Patient Understanding of Key Information Related to Recovery After a Facility-Based Outpatient Procedure or Surgery, Patient Reported Outcome-Based Performance Measure (PRO-PM)

Version 1.0 Methodology Report

April 2024

Prepared by:
Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation (CORE)

This material was prepared by CORE under contracts to the Centers for Medicare & Medicaid Services (CMS), as an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy.

Table of Contents

List of Figures

List of Tables

Project Team

Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation (YNHHSC/CORE) Project Team

Name	Team Role
Clarissa Myers, DPT, MPH	Project Lead
Amy Moyer, MS, PMP	Director
Lisa Suter, MD,	Project Director
Kathleen M.B. Balestracci, PhD, MSW	Associate Director
Elizabeth W. Triche, PhD	Associate Director
Shefali Grant, MPH	Project Manager
Alexandra Stupakevich, MPH	Project Coordinator
Zhenqiu Lin, PhD	Analytic Director
Si Zhou, MS	Analyst

Acknowledgements
This work is a collaborative effort, and the authors gratefully acknowledge the individuals that provided feedback, experience, and advice on the development of this measure: our Technical Expert Panel (TEP) members; our Person and Family Engagement (PFE) Work Group, our clinical experts; Dr. Iman Simmonds, Dr. Kasia Lipska, and Dr. Karen Dorsey Sheares as well as Ms. Janis Grady at the Centers for Medicare & Medicaid Services (CMS).

Disclaimer: The views, thoughts, and opinions expressed in this report belong solely to the author(s), and not necessarily to any contributors or consultants, including the TEP and PFE Work Group members and their affiliated organizations. Acknowledgement of input does not imply endorsement of the methodology and policy decisions.

Executive Summary

The demand for outpatient surgical procedures has been steadily growing amongst Medicare beneficiaries. Between 2005 and 2011, the number of outpatient surgical procedures increased by 14%.[1,2] Medicare payments for outpatient operations rose by $8.5 billion between 2008 and 2014.[2] Moreover, these operations are increased in complexity as The Centers for Medicare & Medicaid (CMS) continues to relax the list of procedures it will reimburse only if they occur in the inpatient setting. Unlike inpatient procedures and surgeries, patients undergoing operations in the outpatient setting are sent home the same day. After discharge, patients may experience lingering side effects of anesthesia, or potential mild complications from their procedure. Furthermore, hospital outpatient departments (HOPDs) and ambulatory surgical centers (ASCs) fail to provide patients with critical information about recovery at a much higher rate than inpatient hospitals. Given the increasing frequency and complexity of outpatient operations, it is imperative for patients to have a clear understanding of their recovery plan.

The lack of consistently written documentation in the outpatient setting is associated with worse patient understanding and lower patient involvement in their recovery.[3,4] The timing of the development of this patient reported outcome-based performance measure (PRO-PM) is appropriate given the trend towards shifting more surgeries and procedures to the outpatient setting, along with the evidence that patients do better when they are provided with understandable information related to their recovery.

CMS contracted with Yale New Haven Health Services Corporation – Centers for Outcomes Research and Evaluation (CORE) to support development of the Information Transfer PRO-PM. In this report, we outline the approach to development, and provide detailed measure specifications. We describe the testing process and results of testing of this measure, which was conducted in two phases, across HOPDs.

1. Measure Introduction

1.1 Measure Overview

The concept for this PRO-PM originated from stakeholder engagement. In 2018-2019, CMS directed CORE to generate new measure concepts for the Hospital Outpatient Quality Reporting (HOQR) and Ambulatory Surgery Center Quality Reporting (ASCQR) Programs. CORE convened five stakeholder groups (patients and patient advocates; clinicians; ASC and HOPD leadership; measure developers and electronic health record [EHR] vendors; and federal agency representatives) to elicit input on measure concepts. Participants noted that patients are routinely discharged from HOPDs and ASCs without detailed, personalized clinical information. Patients were discharged without key information about their procedure such as the name of the procedure, intraoperative findings, and any complications they experienced. Patients were not receiving clear instructions on self-care, such as when to start and stop medications, adjust their physical activity, or care for their wounds. Based on this stakeholder feedback and subsequent direction from CMS, CORE began the development of a PRO-PM to measure patients' level of understanding of the information they received.

