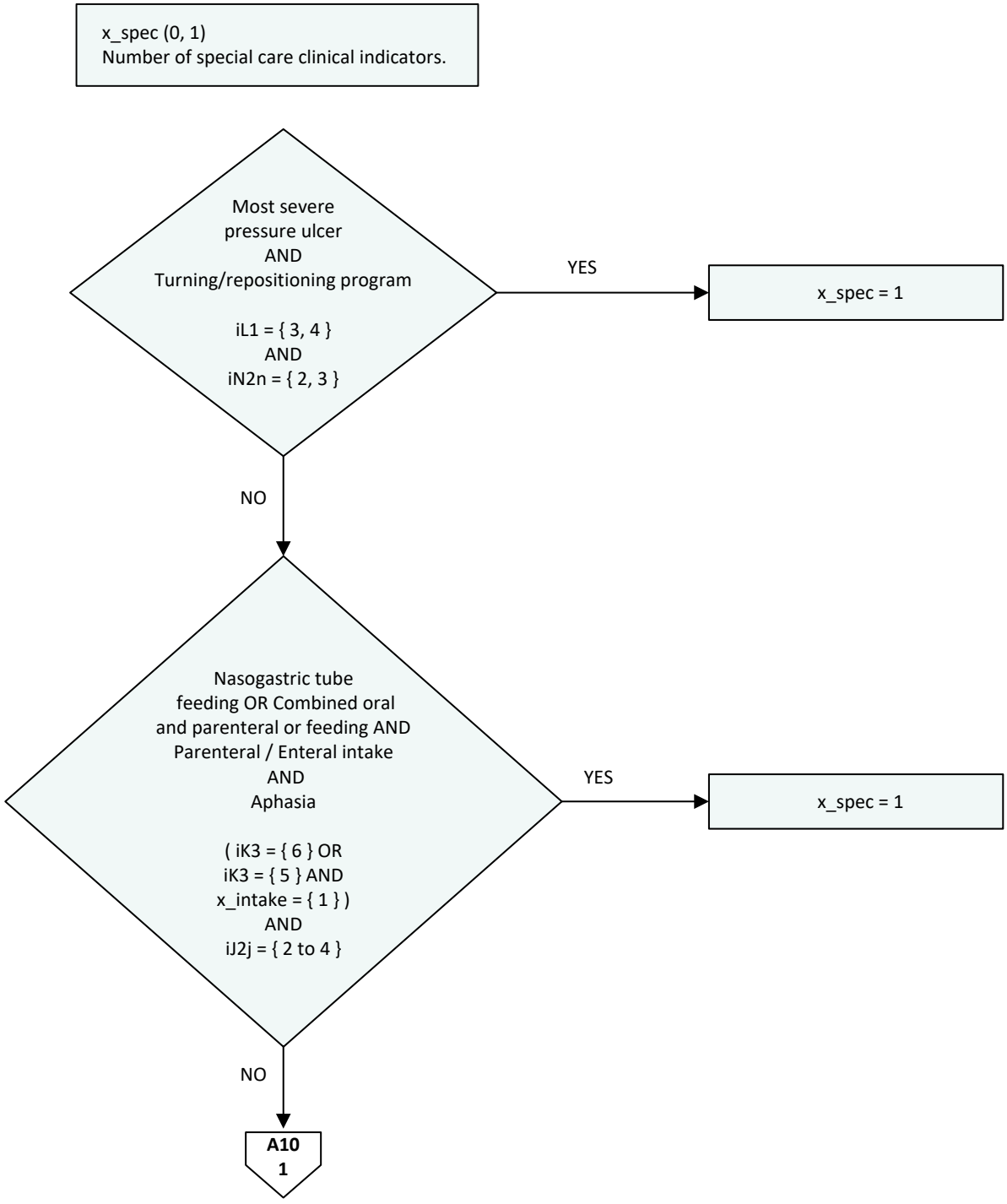
x_sept (0, 1)
Indicator for Septicemia

Please note CIHI is providing guidance to use A40. or A41. for coding sepsis using ICD-10 CA however the RUG-III-HC sas code and flow charts documents include a broader list of ICD-10 CA sepsis codes.

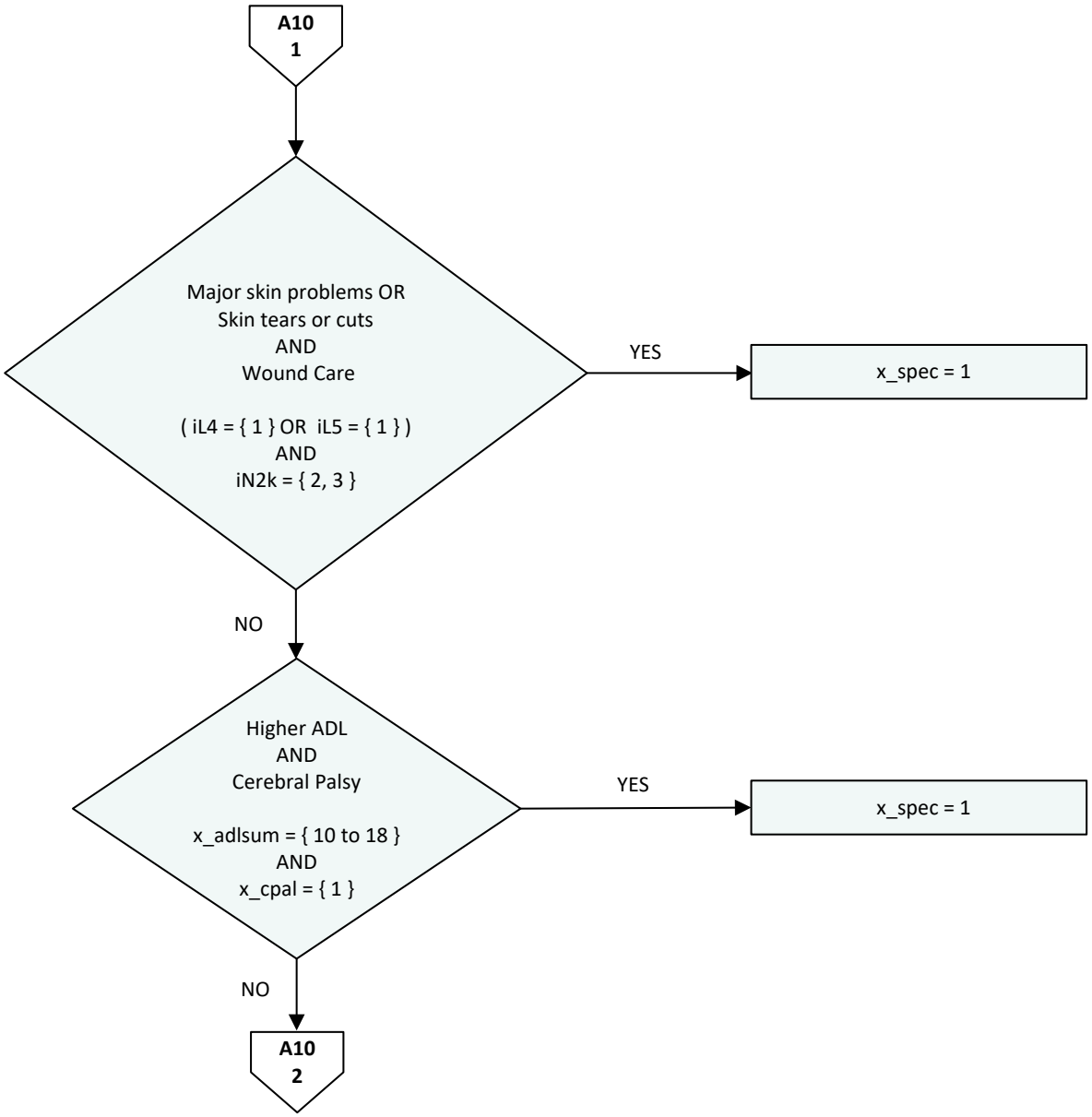
Multiple disease diagnoses can be submitted for an assessment. Check all disease diagnoses values in section iI2.



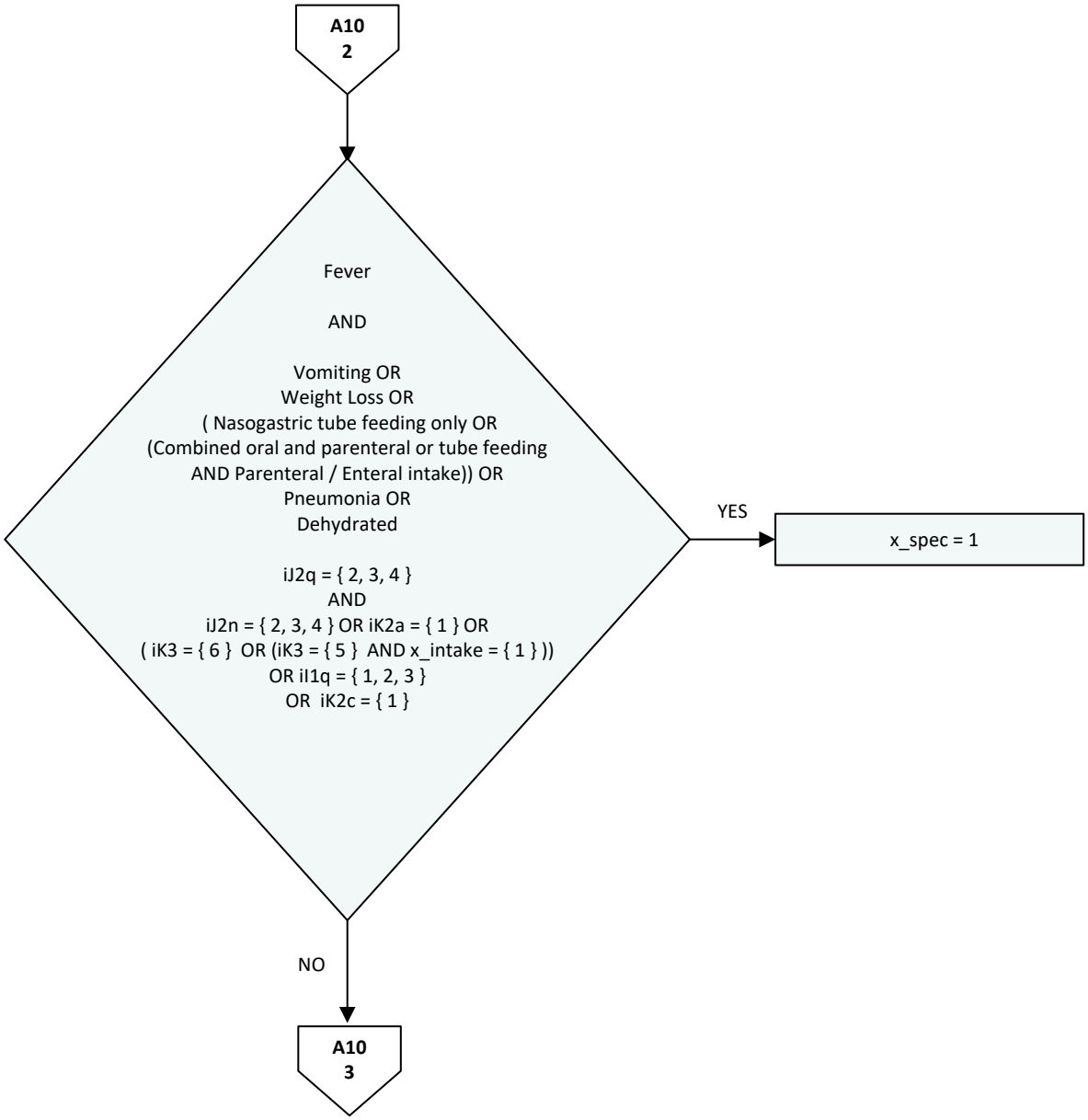
VARIABLE: X_SPEC (1 OF 4)



