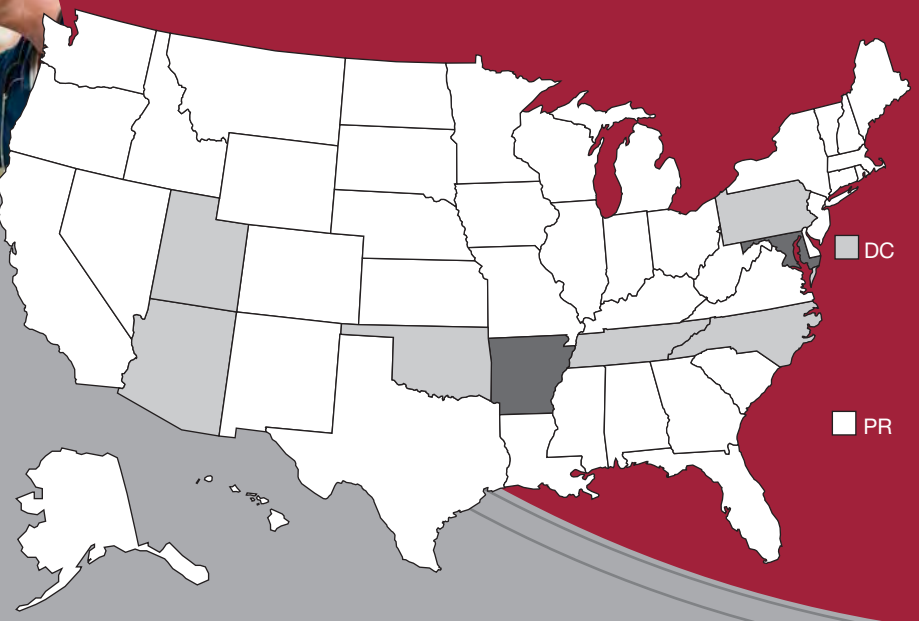
FINAL CONTRACT REPORT

Evaluation of Stage 3 Meaningful Use Objectives: Maryland and Arkansas



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HEALTH IT

Final Contract Report

Evaluation of Stage 3 Meaningful Use Objectives: Maryland and Arkansas

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Preface

This project was one of four task order contracts awarded under the Evaluation of Stage 3 Meaningful Use (MU) Objectives request for task order (RFTO). The purpose of the RFTO was to fund rapid cycle evaluation studies of the implementation of Stage 3 MU proposed objectives of the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs. Specifically, the evaluations were to yield—

- Proposed strategies for improving the objectives at the policy level.
- Proposed EHR innovations that would better enable providers to meet the proposed objectives.
- Suggestions for hospitals and/or ambulatory practices on how to increase the value to them of MU objectives.

About ACTION II

This project was funded as an Accelerating Change and Transformation in Organizations and Networks (ACTION) II task order contract. ACTION II is a model of field-based research designed to promote innovation in health care delivery by accelerating the diffusion of research into practice. The ACTION II network includes 17 large partnerships and more than 350 collaborating organizations that provide health care to an estimated 50 percent of the U.S. population.

For more information about this initiative, go to http://www.ahrq.gov/research/findings/factsheets/translating/action2/index.html

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Executive Summary

The HITECH Act initiated a major wave of electronic health record (EHR) adoption among hospitals and ambulatory care providers through incremental incentives. These incentives are tied to providers' adherence to a predefined set of staged 'Meaningful Use' (MU) objectives of EHRs. The Medicare and Medicaid EHR Incentive Programs (i.e., the MU program) mandated under the 2009 American Recovery and Reinvestment Act was intended to broaden the use of electronic health records (EHRs) to advance patient quality, safety, and health care affordability across the United States. Over time, the focus and requirements for MU objectives have evolved from data collection (e.g., capturing demographics in Stage 1 MU) into a combination of data, functional, and workflow requirements (e.g., care coordination objectives in Stage 3MU).

Despite the MU program's success in increasing EHR adoption among providers, experts have expressed skepticism over the effectiveness of MU in improving health outcomes and lowering cost. Some providers have conveyed that the upcoming Stage 3 MU implementation will be complex and costly. In response to these concerns the Agency for Healthcare Research and Quality (AHRQ) has funded a number of projects (grants and contracts) to evaluate the feasibility and usability of proposed Stage 3 MU measures before the objectives are finalized. This report describes one of these AHRQ funded projects, which evaluates two of the proposed Stage 3 MU measures among a select number of eligible hospitals.

The main goal of this project is to evaluate the feasibility of two Stage 3 MU Care Coordination (CC) measures (i.e., SGRP 305 & 308) and to provide constructive feedback to policymakers and providers on modifying or amending these measures. This project assesses the feasibility of these two Stage 3 MU-CC objectives at nine hospitals in Arkansas and Maryland. The evaluation is categorized based on: (a) strategies for improving objectives at the policy level; (b) EHR innovations to enhance attaining the objectives; and (c) recommendations to increase internal value of Stage 3 MU-CC objectives.

Based on documentation published by the Office of the National Coordinator for Health Information Technology (ONC) at the beginning of this project, the two Stage 3 MU care coordination measures were defined as: (1) SGRP 305: For patients referred during an EHR reporting period, referral results generated from the EHR, 50 percent are returned to the requestor and 10 percent of those are returned electronically; and (2) SGRP 308: For 10 percent of patients with a significant health care event, eligible hospital will send an electronic notification to at least one key member of the patient's care team, with the patient's consent if required, within 2 hours of when the event occurs.

A balanced sample of hospitals from Maryland and Arkansas (five from Maryland and four from Arkansas) participated in this project. Participating hospitals represented a wide range of operational dimensions varying from a bed-count of approximately 950 and an annual operating expense of almost approximately $1.7 billion to a bed-count of approximately 115 and operating expenses of $130 million. The participating hospitals had some capability to exchange laboratory results, radiology reports and summary of care documents among their network members or external entities (other hospitals or ambulatory care clinics). All participating hospitals had attested to Stage 1 MU before the project started. The average rate of Stage 1 MU Core Measures achieved by all participating hospitals, during the last year of Stage 1 MU attestation, was 95.2

percent (excluding categorical measures). The overall average rate achieved for Stage 1 MU Menu Measures was 62.7 percent (excluding unreported measures).

