

AVOIDANCE OF UTILIZATION OF HIGH ULTRAFILTRATION RATE  
MEASURE CALCULATION ALGORITHM

Data are collected and scores for each facility are calculated on a monthly basis; scores are then averaged over the 12-month reporting period to obtain the facility's annual score.

Scores are calculated using the following algorithm:

**1. Build the "Month 1 Raw Denominator Population"**

For the Month 1 calculation period,\* identify all patients in the facility during the reporting month whose:

- a. Primary Type Treatment/Modality = Hemodialysis
- b. Primary/Current Dialysis Setting = In-center
- c. Date of Birth =  $\geq 18$  years prior to treatment date

\* The calculation period is defined as the same week that the monthly Kt/V is drawn. If more than one Kt/V is drawn in a given month, the last draw for the month will be used to define the data collection period (i.e., these data elements will be collected during the week that the final Kt/V value of the month is drawn).

**2. Remove patients with exclusions to define the "Month 1 Final Denominator Population"**

For all patients meeting all of the Step 1 requirements, identify all patients meeting any of the following exclusion criteria and remove from the denominator population:

- a. Date Patient Started Chronic Dialysis at Current Facility =  $\geq 30$  days prior to treatment date
- b. Transient Status = Not transient OR patients with  $< 7$  hemodialysis treatments in the facility during the month.
- c. Sessions Per Week =  $\geq 4$
- d. Patients without a completed CMS Medical Evidence Form (Form CMS-2728) in the reporting month
- e. Kidney transplant recipients with a functioning graft

**3. Identify the "Month 1 Numerator Data Elements"**

For all patients remaining in the denominator after Step 2, collect each of the following data elements for each dialysis session (including supplemental sessions) delivered during the Month 1 calculation period:

- a. Pre-Dialysis Weight for Session
- b. Post-Dialysis Weight for Session
- c. Session Date
- d. Time Delivered Per Session, in Minutes
- e. Sessions Per Week

**4. Build the "Month 1 Numerator Population"**

For each patient, for all dialysis sessions included in the final Month 1 Numerator Data Set:

- a. Calculate the UFR (in ml/kg/hour) for each dialysis session (including supplemental sessions):

Session X UFR =  $\left( \frac{\text{Session X Pre-Dialysis Weight in kg} - \text{Session X Post-Dialysis Weight in kg}}{1000 \text{ ml/kg}} \right) \div \text{Session X Post-Dialysis Weight in kg} \div (\text{Session X Delivered Treatment Time in minutes}) \times 60 \text{ minutes/hour}$

- b. Calculate each patient's average UFR for all dialysis sessions (including supplemental sessions) during the calculation period:

**Average UFR =  $(\text{UFR1} + \text{UFR2} + \dots + \text{UFRX}) \div \text{X Treatments}$**

- c. Calculate each patient's average treatment time over all dialysis sessions (including supplemental sessions) during the calculation period:

**Average Treatment Time (in minutes) =  $(\text{Time 1} + \text{Time 2} + \dots + \text{Time X}) \div \text{X Treatments}$**

- d. For each facility, include in the numerator all patients with:

- i. an average UFR during the calculation period (4.b. value)  **$\geq 13 \text{ ml/kg/hour}$** ;  
AND
- ii. an average treatment time during the calculation period (4.c. value)  **$< 240 \text{ minutes}$** .

5. Calculate the facility's Month 1 performance score:

**Month 1 Performance Score =  $\text{Month 1 Numerator Population} \div \text{Month 1 Denominator Population}$**

6. Repeat Steps 1 through 5 for each of the remaining 11 months of the reporting year.

7. Calculate the facility's annual performance score:

**Facility's Average Annual Performance Score =  $(\text{Facility's Month 1 Score} + \text{Month 2 Score} + \dots + \text{Month 12 Score}) \div 12$**

AVOIDANCE OF UTILIZATION OF HIGH ULTRAFILTRATION RATE  
TECHNICAL MEASURE SPECIFICATIONS

| MEASURE   | DESCRIPTION   | NUMERATOR   | DENOMINATOR  | EXCLUSIONS  |
|---|---|---|--|---|
| <p><b>NQF 2701:</b><br/><b>Avoidance of Utilization of High Ultrafiltration Rate (<math>\geq 13</math> ml/kg/hour)</b></p> <p>Level: Facility</p> <p>Lower score = Better performance</p> | <p>Percentage of adult in-center hemodialysis patients in the facility whose average ultrafiltration rate (UFR) is <math>\geq 13</math> ml/kg/hour AND who receive an average treatment time <math>&lt; 240</math> minutes.*</p> <p>*The measure criteria can be met by employing either or both of two approaches:</p> <ol style="list-style-type: none"> <li>Dialyzing patients at an average UFR <math>&lt; 13</math> ml/kg/hour;<br/>AND/OR</li> <li>Dialyzing patients for an average of <math>\geq 240</math> minutes per session during the reporting period.</li> </ol> | <p>Number of patients<sup>1</sup> from the denominator whose average UFR is <math>\geq 13</math> ml/kg/hour AND who receive an average of <math>&lt; 240</math> minutes per treatment during the calculation period.</p> <p>The average UFR and treatment time are calculated for the treatments received in the calculation period, defined as the same week that the monthly Kt/V is drawn.</p> <p>The average UFR is calculated as follows:</p> <ol style="list-style-type: none"> <li>The UFR (in ml/kg/hour) is calculated for each treatment in the calculation period as:<br/> <math display="block">\left( \frac{\text{Pre-Dialysis Weight in kg} - \text{Post-Dialysis Weight in kg}}{\text{Delivered Treatment Time in minutes}} \right) \times 60 \text{ minutes/hour}</math> </li> <li>The average UFR for the calculation period is then calculated by summing the UFRs for each treatment and dividing by the number of treatments in the calculation period:<br/> <math display="block">(\text{UFR1} + \text{UFR2} \dots + \text{UFRX}) \div (\text{X treatments})</math> </li> </ol> <p>The average treatment time is calculated as:<br/> <math display="block">\frac{\text{Total Minutes Dialyzed during calculation period}}{\text{Number of treatments in calculation period}}</math> </p> | <p>Number of adult in-center hemodialysis patients in an outpatient dialysis facility undergoing chronic maintenance hemodialysis during the calculation period.</p> | <ol style="list-style-type: none"> <li>Age <math>&lt; 18</math> years.</li> <li>Patients in a facility <math>&lt; 30</math> days.</li> <li>Home dialysis patients.</li> <li><math>&lt; 7</math> hemodialysis treatments in the facility during the month.</li> <li>Facilities treating <math>&lt; 25</math> adult in-center hemodialysis patients during the reporting period.</li> <li>Patients without a completed CMS Medical Evidence Form (Form CMS-2728).</li> <li>Kidney transplant recipients with a functioning graft.</li> <li>Patients who receive 4 or more dialysis sessions during the calculation period.</li> </ol> |

