



**Atherosclerosis Risk in Communities Study**

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Cohort Exam Visit 7 NCS

V7NCSCOG71 Derived Variable Dictionary (v.1.1)

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Prepared by the Collaborative Studies Coordinating Center

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## NEW OR CHANGED FROM PREVIOUS DISTRIBUTION

This table describes the changes to the last published V6NCSCOG71 dictionary. As the dataset undergoes modifications, this table will describe the updates made to the previously distributed dataset.

<b>Modification Date</b>	<b>Variable Name</b>	<b>Reason(s) for Change</b>
06/29/2020		Dataset final and frozen

## 1. ADMINISTRATIVE

### 1.1 ID (ARIC Subject ID)

Type: Character; length: \$7

### 1.2 SUBJECTID (Subject ID (CIR))

Type: Character; length: \$7

### 1.3 STAGE\_2\_COMPLETE (V7 Stage 2 data collection complete (1=Yes,0=No) (CDS7 measurement present))

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 If the PPT is selected for stage 2 data collection (SELECTEDSTG2='Y' and CDS7> NULL;  
Else =0 if SELECTEDSTG2='Y' and CDS7=NULL then  
Else =.N if SELECTEDSTG2='N';  
Else =NULL

## 2. NCS BATTERY VARIABLES

### Temporary NCS5ederv (V7 Word fluency (derived))

Algorithm: NCS5ederv= sum of (NCS5b, NCS5c, NCS5D)

### Temporary NCS7ederv (V7 Logical memory I (derived))

Algorithm: NCS7dderv = sum of (NCS7b, NCS7c)

### Temporary NCS9ederv (V7 Trails A time in seconds (derived))

Algorithm: If NCS9b and NCS9c are both NOT NULL, then  
=NCS9b\*60+NCS9c  
Else, NULL

### Temporary NCS10ederv (NCS10ederv)

Algorithm: If NCS10b and NCS10c are both NOT NULL, then

=NCS10b\*60+NCS10c  
Else, NULL

### **Temporary NCS15ederv (NCS15dderv)**

Algorithm: NCS15ederv = sum of (NCS7dderv, NCS15dderv)

### **Temporary LOGMEMSCORE (V7 Logical memory score (derived))**

Algorithm: = sum of (NCS7dderv, NCS15dderv)

If neither score is present then LOGMEMSCORE is NULL

### **Temporary TMTAScore (V7 Trails A score (derived))**

Algorithm: =(NCS9ederv) \* -1 + 240

### **Temporary TMTBscore (V7 Trails B score (derived))**

Algorithm: =(NCS10ederv) \* -1 + 240

### **2.1 DWRPRES (V7 DWR present (1=Y, 0=N))**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if NCS3b is NOT NULL  
=0 otherwise

Source variable(s): NCS3b

### **2.2 LOGMEMPRES (V7 Logical Memory Present (1=Y, 0=N))**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if LOGMEMSCORE is NOT NULL  
=0 otherwise

Source variable(s): NCS7b, NCS7c, NCS15b, NCS15c

### **2.3 INCLRNPRE (V7 Incidental Learning Present (1=Y, 0=N))**

Format: 1=Yes, 0=No  
Type: Numeric  
Algorithm: =1 if NCS4c is NOT NULL  
=0 otherwise  
Source variable(s): NCS4c

#### **2.4 TMTAPRES (V7 Trails A Present (1=Y, 0=N))**

Format: 1=Yes, 0=No  
Type: Numeric  
Algorithm: =1 if TMTASCORE is NOT NULL  
=0 otherwise  
Source variable(s): NCS9b, NCS9c

#### **2.5 TMTBPRES (V7 Trails B Present (1=Y, 0=N))**

Format: 1=Yes, 0=No  
Type: Numeric  
Algorithm: =1 if TMTBSCORE is NOT NULL  
=0 otherwise  
Source variable(s): NCS10b, NCS10c

#### **2.6 DSSPRES (V7 Dig Sym Sub Present (1=Y, 0=N))**

Format: 1=Yes, 0=No  
Type: Numeric  
Algorithm: =1 if NCS2b is NOT NULL  
=0 otherwise  
Source variable(s): NCS2b

#### **2.7 DSBPRES (V7 Digit Span Backwards Present (1=Y, 0=N))**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if NCS8b is NOT NULL  
=0 otherwise

