

Re: LHM
From: Kevin



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Equal Access to Justice

July 31, 2018

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Re: Comments re: Notice of Rule-Making for ARChoices Program (issued 7/2/18)

To Whom It May Concern:

We write to comment on the proposed revisions to the ARChoices program described in the Notice of Rule-Making and the proposed rule issued on 7/2/18 (indexed by the AR Secretary of State as Proposed Rule 016.06.18-009).

DHS's proposed rule aims to adopt an algorithm-based methodology for allocating attendant care services under the ARChoices program. The algorithm-based methodology at issue is known as RUGs, which is short for Resource Utilization Groups. DHS first implemented the RUGs methodology to allocate attendant care in 2016, marking a departure from the 17-year practice of using the professional judgment of the agency's registered nurses. RUGs takes about 60 questions from a 286-question assessment survey and sorts an individual into one of 23 tiers (or "resource utilization groups") with a fixed number of hours set for each group.¹ No variation from the fixed number of hours is allowed.

Since DHS first implemented RUGs on 1/1/16, it has been the subject of ongoing litigation. On 10/28/16, a federal judge ruled that DHS was not providing sufficient information about the algorithm to individual beneficiaries so that they could understand why their hours were being cut. On 5/14/18, a state judge invalidated the RUGs methodology for not being adopted in compliance with public notice and comment requirements. On 5/23/18, a state judge enjoined DHS from re-implementing the RUGs methodology through the emergency rulemaking process, which would not have allowed for public comment prior to implementation. DHS was held in contempt of court and its attorneys were referred for professional discipline.

The current proposed rule would re-implement RUGs in exactly the same manner as it operated between 1/1/16 and 5/14/18. Since RUGs was first implemented, Legal Aid of Arkansas has had upwards of 170 cases involving the ARChoices program. Through individual administrative hearings and the court proceedings, Legal Aid has learned about the operation of the algorithm, the DHS process for adopting it, and the various ways it impacts the lives of our clients and the wider group of people who are on ARChoices.

¹ RUG/HC and Acuity-Based Care Allocation Table. ATTACHED.



I. RUGs provide insufficient care to meet the care needs of the ARChoices beneficiaries who have come to Legal Aid.

Prior to 2016, individuals under age 65 could receive a maximum of 56 attendant care hours per week, and individuals age 65 or over could receive a maximum of 48 attendant care hours per week. As DHS has implemented RUGs, an individual is limited to a monthly maximum of 161 hours unless she requires IV medication, suctioning, tracheostomy care, a ventilator or respirator, or parenteral/abdominal feeding. This effective maximum—roughly 37 hours per week or 5.5 hours per days—is insufficient to meet the care needs of many individuals who lack the treatments needed to qualify for more hours. There is no variation allowed from the fixed number of hours.

Legal Aid has represented dozens of individuals with cerebral palsy, quadriplegia, multiple sclerosis, and other chronic ailments whose conditions prevent them from significant independent performance of any activity of daily living. The time needed to get out of bed, bathe, use the toilet, groom, prepare food, eat, clean the house, do laundry, shop, attend appointments, change positions so as to avoid pressure sores, and do range of motion activities far exceeds the 5.5 hours per day allotted in the best-case scenario of placement in RUG “SSB.” Testimony from beneficiaries and caregivers establishes this. Thus, individuals are forced to choose what needed care activities to go without.

The limited allotment of 5.5 hours per day ignores the practical realities of beneficiary’s care needs. They often need someone to come three times per day—in the morning to get out bed, use the restroom, bathe, and eat, in the afternoon to prepare a meal, use the toilet, and change position, and in the evening to eat, get ready for bed, get back to bed, and prepare for a night alone. Caregiving agencies routinely are unable to schedule three visits when an individual has only 5.5 hours of attendant care. Some care, such as bowel treatments, requires an extended period of attention.

Even then, individuals are forced to make choices that most individuals without disabilities do not have to make. For example, several clients will not drink any liquids after 6 p.m. because they do not want to extend the period of time in which they will lie in a soiled diaper between the time a caregiver leaves in the evening and comes back the next morning. If an individual has an itch, it goes unscratched. If an individual did not get positioned just perfectly in bed, she lies uncomfortable. If an individual gets a headache or body ache after someone has left, she lies hurting. If an individual gets too hot or cold, she lies uncomfortable.

Of course, the limited hours also restrict an individual’s ability to participate meaningfully in the community. Individuals with physical disabilities are at least three times more likely to experience depression compared to the general population.² Going for a “walk” in the neighborhood using an electric wheelchair, heading to a community concert in the town square, going shopping at thrift stores, or meeting with friends are all activities that affirm the dignity of the individual and ward off the isolation that disability can impose. Individuals on the ARChoices program are largely unable to engage in such community activities without attendant care services.

In those rare circumstances where an individual qualifies for placements in a RUG with more hours (i.e. simply having one of the treatments like IV medications listed above is not enough on its own; other

² Noh, Jin-Won et al. “Relationship between Physical Disability and Depression by Gender: A Panel Regression Model.” Ed. Xuchu Weng. *PLoS ONE* 11.11 (2016): e0166238. *PMC*. Web. 31 July 2018., available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5130183/>

factors must also be met), the care is still insufficient for most care needs. First, placement in the RUG with 352 monthly hours is essentially impossible, as DHS's statistics show that only one person has ever been placed in such RUG in the 2.5 years in which the RUGs have operated.³ Second, placement in the RUG with 201 monthly hours is rare—only 2% of program participants qualify—and is insufficient to meet the care needs of individuals who qualify. The monthly allocation translates to approximately 46 hours per week, or 6.5 hours per day. This does not meet the needs of individuals with such intense care needs, many of whom were receiving 56 hours per week under the prior system of nurse discretion.