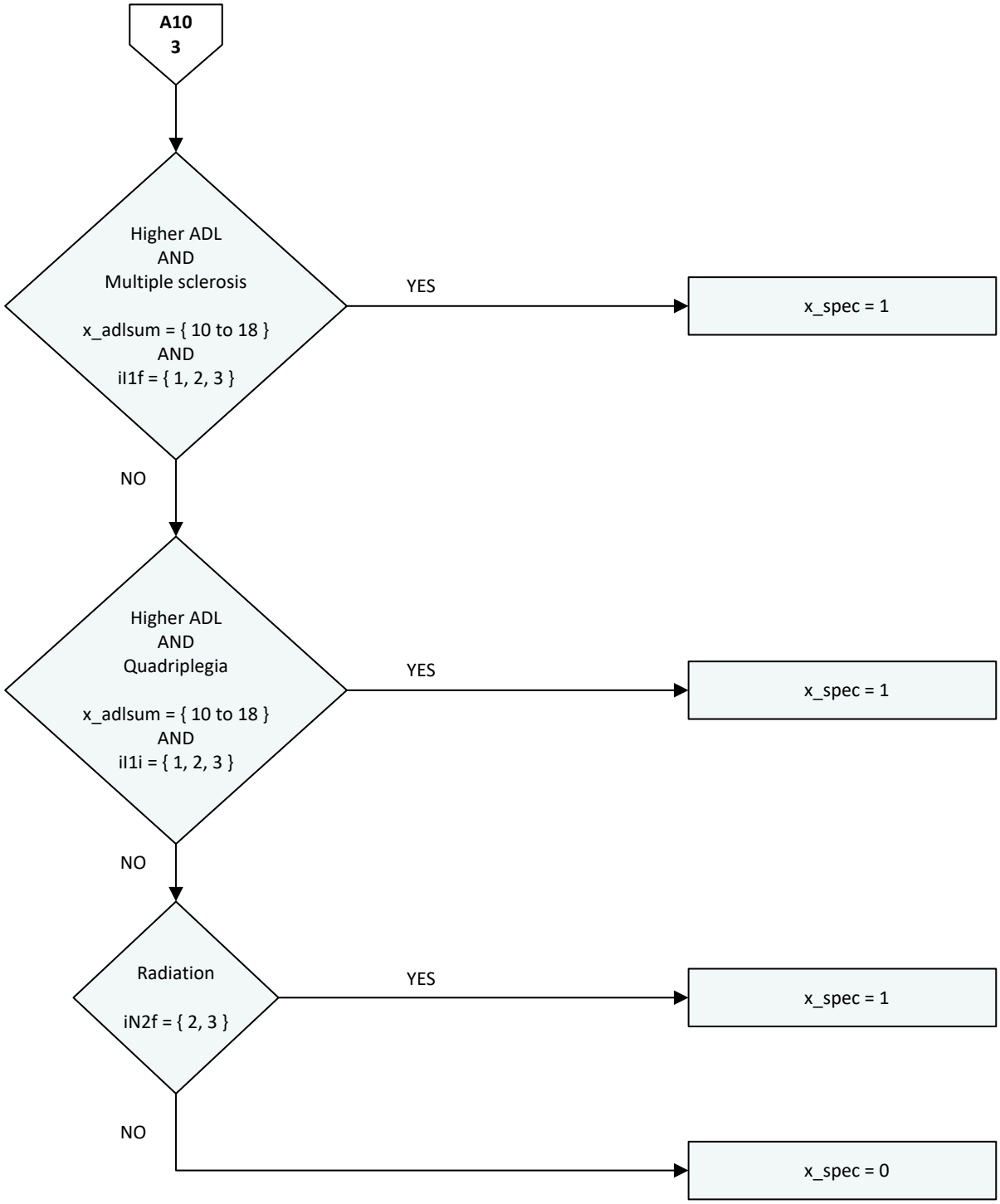
VARIABLE: X_SPEC (2 OF 4)



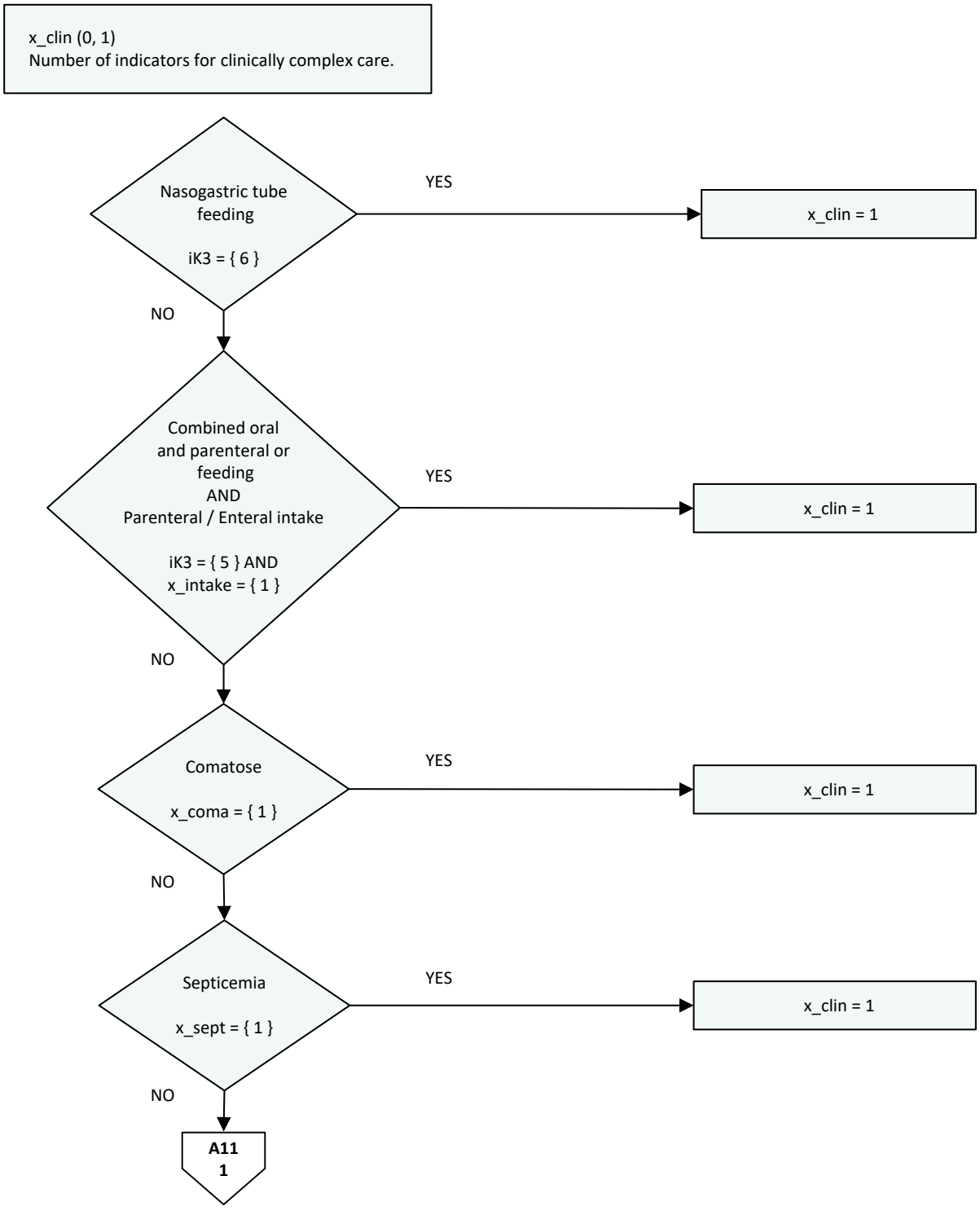
VARIABLE: X_SPEC (3 OF 4)