The Information Transfer PRO-PM collects information from patients aged 18 years or older who had an elective procedure or surgery at a HOPD. The measure reports the average score among patients who rated the hospitals' ability to communicate clear, personalized discharge instructions using a 9-item survey instrument. This brief electronic survey is comprised of three domains: applicability, medications, and daily activities. While the original concept focused on discharge instructions received at time of discharge, the current measure focuses on all discharge-related instructions received at any point from the time a patient schedules their operation or procedure to the time of their discharge. Studies have shown patients learn best from repeated exposure to information delivered in a variety of media. Feedback from stakeholders further supported that many patients who receive discharge instructions receive information and counseling prior to their procedure occurring as well as receiving instructions or materials after their procedure, so this is meant to capture instruction provided at any timepoint surrounding their procedure or surgery.

This measure has been developed as a PRO-PM, rather than a facility-level process measure, as it is important to directly assess patients' perceived understanding of the information received regarding the three domains.

1.2 Measure Importance and Use

As the scale and complexity of outpatient surgical procedures increases, so does the concern that patients discharged after undergoing general anesthesia may not fully understand the information they receive. A study comparing inpatient and outpatient surgery procedures found that inpatient providers were more effective in communicating discharge instructions to patients, including continuing medication names and instructions (96% vs. 40%); new medication names and instructions (99% vs. 29%); and pending diagnostic test names and instructions (90% vs. 61%).[5] A lack of consistently

written documentation in the outpatient setting is associated with worse patient understanding and lower patient activation during their recovery.[5-7] Consequently, simpler and more complete information has been linked to fewer follow-up calls to providers and reduced hospital readmissions [8-10]

CORE evaluated three systematic reviews focusing on the most effective ways to educate patients following surgical procedures, emergency department visits, and inpatient medical admissions. Despite the diverse range of diseases, treatments, and settings, the most significant finding from all three reviews was that patients benefited the most from a combination of verbal instruction and personalized written or video messages delivered over several sessions.[3,11-12]

Improvements in the communication of vital information for recovery after outpatient procedures or surgery are necessary. The primary objective of this measure is to enhance the quality of communication provided by healthcare facilities, thereby improving patients' understanding of clinical information relevant to their outpatient procedure or surgery recovery. Enhanced patient understanding can facilitate improved care and better intermediate outcomes (such as fewer medication errors and duplicate tests and imaging), resulting in better health outcomes, better patient experience, and lower costs.

Evidence suggests that patients experience better outcomes when they have a clear understanding of the information related to their recovery. The development of this PRO-PM is timely given the ongoing trend of shifting more surgeries and procedures to the outpatient setting.

2. Methods

2.1 Overview

Prior to developing a PRO-PM, CORE undertook the task of creating and validating a survey instrument (patient reported outcome measure, or PROM) to effectively capture patient-reported outcomes. The survey development process involved identifying measure domains, drafting survey questions, testing the survey questions, and then revising the survey based on stakeholder engagement and a public comment period. Following the survey instrument creation two pilot tests were conducted, with the first one taking place between August and October 2021 in two HOPDs located in different states. The primary objective of this initial pilot was to evaluate the survey instrument, identify potential variables for inclusion in the final model, and assess scores between questions to further streamline and retest the survey. After incorporating feedback from stakeholders, CORE revised the survey and then conducted a larger second pilot from August 2022 to March 2023. For this second pilot, HOPDs in five states were involved, aiming to evaluate the reliability and validity of the survey and identify the measure scoring within a more extensive sample of facilities.

To be included in the final analyses, each HOPD had to meet a completed survey threshold of 100 responses. The final sample of data collected included information from survey respondents (survey responses and interviews) as well as data from non-respondents from both pilot tests.

2.2 Data Sources

Pilot one data was obtained from two participating HOPDs between August and October 2021. Pilot two data was obtained from four participating organizations (26 HOPDs) between August 2022 and March 2023.

2.3 Measure Cohort: Denominator

The denominator is the total number of eligible respondents for a given HOPD, i.e., the total number of persons aged 18 years or older, who had a procedure or surgery, and who were discharged alive from that HOPD with less than two midnights.

2.4 Measure Outcome: Numerator

The numerator is the sum of all individual scores a HOPD receives from eligible respondents. An individual score is calculated for each respondent by taking the sum of items for which the respondent gave the most positive response (“Yes” or “Very Clear”) and dividing by the number of items the respondent deemed applicable to their procedure or surgery. Applicable items are calculated by subtracting the sum of items for which the respondent selected “Does not apply” from the total number of items (nine).