Finally, the bulk of this comment has been directed towards individuals who may qualify for the RUG with 5.5 daily hours of care. There are many more beneficiaries who are placed into lower acuity RUGs who do not receive even this much care. The allocations for these individuals—often ranging between 4.5 and 2.5 hours per day for many Legal Aid clients—have been insufficient to meet their needs.

II. Reductions in Home and Community-Based Services through use of the RUGs methodology may increase costs to the state.

DHS's own estimates show that, on average, institutional care in a nursing facility is 2.76 times more expensive than community-based care.⁴ Use of the RUGs methodology runs counter to recommendations to re-balance DHS's spending on Medicaid long-term care from institutions to community-based care. As the Stephen Group noted in its 2015 report commissioned by the Arkansas General Assembly, Arkansas spends roughly 65% of its long-term care dollars on nursing facility care, well over the national average of 50%.⁵ In contrast, many states, including neighboring Missouri and Kansas, spend over 50% of their Medicaid long-term care dollars on home and community-based services.⁶

Generally, bolstering home-and-community-based services supports not only the dignity of individuals, but also generates significant cost savings. The use of the RUGs methodology to reduce the care of individuals is likely to result in increased institutionalization, harming both beneficiaries and the bottom line.

³ DHS's Responses to Plaintiffs' First Set of Interrogatories and Document Production Requests, p. 16 (Interrogatory No. 15), Pulaski County Case No. 60CV-17-442 (showing data as of 12/31/2016). **ATTACHED.**

⁴ ARChoices Waiver Renewal Application, p. 161. **ATTACHED.** The full version of this document is available as part of Final Rule 016.06.15-021, available at www.sos.arkansas.gov/rules_and_regs/index.php. Definition of the relevant factors in the cost estimates are from CMS, with relevant excerpts **ATTACHED** and the full document available at <https://www.medicare.gov/medicaid-chip-program-information/by-topics/waivers/downloads/technical-guidance.pdf>

⁵ The Stephen Group, Recommendations to Arkansas Health Care Reform Task Force, Section 14.2 (dated 10/1/15). **ATTACHED.** Full report available at <http://www.arkleg.state.ar.us/assembly/2015/Meeting%20Attachments/836/I14099/TSG%20Volume%20II%20Recommendations.pdf>

⁶ Kaiser Family Foundation, Medicaid and Long-Term Services and Supports: A Primer (dated December 2015), available at <https://www.kff.org/medicaid/report/medicaid-and-long-term-services-and-supports-a-primer/>

III. RUGs cuts the attendant care hours of people who have demonstrated no medical improvement.

Upon introduction, RUGs resulted in cuts to 47% of program beneficiaries.⁷ Many of these individuals represented by Legal Aid had experienced no actual improvement in their functional abilities. In fact, many individuals' conditions had worsened. DHS did not miraculously cure or reverse cerebral palsy or quadriplegia. Nonetheless, hours were reduced for thousands of beneficiaries—many who had been on the program for several years receiving a consistent amount of hours—strictly based on the move to the RUGs methodology. For Legal Aid clients, most care cuts were between 20% and 60%, which generally translated into a loss of between 11 and 27 care hours per week. There were no adjustments made to accommodate these individuals or grandfather them in to the new system to lessen the shock of drastic care cuts.

IV. DHS did not meaningfully validate RUGs in Arkansas and lost key data.

To the extent that the RUGs methodology was subjected to studies to determine the validity of its system of sorting individuals into 23 separate groups (and the expected burden of care assigned to each group), such studies happened in Ontario, Canada and Michigan. These studies are not inherently applicable to Arkansas, and DHS did not independently verify the validity of the RUGs sorting process in Arkansas. DHS did not investigate any other case mix systems prior to adopting RUGs.⁸

To the extent DHS did any data-driven analysis in initially determining the amount of attendant care to associate with each RUG, the data has been lost.⁹

Furthermore, there is no evidence of significant pre-implementation review about the number of hours to allocate. Craig Cloud, the director of the Division of Aging and Adult Services, did not question the amounts of care to be allocated based on the lost data.¹⁰ Relatedly, DHS did not do any projections about the number of people who would have their hours increased or reduced under RUGs, about whether particular segments of the people on the waiver might be helped or hurt, or about whether the use of RUGs would place individuals at risk of institutionalization.¹¹

⁷ Declaration of Lori Rose, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119 (Docket No. 21.1), Paragraph 10, p. 5 (filed 6/9/16). **ATTACHED.** Ms. Rose's declaration states that 53% of beneficiaries experienced an increase or no change in hours. DHS later clarified that 43% of beneficiaries experienced an increased and 10% experienced no change.

⁸ Deposition of Craig Cloud, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119, p. 48-51 (conducted 9/15/16). **ATTACHED**

⁹ Stipulation of Undisputed Background Facts, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119 (Docket No. 44), Paragraph 35, p. 7 (filed 10/11/16). **ATTACHED.**

¹⁰ Deposition of Craig Cloud, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119, p. 61-65 (conducted 9/15/16). **ATTACHED.**

¹¹ Deposition of Craig Cloud, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119, p. 90-96. **ATTACHED.**

Moreover, despite 2.5 years of use, DHS has not kept any data to evaluate the impact of RUGs on ARChoices beneficiaries. DHS did not track data on the magnitude of the cuts or increases and called a request for such data “unduly burdensome” because “it would require extensive manual review of thousands of 2015 and 2016 assessments.”¹² This shows that DHS apparently did not develop any internal capacity to meaningfully evaluate the efficacy of the RUGs methodology.