<sup>1</sup> To address the fact that patients may contribute varying amounts of time to the annual denominator population, results will be reported using a “patient-month” construction.

## KCQA TESTING DATA ATTACHMENT

### AVOIDANCE OF UTILIZATION OF HIGH UFR ( $\geq 13$ ML/KG/HOUR)

This document provides tables containing the data generated by the three participating dialysis organizations during testing of the KCQA performance measure, *Avoidance of Utilization of High UFR ( $\geq 13$  ml/kg/hour)*. To preserve anonymity, data are presented as coming from Organization A, B, and C. This nomenclature is random and is scrambled throughout the measure submission documents such that Organization A in one section might become Organization B or C in another section.

**Table 1: Facility Information by Organization**

| ORGANIZATION  | NUMBER OF FACILITIES INCLUDED IN TESTING | RANGE OF FACILITY SIZES (I.E., NUMBER OF PATIENTS AT FACILITY) | MEAN FACILITY SIZE |
|---------------|--|--|--------------------|
| A             | 212                                      | 1-188  | 54.81              |
| B             | 1,993                                    | 1-664  | 113.91             |
| C             | 2,047                                    | 1-487  | 64.25              |
| <b>TOTALS</b> | <b>4,252</b>                             | <b>1-664</b>   | <b>84.11</b>       |

**Table 2: Patient Information by Dialysis Organization (across all months of testing)**

| ORG.         | TOTAL NUMBER OF PATIENTS IN TESTING | RANGE OF PATIENT AGES | MEAN PATIENT AGE | PERCENT MALE | PERCENT FEMALE | PERCENT WHITE | PERCENT BLACK/AFRICAN AMERICAN | PERCENT HISPANIC | PERCENT AMERICAN INDIAN/ALASKA NATIVE | PERCENT ASIAN | PERCENT NATIVE HAWAIIAN / OTHER PACIFIC ISLANDER | PERCENT OTHER/DECLINE TO STATE/MISSING |
|--------------|-------------------------------------|-----------------------|------------------|--------------|----------------|---------------|--------------------------------|------------------|---------------------------------------|---------------|--|--|
| A            |                                     | 18.01-100.01          | 61.90            | 56.27        | 43.73          | 47.25         | 43.59                          | 6.73             | 2.39                                  | 2.21          | 0.29   | 2.79                                   |
| B            |                                     | 18.01-104.00          | 61.15            | 56.25        | 43.75          | 38.31         | 35.89                          | 17.32            | 1.32                                  | 3.62          | 0.91   | 0.09                                   |
| C            |                                     | 18.01-84.93           | 62.24            | 56.30        | 43.70          | 59.58         | 36.24                          | 14.30            | 0.87                                  | 1.93          | 0.42   | 0.96                                   |
| <b>TOTAL</b> | <b>412,522</b>                      | <b>18.01-104.00</b>   | <b>61.66</b>     | <b>56.26</b> | <b>43.74</b>   | <b>52.37</b>  | <b>36.33</b>                   | <b>15.60</b>     | <b>1.16</b>                           | <b>2.82</b>   | <b>0.67</b>                                      | <b>0.57</b>                            |

**Table 3: Information on Missing Data (monthly and annual counts, across all facilities, by dialysis organization)\***

All facilities remained in the analysis, regardless of the magnitude of missing data; however, participating dialysis organizations were instructed to remove individual dialysis sessions from the analysis with any missing data elements:

|                         |        | DIALYSIS SESSIONS EXCLUDED ACROSS ALL FACILITIES<br>(TOTAL NUMBER / AVERAGE PER FACILITY / FACILITY RANGES) |               |               |               |                |               |               |               |               |               |               |               | TOTAL                |
|-------------------------|--------|---|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------------|
|                         | Org. A | Jan   | Feb           | Mar           | Apr           | May            | Jun           | Jul           | Aug           | Sep           | Oct           | Nov           | Dec           | Annual               |
| Missing/incomplete data |        | T=1,984<br>A=9.36   | 1,679<br>7.92 | 1,853<br>8.74 | 1,701<br>8.02 | 3,572<br>16.85 | 1,437<br>6.78 | 1,554<br>7.33 | 1,638<br>7.73 | 1,517<br>7.16 | 1,580<br>7.45 | 1,629<br>7.68 | 1,518<br>7.16 | T=21,662<br>A=102.18 |

