Question 1.

Which CTM® version should be used for public reporting?

After much deliberation and consultation with NQF staff, the developer has decided to put forth the CTM-3 as the measure to be considered for public reporting. The CTM-3 includes the three major domains that patients have identified in qualitative studies as critically important to their experience with coordination out of the hospital; namely understanding one's self-care role in the post-hospital setting, medication management, and having one's preferences incorporated into the care plan.

The more comprehensive CTM-15 adds important information that health care systems and institutions can use to improve coordination of care out of the hospital. However, the three items that comprise the CTM-3 essentially "drive" the overall CTM-15 score, as the CTM-3 items account for 82-93% of the variance within CTM-15 scores. Thus the information lost by using the CTM-3 measure is minimal in comparison to what is gained in terms of reducing response burden.

The 3-Item Care Transitions Measure® (CTM-3)

The first statement is about when you were in the hospital . . .

1. The hospital staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left the hospital.

The next statement is about when you were preparing to leave the hospital . . .

2. When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.

The next statement is about your medications...

3. When I left the hospital, I clearly understood the purpose for taking each of my medications.

Question 2.

Which specific aspects of coordination of care out of the hospital does the CTM-3 address?

The CTM-3 measures the extent to which patients are being prepared to participate in post-hospital self-care activities.

These care processes are in fact not optional but are mandated under Medicare Conditions of Participation (see Table) and as such, are also integral components of JCAHO accreditation. JCAHO has been criticized by its consumer council for its lack of rigorous attention to these areas and in response, has a number of new initiatives, including extending its tracer methodology to the discharge process, exploration of new metrics, and patient safety standards focused on medication reconciliation.

The CTM® was developed to assess the extent to which hospital staff accomplished essential care processes in preparing patients for discharge. In contrast to other measures that address the discharge out of the hospital, the focus of the CTM-3 is on what hospital staff actually <u>did</u> to prepare the patient, rather than what questions hospital staff may have <u>asked</u> the patient. As a significant percent of post hospital care plans include a role (either implicitly or explicitly) for family caregivers, one of the CTM® items includes reference to the family (as do the Medicare Conditions of Participation).

Selected Medicare Conditions of Participation Concerning Hospital Discharge/Continuum of Care Activities

Discharge planning: General Requirement

The hospital must have in effect a discharge planning process that applies to all patients. The policies and procedures for discharge planning must be specified in writing.

Discharge-Planning Evaluation

The hospital must provide a discharge planning evaluation to the patients identified in as at-risk and to other patients upon the patient's request or at the request of a physician.

Elements of the Discharge-Planning Evaluation

The discharge planning evaluation must include an evaluation of the likelihood of a patient's needing post-hospital services and of the availability of the services.

Evaluating the Likelihood of Self-Care

The discharge planning evaluation must include an evaluation of the likelihood of a patient's need for self-care or the possibility of patients being cared for in the environment from which they entered the hospital.

Documentation of Discharge Planning and Patient Discussion

The hospital must include the discharge planning evaluation in the patient's medical record for use in establishing an appropriate discharge plan and must discuss the results of the evaluation with the patient or individual acting on his or her behalf.

Hospital to Arrange Services

The hospital must arrange for the initial implementation of the patient's discharge plan.

Reassessing the Discharge Plan

The hospital must reassess the patient's discharge plan if there are factors that may affect continuing care needs or the appropriateness of the discharge plan.

Pre-discharge Counseling

As needed, the patient and family members or interested persons must be counseled to prepare them for post-hospital care.

As described above, the CTM-3 explicitly takes patient preferences into consideration in the wording to question #1.

A further validation that the CTM-3 addresses essential care processes comes from the fact that CTM-3 items predict re-hospitalization and return to the emergency department. The developer has also demonstrated that CTM scores can discriminate among hospitals known to differ in the extent to which they have made coordination out of the hospital a priority (through greater integration) in the hypothesized direction. (Coleman, EA, Mahoney E, Parry C. Assessing the Quality of Preparation for Post-Hospital Care from the Patient's Perspective: The Care Transitions Measure. Medical Care. 2005;43(3):246-255.)