Interviews, focus-groups, data collection instruments, and surveys are the main methods used in this project. The project started with an expert panel that provided in-depth feedback on both Stage 3 MU-CC objectives (i.e., SGRP 305 & 308). Analyzing the feedback resulted in an evaluation matrix that was used to construct the project's data collection instrument. Chief [Medical] Information Officers (CMIOs/CIOs) of all participating hospitals were interviewed before and after the data collection was conducted. The full survey, which includes the data collection process, was completed by six of the hospitals and a simplified version of the survey was completed by all hospitals. Results of the interviews, data collection instrument, and the survey were aggregated and merged to protect the identity of individual hospitals.

The results show mixed outcomes for different elements of the measures. In general, hospitals expressed both positive and negative views on the language of the objectives, showed variable feasibility rates to implement each measure using their existing EHRs, and estimated moderate to large value-added to their performance and outcome if the objectives were fully executed. In summary, the participating hospitals suggested simplifying and merging SGRP 305 into another existing measure (i.e., SGRP 303), and clarifying the details of SGRP 308. Following are highlights of the findings for each measure:

- **SGRP 305**: The project's data collection instrument includes a scale (ranging from 1 to 10) to gauge the difficulty associated with operationalizing each objective. Using this scale, the average difficulty to calculate SGRP 305 among participating hospitals was computed at 7.52 (out of 10). This rate represents a high level of difficulty to calculate and operationalize SGRP 305, even after using advanced IT methods. This difficulty was predominantly originated from the lack of structured data collected by providers and captured in EHRs. Indeed, the average success of the hospitals to compute the denominator of all elements that are necessary to operationalize SGRP 305 is only 11.1 percent. Notably the difficulty-level decreases as the care coordination referral requirements narrow from out-of-network providers to in-network providers only. In more than half of the cases (64 percent) the participating hospitals had to use a non-EHR system or did not know which IT system to use to collect the necessary data for SGRP 305 implementation. Most of the hospitals have existing EHR modules that can make this measure feasible; however, none have a dedicated component to manage referral results. All participating hospitals have dedicated care coordination teams that can benefit from the rollout of this measure. Some of the hospitals are actively participating in a health information exchange (HIE) network and have the opportunity to accommodate this objective through an HIE organization as well.
- **SGRP 308**: The average difficulty to calculate this measure among the participating hospitals is 6.60 (out of 10). This score represents a moderate difficulty to operationalize SGRP 308. In addition, this rate is lower than SGRP 305's difficulty rate thus making SGRP 308 more feasible to implement. This difficulty is mainly due to the fact that SGRP 308 data elements are often dispersed in various data repositories and cannot be accessed in real time. The difficulty-level decreases as the 'significant health care event' notification narrows from outside providers to in-network providers. The average success of the participating hospitals to calculate the denominator for various elements of this measure is 23.3 percent. In more than two-thirds of the cases (67 percent) the

participating hospitals can use their EHR system to collect the necessary data to measure SGRP 308 but may not be able to operationalize it. Most of the hospitals have EHR modules that can make parts of this objective feasible; however, none have dedicated EHR components to operationalize all pieces. For example, all hospitals have contact management systems that include the contact information of care team members, but none of the systems cover all details necessary to achieve this measure (e.g., regularly updating the contact information and having patient consent matched with individual care team members). Some of these hospitals have HIE connections and might be able to expand on them to accommodate this objective.

Note that this project has also produced additional results for other Stage 3 MU measures (e.g., SGRP 303), but those findings are considered secondary and are only included in the appendices.

Participating hospitals furnished the project team with their concerns and suggested solutions for both measures. These recommendations address factors that can increase the feasibility of a successful implementation for these measures by: adjusting the existing Stage 3 MU policy, proposing EHR innovations, and enhancing the potential value-added to hospitals. Following is a set of common themes that was extracted from the collective recommendations for both measures:

- Need for a clear language of objectives: The language of the SGRP 305 and 308 measures (based on a version published at the start of this project) has specific data elements that are ambiguous and may have different connotations to different providers. For example, the term 'referral' does not specify the types of referral. And, the term 'arrival at ED' does not distinguish itself from 'admission to ED'.
- Potential mergers of objectives: There was consensus among participating hospitals that these measures can be merged with other Stage 3 MU objectives to reduce confusion and streamline the development and implementation processes. For example, SGRP 305 can be merged into SGRP 303. [Note that this merger indeed became effective at the policy level in early 2014—midway through the project]
- Exclusion criteria or optionality for the objectives: Most of the participating hospitals suggested making the more challenging Stage 3 MU measures, including SGRP 305 and 308, optional (i.e., converting them from a core objective into a menu objective). In addition, these hospitals currently cannot achieve SGRP 305 and 308 to their full extent, unless the language of the measures adds exclusions for certain cases or softens its thresholds. For example, not having an active state-wide or regional HIE for a given hospital could be a factor to make these measures optional.
- Challenges beyond EHR certification: Despite the fact that future EHR certification criteria may demand automating most of the functions needed to achieve SGRP 305 and 308, participating hospitals stressed the fact that these measures go beyond EHRs and will affect their clinical workflows. For example, the workflow of care coordination staff will change considerably to accommodate a successful implementation of the Stage 3 MU-CC measures. In addition, these measures will require health information technology (IT) systems that are often assumed not to be a component of an EHR. For example, EHRs are often not suitable to maintain a comprehensive and up-to-date 'patient - care member - consent' information management platform.

- HIE connectivity: Connectivity to an active HIE organization that has high penetration among hospitals and outpatient offices is infrequent and not under the purview of the participating hospitals. Additional HIE development on local, regional and state-wide levels is required to facilitate the implementation of Stage 3 MU's care coordination objectives. In addition to exchange of notifications, HIEs can assist eligible hospitals to overcome the issues with 'patient identification' to support care coordination. For example, the receiving provider of a referral result can use the centralized patient identification service provided by an HIE (e.g., master patient index) to find the local EHR records of the referred patient.
- Interoperability: Although standards of health information exchange have become widely available through the efforts of multiple organizations, the adoption of such standards is still in its early stages. EHR certification should build upon these standards to facilitate direct EHR-to-EHR exchanges. This will be critical in accomplishing Care Coordination measures of Stage 3 MU as it will increase the flexibility of the providers to automate these measures without major changes to their workflow.