|   |          |  |   |   |   |   |   |   |   |   |   |   |   |                                   |
|---|----------|--|---|---|---|---|---|---|---|---|---|---|---|-----------------------------------|
|   |          | R=(0-323)  | (0-288)                                       | (0-209)                                       | (0-152)                                       | (0-214)                                       | (0-113)                                       | (0-146)                                       | (0-156)                                       | (0-136)                                       | (0-136)                                       | (0-186)                                       | (0-187)                                       |                                   |
|   | <b>B</b> | 2,969<br>1.49<br>(0-19)  | 2,372<br>1.19<br>(0-6)                        | 2,790<br>1.40<br>(0-8)                        | 2,950<br>1.48<br>(0-9)                        | 2,870<br>1.44<br>(0-10)                       | 2,910<br>1.46<br>(0-15)                       | 3,169<br>1.59<br>(0-16)                       | 3,408<br>1.71<br>(0-14)                       | 3,149<br>1.58<br>(0-17)                       | 2,651<br>1.33<br>(0-12)                       | 2,571<br>1.29<br>(0-11)                       | 3,009<br>1.51<br>(0-24)                       | <b>34,818</b><br><b>17.47</b>     |
|   | <b>C</b> | 1,494<br>0.73<br>(0-21)  | 1,392<br>0.68<br>(0-20)                       | 1,433<br>0.70<br>(0-13)                       | 1,494<br>0.73<br>(0-40)                       | 1,617<br>0.79<br>(0-49)                       | 1,576<br>0.77<br>(0-280)                      | 1,781<br>0.87<br>(0-53)                       | 1,617<br>0.79<br>(0-54)                       | 1,616<br>0.79<br>(0-34)                       | 1,556<br>0.76<br>(0-27)                       | 1,494<br>0.73<br>(0-36)                       | 1,638<br>0.80<br>(0-23)                       | <b>18,708</b><br><b>9.14</b>      |
| <b>TOTAL SESSIONS EXCLUDED</b>          |          | <b>T=6,447</b><br><b>A=1.52</b><br><b>R=(0-323)</b>  | <b>5,443</b><br><b>1.28</b><br><b>(0-288)</b> | <b>6,076</b><br><b>1.43</b><br><b>(0-209)</b> | <b>6,145</b><br><b>1.45</b><br><b>(0-152)</b> | <b>8,059</b><br><b>1.90</b><br><b>(0-214)</b> | <b>5,923</b><br><b>1.39</b><br><b>(0-280)</b> | <b>6,504</b><br><b>1.53</b><br><b>(0-146)</b> | <b>6,663</b><br><b>1.57</b><br><b>(0-156)</b> | <b>6,282</b><br><b>1.48</b><br><b>(0-136)</b> | <b>5,787</b><br><b>1.36</b><br><b>(0-136)</b> | <b>5,694</b><br><b>1.34</b><br><b>(0-186)</b> | <b>6,165</b><br><b>1.45</b><br><b>(0-187)</b> | <b>T=75,188</b><br><b>A=17.68</b> |
| <b>MONTHLY AVERAGE PER ORGANIZATION</b> |          | <b>6,266 dialysis sessions with missing data per dialysis organization per month</b>                     |   |   |   |   |   |   |   |   |   |   |   |                                   |
| <b>MONTHLY AVERAGE PER FACILITY</b>     |          | <b>1.47 dialysis sessions with missing data per facility per month across all dialysis organizations</b> |   |   |   |   |   |   |   |   |   |   |   |                                   |

\*A specific examination of missing data rates during only the Kt/V week was not conducted; however, it can be inferred that the percentage of missing data during that week is equivalent to that of the entire month; it may in fact be less, since facilities are attuned to data collection during that week.

**Table 4: Information on Patient-Level Exclusions (monthly and annual counts, across all facilities, by dialysis organization)\***