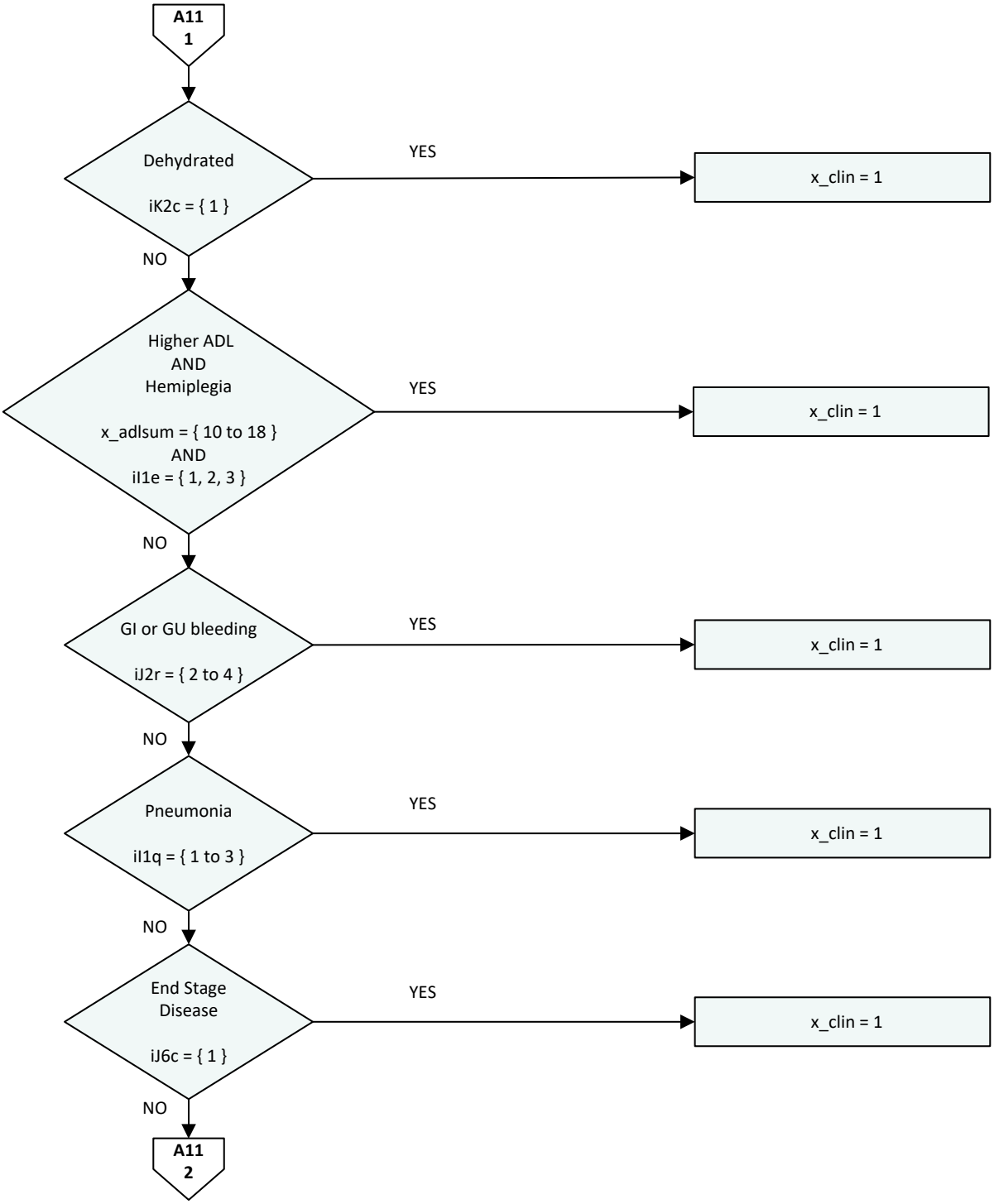
VARIABLE: X_SPEC (4 OF 4)



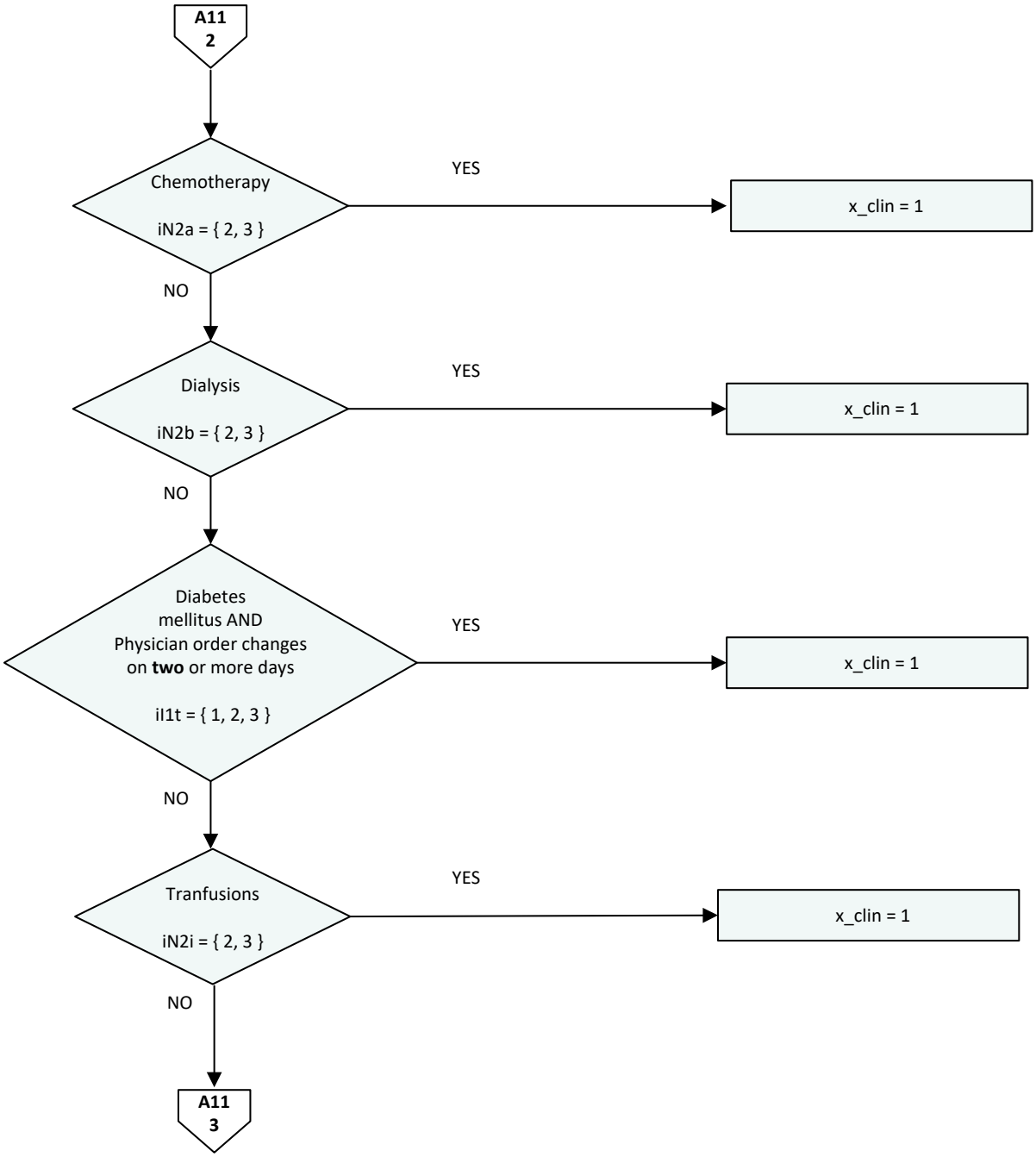
VARIABLE: X_CLIN (1 OF 4)



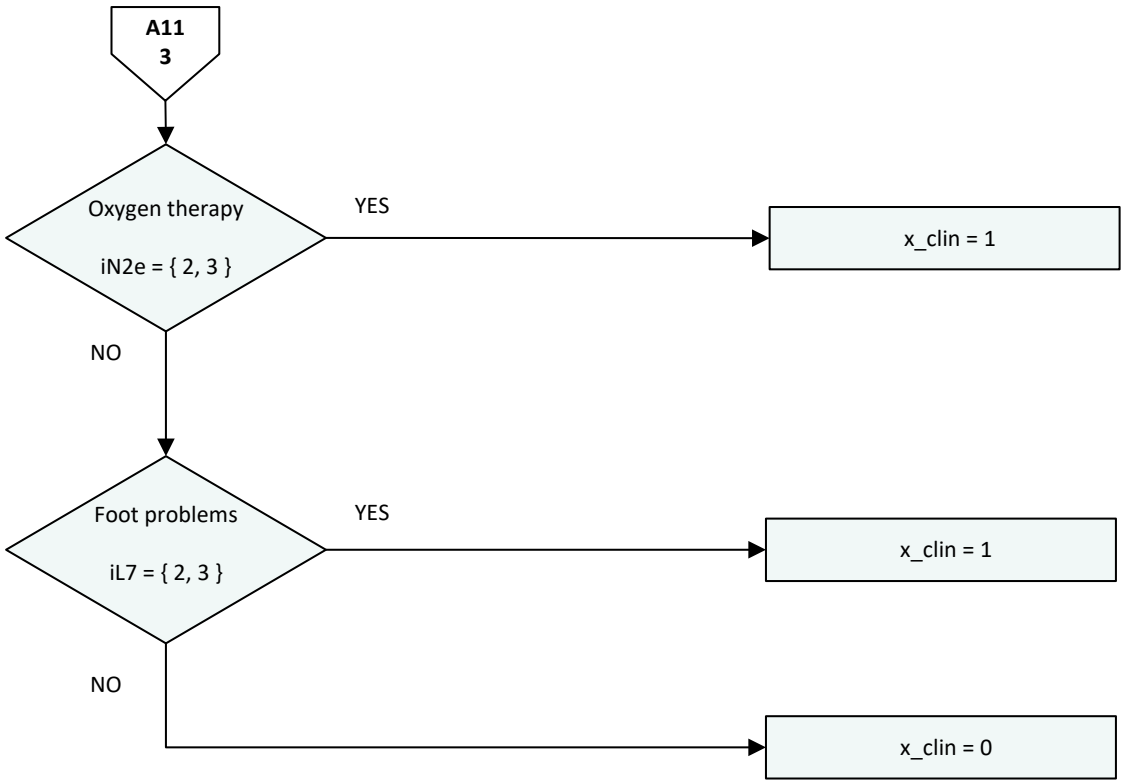
VARIABLE: X_CLIN (2 OF 4)



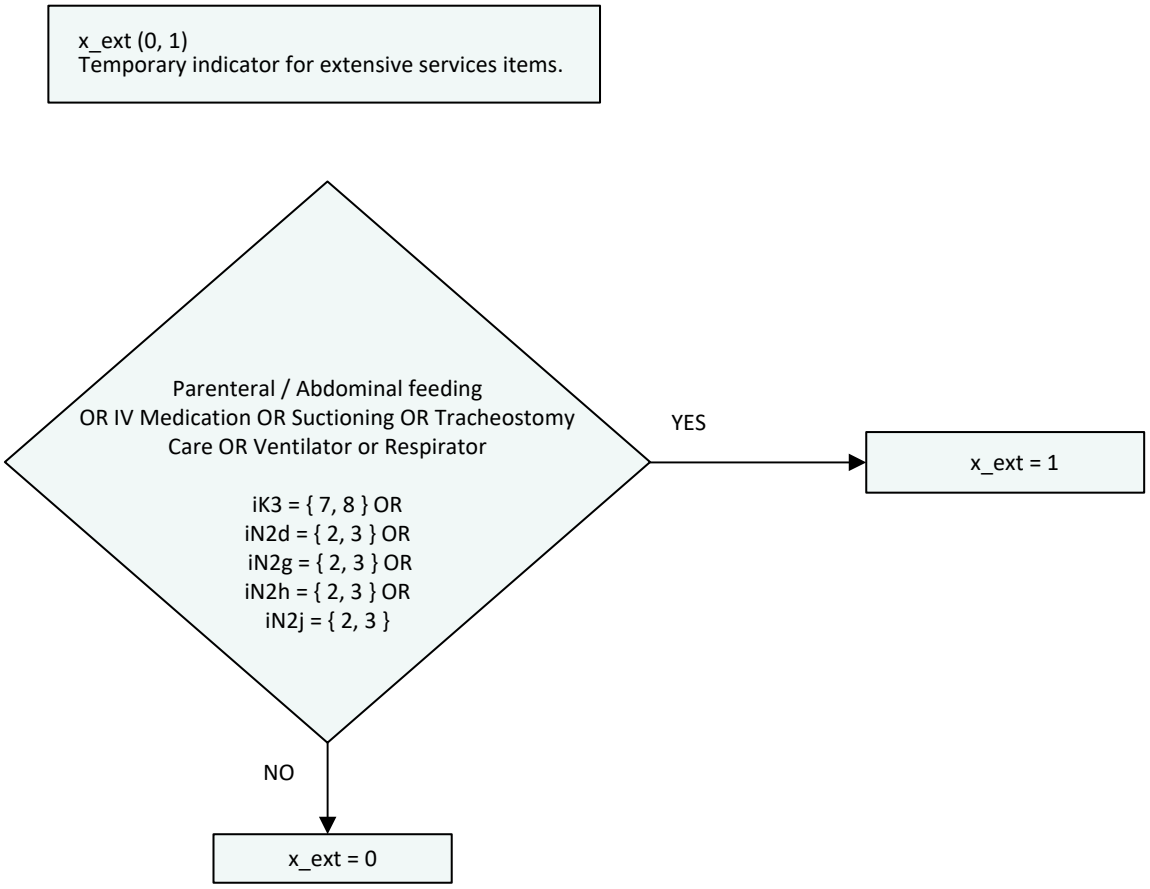
VARIABLE: X_CLIN (3 OF 4)