Source variable(s): NCS8b

## **2.8 SEMANTPRES (V7 Semantic (Animal Naming) Present)**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if NCS6b is NOT NULL  
=0 otherwise

Source variable(s): NCS6b

## **2.9 BNT30PRES (V7 Boston Naming Present (1=Y, 0=N))**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if NCS12b is NOT NULL  
=0 otherwise

Source variable(s): NCS12b

## **2.10 FASPRES (V7 FAS (Word Fluency) Present (1=Y, 0=N))**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if NCS5ederv is NOT NULL  
=0 otherwise

Source variable(s): NCS5b, NCS5c, NCS5d

### **3. DOMAIN VARIABLES**



Relevant excerpt about domain z-scores from V6 Manual 17 on the ARIC website:

1. Domain  $Z_{V5V6}$  scores are converted to Z scores relative to the Normative Sample ( $Z_{NSV6}$ ) as the  $Z_{V5V6}$  value minus the participant's (PPT) predicted mean from the Normative Sample ( $Z_{V5NS}$ ) divided by the root-mean-squared error (RMSE) from race-specific linear regression models of  $Z_{V5V5}$  for the normative sample adjusted for age, education and WRAT score, as described in the following steps:
  - 1.1 Visit 5 Domain score values ( $Z_{V5V5}$ ) for each participant in the Normative Sample were calculated by Gross et al (2015).
  - 1.2 Race-specific (African American, Caucasian) linear regression models for each domain score adjusted for age (continuous), education (< HS, HS, >HS) and WRAT score at Visit 5 (continuous) were computed from the Normative Sample domain scores ( $Z_{V5V5}$ ) as follows:

Coefficients and 95% CI for Linear Regression Model of Domain Scores

Domain	Race	Intercept	Education < HS	Education: HS	V6 Age (yrs) - 75	V5 WRAT - 45	RMSE
Memory	African Am.	0.289 (0.215, 0.363)	-0.274 (-0.432, -0.116)	-0.147 (-0.271, -0.023)	-0.030 (-0.040, -0.019)	0.022 (0.015, 0.029)	0.576
	Caucasian	0.438 (0.392, 0.484)	-0.270 (-0.382, -0.157)	-0.156 (-0.214, -0.097)	-0.035 (-0.040, -0.030)	0.032 (0.026, 0.037)	0.593
Language	African Am.	-0.044 (-0.123, 0.035)	-0.570 (-0.739, -0.400)	-0.312 (-0.444, -0.179)	-0.039 (-0.050, -0.027)	0.037 (0.029, 0.045)	0.615
	Caucasian	0.569 (0.532, 0.606)	-0.416 (-0.506, -0.326)	-0.111 (-0.158, -0.064)	-0.039 (-0.043, -0.034)	0.024 (0.020, 0.028)	0.473
Executive Function	African Am.	0.160 (0.086, 0.235)	-0.348 (-0.508, -0.188)	-0.286 (-0.411, -0.160)	-0.028 (-0.039, -0.017)	0.046 (0.038, 0.053)	0.583
	Caucasian	0.454 (0.412, 0.496)	-0.323 (-0.427, -0.220)	-0.196 (-0.249, -0.142)	-0.026 (-0.031, -0.021)	0.044 (0.040, 0.049)	0.543

Intercept corresponds to Education > HS, Age=75, WRAT=45; entries are estimates and 95% CIs,

RMSE = Model root mean squared error. Results derived in job UC691102.

- 1.3 For each participant, a Z score relative to the Normative Sample ( $Z_{NSV6}$ ) for each domain is calculated as the  $Z_{V5V6}$  value minus that person's predicted mean from the above equation divided by the root-mean-squared error (RMSE).
- 1.4 A small percentage of participants have missing values for education or Visit 5 WRAT score. In these situations, when applying the prediction formula, education will be set to < HS and WRAT will be set to the median WRAT score according to age (70-74, 75-79, 80+), race, and education level (< HS, HS, > HS). Predicted scores for Asian or Native American participants were calculated using the Caucasian-specific formula.

In the final step to determine Domain Failure, the Domain  $Z_{NSV6}$  scores are compared relative to the cut-point of -1.5. A person with one or more domain scores < -1.5 is considered a Cognitive Domain Failure. In addition, a person with one or more domain scores = missing is considered a Cognitive Domain Failure.