|                                  |               | <b>PATIENTS EXCLUDED ACROSS ALL FACILITIES</b><br><b>TOTAL NUMBER / AVERAGE PER FACILITY / FACILITY RANGES</b> |                           |                           |                           |                           |                           |                            |                           |                           |                           |                           |                           | <b>TOTAL PATIENT-MOS</b>        |
|----------------------------------|---------------|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------------|
|                                  |               | <b>Jan</b>   | <b>Feb</b>                | <b>Mar</b>                | <b>Apr</b>                | <b>May</b>                | <b>Jun</b>                | <b>Jul</b>                 | <b>Aug</b>                | <b>Sep</b>                | <b>Oct</b>                | <b>Nov</b>                | <b>Dec</b>                | <b>Annual</b>                   |
| <b>Age &lt;18 years</b>          | <b>Org. A</b> | T=24<br>A=0.11<br>R=(0-6)  | 29<br>0.14<br>(0-6)       | 31<br>0.15<br>(0-6)       | 30<br>0.14<br>(0-6)       | 30<br>0.14<br>(0-7)       | 45<br>0.21<br>(0-18)      | 30<br>0.14<br>(0-7)        | 30<br>0.14<br>(0-7)       | 30<br>0.14<br>(0-6)       | 28<br>0.13<br>(0-6)       | 25<br>0.12<br>(0-6)       | 28<br>0.13<br>(0-7)       | <b>T=360</b><br><b>A=1.70</b>   |
|                                  | <b>B</b>      | 143<br>0.07<br>(0-27)  | 143<br>0.07<br>(0-26)     | 143<br>0.07<br>(0-27)     | 143<br>0.07<br>(0-30)     | 143<br>0.07<br>(0-28)     | 143<br>0.07<br>(0-29)     | 143<br>0.07<br>(0-30)      | 164<br>0.08<br>(0-31)     | 164<br>0.08<br>(0-30)     | 164<br>0.08<br>(0-29)     | 143<br>0.07<br>(0-27)     | 143<br>0.07<br>(0-27)     | <b>1,779</b><br><b>0.87</b>     |
|                                  | <b>C</b>      | 2,631<br>1.32<br>(0-6)   | 2,551<br>1.28<br>(0-7)    | 2,770<br>1.39<br>(0-7)    | 2,671<br>1.34<br>(0-5)    | 2,491<br>1.25<br>(0-5)    | 2,551<br>1.28<br>(0-4)    | 2,362<br>1.19<br>(0-4)     | 2,332<br>1.12<br>(0-5)    | 2,272<br>1.14<br>(0-7)    | 2,392<br>1.20<br>(0-8)    | 2,432<br>1.22<br>(0-8)    | 2,491<br>1.25<br>(0-8)    | <b>29,946</b><br><b>15.03</b>   |
| <b>In facility &lt;30 days</b>   | <b>A</b>      | 751<br>3.54<br>(0-14)  | 751<br>3.54<br>(0-15)     | 853<br>4.02<br>(0-46)     | 826<br>3.90<br>(0-21)     | 811<br>3.83<br>(0-46)     | 791<br>3.73<br>(0-22)     | 852<br>4.02<br>(0-17)      | 800<br>3.77<br>(0-16)     | 799<br>3.77<br>(0-14)     | 789<br>3.72<br>(0-13)     | 886<br>4.18<br>(0-34)     | 817<br>3.85<br>(0-27)     | <b>9,726</b><br><b>45.88</b>    |
|                                  | <b>B</b>      | 23,172<br>11.32<br>(0-162)   | 16,806<br>8.21<br>(0-163) | 16,970<br>8.29<br>(1-161) | 17,420<br>8.51<br>(0-254) | 18,505<br>9.04<br>(0-250) | 18,096<br>8.84<br>(0-108) | 20,941<br>10.23<br>(0-126) | 19,590<br>9.57<br>(0-130) | 17,338<br>8.47<br>(0-127) | 17,338<br>8.47<br>(0-176) | 17,277<br>8.44<br>(0-178) | 17,707<br>8.65<br>(0-182) | <b>221,160</b><br><b>108.06</b> |
|                                  | <b>C</b>      | 5,899<br>2.96<br>(0-35)  | 5,720<br>2.87<br>(0-41)   | 6,677<br>3.35<br>(0-48)   | 6,816<br>3.42<br>(0-47)   | 6,896<br>3.46<br>(0-53)   | 7,195<br>3.61<br>(0-55)   | 8,411<br>4.22<br>(0-89)    | 7,872<br>3.95<br>(0-73)   | 6,557<br>3.29<br>(0-59)   | 6,597<br>3.31<br>(0-58)   | 7,394<br>3.71<br>(0-41)   | 6,497<br>3.26<br>(0-39)   | <b>75,974</b><br><b>38.12</b>   |
| <b>Home hemodialysis patient</b> | <b>A</b>      | 143<br>0.68  | 122<br>0.58               | 166<br>0.78               | 171<br>0.81               | 198<br>0.93               | 222<br>1.05               | 268<br>1.26                | 215<br>1.01               | 231<br>1.09               | 185<br>0.87               | 213<br>1.01               | 202<br>0/95               | <b>2,336</b><br><b>11.02</b>    |