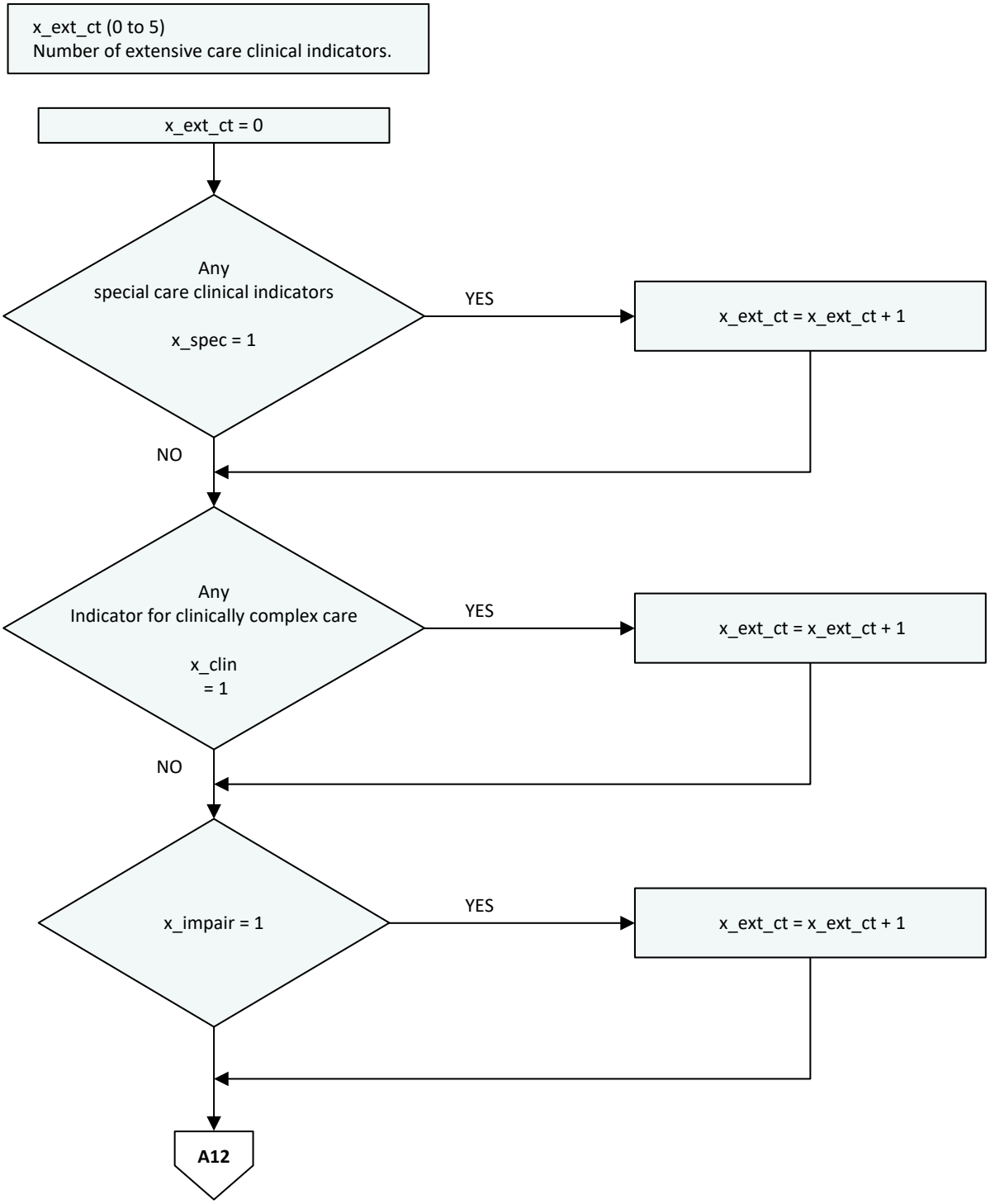
VARIABLE: X_CLIN (4 OF 4)