### Temporary V7DWR

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS3b if DWRPRES=1  
=0 otherwise

### Temporary V7LOGMEM

Algorithm: Use the score if it's present, else use 0 in the calculation  
=LOGMEMSCORE if LOGMEMPRES=1  
=0 otherwise

### Temporary V7INCLRN

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS4c if INCLRNPRES=1  
=0 otherwise

### Temporary V7TMTA

Algorithm: Use the score if it's present, else use 0 in the calculation  
=TMTAScore if TMTAPRES=1  
=0 otherwise

### Temporary V7TMTB

Algorithm: Use the score if it's present, else use 0 in the calculation  
=TMTBSCORE if TMTBPRES=1  
=0 otherwise

### Temporary V7DSS:

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS2b if DSSPRES=1  
=0 otherwise

### 3.1 MEMDOMPRES (V7 Memory Domain Present (1=Y, 0=N))

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if sum of (DWRPRES, LOGMEMPRES, INCLRNPRES)>0  
=0 otherwise

Source variable(s): NCS3b, NCS7b, NCS7c, NCS15b, NCS15c, NCS4c

### **3.2 EFDOMPRES (V7 Executive Functioning Domain Present (1=Y, 0=N))**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if sum of (TMTAPRES, TMTBPRES, DSSPRES)>0  
=0 otherwise

Source variable(s): NCS9b, NCS9c, NCS10b, NCS10c, NCS2b

### **3.3 LANGDOMPRES (V7 Language Domain Present (1=Y, 0=N))**

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if sum of (SEMANTPRES, BNT30PRES, FASPRES)>0  
=0 otherwise

Source variable(s): NCS6b, NCS12b, NCS5b, NCS5c, NCS5d

### **3.4 V7MEMDOM (V7 Memory Domain Score - For Stage 2 Selection Use)**

Description: Merge with MEM Factor Score Coeff by MEMPATT for all highlighted coefficients. Means found in NCS test score means dataset.

Type: Numeric

Algorithm: Calculate if MEMDOMPRES=1:  
=((V7DWR-MEANDWR)\*DWRMD)  
+((V7LOGMEM-MEANLOGMEM)\*LOGMEMMD)  
+((V7INCLRN-MEANINCLRN)\*INCLRNMD)

Source variable(s): NCS3b, NCS4c, LOGMEMSCORE

### **3.5 V7EFDOM (V7 Executive Functioning Domain Score - For Stage 2 Selection Use)**

Description: Merge with EXEC FUNC Factor Score Coeff by EFPATT for all highlighted coefficients. Means found in NCS test score means dataset.

Type: Numeric

Algorithm: Calculate if EFDOMPRES=1:  
=((V7TMTA-MEANTMTA)\*TMTAEFD)  
+((V7TMTB-MEANTMTB)\*TMTBEFD)  
+((V7DSS-MEANDSS)\*DSSEFD)

Source variable(s): TMTAScore, TMTAPRES, TMTBSCORE, TMTBPRES, NCS2b, DSSPRES, EFDOMPRES, V7TMTA, V7TMTB, V7DSS

### 3.6 V7LANGDOM (V7 Language Domain Score - For Stage 2 Selection Use)

Type: Numeric

Description: Merge with LANG Factor Score Coeff by LANGPATT for all highlighted coefficients. Means found in NCS test score means dataset.

Algorithm: Calculate if LANGDOMPRES=1:  
=((V7SEMANT-MEANSEMANT)\*SEMANTLD)  
+((V7BNT30-MEANBNT30)\*BNT30LD)  
+((V7FAS-MEANFAS)\*FASLD)

Source variable(s): LANGDOMPRES, V7SEMANT, V7BNT30, V7FAS

### 3.7 PREDMEMDOM (V7 Predicted Domain Score - Memory)

Type: Numeric

Algorithm: PREDMEMDOM\_CORR= beta0\_M + V5Age\_beta\_M \* Age75V7 + (Education = 1) \* Educ1\_beta\_M + (Education = 2) \* Educ2\_beta\_M + WRAT\_beta\_M \* WRAT45

When calculating predicted means, use education=1 for PPTs who have missing education; use the median race-specific AND age-specific AND education-specific WRAT45 score when WRAT is missing. This will allow all PPTs to have a predicted mean.