|  |   |                                 |                            |                            |                            |                            |                            |                            |                            |                            |                            |                            |                            |                                 |
|--|---|---------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---------------------------------|
|  |   | (0-9)                           | (0-6)                      | (0-10)                     | (0-9)                      | (0-10)                     | (0-22)                     | (0-14)                     | (0-15)                     | (0-8)                      | (0-9)                      | (0-12)                     | (0-9)                      |                                 |
|  | B | 15,741<br>7.69<br>(0-274)       | 15,475<br>7.56<br>(0-265)  | 15,680<br>7.66<br>(0-273)  | 15,741<br>7.69<br>(0-269)  | 15,823<br>7.73<br>(0-271)  | 15,885<br>7.76<br>(0-272)  | 16,008<br>7.82<br>(0-264)  | 15,967<br>7.80<br>(0-271)  | 15,905<br>7.77<br>(0-268)  | 16,069<br>7.85<br>(0-281)  | 16,008<br>7.82<br>(0-286)  | 16,008<br>7.82<br>(0-288)  | 190,309<br>92.97                |
|  | C | 0                               | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                               |
| Received <7 HD treatments in facility during reporting month | A | 606<br>2.86<br>(0-12)           | 752<br>3.55<br>(0-24)      | 628<br>2.96<br>(0-17)      | 640<br>3.02<br>(0-19)      | 636<br>3.07<br>(0-47)      | 630<br>2.97<br>(0-18)      | 595<br>2.81<br>(0-19)      | 603<br>2.84<br>(0-12)      | 651<br>3.07<br>(0-13)      | 621<br>2.93<br>(0-13)      | 706<br>3.33<br>(0-15)      | 625<br>2.95<br>(0-20)      | 7,693<br>36.29                  |
|  | B | 11,320<br>5.53<br>(0-104)       | 10,849<br>5.30<br>(0-75)   | 11,074<br>5.41<br>(0-143)  | 10,931<br>5.34<br>(0-128)  | 11,218<br>5.48<br>(0-96)   | 12,180<br>5.95<br>(0-114)  | 12,937<br>6.32<br>(0-129)  | 12,159<br>5.94<br>(0-150)  | 11,381<br>5.56<br>(0-115)  | 10,849<br>5.30<br>(0-176)  | 11,914<br>5.82<br>(0-139)  | 11,606<br>5.67<br>(0-120)  | 138,418<br>67.62                |
|  | C | 15,426<br>7.74<br>(0-117)       | 16,980<br>8.52<br>(0-178)  | 16,402<br>8.23<br>(0-255)  | 15,067<br>7.56<br>(0-131)  | 15,346<br>7.70<br>(0-163)  | 16,522<br>8.29<br>(0-98)   | 16,622<br>8.34<br>(0-93)   | 17,439<br>8.75<br>(0-186)  | 15,167<br>7.61<br>(0-146)  | 14,350<br>7.20<br>(0-187)  | 15,486<br>7.77<br>(0-99)   | 14,688<br>7.37<br>(0-119)  | 189,495<br>95.08                |
| No completed CMS-2728 Form in reporting month                | A | 0                               | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                               |
|  | B | 0                               | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                               |
|  | C | 2,730<br>1.37<br>(0-13)         | 2,790<br>1.40<br>(0-12)    | 2,770<br>1.39<br>(0-12)    | 2,750<br>1.38<br>(0-14)    | 2,770<br>1.39<br>(0-12)    | 2,730<br>1.37<br>(0-12)    | 2,691<br>1.35<br>(0-12)    | 2,631<br>1.32<br>(0-12)    | 2,531<br>1.27<br>(0-12)    | 2,511<br>1.26<br>(0-13)    | 2,611<br>1.31<br>(0-14)    | 2,571<br>1.29<br>(0-13)    | 32,086<br>16.10                 |
| Kidney transplant recipient with functioning graft           | A | 0                               | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                               |
|  | B | 0                               | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                               |
|  | C | 0                               | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                          | 0                               |
| >4 dialysis sessions in calculation period                   | A | 1,246<br>5.88<br>(0-56)         | 154<br>0.73<br>(0-10)      | 122<br>0.58<br>(0-14)      | 133<br>0.63<br>(0-9)       | 149<br>0.70<br>(0-27)      | 128<br>0.60<br>(0-11)      | 124<br>0.59<br>(0-11)      | 110<br>0.52<br>(0-12)      | 131<br>0.62<br>(0-11)      | 137<br>0.65<br>(0-22)      | 129<br>0.61<br>(0-10)      | 927<br>4.37<br>(0-48)      | 3,490<br>16.46<br>(0-48)        |
|  | B | 1,474<br>0.72<br>0-31           | 2,293<br>1.12<br>0-49      | 1,556<br>0.76<br>0-15      | 1,515<br>0.74<br>0-16      | 1,494<br>0.73<br>0-31      | 1,597<br>0.78<br>0-27      | 1,412<br>0.69<br>0-15      | 1,556<br>0.76<br>0-20      | 1,494<br>0.73<br>0-17      | 1,453<br>0.71<br>0-13      | 1,535<br>0.75<br>0-15      | 1,945<br>0.95<br>0-81      | 19,324<br>9.44<br>(0-81)        |
|  | C | 3,787<br>1.9<br>(0-16)          | 6,577<br>3.3<br>(0-84)     | 3,986<br>2.0<br>(0-14)     | 3,986<br>2.0<br>(0-17)     | 3,587<br>1.8<br>(0-14)     | 3,787<br>1.9<br>(0-14)     | 3,787<br>1.9<br>(0-15)     | 3,587<br>1.8<br>(0-15)     | 3,787<br>1.9<br>(0-13)     | 3,787<br>1.9<br>(0-15)     | 3,986<br>2.0<br>(0-19)     | 4,584<br>2.3<br>(0-57)     | 49,319<br>24.75<br>(0-84)       |
| TOTAL MONTHLY EXCLUSIONS BY ORGANIZATION                     | A | T=2,364<br>A=11.15<br>R=(1-56)  | 1,433<br>6.76<br>(1-36)    | 1,427<br>6.73<br>(1-47)    | 1,374<br>6.48<br>(1-25)    | 1,348<br>6.36<br>(1-50)    | 1,382<br>6.52<br>(1-22)    | 1,388<br>6.55<br>(1-24)    | 1,328<br>6.26<br>(1-21)    | 1,385<br>6.53<br>(1-21)    | 1,372<br>6.47<br>(1-23)    | 1,485<br>7.01<br>(1-34)    | 2,153<br>10.16<br>(1-48)   | T=18,439<br>A=86.98<br>R=(1-50) |
|  | B | 41,964<br>20.5<br>(0-274)       | 36,806<br>17.98<br>(0-265) | 36,615<br>17.89<br>(0-273) | 36,930<br>18.04<br>(0-269) | 37,826<br>18.48<br>(0-271) | 38,146<br>18.64<br>(0-272) | 40,432<br>19.71<br>(0-264) | 39,054<br>19.08<br>(0-271) | 37,228<br>18.19<br>(0-268) | 37,010<br>18.08<br>(0-281) | 37,389<br>18.27<br>(0-286) | 38,712<br>18.91<br>(0-288) | 458,112<br>223.91<br>(0-288)    |
|  | C | 17,898<br>8.98<br>(1-117)       | 22,057<br>11.07<br>(1-178) | 19,353<br>9.71<br>(1-255)  | 18,254<br>9.16<br>(1-131)  | 18,234<br>9.15<br>(1-163)  | 19,553<br>9.81<br>(1-98)   | 19,679<br>9.87<br>(1-93)   | 20,122<br>10.10<br>(1-186) | 18,369<br>9.22<br>(1-146)  | 17,766<br>8.91<br>(1-187)  | 19,270<br>9.67<br>(1-99)   | 19,349<br>9.71<br>(1-119)  | 229,904<br>115.36<br>(1-255)    |
| TOTAL MONTHLY EXCLUSIONS ACROSS ALL ORGANIZATIONS            |   | T=6,226<br>A=14.64<br>R=(0-274) | 60,296<br>14.18<br>(0-265) | 57,395<br>13.50<br>(0-273) | 56,558<br>13.31<br>(0-269) | 57,408<br>13.51<br>(0-271) | 59,081<br>13.90<br>(0-272) | 61,499<br>14.47<br>(0-264) | 60,504<br>14.23<br>(0-271) | 56,982<br>13.40<br>(0-268) | 56,148<br>13.21<br>(0-281) | 58,144<br>13.68<br>(0-286) | 60,214<br>14.17<br>(0-288) | T=706,455<br>A=166.19           |