2.5 The Survey

The survey is a 9-item instrument addressing three domains that evaluate patients’ perceived understanding of information they received regarding their recovery process. The three domains (Applicability, Medication, Activity) were informed by our literature

review, PFE Work Group and TEP. A copy of the full survey can be found in Appendix A. The survey instructs respondents to rate the clarity of all sources of information they received during an episode of care on a scale ("Yes" or "Very Clear", "Somewhat" or "Somewhat Clear", and "No" or "Not clear") for each item in each domain. CORE has defined the episode of care as beginning from the moment they elected to undergo an outpatient procedure or surgery, to the day they received the survey (within two to seven days post procedure or surgery). Some of the pieces of information that patients may be referencing when they respond to the survey include, but are not limited to, pre-operative clinical encounters, post-operative packets, post-operative calls made by providers, conversations with nurses and doctors after the procedure or surgery, discharge summaries, and other resources made by the facility for specific topics or procedures. This approach focuses on the result (patient understanding of how to manage their recovery), rather than any one specific document, encounter, or patient-education strategy.

2.6 Risk-Adjustment

Consideration of risk adjustment is important to decompose measured entity-level variation into factors that are and are not correlated with the performance measure. Moreover, valid models should ensure that they are not subject to omitted variable bias when excluding risk-adjustment variables that are correlated with both the outcome and risk variables. As the outcome for our measure is patient's rating of the clarity of information about their recovery process, it is important to test for certain patient characteristics that may bias results. However, adjusting for risk variables that are under the locus of control of hospitals could exacerbate health disparities. The CORE team considered testing using collected data to examine the need to risk adjust the measure for gender, race, age, patients self-reported health status, self-reported level of education, and history of surgical procedures. CORE team also explored risk adjustment options with stakeholder groups to determine whether they were appropriate.

2.7 Calculation of Measure Score

Consideration was given to the method of scoring this PRO-PM, and ultimately the decision was to calculate using a top-box approach which is intended to find the percentage of respondents who select the top choice of responses. Individual patient scores reflect the percentage of the total number of items respondents selected the most favorable responses for ("Yes" or "Very Clear"), out of the total number of items respondents deemed applicable to their procedure/surgery. Facility scores are the mean of individual patient scores.

2.8 Measure Testing

This section describes the plan to perform all testing required to fully develop and assess this PRO-PM and validate the survey instrument for use in calculating measure scores for HOPDs.

As with any quality measure, it is important to demonstrate that there is variation across providers. We conducted multiple HOPD-level analyses to investigate the degree of variation for the final measure score. Distribution of the final measure scores across facilities, and distribution of scores by each survey domain (applicability, medication, and daily activities) is also reported. Facility and respondent descriptions will also be reported, to understand the cohort.

Variation between facilities' measure scores is important to demonstrate variability in performance. The final results reported below are calculated based on HOPDs that reached a threshold of 100 completed surveys.

Analyzing candidate risk variables was important, to consider the need for risk-adjustment of the final measure. Data was used to analyze patients self-reported race, ethnicity, age, education, patients self-reported health status, and history of procedures. Using these risk variables, an adjusted model and unadjusted model were compared with the predicted and expected values to evaluate reliability and consistency and help inform decisions around risk adjusting.

An additional challenge with construction of a PRO-PM is addressing non-response bias; when the likelihood of a patient responding to a survey varies with differences in patient characteristics, then the results of the survey may be affected by a non-response bias. If different types of patients are not randomly distributed across providers, then it may cause certain providers' scores to be systematically better or worse. As part of our pilot data, we assessed for differences in observable characteristics for non-respondents, like age, procedure, sex, and race to compare them with individuals who responded to the survey. Along with this bias, the CORE team analyzed missingness of data.

Reliability of the measure was analyzed with two purposes in mind, one to measure the instrument or data element reliability for each survey domain, using Cronbach's alpha score; this score assesses the internal consistency of the 9-item scale, or the extent to which the 9 items within the scale measure the same underlying construct. The signal-to-noise ratio was used to assess the reliability of the performance score for the 15 HOPDs that met the completed 100-survey threshold, or the proportion of variability in measured performance that can be explained by real differences in performance.