For age-specific, use agegrp=6, 7, and 8+9  
For race-specific, use black 'B' or nonblack 'W'+ 'A'  
For education-specific, use the EDUCATION variable

Source variable(s): beta0\_M, V5Age\_beta\_M, Age75V7, Education, Educ1\_beta\_M, Educ2\_beta\_M, WRAT\_beta\_M, WRAT45, agegrp

### 3.8 PREDEFDOM (V7 Predicted Domain Score – Executive Function)

Type: Numeric

Algorithm:  $PREDEFDOM\_CORR = \text{beta0\_E} + V5Age\_beta\_E * \text{Age75V7} + (\text{Education} = 1) * \text{Educ1\_beta\_E} + (\text{Education} = 2) * \text{Educ2\_beta\_E} + \text{WRAT\_beta\_E} * \text{WRAT45}$

When calculating predicted means, use education=1 for PPTs who have missing education; use the median race-specific AND age-specific AND education-specific WRAT45 score when WRAT is missing. This will allow all PPTs to have a predicted mean.

For age-specific, use agegrp=6, 7, and 8+9  
For race-specific, use black 'B' or nonblack 'W'+ 'A'  
For education-specific, use the EDUCATION variable

Source variable(s): beta0\_E, V5Age\_beta\_E, Age75V7, Education, Educ1\_beta\_E, Educ2\_beta\_E, WRAT\_beta\_E, WRAT45, agegrp

### 3.9 PREDLANGDOM (V7 Predicted Domain Score – Language)

Type: Numeric

Algorithm:  $PREDLANGDOM\_CORR = \text{beta0\_L} + V5Age\_beta\_L * \text{Age75V7} + (\text{Education} = 1) * \text{Educ1\_beta\_L} + (\text{Education} = 2) * \text{Educ2\_beta\_L} + \text{WRAT\_beta\_L} * \text{WRAT45}$

When calculating predicted means, use education=1 for PPTs who have missing education; use the median race-specific AND age-specific AND education-specific WRAT45 score when WRAT is missing. This will allow all PPTs to have a predicted mean.

For age-specific, use agegrp=6, 7, and 8+9  
For race-specific, use black 'B' or nonblack 'W'+ 'A'  
For education-specific, use the EDUCATION variable

Source variable(s): beta0\_L, V5Age\_beta\_L, Age75V7, Education, Educ1\_beta\_L, Educ2\_beta\_L, WRAT\_beta\_L, WRAT45, agegrp

*Race- and domain- specific root mean square errors come from the regression models that determine race- and domain-specific predicted scores. Refer to the description at the beginning of this section and in Manual 17.*

**3.10 RMSE\_M (Race-Specific Root Mean Square Error – Memory Domain)**

**3.11 RMSE\_E (Race-Specific Root Mean Square Error – Executive Function Domain)**

**3.12 RMSE\_L (Race-Specific Root Mean Square Error – Language)**

**3.13 V7MEMDOMZ (V7 Memory domain z score)**

Type: Numeric

Algorithm: Calculate V7 memory domain z score if MEMDOMPRES=1  
$$=(V7MEMDOM-PREDMEMDOM)/RMSE\_M$$

Source variable(s): V7MEMDOM, PREDMEMDOM, RMSE\_M

**3.14 V7LANGDOMZ (V7 Language domain z score)**

Type: Numeric

Algorithm: Calculate V7 language domain z score if LANGDOMPRES=1  
$$=(V7LANGDOM-PREDLANGDOM)/RMSE\_L$$

Source variable(s): V7LANGDOM, PREDLANGDOM, RMSE\_L

**3.15 V7EFDOMZ (V7 Executive Functioning domain z score)**

Type: Numeric

Algorithm: Calculate V7 executive function domain z score if EFDOMPRES=1  
$$=(V7EFDOM-PREDEDDOM)/RMSE\_E$$

Source variable(s): V7EFDOM, PREDEDDOM, RMSE\_E

## 4. DECLINE VARIABLES

### Temporary V7DWR

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS3b if DWRPRES=1  
=0 otherwise

### **Temporary V7LOGMEM**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=LOGMEMSCORE if LOGMEMPRES=1  
=0 otherwise

