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Displaying Behavioral Health Measurement-Based Care Data

Identifying Key Features from Clinician and Patient Perspectives

Measurement-based care (MBC) has been defined as “the systematic administration of symptom rating scales and [use of] the results to drive clinical decisionmaking at the level of the individual patient” (Fortney et al., 2017). MBC has three main components:

1. repeatedly collecting patient-reported data throughout treatment
2. using the information to inform treatment decisions
3. sharing the information with patients, other members of the treatment team, and administrators and organizations to promote data-driven care and improve the effectiveness of treatment (U.S. Department of Veterans Affairs [VA], 2016).

Displaying Measurement-Based Care Data

Repeated measurement of symptoms yields measure scores, which in turn provide useful clinical information and can facilitate discussions with patients regarding treatment progress and shared decisionmaking. A clinician can perform a verbal review of measure scores with a patient, comparing the score from the present session with one or more scores from prior sessions and describing whether or how the score has changed.

This approach presents some challenges, as it may be difficult for clinicians to adequately verbally describe changes across several scores, and it may be difficult for patients to understand or visualize patterns of change over time. Displays of MBC score data in a visual format, such as a graph, can improve patient understanding and engagement in their treatment progress (National Cancer Institute, 2011).

KEY FINDINGS FOR DATA DISPLAYS

- Clinicians preferred a downward-trending line graph to indicate improvement, as did more than half of patients.
- Clinicians and patients preferred the inclusion of interpretive ranges that indicated the severity of depression symptoms (e.g., mild, moderate) on the graph. Both preferred color displays of these ranges over a black-and-white display, as they were viewed as clearer and more engaging.
- Clinicians preferred the inclusion of a threshold line indicating the level of symptoms associated with a probable posttraumatic stress disorder diagnosis, but patient perceptions were more mixed.
- Clinicians and patients preferred the inclusion of treatment milestones on the display (such as medication changes or aspects of psychotherapy). Clinicians desired the ability to customize the types of milestones that could be included. Clinicians and patients also wanted the option to display life-event milestones, such as job loss.

Potential Display Features for Measurement-Based Care Data

When deciding how to visually communicate MBC data, it is important to consider different aspects of the data display. Will the graph be a line or a bar chart? Will it include text? Will different colors be used? Some general principles emerge from the literature that can inform best practices for data displays.

Simple Line Graphs

Line graphs are ideal for communicating trends over time, comparing differences between scores, and tracking treatment progress (National Cancer Institute, 2011). Patients tend to prefer seeing multiple points of data depicting information over time, rather than data from a single time point, because multiple points provide a more accurate representation of overall health (Bantug et al., 2016; Brundage et al., 2015).

Both clinicians and patients prefer line graphs with a limited amount of information and detail. Simple graphs that reduce cognitive load are easier to

understand, more straightforward, and can overcome potential barriers related to variability in patient age (i.e., cognitive decline in older adults) or education levels (Bantug et al., 2016; Brundage et al., 2005). Multiple studies have shown that younger and more-educated patients are better able to comprehend graphical displays depicting health data trends than older and less-educated patients, especially if the display format is more complex (Bantug et al., 2016; Brundage et al., 2005; Kuijpers et al., 2016). Simple line graphs may overcome this challenge, as they have the highest levels of interpretation accuracy and preference across patient populations (Bantug et al., 2016; Brundage et al., 2003; Brundage et al., 2005). Patients have expressed concerns that inclusion of additional details about the data (e.g., error bars) may have a higher potential for misinterpretation and lead them to make inaccurate treatment decisions (Brundage et al., 2003).

Directionality

Clinicians and patients often disagree about the direction in which health data should be displayed. The discrepancy lies between those who interpret higher scores as an indication of improvement and those who interpret higher scores as indicating “more symptoms” (i.e., worsening health; Snyder et al., 2019).

Patients tend to prefer that higher scores indicate “improvement,” as the concept of a “high score” has a positive connotation (Brundage et al., 2015; Snyder et al., 2017; Tolbert et al., 2018). Graphs in which higher scores mean “more symptoms” could confuse

Abbreviations

MBC	measurement-based care
PCL-5	PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
PHQ-9	Patient Health Questionnaire–9
PTSD	posttraumatic stress disorder
VA	U.S. Department of Veterans Affairs

patients and lead to interpretation errors (Tolbert et al., 2018). For clinicians, symptom-measure graphs in which higher scores mean worsening symptoms are familiar; changing the directionality of these data displays might be counterintuitive and cause confusion or misinterpretation (Snyder et al., 2019; Tolbert et al., 2018).