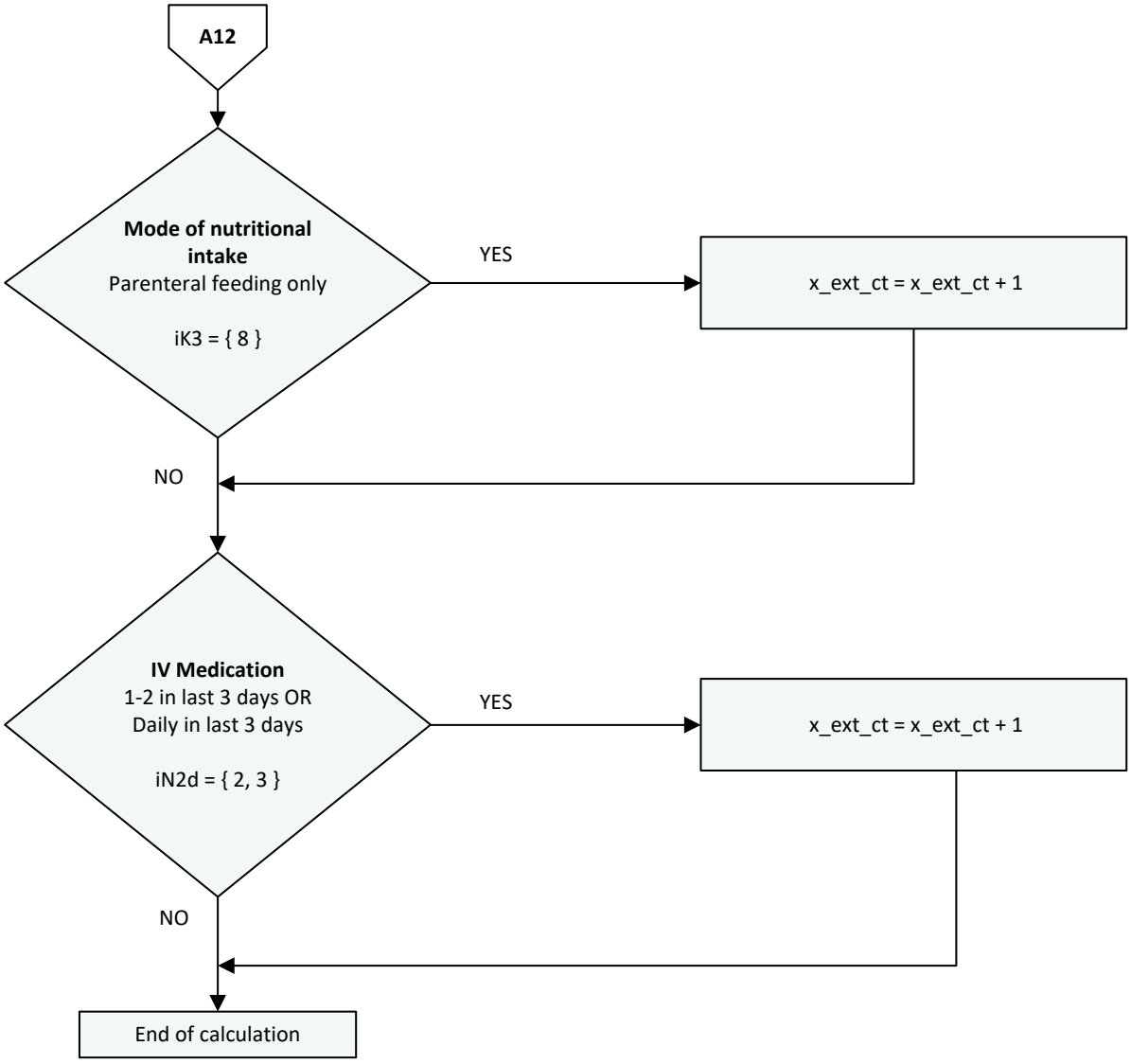
VARIABLE: X_EXT



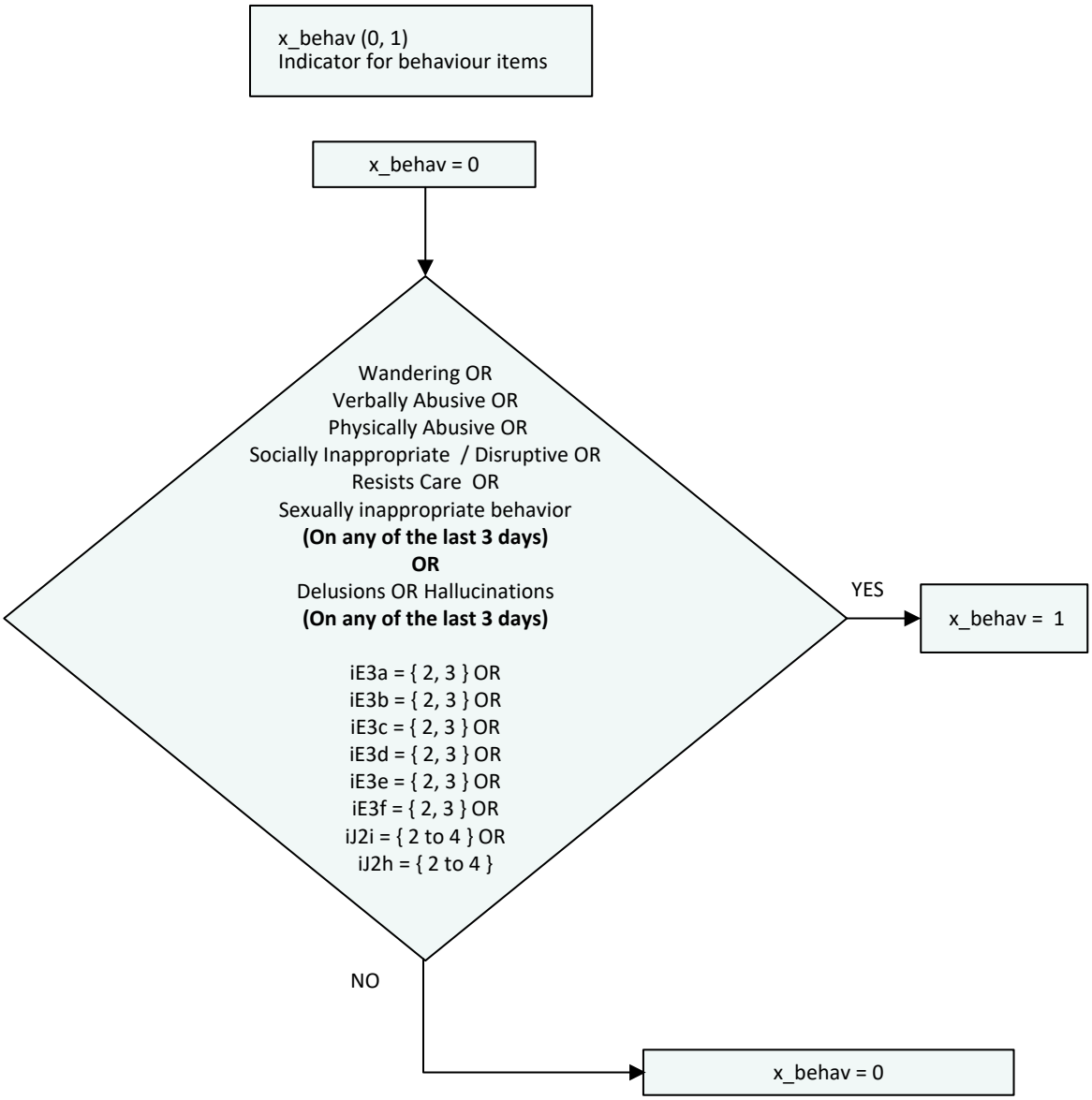
VARIABLE: X_EXT_CT (1 OF 2)



VARIABLE: X_EXT_CT (2 OF 2)



VARIABLE: X_BEHAV

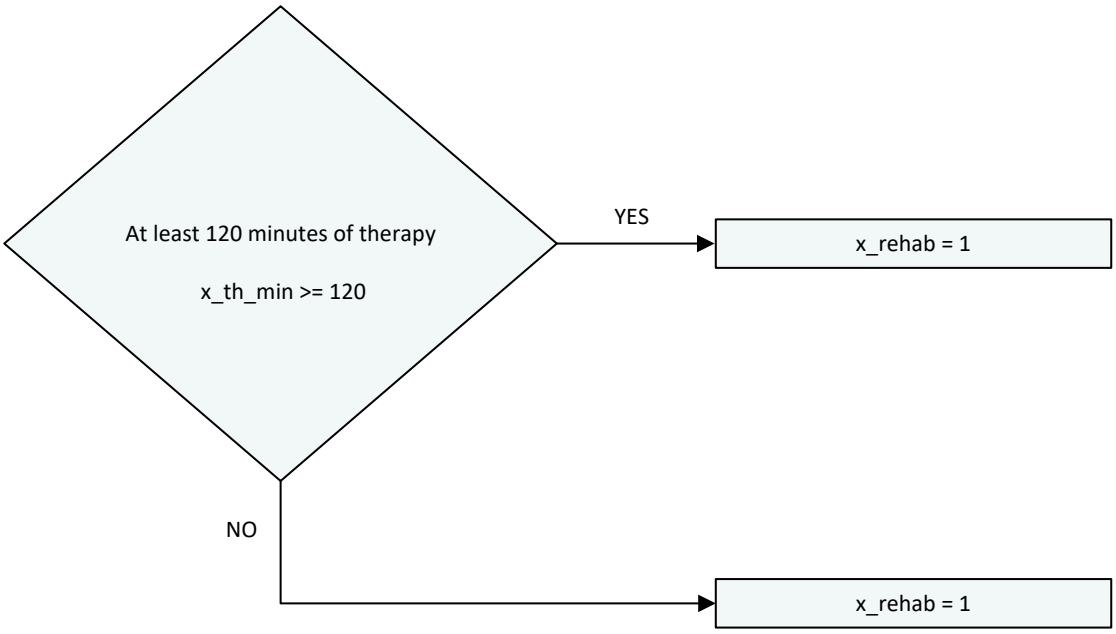


IRRS RUG-III-HC Section 3: Calculate RUG-III-HC category triggers

RUG-III-HC TRIGGERS (1 OF 5)

x_reh (0, 1)

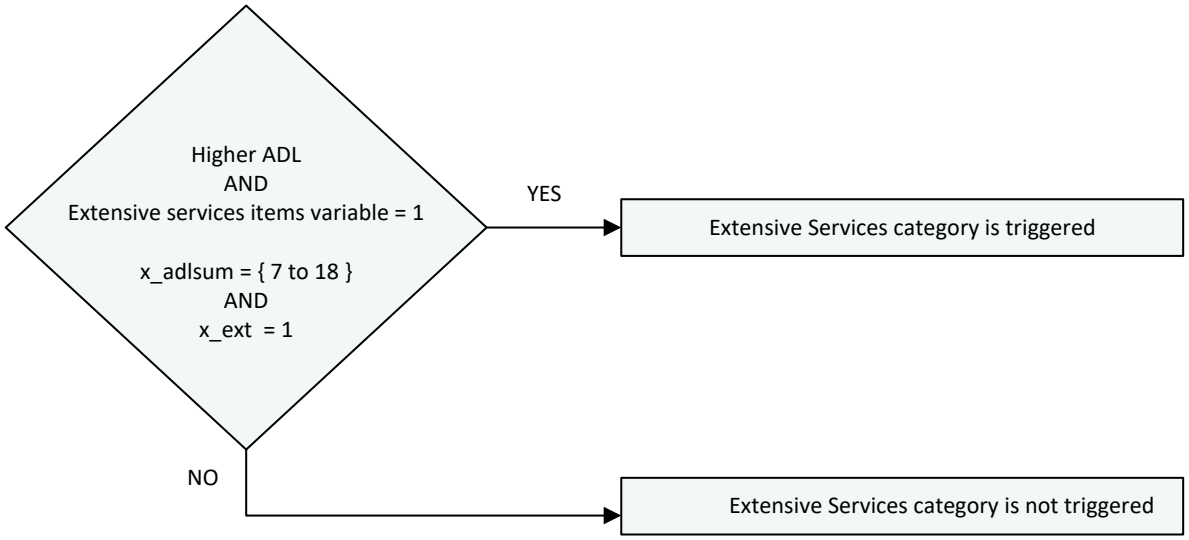
The Special Rehabilitation trigger is set if there was at least 120 minutes of Physical Occupational or Speech therapy provided during the look back period.



RUG-III-HC TRIGGERS (2 OF 5)

The assignment of qualifying extensive services RUG-III-HC groups to assessments includes the identification of the trigger for the extensive services category. This document does not provide a specific temporary variable for assessments that trigger the extensive services category.

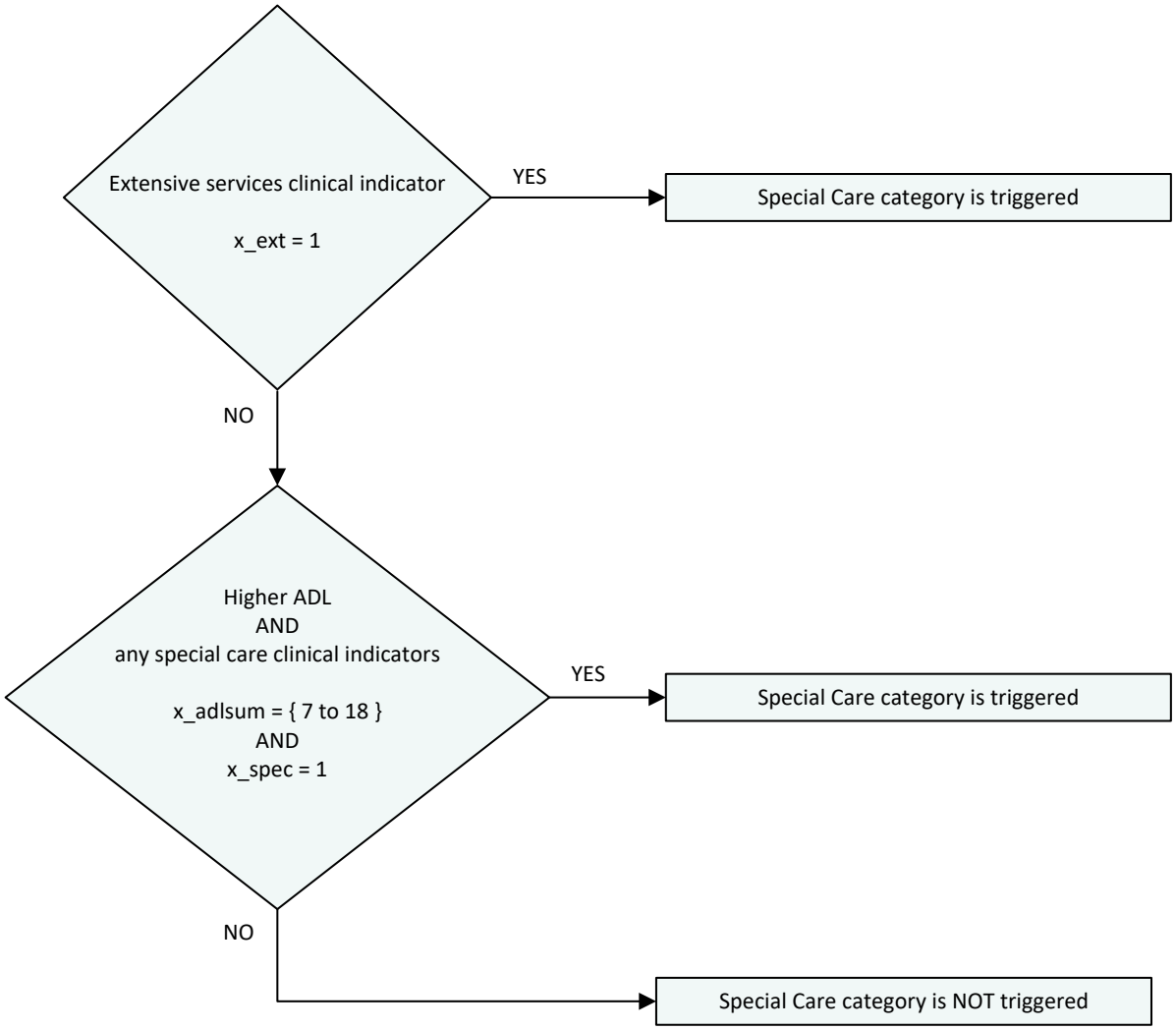
The RUG-III-HC Extensive Services trigger is set if there are any RUG-III-HC Extensive Care clinical items AND a higher ADL score.