### **Temporary V7INCLRN**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS4c if INCLRNPRES=1  
=0 otherwise

### **Temporary V7TMTA**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=TMTAScore if TMTAPRES=1  
=0 otherwise

### **Temporary V7TMTB**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=TMTBSCORE if TMTBPRES=1  
=0 otherwise

### **Temporary V7DSS**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS2b if DSSPRES=1  
=0 otherwise

### **Temporary V7SEMANT**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS6b if SEMANTPRES=1  
=0 otherwise

### **Temporary V7BNT30**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS12b if BNT30PRES=1  
=0 otherwise

### **Temporary V7FAS**

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS5ederv if FASPRES=1

=0 otherwise

## Temporary V7DSB

Algorithm: Use the score if it's present, else use 0 in the calculation  
=NCS8b if DSBPRES=1  
=0 otherwise

### 4.1 NCS\_SOURCE (Study where NCS Stage 1 and Stage 2 Data Collected)

Format: C=Cohort, A=ACHIEVE

Type: Character

Algorithm: = 'C' if NCS is collected at the ARIC V7 visit;  
Else = 'A' if NCS is collected in the ACHIEVE baseline

### 4.2 YRSV5V7 (V7 Years between V5 and V7 (or ACHIEVE))

Description: Time in years between V5 exam and V7 exam. Used for calculating annual rate of cognitive decline.

Type: Numeric

Algorithm: If V6IN4 is nonmissing then calculate YRSV5V7.

If NCS\_source='C' then  
YRSV5V7=the years between V5 and V7 calculated as the number of days between V5 and V7 divided by 365.25  
$$=(V7DATE71-V6IN4)/365.25$$

If NCS\_source='A' then  
YRSV5V7=the years between V5 and ACHIEVE NCS calculated as the number of days between V5 and ACHIEVE NCS divided by 365.25  
$$=(NCS0a-V6IN4)/365.25$$

V6IN4 is the V5 visit date and [CCV7DERV]VISITDATE is the V7 visit date (NCS0a is the date of the NCS collected in ACHIEVE)

Source variable(s): V6IN4, NCS\_source, V7DATE71, NCS0A, [CCV7DERV]VISITDATE

### 4.3 YRSV6V7 (V7 Years between V6 and V7 (or ACHIEVE))

Description: Time in years between V6 exam and V7 exam. Used for calculating annual rate of cognitive decline.



Type: Numeric

Algorithm: If V6DATE61 is nonmissing then calculate YRSV6V7.

If NCS\_source='C' then

YRSV6V7=the years between V6 and V7 calculated as the number of days between V6 and V7 divided by 365.25  
 $= (V7DATE71 - V6DATE61) / 365.25$

If NCS\_source='A' then

YRSV6V7=the years between V6 and ACHIEVE NCS calculated as the number of days between V6 and ACHIEVE NCS divided by 365.25  
 $= (NCS0a - V6DATE61) / 365.25$

V6DATE61 is the V6 visit date and [CCV7DERV]VISITDATE is the V7 visit date (NCS0a is the date of the NCS collected in ACHIEVE)

Source variable(s): V6DATE61, NCS\_source, V7DATE71, NCS0A, [CCV7DERV]VISITDATE

#### 4.4 GLOBPRES (V7 General cognitive performance present (1=Y, 0=N))

Format: 1=Yes, 0=No

Type: Numeric

Algorithm: =1 if sum of (DWRPRES, LOGMEMPRES, INCLRNPRES, TMTAPRES, TMTBPRES, DSSPRES, DSBPRES, SEMANTPRES, BNT30PRES, FASPRES) > 0  
=0 otherwise

Source variable(s): DWRPRES, LOGMEMPRES, INCLRNPRES, TMTAPRES, TMTBPRES, DSSPRES, DSBPRES, SEMANTPRES, BNT30PRES, FASPRES

#### 4.5 V7GCP (V7 Global Cognition Score - For Stage 2 Selection Use)

Type: Numeric

Algorithm: Decline factor score coefficients, DWRGCP, LOGMEMGCP, INCLRNGCP, TMTAGCP, TMTBGCP, DSSGCP, SEMANTGCP, BNT30GCP, FASGCP, DSBGCP, provided by AGross, documented in

Manual 17. V5 mean tests scores (MEANDWR, MEANLOGMEM, MEANINCLRN, MEANTMTA, MEANTMTB, MEANDSS, MEANSEMANT, MEANBNT30, MEANFAS, MEANDSB) are used in the calculations.

