

## Five-Star Staffing Domain Nursing Acuity and Staffing Ratings

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Every quarter, HHI is inundated with phone calls regarding the **Five-Star Staffing Domain** for the Nursing Home Compare 5 Star Quality Rating. Most of the inquiries are related to seeking help with:

- Assessing if all employees are accurately coded and reflected in PBJ submission,
- Determining how many hours are needed to attain a higher star rating, or
- Creating a customized spreadsheet showing current and needed hours for each Nursing category.

The first request is straightforward, however, the second two requests require the ability to answer the following question:

### “How does CMS calculate the Adjusted Nursing Hours Per Patient Day?”

The intent of this article is to distill and synthesize a user friendly schematic for providers to better understand the calculation for **Adjusted Nursing Hours Per Patient Day**. In other words, to better understand the formula to convert Acuity into the CMS imposed staffing level.

While the concept is simple, expected staffing levels based on patient Acuity, the calculation is much more complex and utilizes multiple data sources.

The below **Figure 1** (block diagram), illustrates the procedural steps necessary to establish the Nursing Staff Rating for a Skilled Nursing Facility. There are **two independent data paths** that the Centers for Medicare and Medicaid Services (CMS) uses to determine this rating.

#### 1) Hours

The **reported staffing hours (r)** for each of the nursing categories:

- Registered Nurse (RN),
- Licensed Practical Nurse (LPN), and
- Certified Nurse Assistant (CNA)

that are reported quarterly through the Payroll-Based Journal (PBJ) data system.

The data, when summarized, leads to the aggregate hours per patient per day (HPPD) for each nursing type. The sum of the three nursing types provides the total HPPD.

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## 2) Acuity

The second data source is the **Resource Utilization Group – RUG-IV (66)** that defines the daily case mix Index for each patient. The Five-Star Staffing Domain process utilizes the Minimum Data Set (MDS) to assess and classify each patient. If you ever wondered where this RUG level is displayed on the MDS, see section **Z0300, Insurance Billing**.

### Estimated Hours Per Patient Per Day

The Minimum Data Set (MDS) is the method for clinically assessing each patient. The patient Acuity is established by assigning a RUG level to that patient based on the assessment. The Acuity level for staffing purposes is quantified by an estimate of the number of hours per patient per day (h) that each nursing type should spend with that patient for that RUG designation. These case mix hours are derived from STRIVE, which is a CMS Staff Time Resource Intensity Verification Study (2006-2007) that measured the average hours per resident per day needed to satisfy the Nursing demands of each RUG.

### Adjusted Hours

The reported HPPD is adjusted by using the following formula:

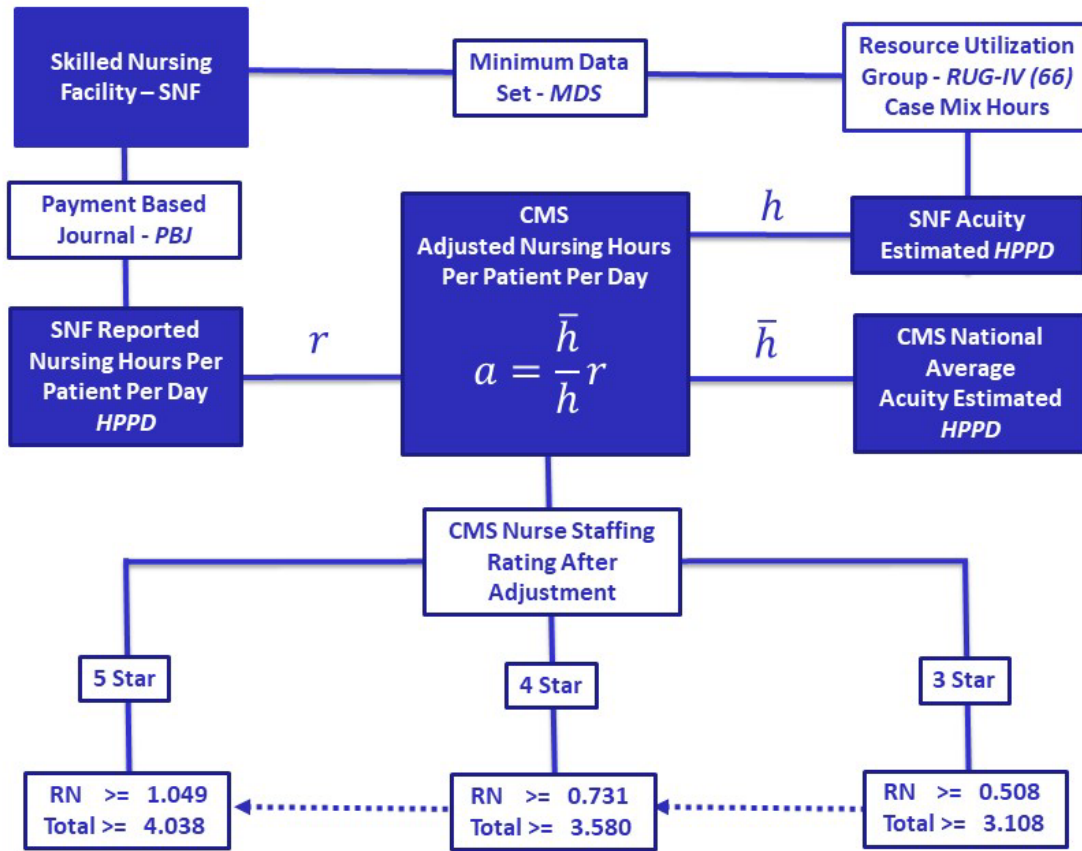
$$a = \frac{\bar{h}}{h}r$$

As indicated before, the symbol r represents the hours per patient per day reported to CMS by each SNF. The **factor h** accounts for the **Acuity estimated HPPD** for that SNF calculated from the **composite facility RUG values by CMS**. After all the SNFs have provided a quarterly report, **CMS computes the statistical mean estimated hours per patient per day  $\bar{h}$  from the entire ensemble**.

Figure 1 illustrates the data sources and algorithms used to establish a Nursing Staff Rating for a Skilled Nursing Facility (SNF). The Centers for Medicare & Medicaid Services (CMS) utilize Payroll-Based Journal (PBJ) data to determine each nursing facility's staffing levels. These reported hours per patient per day (HPPD) are then adjusted by CMS to determine the basis for a 5 Star staffing rating. The adjustments follow from the Resources Utilization Group (RUG-IV) Case Mix Hours based on the Minimum Data Set (MDS) patient assessments.

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Figure 1  
Five-Star Nurse Staffing Rating Methodology™



### Definition of Variables for Figure 1

- a = Adjusted Nursing Hours per Patient Day
- h = SNF Acuity Estimated HPPD
- r = SNF Reported Nursing Hours Per Patient Per Day HPPD
- h = SNF Acuity Estimated HPPD
- h̄ = CMS National Average Acuity Estimated HPPD
- HPPD = Hours Per Patient Per Day

Lastly, the below **Figure 2** portrays a user friendly, one page, **Nurse Staffing Rating Chart** for providers to calculate their Staffing Domain rating via knowledge of the facility specific:

- RN HPPD
- Total Nursing HPPD

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By crosswalking the x and y axis, one can readily determine the expected **Five-Star Staffing Domain Rating**.