RUG-III-HC TRIGGERS (3 OF 5)

The assignment of qualifying special care RUG-III-HC groups to assessments includes the identification of the trigger for the special care category. This document does not provide a specific temporary variable for assessments that trigger the special care category.

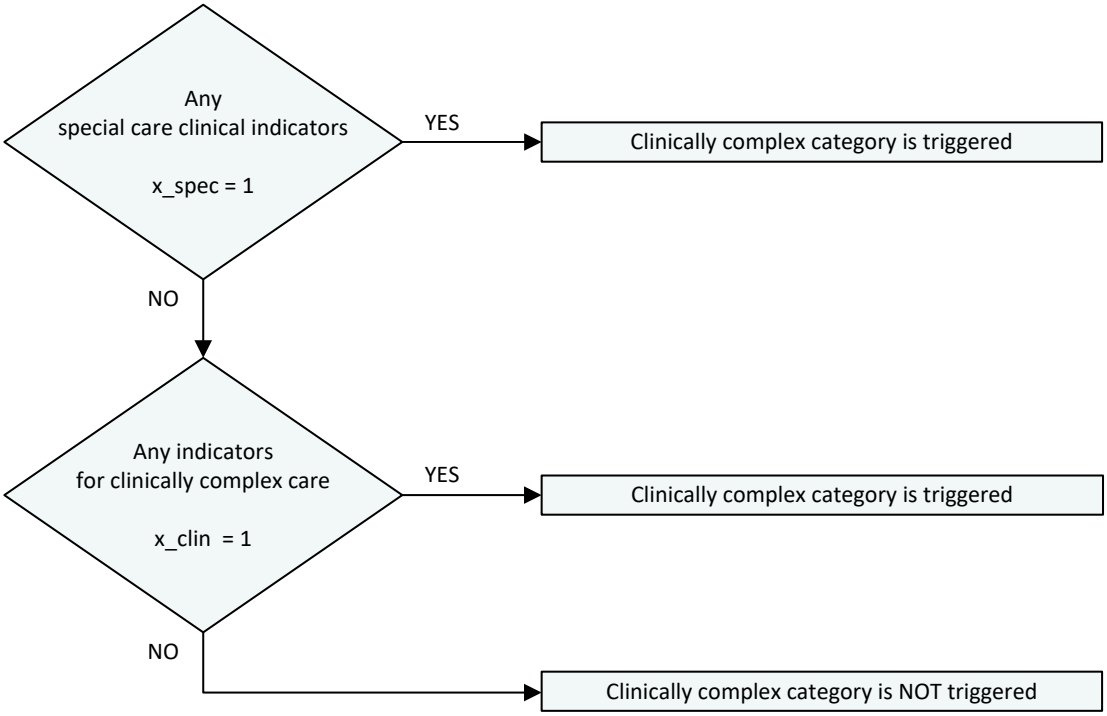
The RUG-III-HC Special Care trigger is set
a) if there are any Extensive Care clinical indicators
OR
b) if there are any Special Care clinical indicators AND there is also a higher ADL score for the assessment



RUG-III-HC TRIGGERS (4 OF 5)

The assignment of qualifying clinically complex RUG-III-HC groups to assessments includes the identification of the trigger for the clinically complex category. This document does not provide a specific temporary variable for assessments that trigger the clinically complex category.

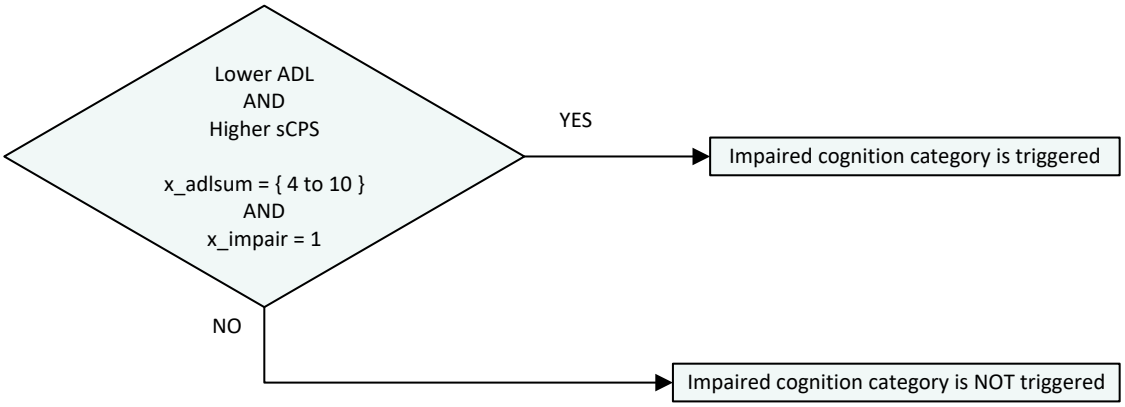
The Clinically Complex trigger is set
a) if there are any Special Care clinical indicators
OR
b) if there are any indicators for Clinically Complex care



RUG-III HC-TRIGGERS (5 OF 5)

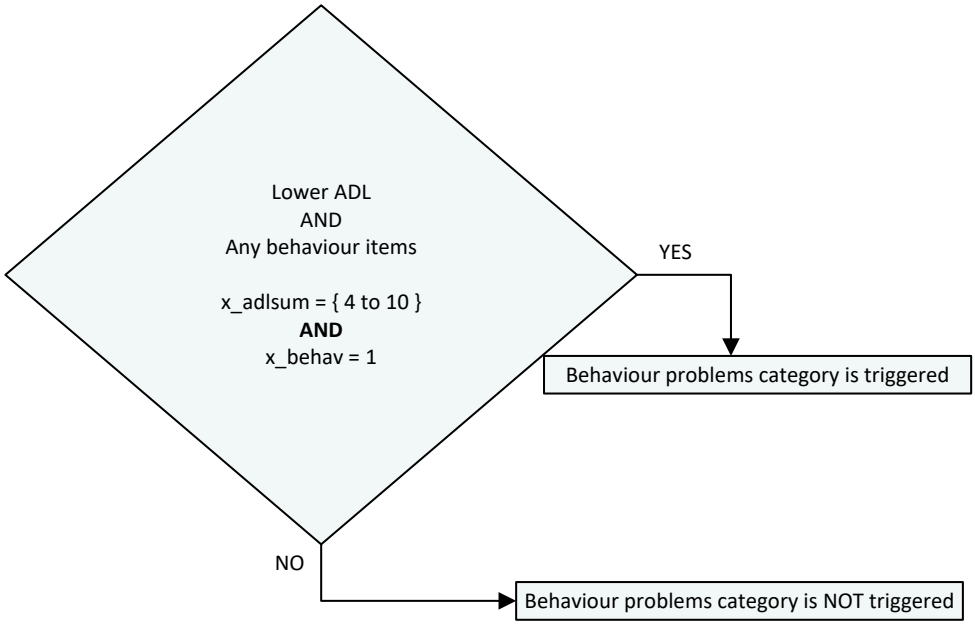
The assignment of qualifying impaired cognition RUG-III-HC groups to assessments includes the identification of the trigger for the impaired cognition category. This document does not provide a specific temporary variable for assessments that trigger the impaired cognition category.

The Impaired Cognition TRIGGER is set when there is a Lower ADL score and a Higher CPS score



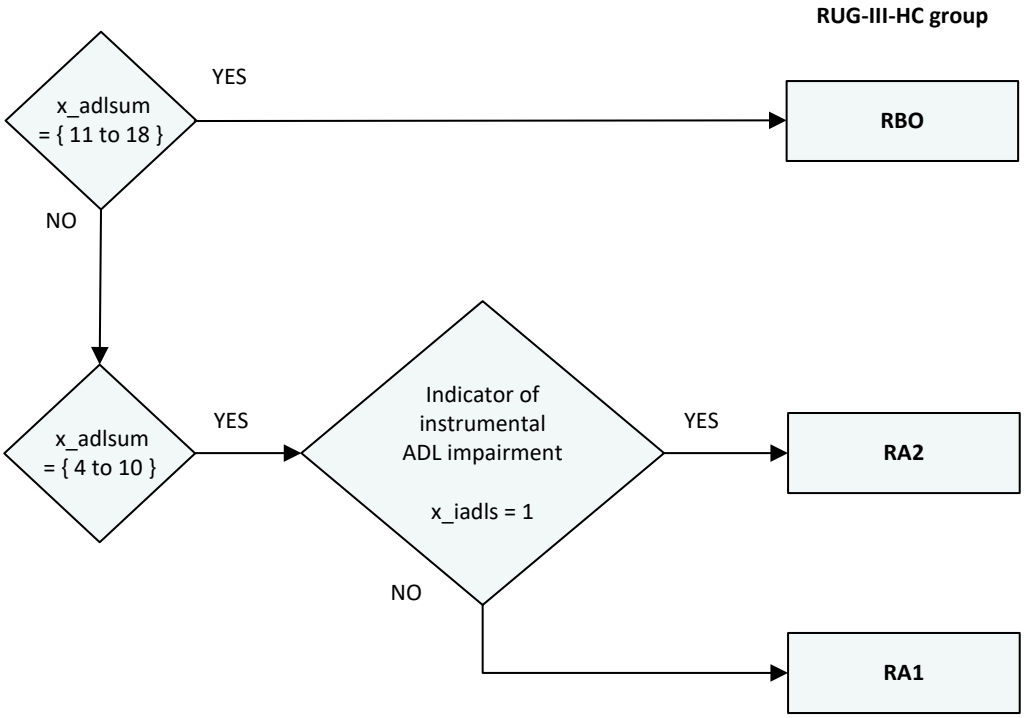
The assignment of qualifying behaviour problems RUG-III-HC groups to assessments includes the identification of the trigger for the behaviour problems category. This document does not provide a specific temporary variable for assessments that trigger the behaviour problems category.