Since the first review of the CTM-3, the Institute of Medicine has released a report entitled "Performance Measurement: Accelerating Improvement". The developer wishes to point out that transitional care, a component of coordination of care out of the hospital, was identified as one of three priority areas for performance measurement. The CTM-3 directly addresses this critical area and was featured in this report. The developer would like to further point out that there are currently no NQF approved measures addressing coordination of care out of the hospital that respond to the Institute of Medicine's charge.

Question 3.

What has been the experience of using the CTM-3 in practice?

Responders inquired about the extent to which the CTM-3 is "ready for prime time" and its feasibility and usability for use in "real world" practice. The developer is pleased to report that to date, it has received 462 requests for permission to use the CTM-3 from countries. Among these requests, 262 were from hospitals/health systems, 63 from Quality Improvement Organizations, 32 from government health

agencies, and 105 were from researchers. Among these requests, 156 indicated plans to directly employ the CTM-3 to assess current practice in the requestor's institution.

Outside of these requests, the CTM-3 is being used to help respond to the recently released CMS' 8th Statement of Work by at least 12 Quality Improvement Organizations. The CTM-3 is a central "diagnostic" tool being used in a new initiative launched by the Institute for Healthcare Improvement (IHI) within its Transforming Care at the Bedside (TCAB) initiative (the developer is a core faculty member of this initiative).

Further, the developer is directly collaborating with 10 health care delivery systems to implement CTM-3 testing as a core component of performance testing, reporting, and/or rewarding performance, including a pay-for-performance initiative. It is also being used in a CMS 721 demonstration initiative.

With the support of the Commonwealth Fund of New York, the developer has demonstrated that the CTM-3 is responsive to changes in hospital care delivery. Tracking CTM-3 scores over time has helped hospitals identify care deficiencies in coordination out of the hospital that in part, were triggered by system-wide problems that affected organization and staffing.

Question 4.

What have you learned regarding use of the CTM® in diverse populations?

The CTM® is being used in 15 different countries. The Spanish version of the CTM® is complete and is currently in use.

We set out to better understand how the CTM® performs in three populations hypothesized to differ with respect to the coordination out of the hospital experience. These three populations included African Americans, Hispanic Americans, and rural Americans. We were interested in exploring two important and distinct analyses.

The first was how the measure performs in these three populations. We have demonstrated that the factor structure in the more racially diverse group (CFI 0.954) is highly comparable to the reference group (general population, non-oversampled) (CFI=0.952). (Analyses completed using Mplus © 1998-2005 by Muthen and Muthen).

The second was to examine whether the results make sense in terms of what is already known about health disparities. As hypothesized, CTM® testing to date has identified disparities in how these populations experience coordination out of the hospital compared to white and/or urban populations. We found that African Americans and Hispanics reported worse care transition experiences (p=0.006) compared with whites. Similarly, rural residents reported worse care transition experiences (p=0.002) than urban residents.

Question 5.

What is known about the CTM-3 responses by education level?

Responders expressed concern that the wording of the CTM-3 items may be difficult for persons of limited health literacy. The developer is sensitive to this concern as it is in the process of planning a study to further explore issues of health literacy and cognitive impairment in the context of patient's understanding of their discharge instructions.

The responder's concern is a hypothesis that can be empirically tested. The developer has put this hypothesis to the test by examining differential CTM-3 item function by educational level (please see Question #7). The question was tested in diverse populations with respect to education level, race/ethnicity, rural/urban, and geographic residence within the United States. Ultimately, the developer did not detect significant differences in item response by education level.

For more information of the influence of education on CTM-3 scores, please refer to the next document (attached below this one) that provides information on how the CTM® reading level is below comparable items of a NQF endorsed national measure (Question #1) and the influence of education on non-response rates compared with another national measure (Question #3).

Further, the developer has tested the CTM-3 in over 1000 patients and survey administrators have not found that the wording of the items confused patients.

Thus while the developer recognizes that software programs that incorporate tools such as the Flesch-Kincaid are of value in the initial stages of measure development, the developer's extensive testing experience demonstrates that comprehension has not proven problematic.

Question 6.

How did you arrive at selecting the CTM-3 response categories?