$$\begin{aligned} &= ((V7DWR - MEANDWR) * DWRGCP) \\ &+ ((V7LOGMEM - MEANLOGMEM) * LOGMEMGCP) \\ &+ ((V7INCLRN - MEANINCLRN) * INCLRNGCP) \\ &+ ((V7TMTA - MEANTMTA) * TMTAGCP) \\ &+ ((V7TMTB - MEANTMTB) * TMTBGCP) \\ &+ ((V7DSS - MEANDSS) * DSSGCP) \\ &+ ((V7SEMANT - MEANSEMANT) * SEMANTGCP) \\ &+ ((V7BNT30 - MEANBNT30) * BNT30GCP) \\ &+ ((V7FAS - MEANFAS) * FASGCP) \\ &+ (V7DSB - MEANDSB) * DSBGCP \end{aligned}$$

Source variable(s): NCS3b, DWRPRES, LOGMEMSCORE, LOGMEMPRES, NCS4c, INCLRNPRES, TMTAScore, TMTAPRES, TMTBSCORE, TMTBPRES, NCS2b, DSSPRES, NCS6b, SEMANTPRES, NCS12b, BNT30PRES, NCS5b, NCS5c, NCS5d, FASPRES, NCS8b, DSBPRES

#### 4.6 GCPNOV7FACT (V7 Global Cognition Not Calculated - no coefficients)

Type: Numeric

Algorithm: =1 if V7GCP is not calculated because there is no matching coefficient row in the coefficients table on the Global worksheet.

=0 if V7GCP is able to be calculated

Source variable(s): V7GCP

#### 4.7 BLOCKAONLY71 (V7 Participants with Only Block A Complete)

Description:

Type: Numeric

Algorithm: If GLOBPATT = '1011110101' then BLOCKAONLY71=1;  
Else BLOCKAONLY71=0;

Source variable(s): GLOBPATT

#### 4.8 GCPBLOCKA71 (V7 Proxy Global Cognitive Score for PPTs who Only Completed Block A)

Description:

Type: Numeric

Algorithm: Use the coefficients from GLOB Factor Score Coeff by GLOBPATT for all highlighted coefficients using GLOBPATT='1010010101'. Means found in NCS test score means dataset.

```
If BLOCKAONLY71=1
then GCPBLOCKA71=
=((V7DWR-MEANDWR)*DWRGCP)
+((V7LOGMEM-MEANLOGMEM)*LOGMEMGCP)
+((V7INCLRN-MEANINCLRN)*INCLRNGCP)
+((V7TMTA-MEANTMTA)*TMTAGCP)
+((V7TMTB-MEANTMTB)*TMTBGCP)
+((V7DSS-MEANDSS)*DSSGCP)
+((V7SEMANT-MEANSEMANT)*SEMANTGCP)
+((V7BNT30-MEANBNT30)*BNT30GCP)
+((V7FAS-MEANFAS)*FASGCP)
+(V7DSB-MEANDSB)*DSBGCP)
```

Source variable(s): BLOCKAONLY71, NCS3b, DWRPRES, LOGMEMSCORE, LOGMEMPRES, NCS4c, INCLRNPRES, TMTAScore, TMTAPRES, TMTBSCORE, TMTBPRES, NCS2b, DSSPRES, NCS6b, SEMANTPRES, NCS12b, BNT30PRES, NCS5b, NCS5c, NCS5d, FASPRES, NCS8b, DSBPRES

#### 4.9 V5V7DECLINE (V6 Yearly Cognitive Decline (SD) Between V5 and V7)

Type: Numeric

Algorithm: Calculate V5V7DECLINE if V6IN77, V7GCP (or GCPBLOCKA71 for BLOCKAONLY71=1), and YRSV5V7 are all nonmissing.

```
=(V7GCP-V6IN77)/YRSV5V7 for BLOCKAONLY71=0
OR
=(GCPBLOCKA71- V6IN77)/YRSV5V7 for BLOCKAONLY71=1
```

Source variable(s): V7GCP, V6IN77, GCPBLOCKA71, BLOCKAONLY71, YRSV5V7

#### 4.10 V6V7DECLINE (V7 Yearly Cognitive Decline (SD) Between V6 and V7)

Type: Numeric

Algorithm: Calculate V6V7DECLINE if V7GCP (or GCPBLOCKA71 for BLOCKAONLY71=1) , V6GCP, and YRSV6V7 are all nonmissing.  
  