Stage 3 MU's Care Coordination measures—specifically SGRP 305 and 308—will raise the bar on the meaningful use of EHRs. These objectives, however, need to accommodate the challenges that eligible hospitals are facing to achieve such measures. All of the participating hospitals in this evaluation project have already attested to Stage 1 MU but are facing unexpected challenges as Stage 2 MU measures are being rolled out. Results of Stage 2 MU attestation, along with findings of other Stage 3 MU evaluation projects, can guide policymakers to fine tune future objectives in a way that not only raises the bar, but also sets the bar at a compelling level that is achievable by most of the eligible hospitals. Furthermore, introducing flexibility in how hospitals will roll out these measures (e.g., including exclusion criteria or making parts of the measures optional) may propel the likelihood of hospitals to accomplish these measures successfully.

Introduction

Context / Background

Overview of Meaningful Use (MU) of Electronic Health Records (EHRs)

The EHR Incentive Programs, funded by the Health Information Technology for Economic and Clinical Health (HITECH) Act and supported by the DHHS, have enabled medical providers to defray the adoption cost of electronic health records (EHRs). Promoted by the Office of the National Coordinator for Health Information Technology (ONC) and administered by the Centers for Medicare & Medicaid Services (CMS), this program offers medical providers fixed incentives to meaningfully adopt certified EHRs in practice. These conditional incentives are set in staged 'Meaningful Use' (MU) objectives that are informed by ONC's Health IT Policy Committee (HITPC) recommendations. Medical providers are required to attest achieving the MU objectives to become eligible for these incentives. To complete attestation, providers should reach specific thresholds for all core objectives and a minimum number of menu objectives for each MU stage.[1]

The Centers for Medicare & Medicaid Services EHR Incentive Programs are being released in three stages. Stage 1 MU was published in 2011 and went into effect in 2012. Providers were given a deadline of end of 2013 to attest to Stage 1 MU in order to receive Stage 1 MU incentives. Early in 2014, Stage 2 MU became effective and the first round of attestation was opened in May 2014. In June 2014, Stage 2 MU's deadline was set at the end of 2016. Stage 3 MU objectives have been updated multiple times since the initial draft version for public comments was published in January 2013. The Notice of Proposed Rule-Making for Stage 3 MU was published in the *Federal Register* in March 2015.

MU stages are released with incremental increases in both coverage and depth of objectives. Increased coverage is the result of introducing new objectives in a stage, while increased depth often is the result of elevated thresholds for an existing objective. In this continuum of incremental stages, Stage 1 MU is considered a base stage that enhances the use of EHRs for data capture and sharing. Stage 2 MU is considered a more enhanced stage focusing on the advancement of clinical processes. Stage 3 MU is considered the most advanced stage with a special focus on improved outcomes. The Stage 3 MU draft has proposed to retire a series of Stage 1 MU and Stage 2 MU objectives due to an observed ceiling effect, while introducing a number of new objectives that could potentially modify and improve the process of medical care.

MU incentives apply to Eligible Hospitals (EH) [including Critical Access Hospitals (CAHs)] and Eligible Professionals (EP). EPs participate in the program on the calendar year, while EHs participate according to the Federal fiscal year. Both EHs and EPs must attest to demonstrating meaningful use every year to receive incentives and avoid Medicare payment adjustments. Studies have shown significant factors affecting EHs in achieving Stage 1 MU objectives. For example, being a small rural hospital increases the likelihood of not achieving Stage 1 MU objectives in data derived from a sample representative of EHs.[1]

Adoption Rates of MU among Providers

Multiple concurrent factors have propelled the adoption of MU among both eligible hospitals (EHs) and eligible professionals (EPs).[3] These factors include a series of items ranging from EHR's technological advancements to increased e-readiness of providers. Among these factors, the HITECH Act and consequently MU program's financial incentives have been the main driving forces of EHR adoption. The rates of EHR adoption and MU attestation have increased exponentially since 2008, thus creating a potential prime infrastructure to achieve larger health reforms (e.g., leveraging care coordination e-infrastructure in accountable care organizations and patient-centered medical homes).[4]

EHR adoption and consequently Stage 1 MU attestation have grown multifold in recent years. Stage 1 MU attestation has increased from 15 percent among Medicare-eligible providers (both EHs and EPs) in 2011 to 59 percent in 2013.[5] As of May 2014, Stage 1 MU attestation among EHs has reached approximately 94 percent nationally.[6] In the same timeframe, the attestation rate of Stage 1 MU has reached 95 percent among Arkansas EHs, while Maryland has already achieved 100 percent Stage 1 MU attestation among its EHs. The total national payment for EHs, in both the Medicare and Medicaid EHR Incentive Programs, has surpassed $14,604 million[6].

The EHR adoption among EHs has seen a greater increase than that of EPs. EH adoption of EHRs has increased more than five-fold since 2008.[7] Indeed, EHR adoption among EPs has increased from 34.8 percent in 2007 to 71.8 percent in 2012 (any type of EHR) while EHR adoption among EHs (non-Federal acute hospitals) has increased from 9.4 percent in 2008 to 59.4 percent in 2013 (basic EHR with clinical notes). The average EH adoption of basic EHRs in both Arkansas (78.2 percent) and Maryland (73.0 percent) is significantly higher than the national average.