Validity of the measure was assessed in several ways. First, Pearson's correlation coefficient was used to assess the strength and direction of the linear relationship between hospital mean scores on this PRO-PM with the hospital scores on the Outpatient Ambulatory Surgery Consumer Assessment of Healthcare Providers and Systems (OAS CAHPS) similar domains ("communication about your procedure"). Face validity was assessed by votes from the PFE Work Group and TEP asking members to vote on the measure's ability to distinguish good and poor quality of care at measured facilities.

3. Results

3.1 Measure Cohort

The participating HOPDs for the second pilot study, including type of facility, median monthly case volume, and mean inpatient bed size are described below in Table 1.

Table 1. Description of Participating HOPDs

Facility Characteristics	N = number of facilities
Total number of Facilities	26
Teaching facility	19
Inpatient capacity	19
Rural	0
Median Monthly Case Volume	758
Mean Inpatient Bed size	266

Respondent characteristics are shown in Table 2 below, with demographics described by the following variables: age, gender, self-reported race, language, education, type of surgery (major or minor), and number of surgeries. CMS convention uses global billing period to define procedures as major, having follow-up period of 90 days, and minor having a follow-up period of zero to 10 days.

Table 2. Survey Respondent Demographics

Demographic Variables	N (mean)	% (SD)
Age (Mean)	64.32	13.55 (19-94)
Gender (Male)	1,286	41.9%
Self-reported Race		
Native Hawaiian or other Pacific Islander	13	0.5%
Multi	64	2.4%
Black or African American	141	5.4%
Preferred not to answer	167	6.4%
Hispanic or Latino	216	8.2%
Asian	225	8.6%
White	1,798	68.5%
Language		
Spanish	58	2.2%
Other	117	4.5%
English	2,448	93.3%
Education		
8th grade or less	11	0.4%
Some high school, did not graduate	49	1.9%
High school graduate or GED	344	13.1%
Some college or 2-year degree	876	33.3%

Demographic Variables	N (mean)	% (SD)
College-4 years	563	21.4%
More than 4-year college degree	784	29.8%
Surgery		
Minor	695	22.6%
Major	1,240	40.4%
Missing	1,134	37.0%
Number of Surgeries		
0	867	32.8%
1-3	1,442	54.6%
>4	334	12.6%

3.2 Measure Score

CORE conducted multiple HOPD-level analyses to investigate the degree of variation for the final measure score. The survey results were calculated based on HOPD facilities that reached a threshold of 100 surveys. Table 3 reports the variation in performance score across HOPDs, which was evaluated according to the distribution of final measure scores across participating HOPDs. We report the facility total mean score, standard deviation, median score, the maximum individual score, the minimum individual score, and their interquartile range.

Table 3. Distribution of Final HOPD Measure Scores

Facility Responses	mean	Standard deviation	median	max	10th percentile	90th percentile	min
122	87.26	22.24	100	100	50	100	22.22
108	86.88	23.18	100	100	55.56	100	0
120	85.39	25.64	100	100	50	100	0
147	83.3	24.79	100	100	50	100	0
241	82.98	25.51	100	100	44.44	100	0
260	82.51	27.12	100	100	33.33	100	0
106	81.77	27.84	100	100	36.19	100	0
202	81.11	26.52	100	100	42.86	100	0
137	80.51	25.81	88.89	100	35.56	100	0
182	79.71	27.7	88.89	100	33.33	100	0
316	79.3	28.82	94.44	100	33.33	100	0
342	77.98	30.32	88.89	100	25	100	0
118	77.66	27.64	88.89	100	36.67	100	0
222	75.93	29.21	87.5	100	33.33	100	0
354	74.64	29.75	87.5	100	25	100	0

Figure 1 visually describes the variation in measure score by facility, inclusive of the 15 HOPDs that met the 100-survey threshold for inclusion in measure analyses; the whisker plots depict the mean hospital score using the 9-item survey, with scores ranging from 0-100. The mean score is identified by a central dot within the box, and the median score is identified by a solid horizontal line. Hospital mean scores ranged from 74-87, as outlined below in Table 4.