Given that the developer set out to develop a truly patient-centered measure, it was recognized that the response categories must be meaningful to patients and allow for them to fully reflect on their care experiences. The CTM-3 item response categories include strongly agree/agree/disagree/strongly disagree. Prior experience with a yes/no format revealed that patients felt limited by having only two categories. As they attempted to choose the response that captured their experience, the developer noted that they were becoming frustrated and that response burden was actually *increasing* using yes/no rather than decreasing their response burden. In other words, fewer response categories do not always translate into making the survey easier to complete.

Please refer to the next document (attached below this one) that provides information on non-response rates compared with another national measure that provides only a yes/no response format (Question #2). CTM-3 had much lower non-response rates.

Question 7.

Has the developer explored the role of risk adjustment?

The CTM® is a patient-centered measure that assesses the extent to which hospital staff accomplished essential care processes. These care processes are to be extended universally to all hospitalized patients, irrespective of level of disease burden or socio-demographic status. As a result, the CTM®, a process of care measure, does not employ risk adjustment techniques in calculating a summary score.

The developer has empirically studied this question, assessing differential item function by gender, self-rated health, age, educational level, and ethnicity. Each of these analyses has confirmed that these variables do not bias CTM-3 response patterns.

The developer points out, however, that if CTM-3 items were incorporated into another performance measurement tool that does employ risk adjustment for the items listed above, such adjustment would have a neutral effect on CTM-3 scores. In other words, once it has been determined that a variable does influence responses to the measure items, risk adjusting for the variable does not influence the score.

Results from Differential Item Function Testing Using a National Sample

By far the most powerful test of whether a set of items "work" the same way in different populations is the differential item function test. Since we can calculate the difficulty of each item we can ask if the items have the same difficulty. More precisely, do the items have the same difficulty when we control for the overall quality of care coordination out of the hospital.

1. Differential Item Function by Gender (1 = Female; 2 = Male)

+													-+
	PERSON GROUP	DIF MEASURE	DIF S.E.	PERSON GROUP			DIF CONTRAST	JOINT S.E.		d.f.	ITEM Number	Name	
i	1	.19	.20	2	.43	.29	24	.35	69	210	2	Q2	-
	1	.19	.20	9	.03	1.07	.16	1.09	.15	146	2	Q2	
	2	.43	.29	9	.03	1.07	.41	1.11	.37	66	2	Q2	
1	1	05	.20	2	29	.31	.23	.37	.62	213	9	Q9	1
	1	05	.20	9	1.27	1.21	-1.32	1.23	-1.07	150	9	Q9	
	2	29	.31	9	1.27	1.21	-1.55	1.25	-1.24	65	9	Q9	
1	1	65	.21	2	54	.33	11	.39	29	208	13	Q13	1
	1	65	.21	9	-1.21	1.20	.55	1.22	.45	147	13	Q13	
	2	54	.33	9	-1.21	1.20	.67	1.25	.53	63	13	Q13	

2. Differential Item Function by Self-Rated Health 1=Poor, 2 = Fair, 3 = Good, 4 = Very Good/Excellent

PERSOI	N DIF MEASURE	DIF S.E.	PERSON GROUP	DIF MEASURE	DIF S.E.	DIF CONTRAST	JOINT S.E.	t	d.f.	ITEM Number	Name
1	.58	.32	2	.08	.27	.50	.42	1.19	125	2	Q2
1	.58	.32	3	.49	.34	.09	.47	.18	93	2	Q2
1	.58	.32	4	22	.47	.80	.57	1.40	73	2	Q2
2	.08	.27	3	.49	.34	41	.43	95	136	2	Q2
2	.08	.27	4	22	.47	.30	.54	.55	116	2	Q2
3	.49	.34	4	22	.47	.71	.58	1.22	84	2	Q2
4	22	.47	9	.21	1.51	43	1.58	27	32	2	Q2
1	33	.36	2	14	.27	19	.45	42	125	9	Q9
1	33	.36	3	.13	.34	46	.49	94	96	9	Q9
1	33	.36	4	.02	.46	35	.58	59	75	9	Q9
2	14	.27	3	.13	.34	27	.44	63	137	9	Q9
2	14	.27	4	.02	.46	16	.53	29	116	9	Q9
3	.13	.34	4	.02	.46	.12	.57	.21	. 87	9	Q9
1	48	.38	2	56	.28	.08	.47	.16	124	13	Q13
1	48	.38	3	91	.34	.43	.51	.85	93	13	Q13
1	48	.38	4	40	.48	08	.61	14	72	13	Q13
2	56	.28	3	91	.34	.36	.44	.80	135	13	Q13
2	56	.28	4	40	.48	16	.56	28	114	13	Q13
3	91	.34	4	40	.48	51	.59	87	83	13	Q13