Conceptual Perspectives on and Concerns With MU Adoption

There have been a few political and sometimes legal criticisms of the current wave of EHR adoption among providers. For example, some political groups have considered MU's value in improving health outcomes overestimated, the Government Accountability Office (GAO) has shown an over-reporting for attestations, and a few pilot studies have shown significant geo-differences for MU adoption among providers. The common concern expressed in these commentaries and scientific findings is primarily focused on setting the bar too high and too soon. These findings often point out that evaluating MU implementation in the context of advanced integrated delivery networks can potentially inflate successful results. This has necessitated the feasibility evaluation of Stage 3 MU implementation, which is considered the most complex MU so far, in a generalizable subsample of EHs with various levels of health IT advancements. To achieve such a balanced evaluation, MU studies should consider: enrolling various EHs from different regions (to generate unbiased data), evaluating readiness of EHs for MU before and after implementation (to propose effective EHR innovations and workflow changes), and offering a pragmatic and customizable guideline to EHs for MU implementation (to maximize the value of MU adoption). Following is a short review of key perspectives on MU adoption:

Empowerment Through legislation and Financial Incentives

As discussed, the 2009 HITECH Act[8] authorized incentive payments through the Medicare and Medicaid programs to increase physician adoption of EHR systems.[9,10] The Congressional Budget Office estimates that from 2011 through 2019, EHR incentives will total $30 billion.[11] To receive an EHR incentive payment, providers must attest that they are "meaningfully using" (MU) certified EHRs by meeting certain objectives.[12,1] MU will be achieved in three stages[13]: Stage 1 MU focuses on structured data entry in the EHR; Stage 2 MU guides clinicians on the use of technology toward advanced clinical processes; and, Stage 3 MU will be aimed at achieving and measuring improved patient outcomes.[14] As of 2012, the major driving force for MU adoption, in both levels of Stage 1 MU and Stage 2 MU, has been the incentives. Questions remain on the sustainability of EHR adoption, especially among EPs, when incentives turn into penalties.

Increasing Rates of EHR Adoption and MU Attestation

(a) Eligible Hospitals: Since 2008, hospital adoption of EHR technology to meet MU objectives has increased substantially. The hospitals' capability to meet each of the MU objectives grew significantly from 2008 to 2012. For example, the 'advanced directive' objective has increased from a nationwide coverage of 45 to 80 percent among EHs, the 'problem list' objective has grown from 44 to 78 percent, and the 'use of CPOE for medication entry' has almost tripled (from 27 to 72 percent).[15]

(b) Eligible Professionals: In 2012, 72 percent of office-based physicians used EHR systems,[16] up from 48 percent in 2009 and 54 percent in 2011.[17,4]

About 40 percent of office-based physicians reported having a system that met the criteria for a basic system,[16] up from 22 percent in 2009.[17] Primary care physicians' (PCPs) adoption of EHRs, with the potential to meet MU, nearly doubled from 2009 to 2011 (18 to 38 percent), and was significantly higher compared to specialists in 2011 (19 percent).[18] In 2011, half of physicians (52 percent) expressed their intention to apply for MU incentives.[18] Multivariate analyses report that EHR adoption was significantly higher in both 2010 and 2011 compared to 2009, and PCPs are more likely to adopt EHRs with the potential to meet MU.[18] In 2012, 66 percent of office-based physicians reported that they planned to apply, or already had applied, for MU incentives.[16]

(c) Reciprocal effect of adoption: The increased adoption of MU objectives among EHs has shown a positive reciprocal reinforcement among EPs. Various factors such as new care coordination responsibilities of EPs, in addition to MU incentives, have significantly increased the penetration of EHRs among EPs, particularly PCPs. Perhaps the increased level of MU attestation among PCPs has motivated EHs to consider 'Care Coordination' MU measures a feasible objective in the near future.

Evolving MU Objectives and Health Care Delivery Concepts

(a) Topped out measures: Some of the evolving MU objectives, which are inherited and enhanced from one MU stage to another, have already passed the MU thresholds.[15,19] From 2008 to 2012, hospitals' attestation rate on meeting certain Stage 1 MU objectives that are also continued in Stage 2 MU rose considerably, with increases ranging from 32 to 167 percent.[20] Of

the Stage 1 MU objectives that were examined among EHs, sixteen objectives had adoption rates of at least 80 percent in 2012.[20,21] Hospital adoption rates for 13 Stage 2 MU objectives increased by at least 20 percent between 2011 and 2012.[20] Consistent with these findings, a number of Stage 1 MU/Stage 2 MU objectives are assumed to be topped out for both EHs and EPs and thus are suggested to be retired in Stage 3 MU.[22] Consequently, the 'new' Stage 3 MU objectives are considered 'new' challenges and have gained special attention both in the health IT community and among the MU adopters.

(b) Effect of health care reform and new delivery concepts: The Affordable Care Act (ACA)[8] has introduced and reinforced certain health care delivery concepts such as Accountable Care Organization[23,24] (ACO) and Patient-Centered Medical Home[25,26] (PCMH) models. The primary goal of such models is to facilitate achieving the triple aims[27,28] (lowering the cost of care, improving population health outcomes, and mending the experience of care). The underpinning functionality of these delivery models, such as care coordination, is tied into the effective and efficient use of health IT infrastructure,[29] namely EHRs. For example, a report[30] shows that more than 39 percent of the EHs rely on their internal EHRs and MU objectives to address ACO requirements such as enhanced care coordination among hospitals and PCPs. The need to maximize the utility of MU is also evident in PCMH structures in which the PCP is incentivized to effectively coordinate care.[31] Thus, MU has created a context in which the objectives not only increase EHR adoption directly, but may also affect health outcomes indirectly.[32,33]

Criticism of MU objectives

(a) Variations in attestation and incentives: The GAO has identified significant variations in the accuracy of MU attestation among EP/EHs and has provided specific recommendations to CMS to improve its MU verification process.[34] The GAO has also demonstrated that in 2011, almost 80 percent of the EHs that have participated in the Medicare EHR program have claimed an exemption for at least one MU measure thus unbalancing the representation of MU attestation for true MU adoption.[34] By 2011, almost 40 percent of the EHs were awarded a total of $1.7b in Medicaid EHR incentive payments and 16 percent of the EHs received a total of $1.3b under the CMS Medicare incentives. Furthermore, the GAO has raised concerns that the percentage of MU incentives was skewed based on EHs' geographical location (e.g., urban versus rural) and clinical setting (e.g., acute care versus CAH; and number of beds)[11] thus requiring further investigations on variables affecting MU adoption among EHs. For example, acute care hospitals were 1.7 times more likely to have been awarded a Medicaid EHR incentive payment when compared to CAH.[11]

(b) Underachievement of certain MU categories: Based on recent ONC reports,[15] between 2011 and 2012, some of the Stage 1 MU objectives for EHs have improved more than others. For example, the Stage 1 MU category of 'Quality, Safety, and Efficiency' has improved considerably while most of the Stage 1 MU objectives targeting 'Care Coordination' (CC) and 'Public and Population Health' have not.[15] This necessitates investigating the facilitator and barriers to such low-progressing MU categories (e.g., Stage 3 MU-CC).