\*A specific examination of exclusion rates during only the Kt/V week was not conducted; however, as there is no reason to presume that the exclusion rates would vary from monthly rates during that week, it can be inferred that the percentages are equivalent.

**Table 5: Facility Performance Scores and Statistical Significance of Differences in Performance**

UFRs were calculated using the following equation:

$$((\{Pre\text{-}Dialysis\ Weight\ in\ kg\} - Post\text{-}Dialysis\ Weight\ in\ kg\} \times 1000\ ml/kg] \div Post\text{-}Dialysis\ Weight\ in\ kg) \div (Delivered\ Treatment\ Time\ in\ minutes) \times 60\ minutes/hour$$

Negative UFR values were replaced with zero prior to calculation of scores.\*

|                                       | Org. A       | B            | C            | AVERAGE ACROSS ALL ORGANIZATIONS |
|---------------------------------------|--------------|--------------|--------------|----------------------------------|
| MEAN SCORE ACROSS ALL FACILITIES      | 12.67%       | 12.45%       | 10.68%       | 11.66%                           |
| 95% CONFIDENCE INTERVAL               | 12.57-13.34% | 11.57-13.34% | 10.39-10.97% | 11.46-11.87                      |
| RANGE OF SCORES ACROSS ALL FACILITIES | 0.00-48.00%  | 0.00-34.46%  | 0.00-50.00%  | 0.00-50.00%                      |
| STANDARD DEVIATION                    | 8.82         | 6.56         | 6.60         | 6.92                             |
| STANDARD ERROR                        |              |              |              | 0.11                             |
| MEDIAN                                |              |              |              | 10.88%                           |
| MODE                                  |              |              |              | 8.00%                            |
| INTERQUARTILE RANGE                   |              |              |              | 8.14                             |

\* The rationale for this approach is that as a UFR of <0 implies a net addition of fluid to the body, it is not clear that the net addition falls onto a continuum with fluid removal in terms of clinicobiological effect.

**Table 6: Reliability Testing Results (SAS Analysis)**

|                                | A                                 |                               | B                                 |                               | C                                 |                               |
|--------------------------------|-----------------------------------|-------------------------------|-----------------------------------|-------------------------------|-----------------------------------|-------------------------------|
| COVARIANCE PARAMETER ESTIMATES |                                   |                               |                                   |                               |                                   |                               |
|                                | Intercept<br>(between facilities) | Residual<br>(within facility) | Intercept<br>(between facilities) | Residual<br>(within facility) | Intercept<br>(between facilities) | Residual<br>(within facility) |
| Estimate                       | 0.004106                          | 0.002125                      | 0.0678302                         | 0.0564544                     | 41.06                             | 17.41                         |
| Standard Error                 | 0.000418                          | 0.000062                      | X                                 | X                             | 1.37                              | 0.17                          |
| Z Value                        | 9.82                              | 34.02                         | X                                 | X                             | 30.08                             | 100.77                        |
| Pr>z                           | <0.0001                           | <0.0001                       | X                                 | X                             | <0.0001                           | <0.0001                       |
| FIT STATISTICS                 |                                   |                               |                                   |                               |                                   |                               |
| -2 Res Log Likelihood          | -7701.5                           | X                             | X                                 | X                             | X                                 | X                             |
| AIC                            | -7697.5                           | X                             | X                                 | X                             | X                                 | X                             |
| AICC                           | -7697.5                           | X                             | X                                 | X                             | X                                 | X                             |
| BIC                            | -7690.8                           | X                             | X                                 | X                             | X                                 | X                             |
| SOLUTION FOR FIXED EFFECTS     |                                   |                               |                                   |                               |                                   |                               |
| Estimate                       | 0.1245                            |                               | X                                 |                               | X                                 |                               |
| Standard Error                 | 0.004497                          |                               | X                                 |                               | X                                 |                               |
| DF                             | 211                               |                               | X                                 |                               | X                                 |                               |

|                       |         |         |   |
|-----------------------|---------|---------|---|
| <b>T Value</b>        | 27.69   | X       | X |
| <b>Pr&gt;Z</b>        | <0.0001 | X       | X |
| <b>OTHER VALUES</b>   |         |         |   |
| <b>ICC</b>            | X       | 0.59077 | X |
| <b>F</b>              | X       | 17.65   | X |
| <b>Standard Error</b> | X       | 0.00839 | X |
| <b>p</b>              | X       | X       | X |