Different interpretations may also depend on the type of data displayed (e.g., functioning measures versus symptom measures). For example, in a study of cancer patients and clinicians, a physical functioning graph trending *downward* (in which higher scores indicated higher physical functioning) was accurately interpreted as depicting *worsening* health by 100 percent of the clinicians and 96 percent of the patients. In contrast, a fatigue graph trending *upward* (in which higher scores indicated worse fatigue) was accurately interpreted as depicting *worsening* health by 90 percent of the clinicians but only 64 percent of the patients (Brundage et al., 2015).

Little research exists on clinician and patient preferences on the directionality of mental health information, so the best way to display these data is still unclear.

Interpretive Guidance

Additional annotations to data displays, such as severity range cutoffs, clinically significant threshold lines, or other text, can provide guidance on how clinicians and patients should interpret health data. However, the utility of these interpretative guides varies, based on who is viewing the data and how it is used.

Severity Ranges

Both clinicians and patients prefer the inclusion of severity or cutoff ranges in data displays (Brundage et al., 2003; Brundage et al., 2015). For patients, severity ranges with descriptive labels indicating each category's meaning (e.g., mild, moderate) can be used as a reference tool to increase comprehension of scores and graph directionality (Smith et al., 2016). However, without descriptive labeling, severity ranges can cause confusion and misinterpretation (Snyder et al., 2017). Clinicians suggest that ranges must be supported by a strong evidence base before incorporating them into a data display (Snyder et al., 2019).

Threshold Lines

Clinically significant threshold lines are seen as very useful by clinicians, but patients often see them as unnecessary and confusing unless additional labeling is included (Snyder et al., 2017; Tolbert et al., 2018). Clinicians tend to want a method to flag clinically relevant deterioration or symptom increases in patient populations (Kuijpers et al., 2016). Ideally, threshold lines provide a simple method to alert clinicians to concerning scores and enable them to intervene (Greenhalgh, 2009).

However, clinicians are split on whether to show the threshold line to patients. Some advocate for using the line as an education tool to describe clinically important differences to patients, while others express concerns about the line causing unnecessary distress (Brundage et al., 2015; Smith et al., 2016; Snyder et al., 2019). Patients note that the threshold line has little meaning without added text labels or a clinician's explanation (Smith et al., 2016).

Use of Color

Color can be integrated into graph displays to convey the meaning of symptom scores and bring attention to relevant data (National Cancer Institute, 2011). For this reason, both clinicians and patients prefer color graphs (Kuijpers et al., 2016; Smith et al., 2016). Color can help grab patients' attention and reduce the likelihood that data will be ignored or forgotten (National Cancer Institute, 2011). For instance, in one study, patients stated that red circles indicating concerning scores "catch your eye right away" (Smith et al., 2016).

However, certain colors might have different connotations for different patient populations. Cancer patients, for example, tend to associate the color red with negative feelings and often raise concerns about the color being alarming, while other patients see the color red as a "call to action" (Brundage et al., 2015; Smith et al., 2016; Snyder et al., 2017). Color can be used to distinguish categorical information (e.g., mild versus moderate), either by spectrum shading of the same color or using different colors (Dobrozsi and Panepinto, 2017; Shah and Hoeffner, 2002; Smith et al., 2016). Color and shading on their own may not be useful unless labels indicating their meanings are

also incorporated (Smith et al., 2016). Although color has typically been found to be a desirable feature in graphs, those with color blindness may benefit from specific palettes designed for color blindness (e.g., monochromatic palettes, highly contrasting palettes) or integration of “redundant coding,” such as differing line thickness or symbols, to support interpretation in the absence of color (Chaparro and Chaparro, 2017).

Treatment Milestones

Annotated graphs that provide further contextual information can enhance patient understanding (Bantug et al., 2016; Dobrozi and Panepinto, 2017; Shah and Hoeffner, 2002). Patients often desire graphs with interpretation guidance and labeling, such as milestones (e.g., starting or discontinuing a medication) or text explanations (Bantug et al., 2016). Clinicians tend to prefer data that are tailored to each patient population; these data may include information on medication or adherence (Detmar et al., 2002).

Adding treatment milestones to graphs may address both patient and clinician desires by providing the ability to tailor treatment and add further contextual information. The use of milestones can support the goal of MBC to have clinicians and patients reflect on clinical progress, evaluate the effectiveness of treatment, and change treatment course if required (Greenhalgh, 2009).

Our Study

Although existing literature highlights some general principles in displaying health-related data, little guidance exists on best practices for MBC data displays within behavioral health care. We sought to elicit clinician and patient perspectives on various displays of MBC data to identify core display features that would facilitate the use of MBC data during treatment.

Methodological Approach

Displays of MBC Data

We selected the Patient Health Questionnaire–9 (PHQ-9; Kroenke, Spitzer, and Williams, 2001) and the Posttraumatic Stress Disorder (PTSD) Checklist

for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (PCL-5; Weathers et al., 2013) because they are core symptom measures in the U.S. Veterans Health Administration’s multiyear effort to increase use of MBC in behavioral health care throughout its national treatment system (VA, 2016). The PHQ-9 is a nine-item measure of depression symptoms; total scores range from zero to 27, with higher scores indicating more-severe depression symptoms. The PCL-5 is a 20-item measure of PTSD symptoms; total scores range from zero to 80, with higher scores indicating more-severe PTSD symptoms.