Figure 1. Hospital Measure Score, by Facility

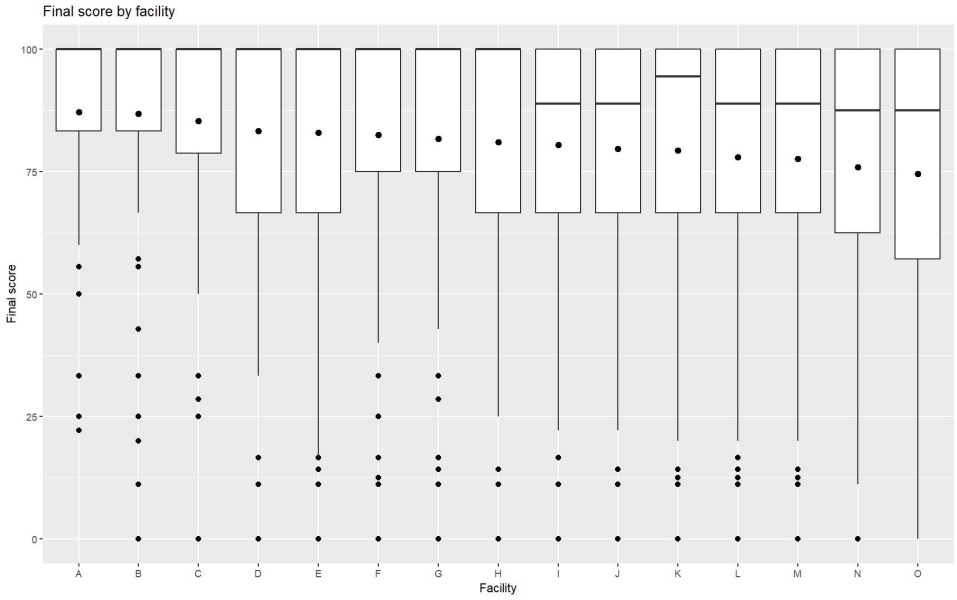


Table 4. Performance Scores

Mean	SD	Max	90th percentile	Median	10th percentile	Min
81.1	3.7	87.3	86.3	81.1	76.6	74.6

3.3 Risk Model

As described above, risk adjustment is critical to analyze to consider factors that are and are not correlated with the performance measure. As the outcome for this measure is the patient's rating of the clarity of information about their recovery process, it is important to test for certain patient characteristics that may bias results, as detailed in Table 5. We examined the association with gender, race, age, self-reported health status, self-reported level of education, and surgical history with the individual 9-item survey for the entire population of eligible respondents, using a Kruskal-Wallis test for categorical variables (greater than two categories) and a two-sample t-test for binomial variables. We then used statistically significant variables in a mixed-effect model to adjust for fixed effects of those factors and the random effects of the patients grouped within hospital. We found statistically significant differences with the individual score on

9-item survey and dependent variables of self-reported education, health status, and number of prior surgeries.

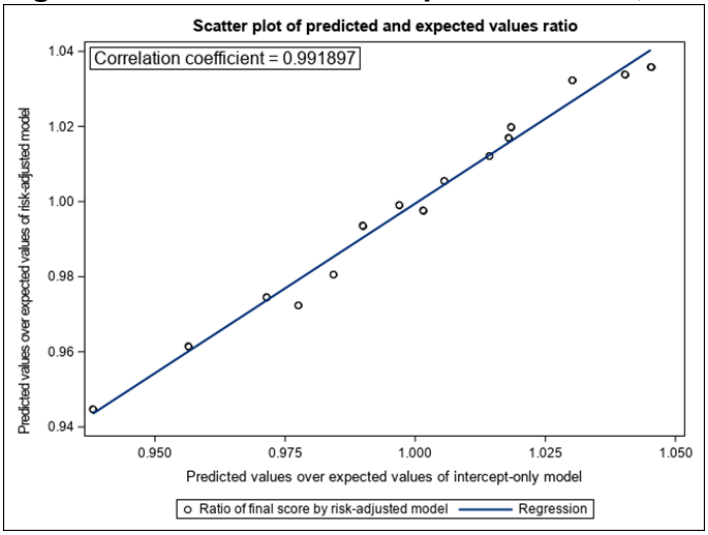
We conducted testing using data collected from the second pilot to examine the need to risk adjust the measure for patients self-reported race, ethnicity, age, education, patients self-reported health status, and history of procedures. There were no statistically significant differences between the adjusted and unadjusted measure scores, Figure 2 depicting the relationship, with a correlation coefficient of 0.99. Furthermore, upon discussion with stakeholders, patients, and CMS, there was consensus to recommend an unadjusted measure. Given the measured outcome, there is statistical and empirical conclusion supporting an unadjusted measure: providers and facilities should be able to provide clear, personalized instruction to all patients about their recovery from a procedure or surgery. Clinicians need to meet patients where they are in their understanding of discharge information. Additionally, to note, our results outline that those of greater education levels were less satisfied with their discharge information.