**Table 7: FM7 Validity Testing Results (Pearson's Correlation Analysis)**

|              | <b>KCQA MEASURE:<br/>AVOIDANCE OF<br/>UTILIZATION OF HIGH UFR</b> | <b>2013 SHR (single year)</b>                                  | <b>2013 HOSPITALIZATION <u>RATE</u><br/>FROM DFR, IF AVAILABLE</b> | <b>2013 SMR</b>  |
|--------------|---|--|--|--|
| <b>Org A</b> | Pearson's Correlation (r) = 1.0                                   | Pearson's Correlation (r) = 0.11287<br>Sig (2-tailed) = 0.1029 | Pearson's Correlation (r) = 0.11287<br>Sig (2-tailed) = 0.1029     | Pearson's Correlation (r) = 0.07297<br>Sig (2-tailed) = 0.2926 |
| <b>B</b>     | Pearson's Correlation (r) = 1                                     | Pearson's Correlation (r) = 0.12<br>Sig (2-tailed) < 0.001     | Not available  | Pearson's Correlation (r) = 0.17<br>Sig (2-tailed) < 0.001     |
| <b>C</b>     | Pearson's Correlation (r) = 1                                     | Pearson's Correlation (r) = 0.09<br>Sig (2-tailed) < 0.0001    | Pearson's Correlation (r) = 0.08<br>Sig (2-tailed) = 0.001         | Pearson's Correlation (r) = 0.03<br>Sig (2-tailed) = 0.15      |

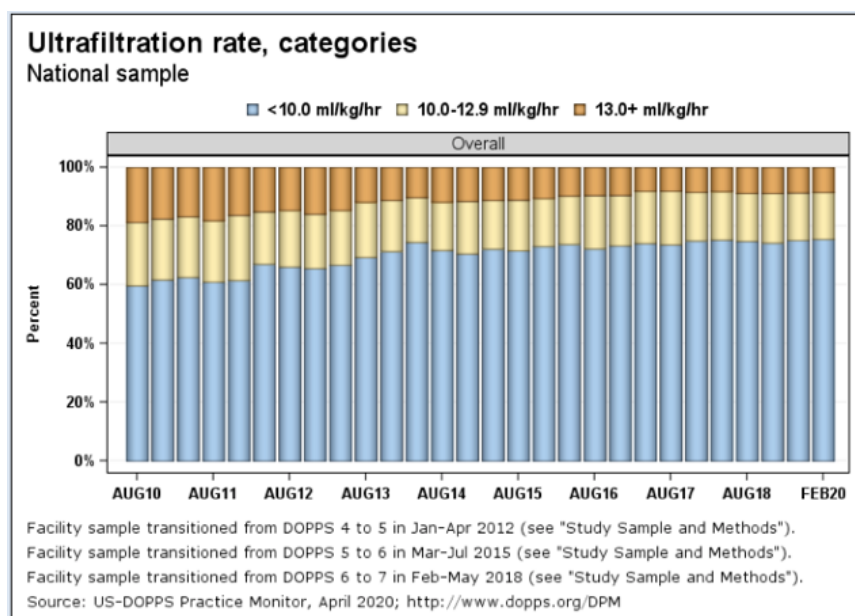


## IMPORTANCE CRITERION GRAPHS

**1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement. Include citations.**

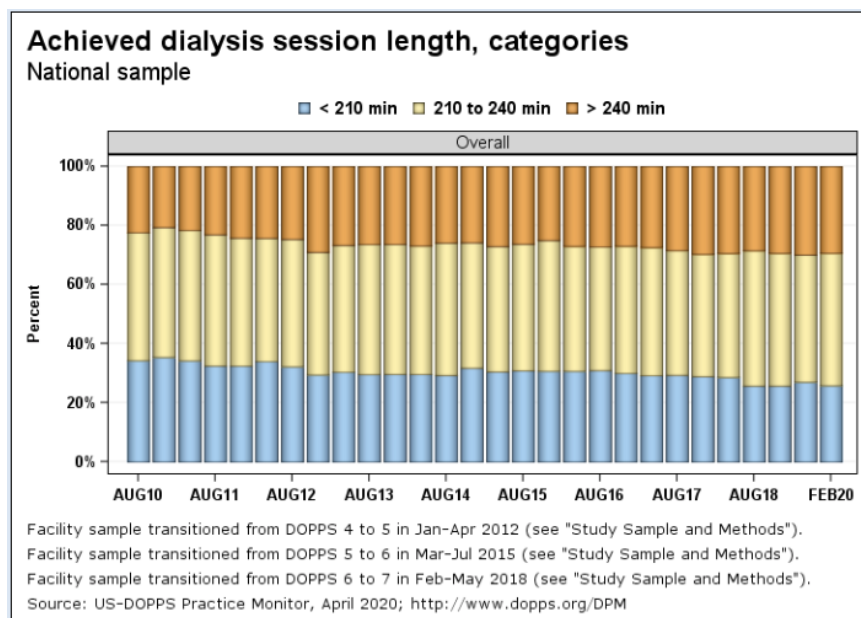
In addition to the testing data presented elsewhere in these submission materials, a recent national sample of DOPPS data indicate that hemodialysis sessions performed at UFR  $\geq 13$  ml/kg/hour remains at approximately 10 percent as of February 2020, indicating continued room for improvement in this aspect of dialysis care.