V. There is no documented evidence of problems with the pre-existing system of nurse discretion.

In the notice of proposed rule-making, DHS inaccurately suggests wide-spread problems with the system of nurse discretion used to allocate attendant care prior to 2016:

The ArPath assessment process, including use of the interRAI assessment and the Resource Utilization Groups Home Care (RUGs) methodology, provides an objective process and eliminates prior reliance on subjective opinions of nurses or on information from providers that is not independent or conflict-free. As proposed in this notice, ArPath replaces the previous subjective approach with an objective, valid and reliable evidence-based methodology. Inherent to such a change, increases or decreases in the amount, duration, or frequency of attendant care services determined medically necessary for a given person is likely and some of these changes may be significant. This is because subjective methods for determining needs are far more likely to result in unsupported inconsistencies and increase the risk for overuse, misuse, and underuse of services. The new methodology is far more likely to correct for overuse, misuse, or underuse of attendant care services while treating individuals with similar needs alike.

However, DHS has no documentation suggesting that nurses misused their discretion. Prior to implementing RUGs, DHS did not conduct a single study regarding hour allocation imbalances, did not conduct any budgetary analysis showing that nurses were giving too many or too few hours, and did not give any written instructions to nurses to change their allocation practices.¹³ In the total absence of any documentation of a problem, the agency’s emphasis on so-called objectivity appears to be a *post-hoc* rationalization for a pre-determined policy choice to implement RUGs

VI. DHS’s implementation of RUGs has been filled with software errors that the agency did not catch.

Although the RUGs algorithm is supposed to consider diagnoses of cerebral palsy, septicemia, and diabetes in making its decisions, DHS’s software failed to take any of these into account. As a result, roughly 150 individuals with cerebral palsy were denied an average of 25 care hours per month for a period of nearly two years. The error was only discovered when Legal Aid of Arkansas brought it to

¹² DHS’s Responses to Plaintiffs’ First Set of Interrogatories and Document Production Requests, p. 12-16 (Interrogatory No. 12), Pulaski County Case No. 60CV-17-442 (showing data as of 12/31/2016). **ATTACHED.**

¹³ Deposition of Craig Cloud, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119, p. 35-46 (conducted 9/15/16); Deposition of Stephenie Blocker, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119, p. 32-35 (conducted 9/14/16). **ATTACHED.**

DHS's attention in July and August 2017.¹⁴ Even then, the agency failed to take adequate corrective measures until a television news story ran in late November 2017. When DHS finally fixed the software effective December 2017, it did not provide any retroactive relief to the people who went without care. Indeed, DHS did not even acknowledge the error, instead calling the issue a "software revision" in its letter to beneficiaries.

With respect to diabetes, DHS has now known about the error since October 2016 and still has not taken steps to fix it. As a result of the software error regarding diabetes, approximately 15% of all ARChoices beneficiaries are receiving fewer hours than they otherwise would, while 4% may be receiving more hours than they otherwise would.¹⁵ Again, this software error was only discovered through Legal Aid of Arkansas's knowledge of the algorithm.

These software errors—especially the fact that DHS did not catch them on its own—demonstrate the problem of running a highly complex, algorithm-based system that the agency itself does not fully understand or have the skills to monitor.

VII. DHS's implementation of the RUGs methodology runs counter to best practices advanced by its founder.

Brant Fries originally developed the RUGs to predict the expected burden of care of new admissions to nursing facilities. Eventually, he expanded the RUGs to the home-care setting. Even then, though, he did not develop the RUGs methodology to be used as a definitive methodology for allocating care, but rather as a tool for predicting the relative burden of caring for individuals with various characteristics.

When states adapted the RUGs methodology to allocate care, Dr. Fries developed a standardized set of policy ideas for states to consider upon implementation.¹⁶ Dr. Fries notes the possibility of "grandfathering" beneficiaries into the new allocation system, allowing them to keep the hours they had under the old system while all new program participants are evaluated under the new system. Dr. Fries also notes that a state agency can give nurses some discretion to adjust RUGs-based allocations upwards or downwards in certain circumstances.

Originally, DHS intended to adopt a set of "extenuating circumstances" to allow an individual to receive a number of hours different from what the RUG level prescribes. Craig Cloud overruled this initial agency plan, even against the advice of long-term staffers with experience in both nursing and management.¹⁷

VIII. Clients have found the complicated RUGs algorithm to be unfair.

¹⁴ Litigation Letter from Legal Aid to DHS (dated 8/10/17). Available from Legal Aid of Arkansas upon request.

¹⁵ Brant Fries, Memo to Craig Cloud and Rich Rosen, RUG-III/HC Coding Issues (dated 11/30/16). **ATTACHED.**

¹⁶ Brant Fries et al., Design Principles for HCBS Case Mix: A Primer, June 2015, p. 26-37. **ATTACHED.**

¹⁷ Deposition of Stephenie Blocker, U.S. District Court, Eastern District of Arkansas Case No. 3:16-CV-119, p. 58-60 (conducted 9/14/16). **ATTACHED**

The algorithm itself is 21 pages of computer code.¹⁸ Though Legal Aid has shown the algorithm to clients, they are unable to understand it. Thus, people on the program cannot understand the criteria by which they are judged, cannot fight reductions, and cannot plan for the future. Indeed, DHS statistics on appeals bear out the issue. Between January 1, 2016 and September 8, 2016—the last date for which data is available—281 individuals appealed a decision relating to ARChoices.¹⁹ Only 9 individuals prevailed, all of whom were represented by Legal Aid.

DHS was using the algorithm for 1.5 years before anyone on staff could understand the algorithm. Now, the agency has one person on staff who can explain how it sorts individuals. The lack of agency expertise on the subject matter has hurt beneficiaries in the past, as evidenced by the software errors mentioned above.