We developed data display options, based on a review of the literature, for each target measure. The core feature of each display was a simple line graph of measure scores over multiple time points, with the range of possible scores on the *y*-axis and treatment dates along the *x*-axis. We developed display options by varying the following features:

1. directionality of the line (downward versus upward to show improvement)
2. inclusion of severity ranges (e.g., mild, moderate) for the PHQ-9 or a threshold line (indicating the score associated with a probable PTSD diagnosis) for the PCL-5
3. use of color (for severity ranges)
4. inclusion of treatment milestones (e.g., medication dose increased).

The display option with the upward trending line placed the *x*-axis at the top of the graph, as most viewers are accustomed to seeing the *x*-axis placed at zero. We evaluated the utility of interpretative ranges on the PHQ-9 because these ranges are available to aid clinicians in interpretation of the PHQ-9 total score. The PCL-5 does not have interpretive ranges that are widely used; instead, a cutoff score is often used to indicate the threshold of a probable PTSD diagnosis (Blevins et al., 2015). Our display used a horizontal line corresponding with a score of 33, with the label “Probable PTSD.”

These four features were varied to create five display options for the PHQ-9 and four display options for the PCL-5 (see Table 1). Note that it was not possible to fully cross all combinations of the features. Figures 1A through 1E depict the five

TABLE 1
MBC Data Display Options

Display Concept	PHQ-9 Display Options	PCL-5 Display Options
Directionality	Downward line shows improvement (Figure 1A) Upward line shows improvement (Figure 1B)	Downward line shows improvement (analogous to Figure 1A) Upward line shows improvement (analogous to Figure 1B)
Severity ranges/ diagnostic threshold, use of color	Severity ranges in color (Figure 1C)	Threshold line in color (Figure 1F)
Severity ranges/ diagnostic threshold, use of color (PHQ-9 only)	Severity ranges in shades of gray (Figure 1D)	N/A
Treatment milestones	Treatment milestones (Figure 1E)	Treatment milestones (analogous to Figure 1E)

PHQ-9 displays. The PCL-5 displays were analogous to three of the PHQ-9 displays; an additional display showed the diagnostic threshold line for the PCL-5 (Figure 1F).

Recruitment and Data Collection

Clinicians and patients were recruited from the VA Greater Los Angeles Healthcare System (West Los Angeles Medical Center and Sepulveda Ambulatory Care Center) and the VA Long Beach Healthcare System. Designated champions for MBC implementation efforts at each site identified clinicians who had used MBC in their practice and invited these individuals to participate. The participating clinicians ($n = 15$) included a diverse mix of mental health professionals, including psychiatrists, clinical psychologists, and behavioral health nurse practitioners. Site champions and clinicians notified patients about the study, with the goal of identifying patients who had at least some experience with MBC as part of their treatment, and connected interested patients with our researchers. Participating patients ($n = 17$) were receiving behavioral health treatment at a participating clinic. Most patients (88 percent) had some familiarity with completing symptom measures as part of their intake or treatment.

We conducted 30-minute individual cognitive interviews in which participants were presented with displays of either PHQ-9 or PCL-5 mock scores.¹ Participants were asked about their familiarity with the PHQ-9 and the PCL-5, and we showed displays

for the measure with which the participant had the most familiarity. More clinicians viewed the PHQ-9 displays, as slightly more clinicians expressed familiarity with using this measure in their clinical practice (nine viewed the PHQ-9; six viewed the PCL-5), and the split was approximately even for patients (eight viewed the PHQ-9; nine viewed the PCL-5). Each participant viewed four display options, with the order of presentation of these options counterbalanced across participants to minimize order effects. Data displays were shown and discussed one at a time. Participants were given time to review each display on their own, then asked about their first impressions, understanding of the display, likes and dislikes, and potential improvements. After all displays were discussed, participants were asked to select their preferred option, which could have included incorporating features from multiple displays.

Clinicians and patients provided verbal consent prior to participating, and patients received a \$50 gift card incentive. Study procedures were approved by the RAND Human Subjects Protection Committee.