3. Differential Item Function by Age (1 = <65; 2 = 65-74; 3 = 75+)

PERSON GROUP	DIF MEASURE	DIF S.E.	PERSON GROUP	DIF MEASURE	DIF S.E.	DIF CONTRAST	JOINT S.E.		d.f.	ITEM Number	Name
1	.61	.28	2	.43	.29	.18	.40	.44	133	2	Q2
1	.61	.28	3	25	.30	.85	.41	2.11	135	2	Q2
2	.43	.29	3	25	.30	.68	.42	1.63	146	2	Q2
1	04	.29	2	17	.30	.13	.42	.31	135	9	Q9
1	04	.29	3	16	.29	.12	.41	.28	137	9	Q9
2	17	.30	3	16	.29	01	.42	03	148	9	Q9
1	-1.26	.32	2	40	.32	86	.45	-1.90	130	13	Q13
1	-1.26	.32	3	23	.29	-1.03	.43	-2.37	136	13	Q13
2	40	.32	3	23	.29	17	.43	40	144	13	Q13

4. Differential Item Function by Education (1 = < High school; 2=high school; 3=some college; 4= college graduate)

	PERSON GROUP	DIF MEASURE	DIF S.E.	PERSON GROUP		DIF S.E.	DIF CONTRAST	JOINT		d.f.	ITEM Number	Name
-	1	.64	.33	2	.15	.31	.49	.45	1.08	118	2	Q2
	1	.64	.33	3	28	.33	.92	.46	1.99	108	2	Q2
	1	.64	.33	4	.70	.35	06	.48	13	95	2	Q2
	1	.64	.33	9	05	1.25	.69	1.29	.54	59	2	Q2
	2	.15	.31	3	28	.33	.44	.45	.97	112	2	Q2
	2	.15	.31	4	.70	.35	55	.47	-1.18	99	2	Q2
	2	.15	.31	9	05	1.25		1.29	.16		2	Q2
	3	28	.33	4	.70	.35	99	.48	-2.06	89	2	Q2
	3	28	.33	9		1.25		1.29				Q2
1	4	.70	.35	9	05	1.25	.76	1.30	.58	40	2	Q2
ı	1	06	.36	2	33	.31	.26	.48	.55	120	9	Q9
	1	06	.36	3	28	.33	.22	.49	.45	108	9	Q9
	1	06	.36	4	.46	.36	52	.51	-1.02	96	9	Q9
	1	06	.36	9	05	1.25	01	1.30	01	59	9	Q9
	2	33	.31	3	28	.33	04	.45	10	114	9	Q9
	2	33	.31	4	.46	.36	78	.47	-1.66	102	9	Q9
	2	33	.31	9	05	1.25	27	1.29	21	65	9	Q9
	3	28	.33	4	.46	.36	74	.48	-1.53	90	9	Q9
	3	28	.33	9	05	1.25	23	1.29	18	53	9	Q9
1	4	.46	.36	9	05	1.25	.51	1.30	.39	41	9	Q9
ı	1	13	.37	2	47	.31	.35	.49	.71	118	13	Q13
	1	13	.37	3	98	.36	.86	.52	1.66	106	13	Q13
	1	13	.37	4	91	.41	.78	.55	1.42	95	13	Q13
	1	13	.37	9	-1.90	1.44	1.77	1.48	1.20	59	13	Q13
	2	47	.31	3	98	.36	.51	.48	1.07	110	13	Q13
	2	47	.31	4	91	.41	.44	.51	.85	99	13	Q13
	2	47	.31	9	-1.90	1.44	1.43	1.47	.97	63	13	Q13
	3	98	.36	4		.41		.54	14	87	13	Q13
	3	98	.36	9	-1.90	1.44	.92	1.48	.62	51	13	Q13
	4	91	.41	9	-1.90	1.44	.99	1.49	.66	40	13	Q13

