



## HOW DO I OBTAIN MEANINGFUL METRICS?

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Patient Blood Management (PBM) metrics are crucial to demonstrate program outcomes, opportunities, evaluate initiatives and monitor practice patterns. The guidance document for the AABB PBM Standards includes suggestions for metrics and program elements that can be measured.<sup>1</sup> Meaningful metrics develop from applying SMART principles: specific, measurable, achievable, relevant and time-specific.<sup>2</sup> Other considerations include the purpose, audience and resulting actions. A metric can be used for trending, monitoring, improving or correcting. It may be reported to hospital leadership, transfusion service leaders, physicians, licensed independent practitioners (LIP) or nurses. A calculated metric is derived from an aggregate data set whereby more detail will be needed to understand sources and contributing factors. W. Edwards Deming sums up the value of meaningful metrics:

“Scientific data are not taken for museum purposes; they are taken as a basis for doing something. If nothing is to be done with the data, then there is no use in collecting any. The ultimate purpose of taking data is to provide a basis for action or a recommendation for action. The step intermediate between the collection of data and the action is prediction.”<sup>3</sup>

Once a metric has been determined, there are additional considerations to assess in order for it to become meaningful. Visualization management is important to augment and aid in interpretation. The ease in which the metric is made accessible and the ability of the consumer to translate the information into action are steps on the path to meaningful metrics.

### METRICS THAT MATTER

The decisions surrounding what to measure should include consideration of data sources, ease of extraction, the amount of refining involved and limitations of the data. Metrics will change over time based upon the focus and initiatives of a PBM program. Three or four key metrics will serve the needs of a PBM program (Table 1.0) without being overwhelming. The presence of complicated dashboards or multiple reports may obscure the ability to synthesize data into actionable information. Therefore, not only minimizing the number of metrics, but also ensuring that each metric is clear, concise and comprising well-defined action steps, is important.

A multi-hospital health system may be challenged to compare facilities that differ in size, services and the complexity of patients. Metcalf et al.<sup>4</sup> found that red blood cell (RBC) utilization moderately to strongly correlated to all-patient-refined (APR) diagnosis-related groups (DRG). Furthermore, the work of Stonemetz<sup>5</sup> et al. reaffirms findings of a direct correlation between case mix index (CMI)

and transfusion requirements for red blood cells, plasma and platelets in surgical patients. Creating a metric using both DRG-based CMI and acute patient days or length of stay (LOS) adjusts for both patient volume and severity of illness. Chart 1.0 demonstrates the variation of RBC utilization within a multi-hospital health system.

It is important to create an atmosphere of transparency by showing key stakeholders and leadership how a hospital compares with others in a system. Translating a high-level aggregate metric into action occurs through exploring more deeply the drivers of a trend or outliers. Chart 1.0 generates questions about the driving variables at hospitals with the highest adjusted utilization. Hospitals with the lowest adjusted utilization may have developed best practices that can be replicated throughout the health system. Further investigation may include probing into clinical practices such as transfusion thresholds, ordering patterns, indications and dosing.

The “Choosing Wisely” campaign promoted the use of single-unit RBCs in stable non-bleeding patients.<sup>6</sup> A metric evolving from this practice is the percentage of one-unit RBC orders. To drive the practice, decision support may be added to the electronic medical record blood ordering process or a simple ordering default to one unit. Chart 2.0 represents a comparison of hospitals within a health system. A target can be set at 60% or greater for one-unit transfusions. The PBM program staff would review the data in more detail to gain insight into the ordering practices at hospitals below target. A review of services and providers routinely ordering two units of RBCs may identify opportunities for improvement or justify some deviations. The PBM program may engage in a targeted campaign to remind ordering providers of the benefits of single-unit ordering practices as the basis for “right dosing.” The intervention can be built upon by providing individual feedback to providers ordering two units without an interim hemoglobin evaluation.

Initiative-directed metrics are of value to PBM programs, since they are created from the prospect of improvement. There are countless opportunities for metrics within this space involving the dosing of blood products, preoperative anemia and utilization of a specific PBM method or strategy. The 3<sup>rd</sup> edition of the AABB Standards for PBM<sup>7</sup> has added the categories of obstetrics, pediatrics, medical patients and outpatient transfusions. Examples of metrics for these categories include the percentage of non-oncology outpatient RBC transfusions with a nutritional deficiency assessment or the percentage of anemic pregnant patients treated for iron deficiency.

## **VISUALIZATION MANAGEMENT**

How metrics are displayed is paramount to viewer interpretation. Whether as an online dashboard or in another form, the primary aim is to minimize the intellectual load on the end-user.<sup>8</sup> Easy access, display flexibility, consistency in design, as well as spatial layout, contribute to decreased cognitive load. Therefore, it is important to limit extraneous or distracting information by questioning the value of each element. The display should include definitions, how to interpret the data elements, limitations and any recommended actions without clouding the display. Titles of metrics should be clear and concise, stating if the metric is a percentage, average or another measure. A good investment into a metric display involves taking time to obtain feedback in order to gauge the effectiveness of a visual format as well as to evaluate potential barriers in interpretation.

Frank et al.<sup>9</sup> described the manner and methods of visualization for the measures of transfusion thresholds and targets. The displayed metric was in a format that was easy for the end-user to determine whether or not their practice was outside the recommended range. Printed tables were posted in areas that provided passive access meaning the physician did not have to find the data; the data found the physician. It is important to give consideration to the ease at which the metric will be available. Displaying metrics in an online dashboard or shared file may be a good choice if the desired audience is already going to this area for other metrics or information. Emailing metrics should include a read receipt to monitor if the message was opened. When presenting metrics at meetings, the presenter should have a firm understanding of the metric as well as the associated actions needed to achieve target goals and be able to answer questions. There are many potential unknowns, including who may be viewing, how the information is interpreted and the ability to translate the data into action.