(c) Political criticism of HITECH and MU: A working group of the U.S. Senate has cautioned against the potential hidden cost of MU and other HITECH expenses.[35] The report raises a series of key implementation deficiencies such as lack of interoperability, uncontrolled costs, lack of oversight, and fragile sustainability.[35] The working group specifically indicates that "some technologically integrated suburban hospitals are being held back from using more

advanced capabilities," implying the fact that a fair representation of EHs are required to assess MU objectives properly.

(d) Possibility for inflated MU experiments: CMS currently has an aggressive, one-size-fits-all implementation schedule to achieve MU. This plan does not account for the different capabilities of providers to comply with the MU requirements.[35] For example, using a large Integrated Delivery System or a set of urban EHs can easily inflate the results and decrease the generalizability of findings.[36]

(e) Common gaps in MU research: Current MU studies mainly rely on surveys of providers and/or publicly available databases such as Medicare attestation data.[13,18] There is a growing need to evaluate MU adoption based on EHR data as well as EHR functionalities and on-the-ground workflow elements.[37,38,39]

Possible Solutions

A combination of the following solutions is used in this project to address the aforementioned concerns about MU's implementation and evaluation:

(a) Using a balanced sample of hospitals: A mixed sample of urban, suburban, rural; teaching and non-teaching; with different bed sizes; and, across different states should be used to evaluate the implementation of Stage 3 MU.

(b) Developing an evidence-driven methodology: Objective data, functions, and workflow elements should be used to develop a comprehensive readiness concept, instead of subjective attestation information only.

(c) Develop comparable benchmarks: Most of the national indicators of MU adoption are not harmonized and may not be applicable to individual hospitals. The benchmarks can also consider state and local variables.

(d) Create pragmatic and adaptable guidelines: Solutions should conclude with pragmatic Stage 3 MU implementation guidelines (i.e., recommendations) that can be customized based on local conditions and benchmarks, thus increasing the feasibility of adoption by a wide range of EHs.

AHRQ-Funded Stage 3 MU Projects

Scientific evidence on the readiness of providers in adopting advanced stages of MU is shallow. This has been partly due to the fact that earlier stages of MU, especially stage 1, have been easier to operationalize and simpler to associate with improved health outcomes (e.g., capturing demographics and vital signs are essential for medical decisionmaking). Hence, the scientific debate on the balance of Stage 1 MU's usefulness versus implementation complexity has been limited. The recent and future stages of MU (i.e., Stage 2 MU and Stage 3 MU), however, are considered complex and require more in-depth scientific evaluation to affirm a positive cost-effectiveness balance.

As discussed earlier, industry experts and government officials have expressed skepticism over the effectiveness of MU in improving health outcomes and lowering cost. Some providers have imparted that the upcoming Stage 3 MU implementation will be complex and costly. In response to these concerns, policymakers have decided to evaluate the feasibility and usability of MU measures before finalizing the Stage 3 MU objectives, and perhaps if necessary, adjusting

Stage 3 MU measures before rolling them out. AHRQ has provided one of the few funding opportunities to evaluate the effect of Stage 3 MU requirements on policy issues, EHR innovations, and health outcomes, before the objectives are finalized (i.e., R18 NOT-HS-13-006 to measure the feasibility of Stage 3 MU among EPs and ACTION-II RFTO32 to evaluate Stage 3 MU among EHs). Findings of these projects will provide HITPC with feedback on how to adjust the final language of Stage 3 MU objectives if deemed necessary. One of these projects—which evaluates two Stage 3 MU-CC measures among a select number of hospitals in Arkansas and Maryland—is described in this document.

AHRQ funding has also provided the opportunity to not only showcase exemplar Stage 3 MU demonstrations in limited settings but also reveal the underlying feasibility differences in Stage 3 MU implementation by enrolling a number of hospitals that represent a balanced selection of EHs with various health IT capabilities. In this project, a mixed number of hospitals are enrolled to evaluate the implementation of Stage 3 MU-CC. This sample includes hospitals with various specifications including urban, suburban, and rural; teaching and non-teaching; high and low bed counts; and different MU attestation levels.

Project Overview

Project Specifications

Overall Contract Aims

This AHRQ-funded contract is meant to evaluate the proposed Stage 3 MU objectives among EHs. A key desired outcome of this contract is to identify strengths and weakness of the Stage 3 MU objectives and to propose policy and technical strategies for improving the measures as the program is rolled out over the next few years. Another intended outcome is to identify EHR/health IT innovations that would support the attainment of Stage 3 MU objectives and to suggest approaches that would assist EHs in maximizing the value of participation in Stage 3 MU. These outcomes will shed light on ways to modify Stage 3 MU that lead to increased benefits for patients, providers, and society-at-large.

Project Aims

The main goal of this project is to evaluate the feasibility of Stage 3 MU's Care Coordination (Stage 3 MU-CC) measures and provide constructive feedback to policymakers on enhancing or modifying the language for Stage 3 MU-CC objectives before their final release later in 2014. The project evaluates the feasibility of Stage 3 MU-CC at a number of EHs in Arkansas and Maryland (a total of 9 hospitals). The evaluation is categorized based on: (a) strategies for improving objectives at the policy level, (b) EHR innovations to enable meeting the objectives, and (c) suggestions to increase internal value of implementing Stage 3 MU-CC objectives for EHs.

To achieve this goal, this project was initiated using a methodological approach to breakdown the intended Stage 3 MU-CC objectives into more granular and practical elements that can be measured throughout the study. Based on these elements, various existing MU-related databases were used to generate a customized benchmark to compare Stage 3 MU-CC readiness among EHs. These findings were then recalibrated and applied to the data that were collected from nine hospitals (5 in Maryland and 4 in Arkansas).