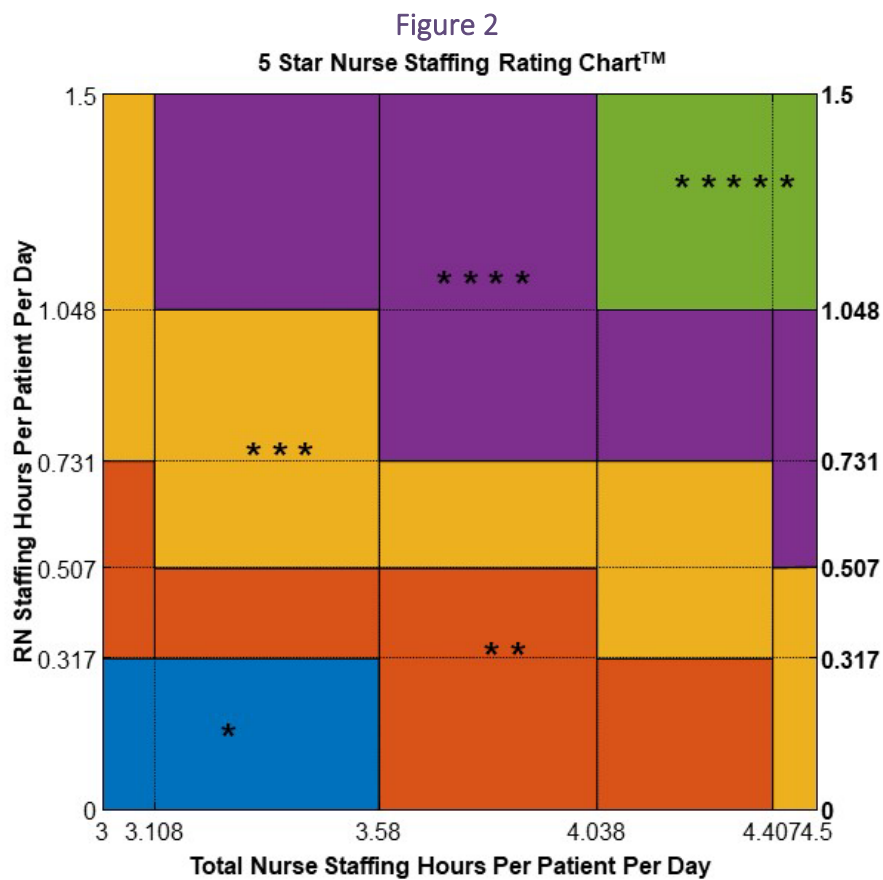
### 5 Star Nurse Staffing Chart

The Five-Star Staffing Rating System is based on the combination of two parameters:

- Adjusted RN Staffing HPPD
- Adjusted Total Nurse Staffing HPPD

The relation between the two measures and the resulting rating is complex. This complexity is best understood by means of the area chart shown in Figure 2.

The five-star region is shown in green. The four-star region is in purple. The three-star region is shown in orange. The two-star region is shown in burnt orange and the one-star region is shown in blue.



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## Conclusions

### Acuity

The term Acuity appears regularly in almost all the literature identified with the Skilled Nursing industry. It is rather elusive and enigmatic term that is never quantified. This paper demonstrates that in the critical area of nurse staffing and the Five-Star Rating System, Acuity is quantified in terms of the nursing hours per patient per day each patient would be expected to receive based on their MDS RUG assessment.

### Adjustment Algorithm

One intent of this paper is to clarify the HPPD adjustment process and show that there is more to getting the desired Five-Star Staffing Rating than simply reporting the PBJ payroll hours. An understanding of the components in the adjustment algorithm is necessary to optimum staffing scheduling. The three HPPD ingredients in the adjustment algorithm are the reported values  $r$ , the Acuity determined values  $h$  and the national average of the Acuity determined variables  $\bar{h}$ .

### Regression to the Mean

A closer look at the adjustment factor  $\bar{h}/h$  shows that when the case mix hours are greater than their mean (i.e.:  $\bar{h} < h$ ) the adjustment factor  $\bar{h}/h$  is less than one and the reported hours will be reduced. When the case mix hours are less than their mean (i.e.:  $\bar{h} > h$ ) the adjustment factor  $\bar{h}/h$  is greater than one and the reported hours will be increased. The adjustment factor  $\bar{h}/h$  is an adaptation of Sir Francis Galton's Regression to the mean whereby CMS corrects to maintain Acuity and eliminate HPPD outliers.

### Staffing Rating

Understanding the various combinations between the adjusted RN hours and the Total adjusted hours that will produce a specific Five Star Rating is essential. Figure 2 illustrates all the possible combinations in a color coded area diagram. The three combinations listed Figure 1 and circled in white in Figure 2 are a guide to scheduling for a given star rating. It is clear that RN hours equal to or greater than 1.049 combined with Total hours equal to or greater than 4.038 will be within the green five star area and give the top rating. In a seminal manner, RN hours equal to or greater than 0.731 combined with Total hours equal to or greater than 3.580 will be within the purple four star area. There are other four star combinations but anything greater than the numbers cited guarantee at least four stars. In addition, this specific array of numbers lead to a more desirable level of staffing when it comes to Acuity. Since only four or five star staffing ratings will contribute to the overall Quality Measure Five-Star Ratings, it is desirable to attain staffing ratings greater than three stars whenever possible.

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For questions on Nursing Home Compare Five-Star Quality Rating, please feel free to call Kris at 617.595.6032.

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