## **DATA TO ACTION**

Meaningful metrics serve a purpose; it cannot be assumed that providers will know clinical practices associated with a specific metric or what the expectation is on their part. The Knowledge to Data (K2D) framework is a five-step process of transforming data into information which is translated into action. The framework uses a rapid feedback cycle that includes clear intent for each data collection initiative, collecting “good enough” data for the purpose, presenting a brief results report, a result debrief, and decisions regarding the data.<sup>10</sup> Steering the PBM team and a small group of key stakeholders through the K2D process provides opportunity to critique and identify potential barriers. It also positions the PBM team to lead metric consumers through the process of interpretation, information, knowledge and action.

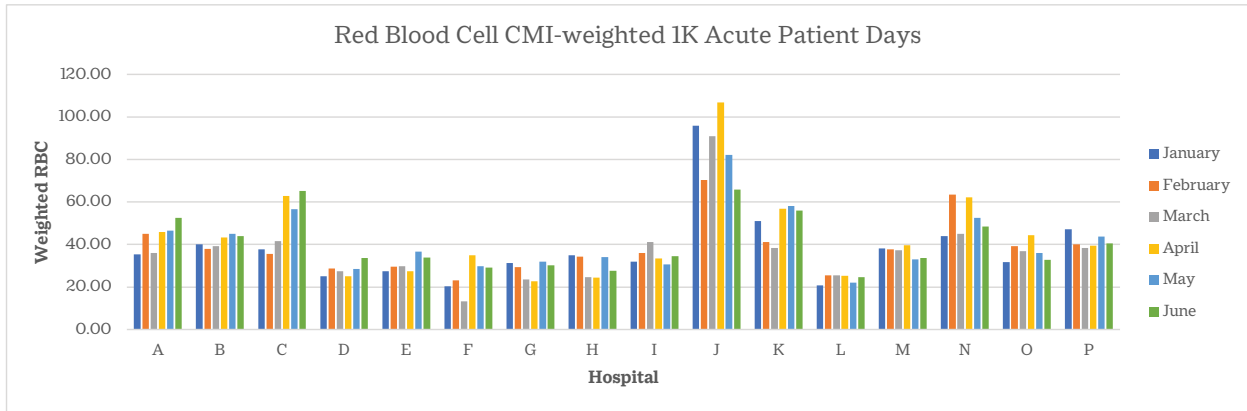
## **CONCLUSION**

Metrics often generate more questions than answers. A good metric will aid a PBM program in achieving its goals. Developing meaningful metrics is a process and one that, if done well, creates a framework for effective execution. The actual metric is just the starting gate to becoming a measure that holds value. The areas of display, access, dissemination and action require a methodical approach. Taking time to obtain constructive feedback and to present a metric based upon those who are expected to take action, will greatly improve its value.

Table 1.0

Metric or Measure	Definition
Blood product utilization	Number of transfused blood products
Blood product adjusted by patient days or discharges	Numerator: number of units transfused Denominator: total patients days or discharges
Blood product case mix index (CMI) weighted by patient days or discharges	Numerator: total blood product Denominator: CMI x( total patient days/1000)
Transfusion rate	Percentage of patients transfused
Single-unit RBC orders	Percentage of RBC orders quantity = 1 unit
Average RBC dose	Numerator: number of RBC units transfused Denominator: number of patients transfused
Average nadir hemoglobin or platelet count	Lowest hemoglobin or platelet count. Surrogate for transfusion threshold
Average final hemoglobin or platelet count	Last hemoglobin or platelet count prior to discharge. Surrogate for transfusion threshold.
Average highest INR	Highest INR used as surrogate for transfusion threshold.
Final INR	Last INR prior to discharge. Surrogate for transfusion target.

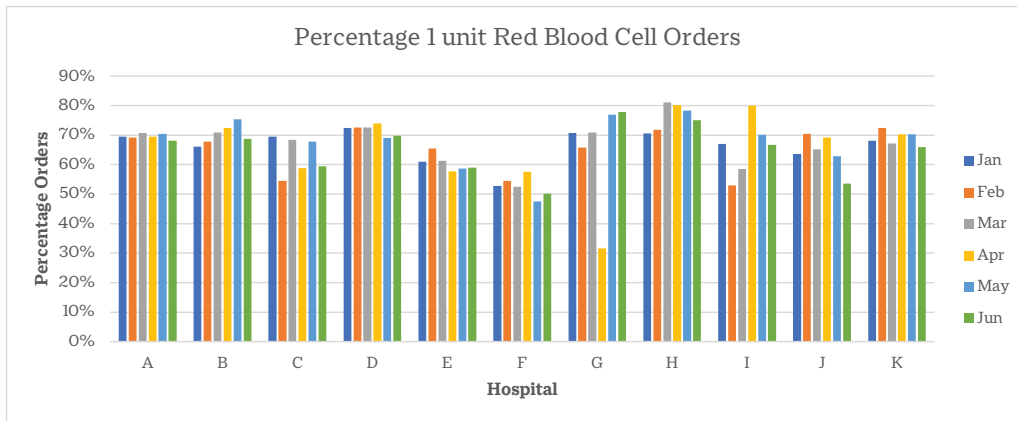
Chart 1.0



Y axis = monthly red blood cell utilization after adjustment

X axis = each letter represents a hospital

Chart 2.0



Y axis = percentage of red blood cell orders with quantity 1 unit

X axis = each letter represents a hospital

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