Furthermore, the algorithm excludes a doctor's opinion about the amount of care someone needs.

IX. An algorithm is not required by CMS.

CMS does not require states to use any particular method for allocating attendant care. Indeed, CMS has expressly declined to “*specif[y] the instruments or techniques that should be used to secure the information necessary to determine an individual’s functional need, person-centered service plan, or service budget.*”²⁰

Relatedly, nothing would prevent DHS from using the system of nurse discretion that had been used for at least 17 years before RUGs was implemented. CMS approved the use of nurse discretion under the same regulations that are in still in effect. DHS has the capacity and knowledge on staff to make allocation decisions using the system of nurse discretion.

Conclusion

The experiences of our clients over the last 2.5 years has shown that the RUGs methodology as originally implemented—and as currently proposed—has several limitations in its ability to serve the needs of ARChoices beneficiaries. DHS’s proposed rule does not substantially address these limitations.

Sincerely,

Kevin De Liban, Attorney
Legal Aid of Arkansas, Inc.

¹⁸ RUGS-HC III Algorithm. **ATTACHED.**

¹⁹ DHS Hearing Statistics (through 9/8/16) . **ATTACHED.**

²⁰ HCBS Rule, Federal Register, 79 Fed. Reg. 2948, 2991, available at <https://www.gpo.gov/fdsys/pkg/FR-2014-01-16/pdf/2014-00487.pdf>

RUG-III/HC and Acuity-based Care Allocation

| RUG-III/HC Category | RUG-III/HC Groups | CMI | RUG allocation per month |
|---------------------------|-------------------|------|--------------------------|
| Behavior Problems | BA1 | 0.49 | 30 |
| | BA2 | 1.02 | 62 |
| | BB | 1.93 | 118 |
| Clinically Complex | CA1 | 0.58 | 36 |
| | CA2 | 1.12 | 69 |
| | CB | 1.54 | 94 |
| | CC | 2.33 | 143 |
| Impaired Cognition | IA1 | 0.62 | 38 |
| | IA2 | 1.33 | 81 |
| | IB | 1.89 | 116 |
| Reduced Physical Function | PA1 | 0.45 | 28 |
| | PA2 | 0.86 | 53 |
| | PB | 1.33 | 81 |
| | PC | 1.61 | 99 |
| | PD0 | 2.24 | 137 |
| Special Rehab | RA1 | 0.89 | 55 |
| | RA2 | 1.58 | 97 |
| | RB | 2.56 | 157 |
| Extensive Services | SE1 | 2.5 | 153 |
| | SE2 | 3.28 | 201 |
| | SE3 | 5.75 | 352 |
| Special Care | SSA | 1.83 | 112 |
| | SSB | 2.63 | 161 |

General Steps:

1. ArPath-Home Care assessment is conducted and results in a RUG group for the client.
2. The RUG group maps to a CMI level, showing his/her expected relative resource needs.
3. The individual's total monthly authorized hours for in-home attendant care are determined.


```
*****
*****
** PROGRAM: SUITE9_CASEMIX_RUG-III-HC_G1_V2.1_P_2015-09-08.txt
**
** BY: Brant Fries, Pil Park
**
** CHECKED BY:
**
** DATE: 11/27/07
**
** REVISION DATES: 1/16/09 (BEF), 11/28/11 (KLS), 03/19/12 (KLS), 10/21/13 (BEF)
**
** 12/09/13 (KLS) , 09/08/15 (BEF)
**
** PURPOSE: CODE FOR RUG-III/HC SYSTEM
**
** SOURCES:
**
** BASED ON: interRAI SUITE, VERSION 9
**
** APPLIES TO: SEE APPLICABILITY MATRIX
**
** 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 classification using the SAS code,
**
** all 58 iCODE items must be scanned for valid values as given
**
** in the list below.
```


| | | | | |
|----|-----|--------|------------|--|
| ** | 17) | iI1e | 0123 | Hemiplegia/hemiparesis (S) |
| ** | 18) | iI1f | 0123 | Multiple sclerosis (S) |
| ** | 19) | iI1i | 0123 | Quadriplegia (S) |
| ** | 20) | iI1q | 0123 | Pneumonia (S) |
| ** | 21) | iI1t | 0123 | Diabetes mellitus |
| ** | 22) | iI2aba | CCC.CC | ICD-9 Code (for Cereb.Palsy/Septicemia) |
| ** | 23) | iI2bba | CCC.CC | ICD-9 Code (for Cereb.Palsy/Septicemia) |
| ** | 24) | iI2cba | CCC.CC | ICD-9 Code (for Cereb.Palsy/Septicemia) |
| ** | 25) | iI2dba | CCC.CC | ICD-9 Code (for Cereb.Palsy/Septicemia) |
| ** | 26) | iI2eba | CCC.CC | ICD-9 Code (for Cereb.Palsy/Septicemia) |
| ** | 27) | iI2fba | CCC.CC | ICD-9 Code (for Cereb.Palsy/Septicemia) |
| ** | 28) | iI2abb | CCC.CC | ICD-10 Code (for Cereb.Palsy/Septicemia) |
| ** | 29) | iI2bbb | CCC.CC | ICD-10 Code (for Cereb.Palsy/Septicemia) |
| ** | 30) | iI2cbb | CCC.CC | ICD-10 Code (for Cereb.Palsy/Septicemia) |
| ** | 31) | iI2dbb | CCC.CC | ICD-10 Code (for Cereb.Palsy/Septicemia) |
| ** | 32) | iI2ebb | CCC.CC | ICD-10 Code (for Cereb.Palsy/Septicemia) |
| ** | 33) | iI2fbb | CCC.CC | ICD-10 Code (for Cereb.Palsy/Septicemia) |
| ** | 34) | iJ2h | 01234 | Delusions |
| ** | 35) | iJ2i | 01234 | Hallucinations |
| ** | 36) | iJ2j | 01234 | Aphasia (S) |
| ** | 37) | iJ2n | 01234 | Vomiting |
| ** | 38) | iJ2q | 01234 | Fever (S) |
| ** | 39) | iJ2r | 01234 | Internal bleeding (S) |
| ** | 40) | iJ6c | 01 | End-stage disease, 6 or fewer months to live (S) |
| ** | 41) | iK2a | 01 | Weight loss |
| ** | 42) | iK2c | 01 | Dehydrated (A) |
| ** | 43) | iK3 | 0123456789 | Mode of nutritional intake (S,A) |
| ** | 44) | iL1 | 012345 | Most severe pressure ulcer (S) |
| ** | 45) | iL4 | 01 | Major skin problems (S) |
| ** | 46) | iL5 | 01 | Skin tears or cuts (S) |
| ** | 47) | iL7 | 01234 | Foot problem (S) |
| ** | 48) | iN2a | 0123 | Chemotherapy (S,A) |