Draft Stage 3 MU Objectives Being Studied

We have used the publicly available 'request for comments' document, published by HITPC, in our discussions with EHs.[22] The latest work-in-progress documents published by HITPC may have already amended or addressed some of the challenges listed in this report. However, we have used the publicly available definitions specified in documents published by HITPC at the beginning of this study to assure generalizability of our findings throughout the entire study duration. Based on the aforementioned ONC-HITPC document the two Care Coordination measures are defined as:

SGRP 305 (EP & EH/CAH): "For patients referred during an EHR reporting period, referral results generated from the EHR, 50 percent are returned to the requestor and 10 percent of those are returned electronically"

SGRP 308 (EH/CAH only): "For 10 percent of patients with a significant health care event (arrival at an Emergency Department (ED), admission to a hospital, discharge from an ED or hospital, or death), EH/CAH will send an electronic notification to at least one key member of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required, within 2 hours of when the event occurs."

The reason for choosing these Stage 3 MU objectives is the importance of care coordination objectives in the future of health care delivery due to multiple impeding and driving factors such as: (1) expanding role of care coordination in the context of new health care delivery mechanism such as ACOs and PCMHs; (2) rising importance of care coordination for the growing population of patients with chronic diseases; and (3) increasing impediments in automating care coordination among providers due to policy, technical, and financial issues. In addition, the participating hospitals showed interest in these two measures, thus increasing the possibility of a successful project if these objectives were evaluated.

Project Tasks / Phases

This project was administered and managed by the Armstrong Institute (AI) at The Johns Hopkins University (JHU). The Center for Population Health IT (CPHIT)[40] at the Department of Health Policy and Management (HPM) of the Johns Hopkins School of Public Health (JHSPH) provided health IT domain expertise. Some team members have joint appointments in the Johns Hopkins School of Nursing (JHSON) or the Division of Health Sciences and Informatics (DHSI) at the Johns Hopkins School of Medicine (JHSOM). To expedite the project, parts of the contract were subcontracted to leverage already developed solutions required to maximize the project's outcome. The Hospital Associations of both Arkansas and Maryland played an active role in the project as well.

The project included two evaluation phases. Phase #1 aimed at developing an evaluation matrix for the selected Stage 3 MU-CC objectives (305 & 308). Phase #2 used the matrix to evaluate the readiness of the participating hospitals to achieve Stage 3 MU-CC objectives and then elicit ways to improve strategic policies, find EHR innovations to propel the feasibility of these objectives, and increase the value of these measures for the eligible hospitals.

Phase #1: Development of Stage 3 MU-CC Evaluation Matrix

In this conceptual phase the project team members collaborated with a group of domain experts to develop a matrix of measurable elements for Stage 3 MU-CC objectives through a consensus-driven methodology. This phase leveraged prior methodologies developed by the research team to develop frameworks for process and outcome measures.[41,42,43] Three categories were identified to cluster Stage 3 MU-CC matrix elements: (1) Data Elements: includes completeness of data, accuracy of data, and timeliness of data; (2) Functional Elements: contains EHR's capability to store data, availability of sub-functions to automate procedures, interoperability with external systems, vendor's official support, existence of alternative functions, and complexity of functions; and, (3) Workflow Elements: encompasses clinical and admin workflow issues, human-factor and usability issues of the system (efficiency, effectiveness, learnability, and user satisfaction).[44] and organizational factors.[45] The elements of this matrix were adopted to evaluate the feasibility of Stage 3 MU-CC implementation (see phase #2).

Phase #2: Pragmatic Evaluation of Stage 3 MU-CC Feasibility

This phase contains the majority of the project's activities and includes developing an Stage 3 MU-CC readiness index based on existing datasets, evaluating implementation readiness of enrolled hospitals to roll out the Stage 3 MU-CC SGRP 305 & 308 objectives, and comparing the implementation readiness with other hospitals.

In this phase the research team contacted individual hospitals and planned a mixed methodology to collect necessary information to evaluate the feasibility of Stage 3 MU-CC objectives given the contextual differences among these hospitals. The evaluation consisted of a preliminary interview of Chief Medical Information Officers (CMIOs) or Chief Information Officers (CIOs) of the hospitals, a detailed survey that was designed based on the evaluation matrix developed in phase #1, a readiness calculation based on the survey and other datasets acquired in the study, and an exit interview of the CMIO/CIOs.[46]

A total of 10 hospitals were initially identified and targeted for this study. A total of nine hospitals participated in this study with varying response rates. All hospitals provided responses to both 305 and 308 Stage 3 MU-CC measures; however, a number of them also provided responses to other Stage 3 MU-CC objectives. Each hospital followed its internal timeline and finished the project on a different deadline. Generally, hospitals were under pressure to implement Stage 2 MU objectives and were not able to meet the agreed-upon deadlines; however, additional support by research team members and further clarification for the data collection instrument helped the technical teams of each hospital to navigate the challenges and finish the study in a timely fashion.

Project Questions

Strategies for Improving Stage 3 MU-CC at the Policy Level

The main research question of this project is to determine changes needed to the language of Stage 3 MU-CC objectives that would increase the feasibility of these objectives among EHs. The HITPC draft language of Stage 3 MU-CC has been revised and commented upon since; however, this project utilized the 2013 draft as the original language for the evaluation process. Suggestions and recommendations for Stage 3 MU-CC SGRP 305 and 308 have already been communicated to the HITPC committee and are included in the findings of this report.

EHR Innovations to Support Meeting Stage 3 MU-CC Objectives

The second research question of this project focuses on innovative EHR applications that can propel the implementation of Stage 3 MU-CC objectives. These innovations range from new data collection methods, to innovative interoperability mechanisms, centralized data systems, and advanced EHR functionalities. These innovative solutions are mostly piloted in a conceptual stage and are yet to be evaluated fully in a large operational endeavor. Suggestions and recommendations for EHR innovations that support Stage 3 MU-CC objectives are also included in the findings of this report.

Increasing Internal Value of Stage 3 MU-CC Objectives

The third and last question of this project focuses on the internal approaches and processes that EHs can design, develop, and deploy in-house to increase the value-added of implementing the Stage 3 MU-CC measures. Given the contextual differences of each of the enrolled EHs, different solutions with various potential effects have been identified. Suggestions and recommendations for value-added approaches that benefit from Stage 3 MU-CC objectives are also included in the findings of this report.