5. Differential Item Function by	y Race/Rural ((1= African American 2 = His	panic; 3= Rural)

PERSON GROUP	DIF MEASURE	DIF S.E.	PERSON GROUP	DIF MEASURE	DIF S.E.	DIF CONTRAST	JOINT S.E.		d.f.	ITEM Number	Name	 -
1 1	.66	.25	2	12	.30	.78	.39	1.98	144	2	Q2	
1	.66	.25	3	.11	.30	.54	.39	1.38	138	2	Q2	
2	12	.30	3	.11	.30	24	.43	55	140	2	Q2	
1	02	.27	2	12	.30	.10	.40	.26	144	9	Q9	
1	02	.27	3	15	.30	.14	.41	.33	140	9	Q9	
2	12	.30	3	15	.30	.03	.43	.08	144	9	Q9	
1												
1	77	.29	2	49	.30	28	.42	66	144	13	Q13	
1	77	.29	3	64	.32	13	.43	30	136	13	Q13	
2	49	.30	3	64	.32	.15	.44	.34	138	13	Q13	

Question 8. What data do you have to support validity testing of the CTM®?

Concerning validity, CTM® data were analyzed treating the items as both continuous and categorical data, allowing for a cross-method validation of the domain structure. Construct validity was also determined by examining the ability of the CTM® to discriminate patients who had an emergency department visit or re-hospitalization for the index condition from those who did not. This data was then converged with patients' reports of negative experiences after their discharge from the hospital. Please also see Question #5 below in the document attached below that compares CTM-3 performance versus HCAHPS. CTM-3 items strongly load on the IOM domain of patient-centeredness.

Please refer to the published manuscript:

Coleman, EA, Mahoney E, Parry C. Assessing the Quality of Preparation for Post-Hospital Care from the Patient's Perspective: The Care Transitions Measure. Medical Care. 2005;43(3):246-255.

Question 9 How was reliability assessed?

Please refer to the published manuscript:

Coleman, EA, Mahoney E, Parry C. Assessing the Quality of Preparation for Post-Hospital Care from the Patient's Perspective: The Care Transitions Measure. Medical Care. 2005;43(3):246-255.

In a different nationally selected inpatient population tested in 2006, Cronbach's alpha was 0.86

Question 10.

Does evidence suggest that there are interventions to address the topic of care coordination out of the hospital effectively?

The Institute of Medicine report, Crossing the Quality Chasm: A New Health System for the 21st Century, strongly advocates improved coordination of care among services and settings. Performance measurement is an essential step towards accomplishment of this goal. The report notes that initiatives should focus not only on the care delivered in the hospital, but how prepared patients are to receive care

in the next setting. Multiple randomized controlled trials, including one conducted by the developer, have confirmed that improved care coordination at the time of hospital discharge can improve patient's experiences and reduce the need for subsequent hospital readmission. ^{1 2 3}

Question 11.

What data collection methods are available for the CTM-3

The developer has used experience using both telephone and mailed survey approaches. Either approach is acceptable and does not influence the responses obtained.

Question 12.

Should process measures like the CTM-3 be replaced by outcomes measures?

Responders asked whether an outcome measure such as hospital readmission should replace process of care measures.

The CTM® measures the extent to which patients are being prepared to participate in post-hospital self-care activities. The developer has demonstrated that patients' reported preparation in these areas (i.e., responses to the CTM-3) predicts recidivism.

However, the published literature is quite clear that the converse statement that all recidivism is due to poor preparation is not accurate. Thus, an important role remains for employing measures beyond recidivism, and process of care measures currently represent the best approach to understanding performance in this critical area.

Ouestion 13.

Could the developer please clarify the CTM-3 specifications?

Please see the attached document that provides information on CTM-3 specifications.

Question 14.

What is the relationship between the CTM-3 and HCAHPS ®?

In fairness to the developer, the National Quality Forum "Hospital Performance: Additional Priority Areas" call for measures was for coordination out of the hospital—not for new items to be considered for HCAHPS ®. Yet responders made numerous comments that either asked for more information regarding how CTM® items and HCAHPS ® items relate and also inquired as to whether CTM® items would be integrated into HCAHPS®. The developer would like to recognize that some of these concerns are outside of NQF's criteria for evaluation and selection of measures; namely importance, scientific acceptability, feasibility and usability.