RFP 4

```

**
** 49) iN2b      0123      Dialysis (S,A)
**
** 50) iN2d      0123      IV medication (S,A)
**
** 51) iN2e      0123      Oxygen therapy (S,A)
**
** 52) iN2f      0123      Radiation (S,A)
**
** 53) iN2g      0123      Suctioning (S,A)
**
** 54) iN2h      0123      Tracheostomy care (S,A)
**
** 55) iN2i      0123      Transfusions (S,A)
**
** 56) iN2j      0123      Ventilator or respirator (S,A)
**
** 57) iN2k      0123      Surgical wound care (S,A)
**
** 58) iN2n      0123      Turning/repositioning program (S,A)
**
** 59) iN3gb     0000-9999  Speech: total # minutes (last 7 days) (S)
**
** 60) iN3fb     0000-9999  OT: total # minutes (last 7 day) (S,A)
**
** 61) iN3eb     0000-9999  PT: total # minutes (last 7 days) (S)
**

```

OUTPUT VARIABLES:

```

**
** aNR3H  SEE LIST BELOW  RUG-III/HC GROUP NUMBER
**
**                               3-DIGIT NUMERIC CODE THAT CAN BE USED TO SORT GROUPS
**
** aR3H   SEE LIST BELOW  RUG-III/HC GROUP CODE
**
**                               3-CHARACTER ALPHABETIC CODE
**
**                               FIRST CHARACTER REPRESENTS HIERARCHY GROUP
**
**                               OTHER CHARACTERS RELATE TO ADL LEVELS

```

| aNR3H | aR3H | DESCRIPTION |
|-------|------|--|
| 111 | RB0 | Rehabilitation High / ADL 11 - 18 |
| 121 | RA2 | Rehabilitation Low / ADL 4 - 10 / IADL 2-3 |
| 122 | RA1 | Rehabilitation Low / ADL 4 -10 / IADL 0-1 |
| 210 | SE3 | Extensive Special Care 3 / ADL > 6 |
| 220 | SE2 | Extensive Special Care 2 / ADL > 6 |
| 230 | SE1 | Extensive Special Care 1 / ADL > 6 |
| 310 | SSB | Special Care / ADL 14 - 18 |

```

RFP 4
**      320      SSA      Special Care / ADL 4 - 13
***
**      411      CC0      Clin. Complex / ADL 11 - 18
***
**      421      CB0      Clin. Complex / ADL 6 - 10
***
**      431      CA2      Clin. Complex / ADL 4 - 5 / IADL 1-3
***
**      432      CA1      Clin. Complex / ADL 4 - 5 / IADL 0
***
**      510      IB0      Cognitive Impairment / ADL 6 - 10
***
**      521      IA2      Cognitive Impairment / ADL 4 - 5 / IADL 1-3
***
**      522      IA1      Cognitive Impairment / ADL 4 - 5 / IADL 0
***
**      610      BB0      Behavior Problem / ADL 6 - 10
***
**      621      BA2      Behavior Problem / ADL 4 - 5 / IADL 1-3
***
**      622      BA1      Behavior Problem / ADL 4 - 5 / IADL 0
***
**      710      PDO      Physical Function / ADL 11 - 15
***
**      720      PC0      Physical Function / ADL 9 - 10
***
**      730      PBO      Physical Function / ADL 6 - 8
***
**      741      PA2      Physical Function / ADL 4 - 5 / IADL 1-3
***
**      742      PA1      Physical Function / ADL 4 - 5 / IADL 0
***

```

INTERMEDIATE VARIABLES:

```

**      ITEM      VALID VALUES      DESCRIPTION
***
**      -----
**      Numeric Indicators for qualification in RUG-III clinical categories
**      x_reh      01      rehabilitation
**      x_ext      01      extensive care
**      x_spec      01      special care
**      x_clin      01      clinically complex
**      x_impair    01      impaired cognition
**      x_behav     01      behavior problems
***

```

Other variables used in computations

```

**      x_bedmb    01345      numeric recode of bed mobility ADL
**      x_trans     01345      numeric recode of transfer ADL
**      x_toilt     01345      numeric recode of toileting ADL

```

```

**
** x_intake 1 numeric indicator for parenteral/enteral intake level
**
** x_eatng 0123 numeric recode of eating ADL
**
** x_adlsum 4-18 RUG-III ADL Index
**
** x_meal 01 numeric recode of meal preparation IADL
**
** x_mmed 01 numeric recode of medication management IADL
**
** x_phon 01 numeric recode of telephone use IADL
**
** x_iadls 0123 RUG-III/HC IADL Index
**
** x_th_min 0000-9999 minutes of rehab therapies totaled across therapies
**
** x_cpai 01 indicator variable for cerebral palsy
**
** x_sept 01 indicator variable for septicemia
**
** x_coma 01 numeric indicator of coma with selected qualifiers
**
** x_ext_ct 012345 count of number of selected hierarchy categories
**
** for which resident qualifies and selected extensive
**
** care services (used in Extensive Care classification)
**
**
** One scale
**
** SCPS 0123456 Cognitive Performance Scale

```

```

-----
** ASSUMPTION ABOUT INPUT DATA: ICD code format is assumed to have leading zeros
**
** before the decimal point. Any digits after the
**
** decimal point are assumed left justified, but may
**
** be blank, e.g., 038.0 or 038., but not 38. or 38. 0.