Table 5. Candidate Risk Variables

Variables	Mean (SD)/ N (%)	P-value
Gender		
Male	1,286 (41.9)	0.734
Race		
White	1,798 (73.2)	0.756
Age (years)	64.32 (13.55)	0.128
Health Status		
Excellent	362 (13.7)	
Very good	1,094 (41.4)	
Good	864 (32.7)	<0.001*
Fair/Poor	320 (12.1)	
Education		
< 4-year college	1,280 (48.7)	
4-year college	563 (21.4)	<0.001 *
> 4-years college	784 (29.8)	
Number of Surgeries		
0	867 (32.8)	
1-3	1,442(54.6)	0.001*
4+	334 (12.6)	

* p-value < 0.05, considered for inclusion in the risk-adjusted model

Figure 2. Predicated and Expected Values, Risk Adjustment Model



The results above in Figure 2 and measure reliability testing in Table 7 demonstrate high reliability and consistency between the adjusted and unadjusted model. Based on stakeholder feedback upon review and discussion of these results, CORE is recommending an unadjusted measure.

3.4 Reliability

To measure and compare between-hospital differences of the hospital mean score on the 9-item scale, we employed a random-effect intercept-only model. This model allowed us to examine the variability in mean scores between hospitals, where the hospital's mean score was the outcome variable, and the hospital identifier was the random intercept. We calculated the signal-to-noise ratio to determine how well we can differentiate a high-performing hospital from a low-performing hospital by taking the proportion of the variability in measured hospital mean score, which can be explained by real differences in performance, where signal is between-hospital variance and noise is the random error.

We used signal-to-noise ratio to assess the reliability of the performance score for 15 facilities that met the completed 100-survey threshold. Furthermore, we measured the instrument or data element reliability for each survey domain using the Cronbach Alpha score, which assesses the internal consistency of the 9-item scale, or the extent to which the 9 items within the scale measure the same underlying construct.

3.4.1 Data Element Reliability

Table 6 outlines the Cronbach alpha score, which quantifies the consistency of survey respondents' answers by domain, for use in the measure score calculation.

Table 6. Data Element Reliability

Domain (n = number of questions)	Cronbach Alpha
Overall (n=9)	**0.841**
Applicability (n = 2)	0.554
Medication, (n = 3)	0.777
Daily Activities, (n=4)	0.813

3.4.2 Measure Reliability

CORE conducted signal-to-noise reliability testing for the hospital measure score; this measure of reliability highlights the proportion of variability in measured performance that can be explained by real differences in performance, so it measures the reliability of the performance score. The values in Table 7 demonstrate good reliability for both the adjusted and unadjusted risk models. With the selected unadjusted model, the calculated median value of 0.69 indicates moderate reliability, suggesting that approximately 69% of the variance in mean score can be attributed to differences between hospitals.

Table 7. Reliability Testing, Signal to Noise Ratio

Model	Mean	SD	Max	Q3	Median	Q1	Min
Unadjusted model	0.6894	0.0888	0.8172	0.7665	0.6968	0.6025	0.5724
Risk-adjust model	0.6600	0.0933	0.7955	0.7408	0.6667	0.5688	0.5381

3.5 Validity

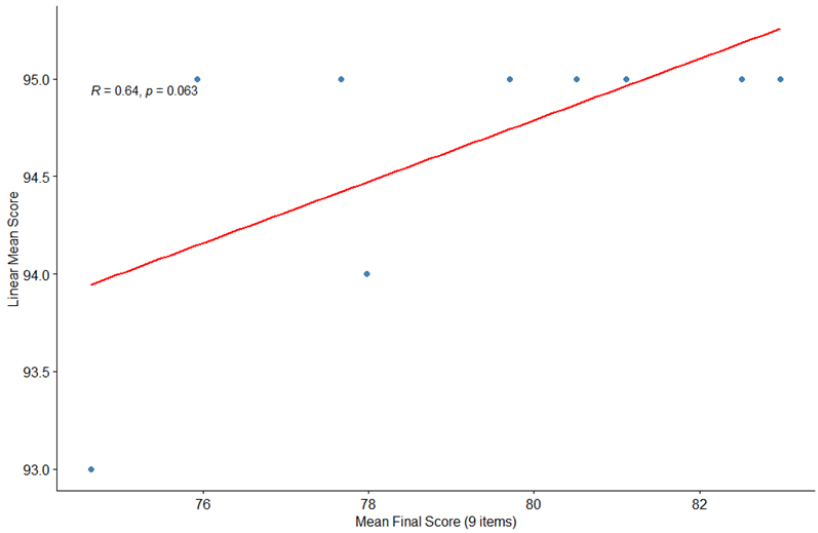
CORE documents both measure and face validity obtained for the Information Transfer PRO-PM.