**Graph 1:**

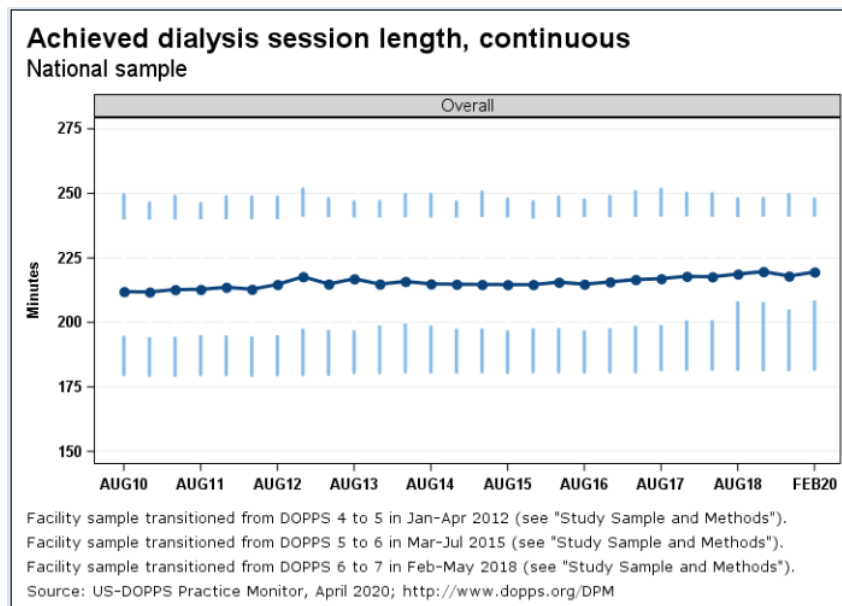


The same DOPPS data also demonstrate considerable room for improvement in achieved average dialysis session length  $>240$  minutes, the second approach by which the measure criteria can be met. This benchmark has moved little over the past decade, remaining at only approximately 30 percent as of February 2020 for a national sample.

**Graph 2:**

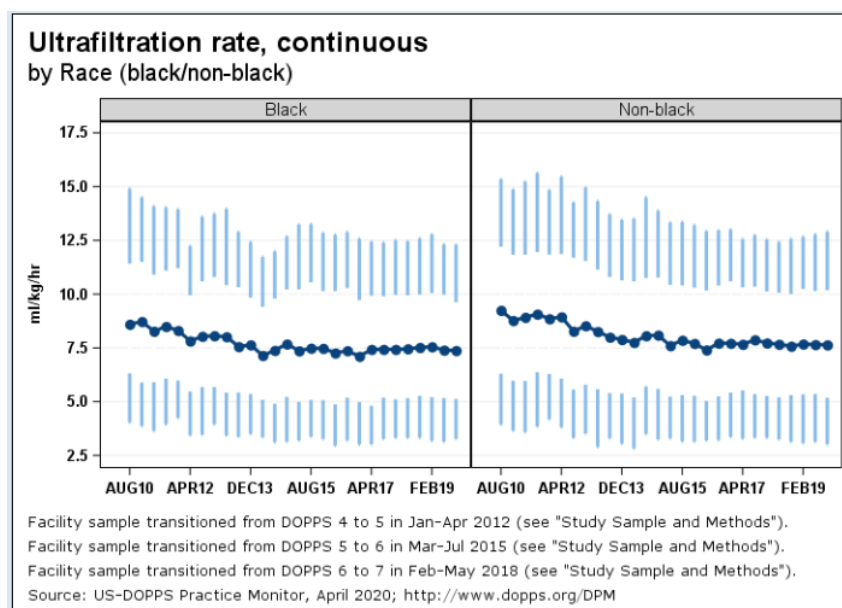


**Graph 3:**

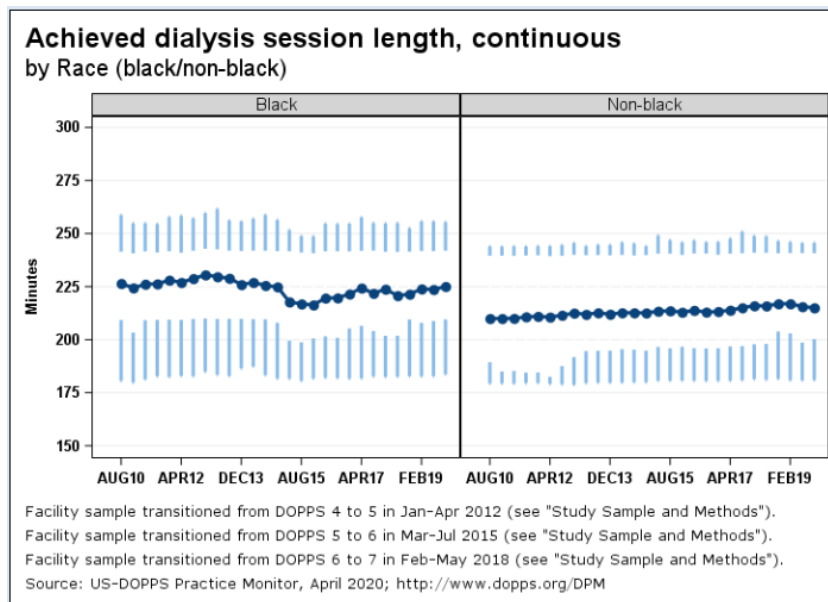


**1b.5. If no or limited data on disparities from the measure as specified is reported in 1b.4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement.** Include citations. Not necessary if performance data provided in 1b.4.

DOPPS provides little additional information on disparities. Only two SDS groups—black vs non-black—are displayed, and the data reveal little difference between the two in either average UFR or achieved session length as of February 2019, with black patients faring slightly better in both categories:



**Graph 5:**



However, as cited in the Evidence Attachment, we have identified one large observational study of 118,394 hemodialysis patients in a large dialysis organization between 2008 and 2012 that demonstrates a more pronounced association between high UFRs and all-cause mortality in blacks, non-Hispanics, and in patients with a higher BMI.<sup>1</sup> The authors also found that patients with average UFR >13 were significantly more likely ( $p < 0.005$  for all associations) to be female (1.33 [1.29-1.37]), non-black (1.28 [1.24-1.31]), and Hispanic (1.20 [1.14-1.27]).

<sup>1</sup> Assimon MM, Wenger JB, Wang L, Flythe JE. Ultrafiltration rate and mortality in maintenance hemodialysis patients. *Am J Kidney Dis.* 2016;68:911-922.