```

ALGORITHM:

NOTES ON FORMING CODE: 10/17/13 Revision fixes ICD-9 and adds ICD-10 codes.

MISSING VALUES: This algorithm is not calculated if any input value is missing.

```

*****
** This code is provided in a common computing package, SAS, in which command lines
** end in a semicolon and comment lines start in an asterisk or start with "/*" and
** end with "*/".

```


** In SAS, additional statements to designate the source dataset need to precede the
 ** code provided here. In addition, the variables in that dataset must be mapped to
 ** the variables used in the code by placing the variable names used in the source
 ** dataset on the right-hand side of each assignment statement in the section
 labeled **;
 ** 'VARIABLE ASSIGNMENTS.'
 **;

**
 **;
 ** For programmers developing code in other languages, it is hoped that this
 ** procedural code can provide sufficiently detailed information about the
 ** algorithms. It is strongly urged that code be checked on real-life examples.
 **;

** THIS INFORMATION IS PROVIDED BY interRAI AS A SERVICE TO ITS USERS. ALTHOUGH
 ** REASONABLE CARE HAS BEEN TAKEN TO MAKE IT ACCURATE, IT IS PROVIDED "AS IS."
 ** THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, AS TO ITS ACCURACY.
 **;

**
 **;
 ** PLEASE SEND ANY COMMENTS OR CORRECTIONS TO: interRAI_Code@umich.edu
 **;

** SYNTAX USED IN THIS SAS CODE:

- ** 1. All lines with an asterisk (*) as the first nonblank character in the line
 are **;
 ** documentation or comment lines. All command lines start with a character
 ** other than an asterisk.
 **;
- ** 2. A semicolon indicates the end of a statement in the SAS code used here, not a
 ** continuation character as in some other languages.
 **;
- ** 3. All variables are represented in small letters, while command words are
 ** represented in capital letters.
 **;
- ** 4. All input interRAI variables are represented with names beginning with a
 ** lower-case 'i'. Specification of these 'iCODES' are available in the iCODE
 ** MATRIX, available from interRAI.
 **;
- ** 5. All input variables are assumed to be NUMERIC, unless otherwise noted.
 **;
- ** 6. All local (non-MDS) variables are NUMERIC and represented in lower case
 ** letters with a prefix of 'x_' (e.g., x_adlsum).
 **;
- ** 7. The only command words and structures used in this SAS code are:

```

**
**
** a. RETURN
**
**      (this command causes the end of processing the current record
**      and initiation of processing the next record)
**
** b. IF <logical condition1>
**
**      THEN <arithmetic statement> executed if condition1 true
**
**      ELSE IF <logical condition2>
**
**      THEN <arithmetic statement> executed if condition2 true
**
**      DO <multiple statements> END
**
**      ELSE <arithmetic statement> executed if no condition is true
**
** c. Logical operators used in logical conditions are
**
**      =      (equal)
**
**      >      (greater than)
**
**      <      (less than)
**
**      >=     (greater than or equal to)
**
**      <=     (less than or equal to)
**
**      NE     (not equal to)
**
** d. Relational operators used in logical conditions are
**
**      AND    (logical and)
**
**      NOT    (logical not)
**
**      OR     (logical or)
**
** 8. Nested IF structures are indented for clarity.
**
** 9. Single quotes delimit a character constant.
**
*****
** DETAILS OF THE RELATIONSHIP BETWEEN MDS V2.0 VARIABLES AND INTERRAI SUITE
** VARIABLES ARE PROVIDED IN THE RUG-III CODING SPECIFICATIONS
*****
** CODE ORGANIZATION
**
**
** After variable assignment, this RUG-III code employs a 2 stage process involving
** a clinical qualification stage followed by a classification stage as follows:
**
** 1. Clinical Qualification Stage. Determine all of RUG-III clinical