Methods

Project Phase #1

Evaluation Matrix

An evaluation matrix was developed to deconstruct Stage 3 MU-CC 305 and 308 objectives into a series of data, functional, and workflow elements. These elements were considered by the project's domain experts to be essential for EHs to achieve the Stage 3 MU-CC measures. EHs were asked to capture and operationalize these elements to evaluate the overall feasibility of accomplishing the Stage 3 MU-CC objectives.

To development of the evaluation matrix were guided based on: (1) the HITPC's original draft of Stage 3 MU-CC objectives that includes the language of the 305 and 308 objectives, and the EHR certification requirements for them; (2) current CMS/ONC documentation on Stage 1 MU and Stage 2 MU measures that relate to care coordination; (3) current literature on care coordination and IT infrastructure needed to optimize it; and (4) clarification made by attending ONC workgroup sessions and personal communication with HITPC.

The approach used to develop the matrix was a Delphi model using a mixed panel of quality metrics experts (academic and professional), care coordination specialists (nurses and geriatricians), clinical informatics experts, and population health researchers.[47,48] The principal investigator of the project met, brainstormed, and discussed each of the measures with individual team members. Identities of the participants remained anonymous while the data acquisition and feedback loop were in progress. Participants provided two rounds of comments based on the feedback they received. Any remaining issues with potential differences of opinions were resolved first by the lead quality metric expert and then, if needed, with the collaboration of participating hospitals' CMIOs/CIOs. After all differences were fine-tuned, a final draft was shared with all team members for a last review. Remaining concerns with harmonization of the evaluation matrix were resolved before incorporating the matrix in phase #2 of the project. The fine tuning of the matrix was mainly focused on resolving the dissimilar terminologies used by different domain experts. For example, in the context of care coordination the word 'referral' has different connotations among clinicians compared to hospital administrators or IT specialists.

The output of this phase was a detailed matrix of Stage 3 MU-CC 305 and 308 objectives that identifies various data elements, EHR functionalities and workflow issues. These items should be addressed by EHs to increase the feasibility of the Stage 3 MU-CC objectives. The 'data' elements of the matrix included a series of sub-elements with different denominator definitions to identify various levels of feasibility in capturing and retrieving essential data elements (indicating data completeness, accuracy and timeliness for each denominator population). The 'functionality' and 'workflow' elements were mainly descriptive items defined by qualitative outcomes (indicating the existence and levels of EHR functionality or clinical workflow that can impact the Stage 3 MU-CC objectives).

The high-level breakdown of the data element for SGRP 305 included: Referral Types; Referral Results; Initiator or Requestor ID; and Indicator of Referral Process (received, completed, results returned, and receipt of results). The higher-level data elements were further broken down based on the timeframe of the reporting and organizational unit (receiving from and referring to). A similar approach was taken to analyze the feasibility of SGRP 308. This resulted

in multiple permutations of the data elements and sub-elements that are reflected in the data collection survey instrument. See Appendix A for details of the evaluation matrix.

Project Phase #2

Expert Panel Comments

During the development of the evaluation matrix, the expert panel also provided additional comments on each measure and its data elements. These comments varied from concerns about the ambiguity of the objectives' language to operational barriers to rolling out certain elements of the Stage 3 MU-CC measures. The comments were gathered in a semi-structured interview process following the evaluation matrix discussions. Comments were transcribed, and then grouped and analyzed using the grounded theory method (with two independent reviewers).[49,50,51] A summary of grouped comments is included in the Findings/Results section. Additional details of the comments are listed in Appendix B.

Participating Hospitals

Participating hospitals were selected from an initial list of eligible hospitals that met Stage 1 MU objectives before the study began and were proposed by the Maryland (MD) and Arkansas (AR) Hospital Associations. A call was scheduled between the principal investigator of the project and each of the hospital's CMIOs/CIOs to evaluate the feasibility of the project given the contextual barriers and challenges that each hospital faces. A total of 10 hospitals agreed to participate in the project, but only 9 of them finished the Stage 3 MU-CC evaluation process. The only Critical Access Hospital initially enrolled in the project had to drop out of the study due to severe IT resource limitation.

Each hospital's CMIO/CIO was contacted individually for an introduction to the project details. The communications included brief summaries of the project's goals, detailed information about the project phases and potential feasibility challenges with rolling out Stage 3 MU-CC objectives. A field coordinator, one for Maryland and one for Arkansas hospitals, assisted hospital staff to further understand the project details and avoid any pitfalls.

In general, the participating hospitals have the following common specifications:

- All offer general medical and surgical services as their primary services
- All are classified as short-term length of stay hospitals (i.e., none provide long-term care)
- None are considered a children hospital
- None are owned by a physician group
- None are considered a Critical Access Hospital (CAH)
- All are accredited by the Joint Commission and have Medicare certification
- All have a not-for-profit ownership structure
- All have a dedicated care coordination / case management unit
- All offer hospital-based outpatient care services
- All had achieved Stage 1 MU attestation before the Stage 3 MU-CC evaluation process started

The participating hospitals represent a balanced sample of hospitals from Maryland and Arkansas (see Table 1). A total of five hospitals from Maryland and four hospitals from

Arkansas participated in this evaluation project. One of the hospitals is officially considered a rural hospital, two hospitals are considered urban-rural (while designated as urban), and the rest of the hospitals are categorized as urban. One of the hospitals is part of a major academic medical school, two of them offer minor teaching opportunities, while the remaining six of them are not considered teaching hospitals. Five of the participating hospitals are part of a larger network. Two pairs of the participating hospitals are part of the same network. Participating hospitals have a wide range of sizes varying from a bed-count of approximately 950 and an annual operating expense of almost $1.7 billion to a bed-count of approximately 115 and operating expenses of $130 million. Most of the participating hospitals had some capability to exchange laboratory, radiology and summary of care documents among their own units or external entities (other hospitals or ambulatory care centers). All Maryland hospitals have active connection to a local HIE (health information exchange). Most of the Arkansas hospitals have the capability to connect to a health IT, but none is actively exchanging data through local HIEs (as of 2012). All participating hospitals, except two, could notify the PCP of their patients if an ED admission has occurred. Six of the participating hospitals could query additional health information for their patients from outside entities. The average rate of Stage 1 MU Core Measures (CM) achieved during the last year of Stage 1 MU attestation by all participating hospitals is 95.2 percent (excluding categorical measures). The average rate achieved for Stage 1 MU Menu Measures (MM) is 62.7 percent (excluding unreported measures; including categorical measures as 1 or 0). Detailed breakdown of the participating hospitals' specifications, grouped based on organizational structures, IT infrastructure, and MU attestation rates, are included in

Appendix B.