Data Analysis

We analyzed detailed notes from each interview, which were checked for accuracy (when necessary) using audio recordings from the interviews. We documented each participant's impressions of each display, along with features that were preferred and not preferred on each display. Additional feedback about improvements or helpful components not explicitly

FIGURES 1A-1F
Alternative Displays of Data

Figure 1A. Downward-trending line (PHQ-9)

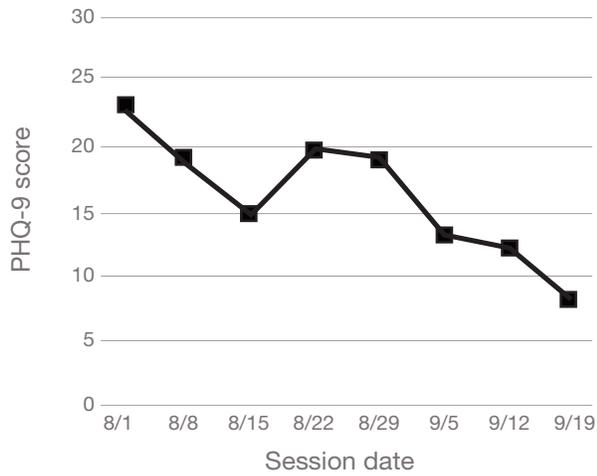


Figure 1B. Upward-trending line (PHQ-9)

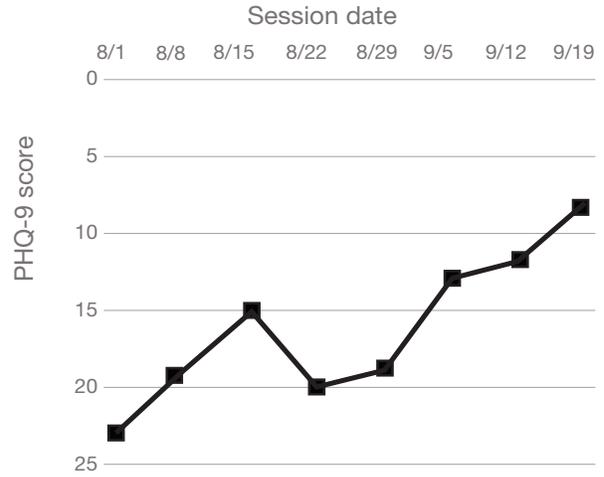


Figure 1C. Color interpretive ranges (PHQ-9)

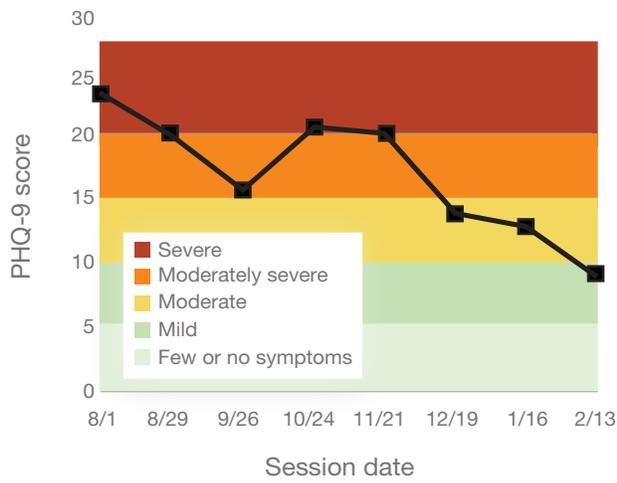


Figure 1D. Gray interpretive ranges (PHQ-9)

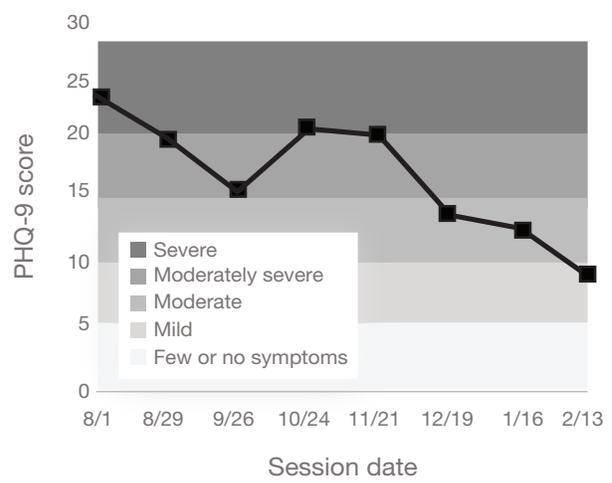


Figure 1E. Treatment milestones (PHQ-9)