```



```

** ;
** BEFORE RUNNING THIS CODE, BE SURE TO RUN:
** ;
**          SCPS (Cognitive Performance Scale)
** ;
** ;
** ;
*****BEGINNING OF SAS
CODE*****;

** DATA STEP STARTS HERE **;

** INCLUDE HERE CODE FOR COGNITIVE PERFORMANCE SCALE (SCPS) **;

** ++++++ ;
** Step 0. VARIABLE ASSIGNMENTS AND VARIABLE VALUE CHECK. ;
** ++++++ ;

** VARIABLE ASSIGNMENTS
** ;
** IF NECESSARY, CHANGE SECOND VARIABLE TO CORRECT LOCAL VARIABLE NAME CHA
** ;
** NOTE: RUG-III/HC CAN BE CALCULATED ON CHA ASSESSMENTS WHICH INCLUDE THE
** ;
** CHA FUNCTIONAL ASSESSMENT. AN APPROXIMATION IS POSSIBLE, HOWEVER BY SETTING
** ;
** TO ZERO THE VARIABLES INDICATED IN THE LIST OF VARIABLES ABOVE WITH A '(S)'.
** ;
** AN APPROXIMATION IS ALSO POSSIBLE SIMILARLY FOR THE INTERRAI AL, BY SETTING TO
** ;
** ZERO THE VARIABLES INDICATED BY A '(A)'
** ;

** NOTE: BE SURE THE VARIABLES TO COMPUTE THE SCPS SCALE ARE AVAILABLE
** ;

iE3a = iE3a ;
iE3b = iE3b ;
iE3c = iE3c ;
iE3d = iE3d ;
iE3e = iE3e ;
iE3f = iE3f ;
iG1aa = iG1aa ;
iG1da = iG1da ;
iG1ea = iG1ea ;
iG2g = iG2g ;
iG2h = iG2h ;
iG2i = iG2i ;
iG2j = iG2j ;
iI1e = iI1e ;
iI1f = iI1f ;
iI1i = iI1i ;
iI1q = iI1q ;
iI1t = iI1t ;
iI2aba = iI2aba ;
iI2bba = iI2bba ;
iI2cba = iI2cba ;
iI2dba = iI2dba ;
iI2eba = iI2eba ;
iI2fba = iI2fba ;
iI2abb = iI2abb ;
iI2bbb = iI2bbb ;

**USE EITHER THESE ICD-10 CODES OR THE ICD-9 CODES ABOVE***;
**USE EITHER THESE ICD-10 CODES OR THE ICD-9 CODES ABOVE***;

```

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```

iI2cbb = iI2cbb ; **USE EITHER THESE ICD-10 CODES OR THE ICD-9 CODES ABOVE***;
iI2dbb = iI2dbb ; **USE EITHER THESE ICD-10 CODES OR THE ICD-9 CODES ABOVE***;
iI2ebb = iI2ebb ; **USE EITHER THESE ICD-10 CODES OR THE ICD-9 CODES ABOVE***;
iI2fbb = iI2fbb ; **USE EITHER THESE ICD-10 CODES OR THE ICD-9 CODES ABOVE***;
iJ2h   = iJ2h   ;
iJ2i   = iJ2i   ;
iJ2j   = iJ2j   ;
iJ2n   = iJ2n   ;
iJ2q   = iJ2q   ;
iJ2r   = iJ2r   ;
iJ6c   = iJ6c   ;
iK2a   = iK2a   ;
iK2c   = iK2c   ;
iK3    = iK3    ;
iL1    = iL1    ;
iL4    = iL4    ;
iL5    = iL5    ;
iL7    = iL7    ;
iN2a   = iN2a   ;
iN2b   = iN2b   ;
iN2d   = iN2d   ;
iN2e   = iN2e   ;
iN2f   = iN2f   ;
iN2g   = iN2g   ;
iN2h   = iN2h   ;
iN2i   = iN2i   ;
iN2j   = iN2j   ;
iN2k   = iN2k   ;
iN2n   = iN2n   ;
iN3gb  = iN3gb  ;
iN3fb  = iN3fb  ;
iN3eb  = iN3eb  ;
SCPS   = SCPS   ;

```

** VARIABLE VALUE CHECK **;

```

if (SCPS = 6 or (SCPS in (0,1,2,3,4,5)
  and 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) and iG1da in (0,1,2,3,4,5,6,8)
  and iG1ea 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)
  then do;

```

```

** ++++++
** 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. ;
** The IADL index is used in splitting the lowest Clinically Complex, ;
** 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 ;
** ++++++ ;

```

```
x_iadls = .;
```

```

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;

```

```
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. ;
** ++++++ ;

```

```
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 variable need for Rehab categories
**
** Variables needed to determine Rehab clinical hierarchy
** qualification for standard rehab classification
** - Total minutes of rehab therapy received (x_th_min)
** OTHER RUG-III REHAB VARIABLES NOT USED
** ++++++

```

```

** -----
** 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.
** ++++++
** Code Cerebral Palsy from ICD-9 Code (Note: adjust if using ICD-10)
** Assumes that ICD-9 is left justified character format xxx.xx and that you
** can test for only xxx.x (omitting final digit). In SAS, this is handled
** by the SUBSTR function below, which extracts the first 5 characters of
** iI2aba.

```

```

** Code Cerebral Palsy from ICD-9 Code
x_cpal=0;
IF SUBSTR(LEFT(iI2aba),1,3) = '343' THEN x_cpal = 1;
IF SUBSTR(LEFT(iI2bba),1,3) = '343' THEN x_cpal = 1;
IF SUBSTR(LEFT(iI2cba),1,3) = '343' THEN x_cpal = 1;
IF SUBSTR(LEFT(iI2dba),1,3) = '343' THEN x_cpal = 1;
IF SUBSTR(LEFT(iI2eba),1,3) = '343' THEN x_cpal = 1;
IF SUBSTR(LEFT(iI2fba),1,3) = '343' THEN x_cpal = 1;

```

```

** Code Cerebral Palsy from ICD-10 Code
** CEREBRAL PALSY IS ICD-10 CODES 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;

```

```

** Code Septicemia from ICD-9 Code
** http://icd9cm.chrisendres.com/index.php?action=search&srchtext=sepsis
** *NOTE: ELIMINATED CODES THAT INDICATE ADDITIONAL 'SEPTIC' CODES TO BE DONE
** ICD-9 CODES: 003.1, 022.3, 027.0, 027.1, 038., 112.5,
**              995.91, 995.92, 999.32, 999.34

```