3.5.1 Measure Validity

To validate the instrument, CORE conducted semi-structured interviews with survey respondents to ensure that their understanding of questions aligns with the intended purpose of the questions. Furthermore, to validate the performance score, our team compared Hospitals performance on the 9-item instrument to their performance on the OAS CAHPS. OAS CAHPS is a previously validated survey of outpatient surgery patients' opinions about the care they received following a surgery or procedure. The OAS CAHPS has 34 items and includes several questions in the domain titled “communication about your procedure.” We evaluated the criterion validity using a Pearson’s correlation coefficient to assess the strength and direction of linear relationship between the Information Transfer PRO-PM hospital mean score to OAS CAHPS linear means score for the domain “communication about your procedure” for 9 of the 15 HOPDS. Specifically, we used publicly reported OAS CAHPS data from January 2021 and December 2021. Figure 3 depicts this relationship, with a calculated

correlation between these two surveys of 0.64. This means that this PRO-PM's 9-item survey instrument mean score was moderately positively correlated with the previously validated OAS CAHPS provider communication domain.

Figure 3. Correlation with OAS CAHPS Survey, Pearson's correlation coefficient



3.5.2 Face Validity

Face validity was captured by administering specific questions to the TEP and PWG members, requesting their vote on the measures ability to distinguish between good and poor quality of care at measured facilities. Eighty percent of technical experts who voted agreed that the measure could distinguish between good and poor quality of care at measured facilities. All of the patients from the patient workgroup reported meaningfulness of the measure, supporting that the measure provides important information and can help improve care for patients in similar situations or with similar conditions.

3.6 Response Bias

One of the challenges of constructing a PRO-PM is addressing non-response. When the likelihood of a patient responding to a survey varies with differences in patient characteristics, then the results of the survey may be affected by a non-response bias. O'Malley et al concluded that case-mix adjustment for the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), as described here, can lead to important reductions in bias in comparisons between hospitals.[11] If different types of patients are not randomly distributed across providers, then it may cause certain providers' scores to be systematically better or worse. As part of our pilot study, we assessed for differences in observable characteristics for non-respondents, like age, procedure, sex, and race to compare them with individuals who responded to the survey. Table 8 outlines the difference in respondents versus non-respondents; patients were significantly more likely to respond if they were older, female, and have had a major surgery.

Table 8. Respondent versus Non-Respondent Data

	Respondents n=3,069		Non-Respondents n=27,070		p-value
Age	64	± 14	58	± 16	<0.001
Female	1,783	58%	15,140	56%	0.022
Surgery					<0.001
Major	1,240	40%	8,609	32%	
Minor	695	23%	9,577	35%	
Missing	1134	37%	8,884	33%	

CORE measure development team evaluated response rates across all 15 facilities and found that they ranged from 5.0 – 39.7%. The surveys were administered in batches; the lowest response rates were seen in facilities belonging to a single organization whose batch administration had a 57% failure to send due to missing email.

We evaluated the distribution of missing/skipping a survey question; 12.2% of all respondents skipped questions about applicability, 12.9% of respondents skipped questions about medications, and 13.7% skipped questions about activity. The minimum number of items skipped was four. Additionally, we calculated the percentage of respondents missing more than four questions for each facility and found that it ranged 10.7% to 20%, with the mean being 13.9%. We were unable to impute missing data.

References

1. Hollingsworth JM, Oerline MK, Ellimoottil C, Herrel LA, Hollenbeck BK. Effects of the Medicare Modernization Act on Spending for Outpatient Surgery. Health Serv Res. 2018;53 Suppl 1:2858- 2869. 2.

2. Kaye DR, Luckenbaugh AN, Oerline M, et al. Understanding the Costs Associated With Surgical Care Delivery in the Medicare Population. Ann Surg. 2020;271(1):23-28.

3. Hoek AE, Anker SCP, van Beeck EF, Burdorf A, Rood PPM, Haagsma JA. Patient Discharge Instructions in the Emergency Department and Their Effects on Comprehension and Recall of Discharge Instructions: A Systematic Review and Meta-analysis. Ann Emerg Med. 2020;75(3):435-444.