=(V7GCP-V6GCP)/YRSV6V7 for BLOCKAONLY71=0  
OR  
=(GCPBLOCKA71- V6GCP)/YRSV6V7 for BLOCKAONLY71=1

Source variable(s): V7GCP, GCPBLOCKA71, BLOCKAONLY71, V6GCP, YRSV6V7

### 5. SELECTION VARIABLES

#### 5.1 MEMDOMFAIL (V7 Memory Domain Failure - Failed or Domain Missing (Y,N))

Format: Y=Yes  
N=No

Type: Character

Algorithm: = 'Y' If . < V7MEMDOMZ < -1.5 OR MEMDOMPRES=0  
= 'N' otherwise

Source variable(s): V7MEMDOMZ, MEMDOMPRES

#### 5.2 LANGDOMFAIL (V7 Language Domain Failure - Failed or Domain Missing (Y,N))

Format: Y=Yes  
N=No

Type: Character

Algorithm: = 'Y' If . < V7LANGDOMZ < -1.5 OR LANGDOMPRES=0  
= 'N' otherwise

Source variable(s): V7LANGDOMZ, LANGDOMPRES

#### 5.3 EFDOMFAIL (V7 Executive Functioning Domain Failure - Failed or Domain Missing)

Format: Y=Yes  
N=No

Type: Character

Algorithm: = 'Y' if . < V7EFDOMZ < -1.5 OR EFDOMPRES=0  
= 'N' otherwise

Source variable(s): V7EFDOMZ, EFDOMPRES

#### **5.4 SUMFAILEDDOM (V7 Sum of Failed Cognitive Domains)**

Type: Numeric

Algorithm: If SUM((V7MEMDOMZ>.), (V7LANGDOMZ>.), (V7EFDOMZ>.)>=2  
then sumfaileddom = SUM((.<V7MEMDOMZ < -1.5 ),  
(.<V7LANGDOMZ < -1.5 ), (.<V7EFDOMZ < -1.5));

Source variable(s): V7MEMDOMZ, V7LANGDOMZ, V7EFDOMZ

#### **5.5 COGFAILURE (V7 Cognitive Decline - 1 or more failed domains or Missing)**

Format: Y=Yes  
N=No

Type: Character; length=\$1.

Algorithm: = 'Y' if MEMDOMFAIL='Y' OR LANGDOMFAIL='Y' OR  
EFDOMFAIL='Y'  
= 'N' otherwise

Source variable(s): MEMDOMFAIL, LANGDOMFAIL, EFDOMFAIL

#### **5.6 V6BAV7DECLINE (V7 Yearly cognitive decline (SD) between V6 Block A and V7)**

Description:

Type: Numeric

Algorithm: Calculate V6BAV7DECLINE if V7GCP (or GCPBLOCKA71 for  
BLOCKAONLY71=1), and YRSV6V7 are nonmissing AND  
(V6GCP=NULL and V6NCSCOG61.BLOCKAONLY61=1 and  
V6NCSCOG61.GCPBLOCKA61>NULL).

=(V7GCP-V6NCSCOG61.GCPBLOCKA61)/YRSV6V7 for  
BLOCKAONLY71=0

OR

=(GCPBLOCKA71- V6NCSCOG61.GCPBLOCKA61)/YRSV6V7 for  
BLOCKAONLY71=1

Source variable(s): V7GCP, GCPBLOCKA71, BLOCKAONLY71, YRSV6V7, V6GCP,  
V6NCSCOG61.BLOCKAONLY61, V6NCSCOG61.GCPBLOCKA61,

### 5.7 DECLINECUTPT (V7 Cognitive decline cutpoint (annual))

Description: Numeric cutpoint value for V7 cognitive decline

Type: Numeric

Algorithm: = -0.055

### 5.8 COGDECLINE (V7 Cognitive Decline Status - Significant or Missing (Y,N))

Description: Significant COGFAILURE is indicated when the yearly global cognitive decline exceeds 0.055 SD units/year.

Format: Y=Yes  
N=No

Type: Character; length=\$1.