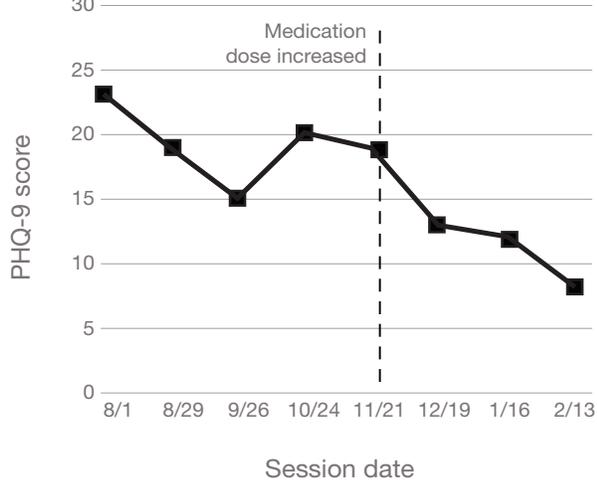
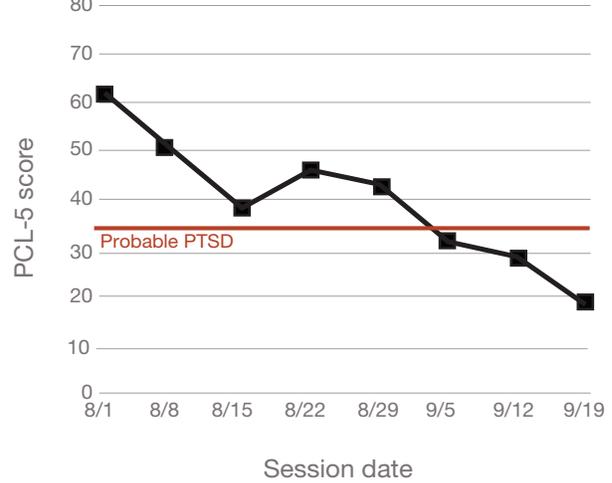


Figure 1F. Threshold line (PCL-5)



depicted in the displays was also documented. A few patients only had limited experience with MBC, which we took into consideration during analysis.

Two members of the research team conducted the data synthesis and analysis. Before beginning the analysis, they met to discuss and agree on the analysis process, including how to extract and synthesize data. We analyzed clinician and patient interview notes separately. We synthesized notes across participants in each group, extracting details regarding preferences and interpretation of the displays into a single document. In most interviews, participants explicitly indicated which display they preferred or noted that they would prefer a version that combined features from multiple displays; these display preferences were aggregated within clinicians and patients, respectively.

Because we conducted semistructured interviews to collect our data, it was not always meaningful to count the number of participants who provided a given response. For example, follow-up questions or prompts might have differed across participants based on their responses. For this reason, we did not report counts for all findings and instead extracted thematic elements that emerged during the interviews. Specifically, we counted the number of participants who stated a preference for a certain display. In addition, we identified themes in stated preferences regarding each varied element (i.e., directionality, interpretive guidance, use of color, treatment milestones). For additional context, we identified how participants reported that they would use and interpret the data presented.

Recommendations for additional features to include in data displays were extracted into a separate list. We combined similar responses across participants to create a list of the most common recommendations.

Main Findings

Preferred Display Option

After reviewing all of the display options, clinicians reported on their preferred display and expressed preferences for features across multiple displays. All clinicians preferred the displays with a

downward-trending line to indicate improvement. Most clinicians preferred interpretive ranges displayed in color for the PHQ-9 (eight of nine clinicians who viewed PHQ-9 displays) or a diagnostic threshold line for the PCL-5 (four of six clinicians who viewed PCL-5 displays). Clinicians were more likely to prefer that the threshold line be an optional feature, compared with their desire for interpretive ranges. Most clinicians preferred the inclusion of treatment milestones (12 of 15 clinicians), on the condition that the milestone included could be customized.

Some themes emerged from clinician interviews. Clinicians reported that they would find these displays useful to integrate into their practice, and many already used some type of display in their practice. Clinicians reported that they would use these displays to support discussions with patients about treatment progress, identifying what might have contributed to symptom changes (e.g., aspects of treatment, life events, specific skills) to reinforce treatment adherence. Clinicians also noted that the displays would be a valuable tool for patient education and engagement.

Over half of patients preferred displays with a downward-trending line indicating improvement (ten of 17 patients), but nearly as many patients preferred an upward-trending line (seven of ten patients). Patient preferences were more similar to those of clinicians on other features. Specifically, patients preferred displays with interpretive ranges displayed in color (seven of eight patients who viewed PHQ-9 displays) or a diagnostic threshold line (six of nine patients who viewed PCL-5 displays). Furthermore, most patients preferred the inclusion of treatment milestones that could include important life events (ten of 17 patients).

Many patients did not find the displays intuitive and clear upon initial independent review, requiring additional explanation from the interviewer to clarify the display and its interpretation. Patients frequently noted that they would appreciate seeing this type of data display as part of their treatment, but only if reviewed and discussed with their clinician. Patients expressed that this type of data display would be useful for conversations with their clinicians about possible explanations for symptom changes (e.g., life

Patients frequently noted that they would appreciate seeing data displays, but only if reviewed and discussed as part of their treatment.

events, new medications) and to facilitate conversations about treatment effectiveness. Patients also thought this type of display would be helpful for their own awareness of how their symptoms are changing over time and to track progress toward recovery.