The Behaviour Problem trigger is set when there is a lower ADL score and any Behaviour Problem item

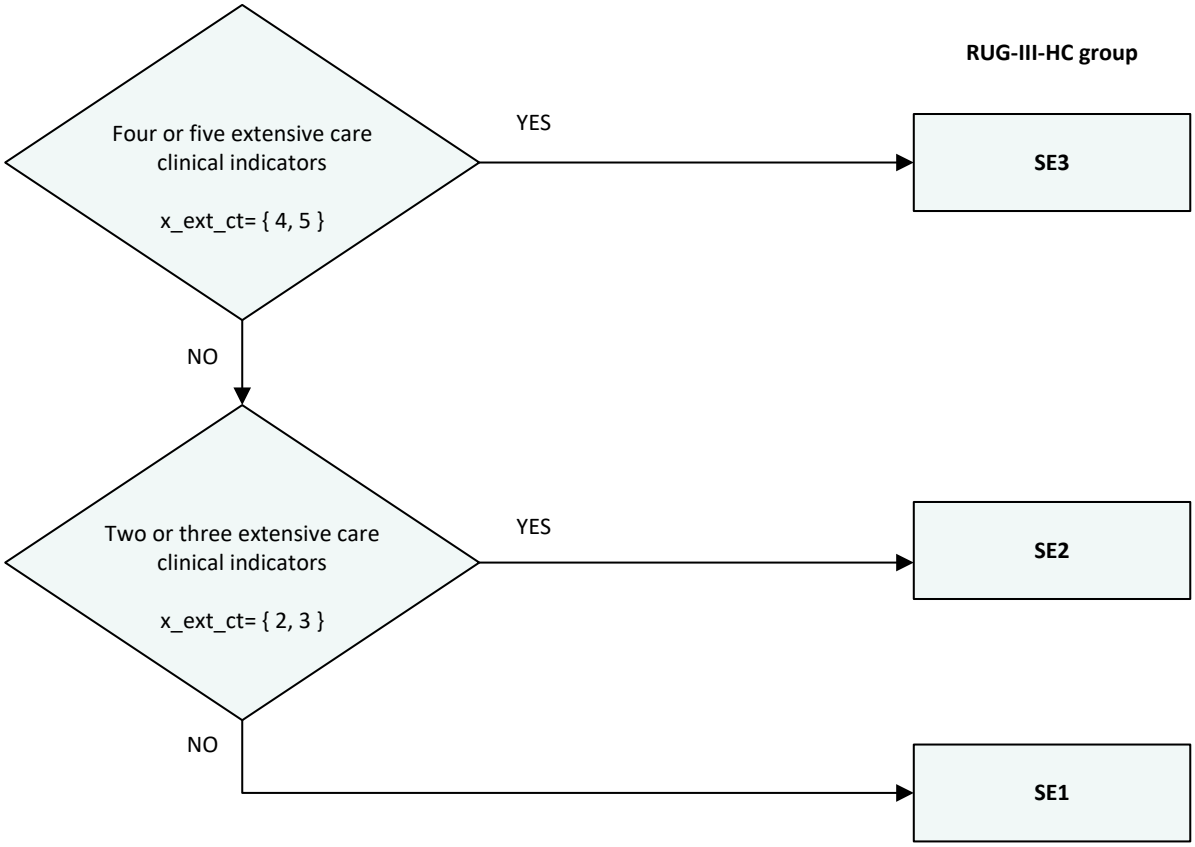


IRRS RUG-III-HC Section 4:
Assign qualifying RUG-III-HC groups

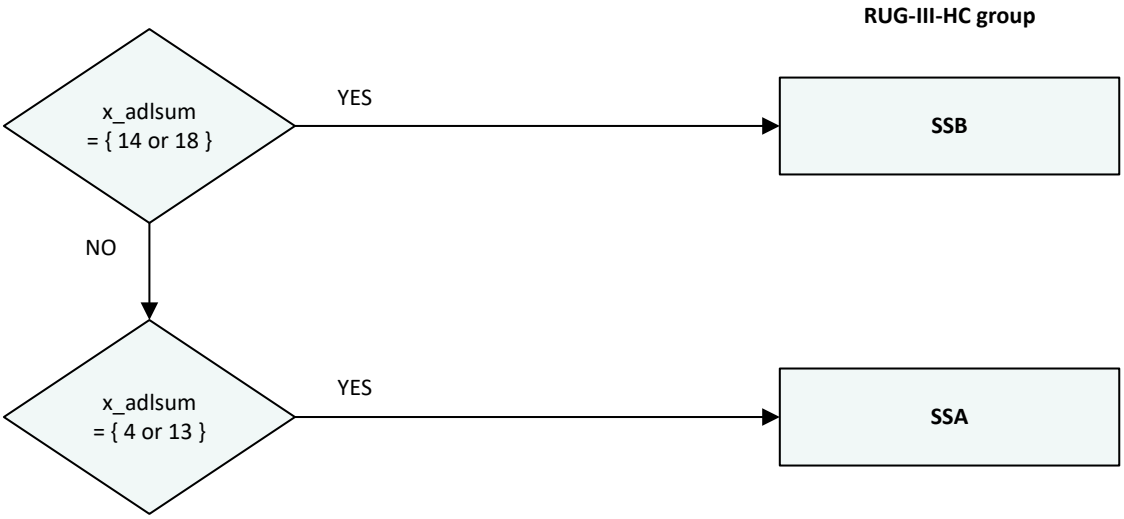
CATEGORY: SPECIAL REHABILITATION



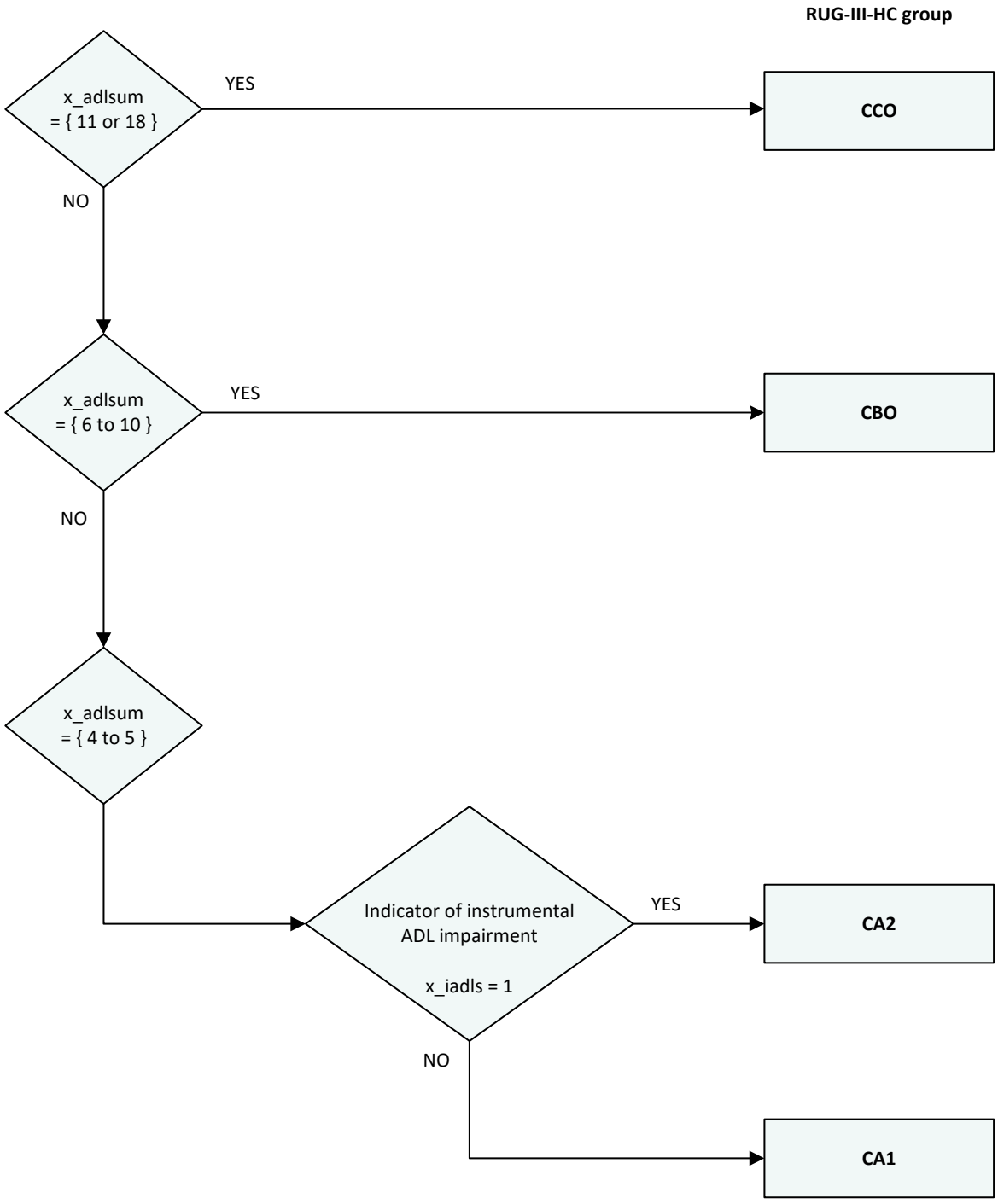
CATEGORY: EXTENSIVE SERVICES



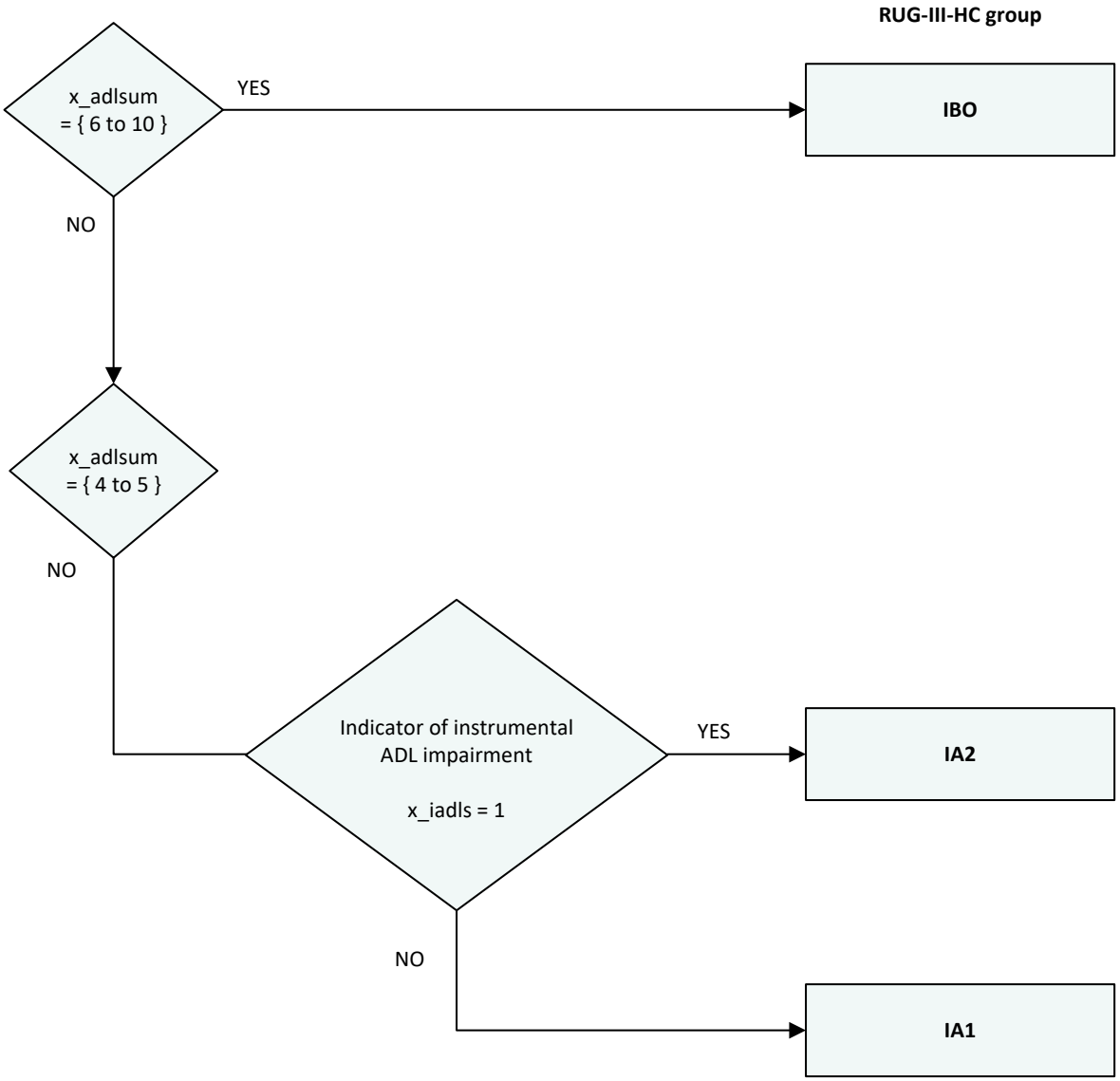
CATEGORY: SPECIAL CARE



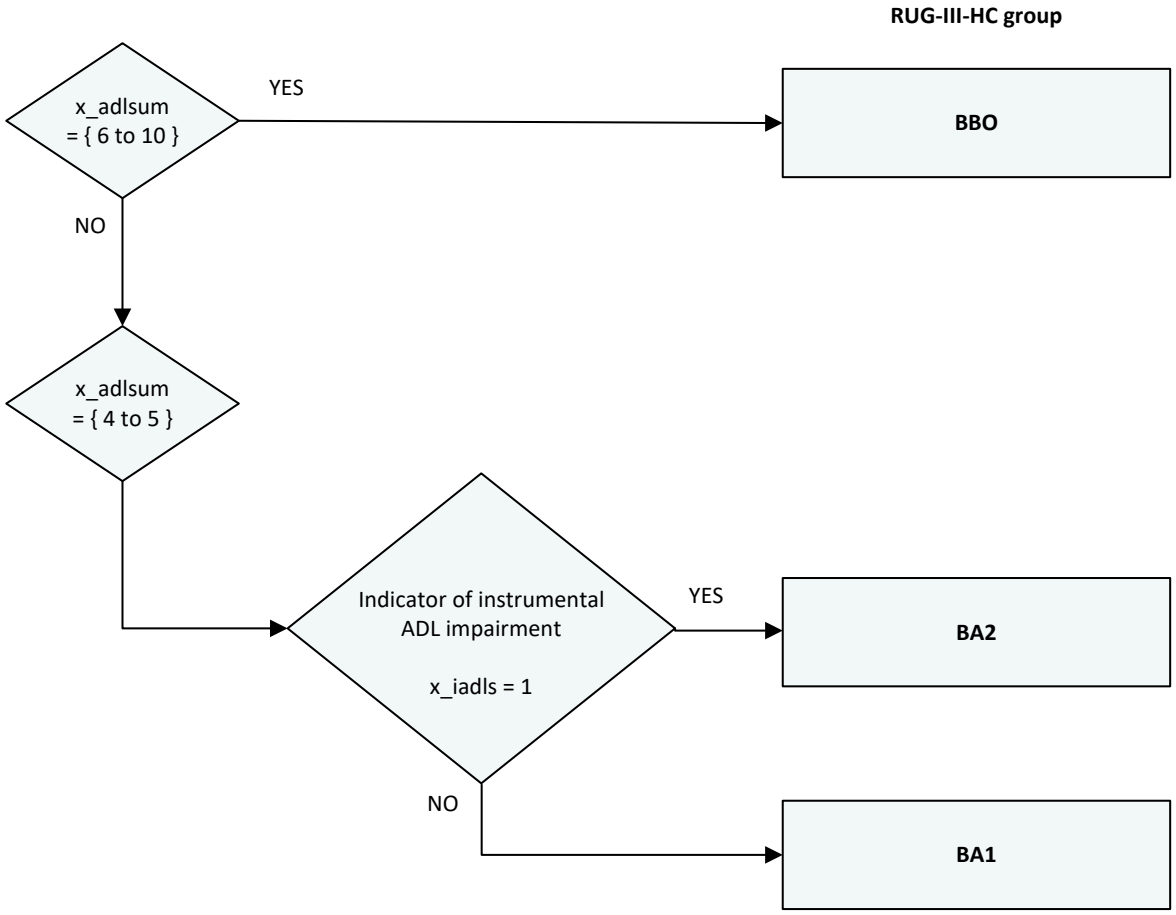
CATEGORY: CLINICALLY COMPLEX



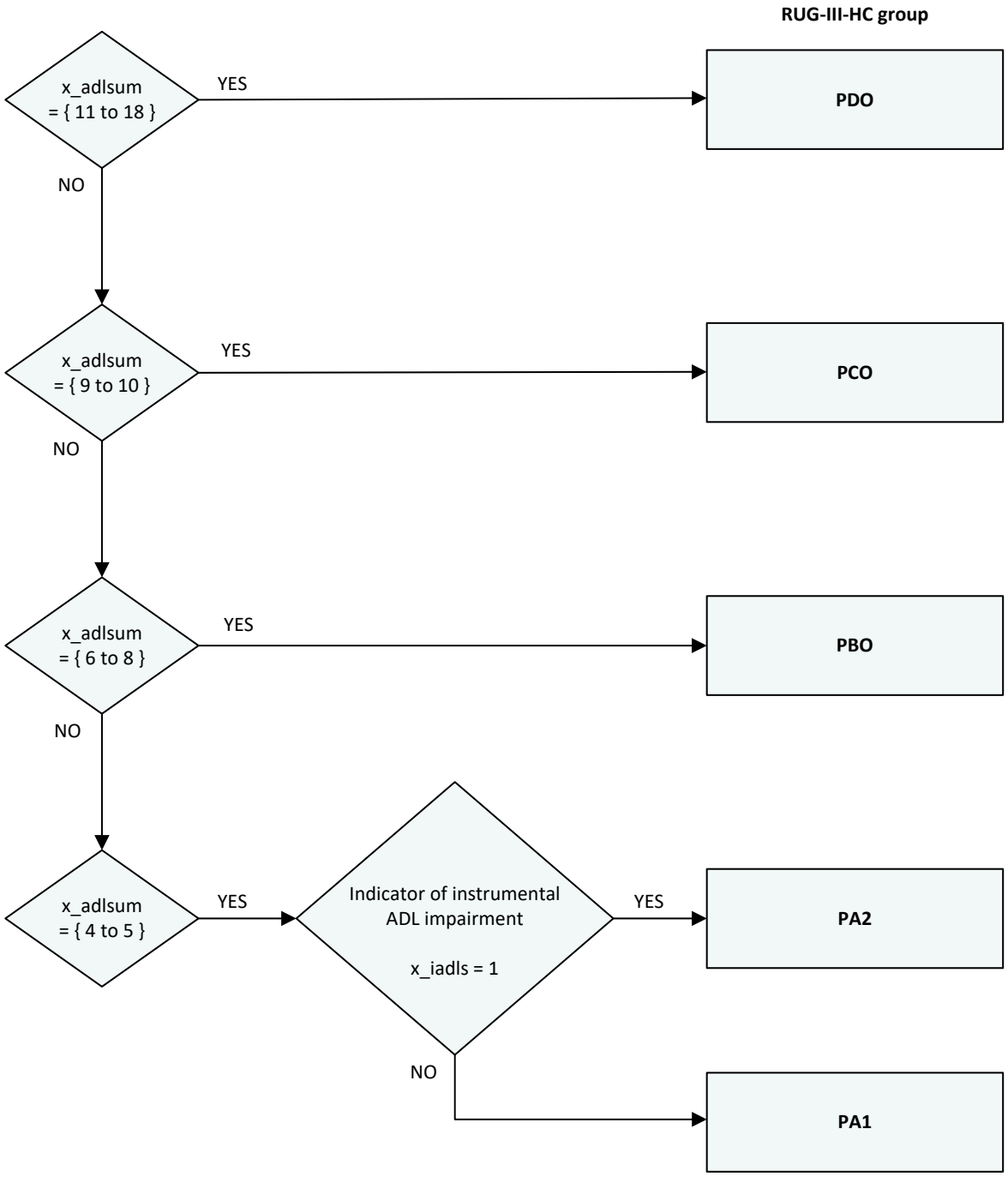
CATEGORY: IMPAIRED COGNITION



CATEGORY: BEHAVIOUR PROBLEMS



CATEGORY: REDUCED PHYSICAL FUNCTIONS



Appendix: Summary of product changes for RUG-III-HC using iCodes

Fiscal year	Grouping methodology
2025–2026	Modifications were made to calculate iADL for assessments completed in different settings.
2023–2024	Corrections were made to calculate iADL in a hospital setting.
2022–2023	Corrections were made to the value range descriptions for the Mood and Behaviour variables.
2018–2019	Initial release

help@cihi.ca

CIHI Ottawa
495 Richmond Road
Suite 600
Ottawa, Ont.
K2A 4H6
613-241-7860

CIHI Toronto
4110 Yonge Street
Suite 300
Toronto, Ont.
M2P 2B7
416-481-2002

CIHI Victoria
880 Douglas Street
Suite 600
Victoria, B.C.
V8W 2B7
250-220-4100

CIHI Montréal
1010 Sherbrooke Street West
Suite 511
Montréal, Que.
H3A 2R7
514-842-2226

cihi.ca

59195-1124