Algorithm: If V5V7DECLINE and V6V7DECLINE and V6BAV7DECLINE are all missing then do;  
          COGDECLINE ='Y';  
End;

Else if V6V7DECLINE>NULL then do;  
  If V6V7DECLINE < DECLINECUTPT then COGDECLINE='Y';  
  Else COGDECLINE='N';  
End;

Else if V6BAV7DECLINE>NULL then do;  
  If V6BAV7DECLINE < DECLINECUTPT then  
  COGDECLINE='Y';  
  Else COGDECLINE='N';  
End;

Else if V5V7DECLINE>NULL then do;  
  If V5V7DECLINE < DECLINECUTPT then COGDECLINE='Y';  
  Else COGDECLINE='N';  
End;

Source variable(s): V5V7DECLINE, V6V7DECLINE, V6BAV7DECLINE, DECLINECUTPT

## 5.9 DECLINEINDICATOR (V7 Decline reference point)

Format: Y=Yes  
N=No

Type: Character; length=\$2.

Algorithm: If V5V7DECLINE and V6V7DECLINE and V6BAV7DECLINE are all missing then do;  
DECLINEINDICATOR='MI';  
End;

Else if V6V7DECLINE>NULL then do;  
DECLINEINDICATOR='V6';  
End;

Else if V6BAV7DECLINE>NULL then do;  
DECLINEINDICATOR='6A';  
End;

Else if V5V7DECLINE>NULL then do;  
DECLINEINDICATOR='V5';  
End;

Source variable(s): V5V7DECLINE, V6V7DECLINE, V6BAV7DECLINE

## 5.10 STG2EXEMPT (V7 PPT Stage 2 Exempt Status (Y, N))

Format: Y=Yes  
N=No

Type: Character; length=\$1

Algorithm: = 'Y' if ((V6IN64='Y') /\*V5 dementia dx\*/  
OR COGDIAG='D'  
OR ([CCV7DERV] PRORATEDMMSE71 < 21 if V51 is NOT B)  
OR ([CCV7DERV] PRORATEDMMSE71 < 19 if V51=B)  
= 'N' otherwise

Source variable(s): V6IN64, [CCV7DERV] PRORATEDMMSE71, V51 (race)

## 5.11 SELECTEDSTG2 (V7 Selected to Stage 2 (Y, N))

Description: A participant is selected to stage 2 data collection when they meet the criteria for COGFAILURE and COGDECLINE. A participant is not selected to stage 2 data collection when they have been classified with dementia at previous visits OR their pro-rated MMSE score is below the race-specific cutpoint OR COGFAILURE='N' or COGDECLINE='N'.

Format: Y=Yes  
N=No

Type: Character; length=\$1

Algorithm: =NULL  
  
ELSE  
='N'  
IF V6IN64='Y'  
OR  
COGDIAG61='D'  
OR  
. < PRORATEDMMSE71 < 21 if V51 is NOT B  
OR  
. < PRORATEDMMSE71 < 19 if V51=B  
OR  
COGFAILURE='N'  
OR  
COGDECLINE='N'  
  
ELSE  
='P'  
IF V6NCSCOG61.SELECTEDSTG2='Y' and  
REVIEWERSYND61=NULL  
/\* P response means pending because PPT is selected for  
classification at V6 \*/  
  
ELSE  
='Y'  
IF COGFAILURE='Y' AND COGDECLINE='Y'

Source variable(s): V6IN64, COGDIAG61, PRORATEDMMSE71, COGFAILURE, COGDECLINE, [V6NCSCOG61] SELECTEDSTG2, REVIEWERSYND61, V51



**5.12 SAMEALGDX (V7 Indicator where V7 algdx is NOT changed from V6/V5 reviewer dx)**

Description: The Neurocognitive Classification Committee made the process decision to not review any cases where the previous review by the Committee aligned with the V7 algorithmic diagnosis.

Format: 1=Yes or 0=No

Type: Numeric

Algorithm: = 1  
If ((COGDIAG61>NULL AND V6SELECTEDSTG2>NULL AND  
ALGDX\_CAT>NULL) AND (V6SELECTEDSTG2='Y' AND  
ALGDX\_CAT EQ COGDIAG61))  
OR  
If ((COGDIAG61=NULL AND COGDIAG51>NULL and  
V5STAGE\_2\_COMPLETE>NULL AND ALGDX\_CAT>NULL) AND  
(V5STAGE\_2\_COMPLETE=1 AND ALGDX\_CAT EQ COGDIAG51))  
Else =0