Clinician and Patient Perspectives on Display Features

Directionality

Clinicians preferred displays that used a downward-trending line to indicate patient improvement. Clinicians found this feature straightforward and intuitive, as this approach was familiar from their prior clinical training and experience. Almost all clinicians had a strong dislike for a line that trended upward to show improvement; this display was initially misinterpreted at a higher rate than a display that used a downward-trending line. Over half of patients preferred a downward-trending line to indicate improvement, but nearly as many patients preferred an upward-trending line. This finding conflicts with some prior research indicating that patients often prefer an upward-trending line to indicate improvement (Brundage et al., 2015; Snyder et al., 2017; Tolbert et al., 2018). In our interviews, the upward-trending line was viewed by many patients as positive, as the line going up suggested improvement or growth. Patients who preferred an upward-trending line to show improvement were typically patients

who had more difficulty interpreting the display, perhaps indicating less familiarity with graphs, the particular symptom measure, or MBC.

Interpretative Ranges/Threshold Line

Clinicians reported that the interpretative ranges on the PHQ-9 were helpful, allowing them to make a rapid clinical interpretation of the score. Many clinicians voiced questions or concerns regarding the empirical support for the interpretive ranges. Some clinicians suggested adding the specific score numbers for each range to the legend. Clinicians also preferred the inclusion of the diagnostic threshold line on the PCL-5 but were more likely to express concerns about its inclusion. Clinicians reported that the threshold line would be useful for clinical interpretation, particularly at the beginning and end of treatment. Furthermore, it could encourage clinicians to have discussions with patients about recovery from PTSD; these discussions can be difficult to have but still helpful. However, some clinicians had concerns regarding how patients might react to the threshold line, particularly patients receiving ongoing treatment or patients with concerns about any potential impact on their VA benefits. Furthermore, clinicians noted that the solid red line implied more accuracy than is warranted by a score that is typically interpreted as a probable PTSD diagnosis. More interpretation is needed from the clinician to make a formal diagnosis. Using a dashed line or interpretive ranges were suggested as less-absolute alternatives.

Patients had mixed perceptions of a diagnostic threshold line for the PCL-5. Some patients appreciated that the line allowed some additional guidance in understanding the display and said that it could be useful in understanding their symptoms and progress. However, patients often viewed the threshold line negatively. Some patients had an emotional response to the inclusion of the line, reflecting that it could be difficult to see where their symptoms were in relation to the line. For example, some patients had concerns about whether their treatment or benefits would be discontinued if their symptoms went below the threshold line. Some patients reported that the line did not accurately reflect the process of PTSD recovery, although this perspective appeared to be

more likely to come from patients who had been in PTSD treatment for many years and had not experienced symptom remission. For the PHQ-9, patients liked the interpretative ranges because they made the data easier to interpret, but stated that the ranges may be confusing without an accompanying legend.

Use of Color

Clinicians preferred color over black-and-white displays. Color was viewed as more engaging for patients and supportive of the ability to quickly see varying severity of symptoms. However, clinicians raised concerns over the ability to print data displays in color, as color printers were often unavailable. Some clinicians reacted to the shade of red used for the most severe range of the PHQ-9, suggesting that the display should use a less intense red to minimize the possibility that patients would react negatively when discussing more-severe symptoms. Clinicians also noted the importance of ensuring that the color ranges were distinct when viewed by patients with color blindness.

Patients also preferred the use of color when displaying interpretive ranges. Color was viewed as more visually appealing and engaging, and it appeared to lead to quicker and more-accurate understanding of the data display without assistance from the interviewer. The legend, which provided labels for the color ranges (e.g., mild, moderate), was useful in supporting interpretation of the display as well. Most patients had a strong aversion to the use of red, both for the “severe” category on the PHQ-9 interpretive ranges and for the diagnostic threshold line.

Treatment Milestones

Clinicians strongly preferred the inclusion of treatment milestones on the display—if the milestones were customizable. For example, clinicians wanted to be able to add such milestones as significant life events (e.g., patient job loss) and therapy sessions, as well as add comments, such as notes about treatment. Some clinicians viewed milestones as a tool to engage patients in discussions about treatment progress and how aspects of treatment and life stressors may have contributed to symptom changes. Some clinicians raised concerns about the risk of overemphasizing the role of some factors in the patient’s improvement.

For example, emphasizing the role of medication in the patient’s improvement could minimize the importance of the patient’s efforts in psychotherapy (e.g., skill-building, implementing more-helpful coping strategies).

Patients also preferred the inclusion of milestones, but saw milestones as a category broader than just events related to treatment (e.g., medication changes, aspects of psychotherapy). Patients reported they would find it helpful to see life events included on the display. They also often were interested in more details about treatment milestones, such as medication name, dosage increase or decrease, and aspects of psychotherapy.