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¹ Naylor, M et al. Comprehensive discharge planning and home follow-up of hospitalized elders: a randomized clinical trial. JAMA. 1999 Feb 17;281(7):613-20.

² Coleman, EA et al. The Care Transitions Intervention: results from a randomized controlled trial. *Under Review* in the Archives of Internal Medicine.

³ Coleman, EA et al. Preparing patients and caregivers to participate in care delivered across settings: the Care Transitions Intervention. J Am Geriatr Soc. 2004 Nov;52(11):1817-25.

First, the developer would like to reiterate that the CTM-3 was submitted in response to NQF's call for measures as a stand-alone measure. The developer is willing to explore how the CTM-3 could be incorporated into an existing measure, including HCAHPS®. The CTM developer also would like to acknowledge its lack of influence over the HCAHPS® developer. Compatibility with HCAHPS® or lack thereof should not significantly affect the decision of CTM-3 endorsement.

The CTM-3 developer has great respect for the HCAHPS ® developer and does not wish to disparage this important measure in any way. However, while the developer respects the central role HCAHPS ® was designed to play in assessing hospital care performance, it also recognize that HCAHPS ® was not designed to assess coordination of care out of the hospital per se. The CTM-3 developer understands that it is not alone in voicing these concerns over whether HCAHPS ® items adequately address coordination/transition of care out of the hospital—these concerns have also been expressed by national leaders and members of the NQF review committees.

HCAHPS® currently includes two items related to discharge planning which although address important aspects of hospital care, do not necessarily equate with care coordination. For example, the question "During this hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?" raises a number of concerns. Based on multiple qualitative studies with patients, having the opportunity to speak with doctors and nurses about post-hospital needs was not rated as important as the opportunity to actively prepare for what will transpire in the next setting and one's role in self-care. The second HCAHPS® item asks, "During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?" Again, qualitative studies repeatedly identified that patient's frustrations were more centered on identifying who to contact should symptoms or problems arise, rather than knowing which symptoms to watch for (which also speaks to proper preparation). These same qualitative studies clearly articulate that patients' and families' preferences are not adequately incorporated into the post-hospital care plan. HCAHPS ® does not address this significant concern. Finally, there is a growing evidence base that medication misunderstandings is a serious threat to patient safety during the posthospital time period and contributes to recidivism. Understanding of medication instructions is not assessed by HCAHPS®. It is not known whether these two HCAHPS ® items predict recidivism. Further, reports from the HCAHPS ® developer acknowledge that these two items are among the poorest psychometric performers of the items in the current measure.

In contrast, CTM® items were specifically uniquely address coordination of care/transitions out of the hospital. Items were derived directly from qualitative studies of patients who were recently discharged from the hospital and thus, are truly patient-centered. CTM-3 items have been shown to predict recidivism and also discriminate among hospitals with varying performance in coordination out of the hospital. The 462 requests for permission to use the CTM-3 and the 156 performance measurement efforts that employ the CTM-3 speak to the demand for this measure. Hospitals and health care systems are seeking out this measure as unique and distinct and not addressed by other nationally prominent measures, including from HCAHPS®. Thus, the CTM® fills an important gap identified as a priority area for performance measurement by the Institute of Medicine in its report to Congress and CMS, "Performance Measurement: Accelerating Improvement".

However, in keeping with the spirit of NQF review process, we have attempted to conform CTM® item specifications to be more aligned with HCAHPS® items (please see the separate attached document concerning specifications) to facilitate the process in the event that there is an opportunity to explore potential consolidation.

The CTM-3 developer received permission and additional funding to conduct a "head-to-head" comparison between the three CTM® items and the two HCAHPS® discharge planning items. The CTM-3 developer hypothesizes that this testing will demonstrating that the two sets of items are indeed two distinct constructs and thus the items are not simply interchangeable. Please see the next section for the results of this testing.

Of note, the CTM-3 developer requested that the order of the CTM-3 items and the two HCAHPS® discharge planning items be varied to explore whether responses could be "gamed" depending on the order of items. Unfortunately, permission was not granted by the HCAHPS® developer (per the survey unit).