4. Kang E, Gillespie BM, Tobiano G, Chaboyer W. Discharge education delivered to general surgical patients in their management of recovery post discharge: A systematic mixed studies review. Int J Nurs Stud. 2018;87:1-13.

5. Downey E, Olds DM. Comparison of Documentation on Inpatient Discharge and Ambulatory End-of-Visit Summaries. *J Healthc Qual.* 2021;43(3):e43-e52.

6. Hoek AE, Anker SCP, van Beeck EF, Burdorf A, Rood PPM, Haagsma JA. Patient Discharge Instructions in the Emergency Department and Their Effects on Comprehension and Recall of Discharge Instructions: A Systematic Review and Meta-analysis. *Ann Emerg Med.* 2020;75(3):435-444

7. Kang E, Gillespie BM, Tobiano G, Chaboyer W. Discharge education delivered to general surgical patients in their management of recovery post discharge: A systematic mixed studies review. *Int J Nurs Stud.* 2018;87:1-13.

8. Choudhry AJ, Younis M, Ray-Zack MD, et al. Enhanced readability of discharge summaries decreases provider telephone calls and patient readmissions in the posthospital setting. *Surgery.* 2019;165(4):789-794.

9. Mitchell JP. Association of provider communication and discharge instructions on lower readmissions. *J Healthc Qual.* 2015;37(1):33-40.

10. VanSuch M, Naessens JM, Stroebel RJ, Huddleston JM, Williams AR. Effect of discharge instructions on readmission of hospitalised patients with heart failure: do all of the Joint Commission on Accreditation of Healthcare Organizations heart failure core measures reflect better care? *Qual Saf Health Care.* 2006;15(6):414-417.

11. Fredericks S, Guruge S, Sidani S, Wan T. Postoperative patient education: a systematic review. *Clin Nurs Res*. 2010;19(2):144-164. doi:10.1177/1054773810365994

12. Newnham H, Barker A, Ritchie E, Hitchcock K, Gibbs H, Holton S. Discharge communication practices and healthcare provider and patient preferences, satisfaction, and comprehension: A systematic review. *Int J Qual Health Care*. 2017;29(6):752-768.

Appendix A: Survey Instrument

Introduction

This is a brief survey that should take you 5 minutes.

You are receiving this survey because you recently had a procedure at [Facility Name]. Either before or after your procedure you should have been given information about what to do during your recovery process. For example, you may have received a packet of information, video, or had a conversation or phone call that instructed you on what to do after your procedure. We would like to know if this information was easy-to-follow.

Your survey responses will help your doctors and hospital improve the quality of care they provide. Your responses are completely anonymous, neither your name nor any other identifying information will be shared with your doctor or hospital. This survey can be filled out by you or your caregiver.

Information Took Into Account My Needs

The information you got about your recovery considered:

1. Your health needs (for example: medical conditions, pain management, treatment preferences, etc.)
    - Yes
    - Somewhat
    - No
2. Your personal situation (for example: transportation needs, insurance coverage, financial status, etc.)
    - Yes
    - Somewhat
    - No

Medications

How clear was the following information about your recovery:

3. Why you should take any new medications
    - Very clear
    - Somewhat clear
    - Not clear
    - Does not apply
4. Possible side effects of new medications
    - Very clear
    - Somewhat clear
    - Not clear
    - Does not apply
5. When to stop any medications
    - Very clear
    - Somewhat clear
    - Not clear

- Does not apply

Daily Activities
How clear was the following information about your recovery:

6. Changes to your diet
    - Very clear
    - Somewhat clear
    - Not clear
    - Does not apply
7. Changes to physical activities, including exercise.
    - Very clear
    - Somewhat clear
    - Not clear
    - Does not apply
8. When you could return to work
    - Very clear
    - Somewhat clear
    - Not clear
    - Does not apply
9. When you could drive
    - Very clear
    - Somewhat clear
    - Not clear
    - Does not apply

Appendix B: Code Set

Variable	Format	Definition
FACNAME	Character	Facility name
DATE_OF_BIRTH	Date	Patient date of birth
LENGTH_OF_STAY	Numeric	Length of stay, or difference of discharge date from admission date
ADMIT_DATE	Date	Date of procedure/admission
AGE	Numeric	Age in years
DISCH_DATE	Date	Date of discharge