```

x_sept=0;
IF SUBSTR(LEFT(iI2aba),1,3) = '038' THEN x_sept = 1;
IF SUBSTR(LEFT(iI2bba),1,3) = '038' THEN x_sept = 1;
IF SUBSTR(LEFT(iI2cba),1,3) = '038' THEN x_sept = 1;
IF SUBSTR(LEFT(iI2dba),1,3) = '038' THEN x_sept = 1;
IF SUBSTR(LEFT(iI2eba),1,3) = '038' THEN x_sept = 1;
IF SUBSTR(LEFT(iI2fba),1,3) = '038' THEN x_sept = 1;

```



```

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IF SUBSTR(iI2aba,1,5) in ('003.1', '022.3', '027.0', '027.1', '112.5') THEN
x_sept=1;
IF SUBSTR(iI2bba,1,5) in ('003.1', '022.3', '027.0', '027.1', '112.5') THEN
x_sept=1;
IF SUBSTR(iI2cba,1,5) in ('003.1', '022.3', '027.0', '027.1', '112.5') THEN
x_sept=1;
IF SUBSTR(iI2dba,1,5) in ('003.1', '022.3', '027.0', '027.1', '112.5') THEN
x_sept=1;
IF SUBSTR(iI2eba,1,5) in ('003.1', '022.3', '027.0', '027.1', '112.5') THEN
x_sept=1;
IF SUBSTR(iI2fba,1,5) in ('003.1', '022.3', '027.0', '027.1', '112.5') THEN
x_sept=1;

IF SUBSTR(iI2aba,1,6) in ('995.91', '995.92', '999.32', '999.34') THEN x_sept=1;
IF SUBSTR(iI2bba,1,6) in ('995.91', '995.92', '999.32', '999.34') THEN x_sept=1;
IF SUBSTR(iI2cba,1,6) in ('995.91', '995.92', '999.32', '999.34') THEN x_sept=1;
IF SUBSTR(iI2dba,1,6) in ('995.91', '995.92', '999.32', '999.34') THEN x_sept=1;
IF SUBSTR(iI2eba,1,6) in ('995.91', '995.92', '999.32', '999.34') THEN x_sept=1;
IF SUBSTR(iI2fba,1,6) in ('995.91', '995.92', '999.32', '999.34') THEN x_sept=1;

```

** Code Septicemia from ICD-10 Code ;

```

** ICD-10 CODES: 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).
** (NOTE: DO NOT HAVE VARIABLES FOR x_intake, SO ASSUME =1
** 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_cpai) 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 (i11q) OR dehydrated (ik2c).
** 7. Multiple sclerosis (i11f) AND ADL score of 10 or more
** (x_adlsum).
** 8. Quadriplegia (i11i) AND ADL score of 10 or more
** (x_adlsum).
** 9. Radiation therapy (in2f).

```

```

IF (((i11 = 3 OR i11 = 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 ((i14 = 1 OR i15 = 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 (i11q = 1 OR i11q = 2 OR i11q = 3 OR ik2c=1)))
OR ((i11f = 1 OR i11f = 2 OR i11f = 3) AND x_adlsum >= 10)
OR ((i11i = 1 OR i11i = 2 OR i11i = 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.
** NOTE: interRAI HC DOES NOT HAVE IS3

```

```

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).
** (NOTE: DO NOT HAVE VARIABLES FOR x_intake, SO ASSUME =1)
** 2. Comatose (ic1=5) AND not awake (is3) AND
** ADL dependent (ig2i, ig2g, ig2j, ig2h).
** NOTE: is3 NOT AVAILABLE ON interRAI HC

```

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- \*\* 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.
- \*\* NOTE: DO NOT HAVE PHYSICIAN ORDERS OR VISITS ON INTERRAI HC
- \*\* 14. Diabetes (iI1t) AND injections (not available) on 7 days
- \*\* AND physician order changes (iN8) on 2 or more days (NOT
- \*\* AVAILABLE). (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. Determine depression variable (x\_depres) - OMITTED IN RUG-III/HC;  
\*\* ++++++;

\*\* ++++++;  
\*\* Step IX. 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.

```

IF SCPS >= 3 THEN x_impair = 1;
ELSE x_impair = 0;

```

```

** ++++++
** Step X. Test Behavior Problems qualification.
** ++++++

```

```

** -----
** NOTE: THE FOLLOWING DOCUMENTATION WAS CORRECTED 09/08/15 TO INDICATE THAT
** THE BEHAVIOR VARIABLES iE3a-f WERE SCORED FOR 1 OR MORE DAYS, NOT 4
** 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)
** 6. Hallucinations (ij2i).
** 7. 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 XI. 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 a resident 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 (i.e., an ADL sum of 6  
 \*\* or less).

\*\* Note that residents who have Special Care clinical indicators but  
 \*\* have too low an 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 a resident must satisfy one of the  
 \*\* two following conditions  
 \*\* 1. The resident has Clinically Complex clinical indicators (x\_clin = 1),  
 \*\* 2. The resident has both Special Care indicators (x\_spec = 1) and  
 \*\* was not already classified as Special Care (i.e., an ADL sum of 6  
 \*\* or less).

\*\* Split into Clinically Complex groups is based on ADL sum 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';

```

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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 Cognitive Groups **
**
** To be classified as Cognitive Impairment the resident has Cognitive
** Impairment indicators (x_impair = 1) and an ADL sum of 10 or less
**
** Split into Impaired Cognitive groups is based on ADL sum and iADL sum
** (Note: splits of nursing rehabilitation not performed)
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;
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: splits of nursing rehabilitation not performed)
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;
END;

** -----
** Classify into Physical Groups **
** A resident is classified as reduced Physical Function if a previous
** hierarchical classification has not been made
**
** Split into Physical Function groups is based on ADL sum and IADL sum
** (Note: splits of nursing rehabilitation not performed)
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;
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
```

```
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 **;
```