Suggestions for Additional Features

Clinicians and patients were asked what additional features they would add to the displays. Clinician suggestions included

- alerts or flags that would indicate concerning patterns (e.g., lack of improvement or worsening) or symptoms (e.g., suicidality)
- information regarding clinically significant changes
- viewing individual items that contributed to the total score
- ability to toggle between overall scores and scores on symptom clusters
- information about symptoms that have increased or that have changed substantially since the last measurement
- overlays of other measures (e.g., an anxiety symptom measure, a quality of life measure)
- a display of an “average” change trajectory for patients in a specific program or clinic to inform whether this patient is improving as expected
- the ability to include session numbers, rather than only dates, particularly when following a manualized psychotherapy
- numbers associated with interpretive ranges.

Patient suggestions included

- referring to the content of the measure, rather than the measure name or abbreviation (e.g., using “depression” rather than “PHQ-9”)

- including more-descriptive language of graph content on or next to the graph
- including the session number, the period between sessions, the names of months (e.g., Jan., Feb.) instead of numbers, the years, and longer periods
- displaying individual symptom items, rather than only the total score (e.g., each symptom would be depicted by differently colored lines)
- ability to overlay multiple measures (e.g., sleep scores) on one display
- additional details about medications.

Summary and Recommendations

A core component of MBC involves clinicians sharing the results of data with their patients to facilitate discussions of progress, reinforce patient changes, and support shared decisionmaking about treatment adjustments. Visual displays of these data, such as graphs of scores over time, can support these aspects of MBC. We sought to identify optimal features of MBC data displays from the perspective of clinicians and patients, focusing on displays of depression and PTSD symptoms using two of the most common measures used in MBC. We developed displays based on our findings that incorporated features that clinicians and patients preferred (Figures 2 and 3). These displays incorporate a downward-trending line to indicate improvement, interpretive guidance (severity ranges for the PHQ-9 and a diagnostic threshold for the PCL-5), use of color, and treatment milestones. In addition, these displays incorporate additional descriptive information requested by patients, as they refer to depression and PTSD symptoms, not only the abbreviated measure name.

Although clinicians and patients preferred inclusion of severity ranges for the PHQ-9, the perceptions of the diagnostic threshold line were mixed. This suggests that ongoing work to develop and evaluate the PCL-5 should include development of clinically useful severity ranges.

We note that there are some limitations to our work. We conducted qualitative interviews with a relatively small number of clinicians and patients

RECOMMENDATIONS FOR DATA DISPLAYS

- Visual displays of measurement-based care data, such as graphs of scores over time, can support clinicians sharing the results of data with their patients to facilitate discussions of progress, reinforce patient changes, and support shared decisionmaking about treatment adjustments.

at three VA medical centers and may not have fully captured the perspectives of clinicians and patients across the VA or in non-VA clinical settings. These interviews captured respondents' stated preferences, rather than objectively testing their comprehension. Furthermore, patients varied in their experience with MBC. Patients who had MBC as a routine part of their behavioral health care might have been better prepared to share perspectives on how they would like MBC displays incorporated into their care. We evaluated a limited number of displays (i.e., variations on a line graph), and varied only a few core features. Finally, we focused on only two symptom measures that are used in MBC.

Research on the preferences of clinicians and patients surrounding MBC graph displays in behavioral health has been limited to date. Our results provide a rare opportunity to shape the use of MBC data in the VA's efforts to modernize its health care information technology system. In June 2017, the VA announced its plan to adopt a new electronic health record system that would be interoperable with that of the U.S. Department of Defense. Now is an optimal time to consider simple and intuitive ways to display MBC data, especially as incorporating MBC displays into the electronic health record could support dynamic displays, with a preferred default display and options to turn features on or off based on preferences and specific clinical needs. Because clinicians already are required to input MBC data into electronic health records, incorporating graphic display capabilities tailored to clinician and patient preferences may be a useful tool to improve behavioral health outcomes.

FIGURE 2

Display of PHQ-9 Data Incorporating Clinician and Patient Preferred Features

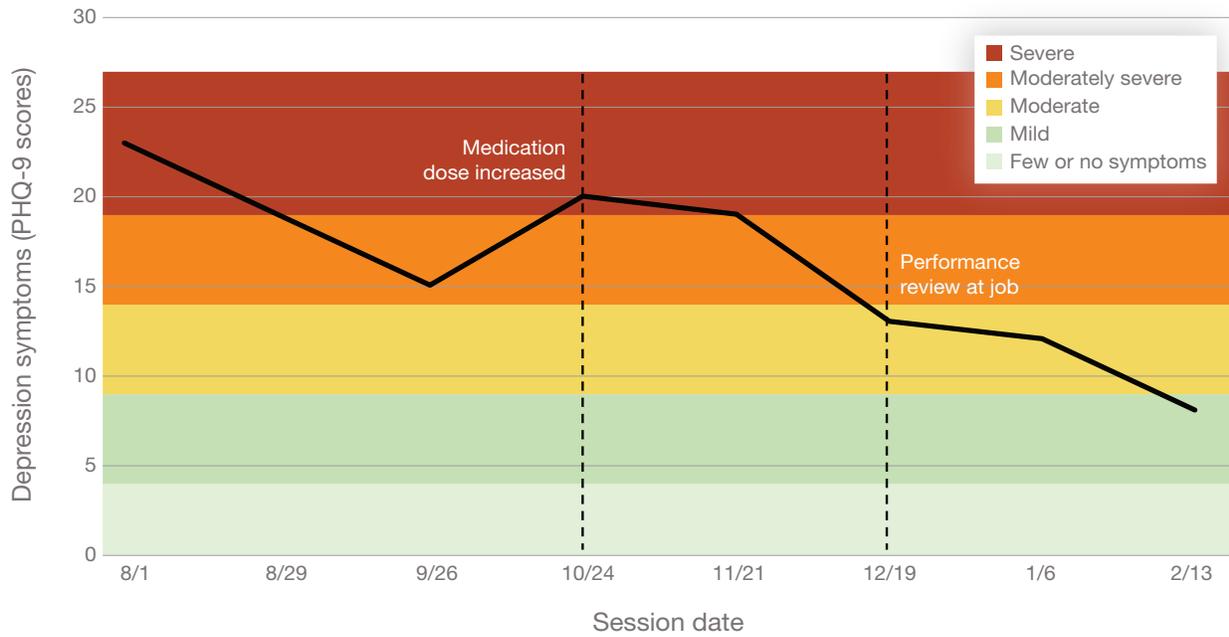
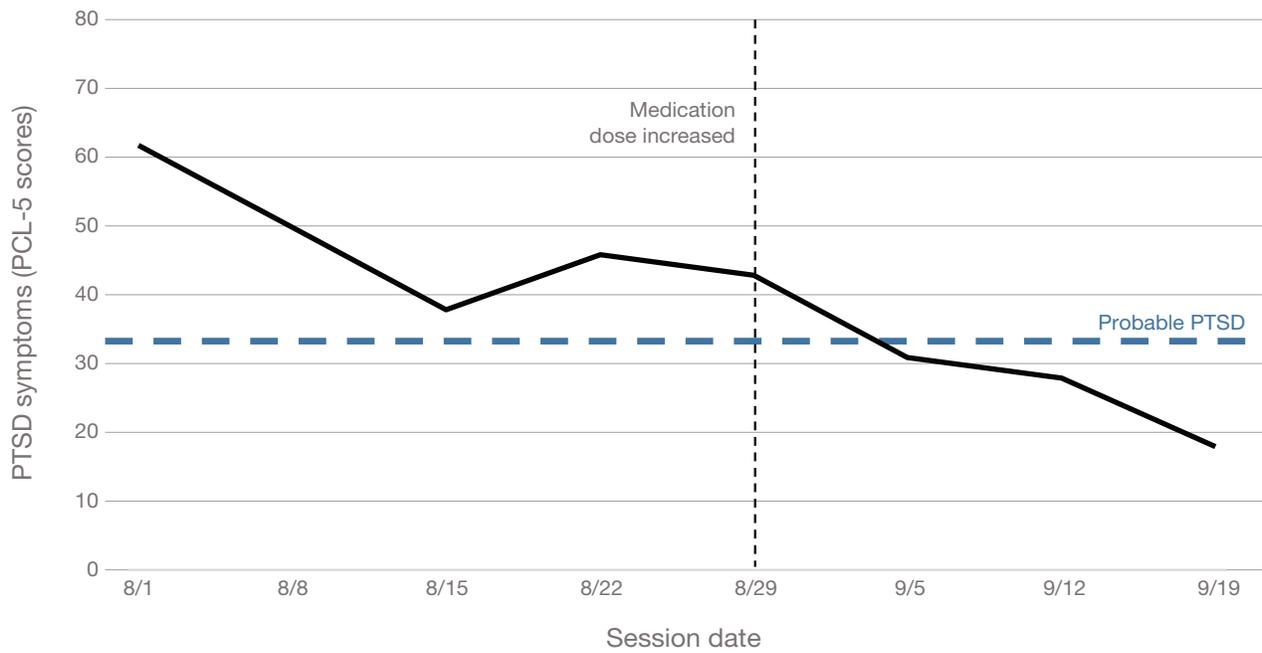


FIGURE 3

Display of PCL-5 Data Incorporating Clinician and Patient Preferred Features



Notes

¹ Cognitive interviews are semistructured, qualitative interviews that allow participants to respond and react to stimuli (with guidance usually increasing as the interview progresses) to assess interpretations and preferences (Beatty and Willis, 2007).

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