Table 1. Summary specification of participating hospitals (organizational, IT infrastructure, MU attestation)

#	Hospital	State	U/R	Teach	Net.	Beds	Ex. Data	HIE Part.	PCP ED	Qry. Out	CM Avg.	MM Avg.
1	Johns Hopkins Hospital	MD	U	Maj	Y	951	0.50	P	Y	Y	.960	.691
2	Western Maryland Regional*	MD	U	-	-	371	0.75	P	N	Y	.937	.833
3	Sinai Hospital of Baltimore*	MD	U	Min	Y_A	460	0.67	P	Y	Y	.954	.606
4	Calvert Memorial Hospital	MD	U	-	-	116	0.75	P	Y	Y	.935	.454
5	Northwest Hospital*	MD	U	-	Y_A	244	0.67	P	Y	Y	.932	.611
6	Washington Regional Med Center	AR	U	-	-	270	0.50	TF	Y	N	.962	.539
7	Mercy Hospital Fort Smith	AR	U	Min	Y_B	383	0.92	TF	Y	Y	.973	.608
8	Baxter Regional Med Center	AR	R	-	-	209	0.33	TF	N	N	.953	.690
9	Mercy Hospital Rogers	AR	U	-	Y_B	141	0.25	NP	Y	N	.959	.613

MD: Maryland; AR: Arkansas; U: Urban; R: Rural; Teach: Teaching role; Maj: Major; Min: Minor; Net: Part of a larger network; Y: Yes; YX: Yes and part of network X; Ex Data: Exchange capability for labs, reports, and summary of care within hospitals entities, outside hospitals, and outside ambulatory care centers; HIE Part.: Heath Information Exchange participation level; P: Participate in a local HIE/RHIO; TF: Have the technical framework but does not participate; NP: Neither has the framework nor participate in a local HIE/RHIO; PCP ED: Has the capability to electronically notify the primary care physician about the ED admission of their patients; Qry. Out: Can automatically query patient data from outside providers; CMAvg: Core Measure averages (excludes categorical measures); MMAvg: Menu Measure averages (includes categorical measures; excludes unreported measures).
* Data collected from these hospitals were partial.

Data Collection Process

Data collection occurred in three steps: Enrollment Interviews, Survey, and Exit Interviews.

1. **Enrollment Interviews**: After enrollment was confirmed an interview was conducted with the CMIO/CIO of each hospital. The interview included a brief overview of the Stage 3 MU-CC 303,[*] 305 and 308 measures, general challenges affecting the feasibility of data collection and implementation of such measures, and potential innovations that can propel the hospitals to achieve them. Interviews were transcribed and coded while discussions were conducted. Each of the project's field coordinators, one for Maryland and one for Arkansas, continued this discussion with CMIOs/CIOs and other IT staff

[*] Note that SGRP-303 was only included in the exit interviews and was excluded from the survey.

members before the survey was administered. All notes were collected, ratified and coded, and then presented to the panel of domain experts before the evaluation matrix was completed. Modifications to the evaluation matrix and eventually to the data collection instrument were finalized before the survey was rolled out. See Appendix D for the final version of the data collection instrument, which makes up the majority of the survey.

2. **Survey**: The project's survey was conducted via email communications. Two options of electronic document survey and an online data collection tool were provided. All hospitals responded by completing the electronic document survey. Data provided by the hospitals were cleaned and coded when necessary, and then collated and summarized in relational tables used for the analytic process.
3. **Exit Interviews**: After data collection was completed, an exit interview of CMIOs/CIOs was scheduled and conducted by a health IT expert to review and summarize the responses. Interviews were transcribed and encoded in order to inform and confirm the final summary of recommendations concluded from the survey.

Data Analysis Process

Grounded theory was used to code and analyze qualitative responses that were collected in interviews and the survey.[49,50,51] If the number of responses did not reach a critical mass, a simplified version of grounded theory was used that does not include inter-rater evaluation. Microsoft Excel was used to summarize the overall results and to facilitate the qualitative analysis. MySQL database was used to store and contain results of the data collection process as well as national datasets for hospitals specifications. R Statistical package was used to analyze hospital specifications and other quantitative results.

Findings and Results

Findings are categorized into multiple categories. Some categorizes only include findings that are collected in certain stages of the project. Some categories only include qualitative results, while some include both qualitative and quantitative results. All categories cover results for both Stage 3 MU-CC objectives (i.e., SGRP 305 and 308). The finding categories are: (1) Interviews and focus groups: outlines the overall and top concerns of domain experts on data elements used to define each of the Stage 3 MU-CC objective; (2) Data elements: summarizes the availability of Stage 3 MU-CC 'data elements' among participating hospitals; (3) EHR functionality: describes the EHR barriers and facilitators to operationalize Stage 3 MU-CC in participating hospitals; (4) Workflow issues: covers the human resource limitations and organizational issues faced by IT staff, clinicians and others to operationalize Stage 3 MU-CC; (5) Overall findings: groups the overall findings based on policy recommendations to make Stage 3 MU-CC objectives more feasible, potential EHR innovations to help hospitals achieve Stage 3 MU-CC objectives, and suggestions to increase value-added of implementing Stage 3 MU-CC for hospitals.

Results of Interviews and Focus Groups

Summary of Expert Panel Concerns on Individual Objectives

During the development of the evaluation matrix, the expert panel provided additional comments on each measure and its data elements. The comprehensive list of the comments is included in Appendix B. The overall summary of these comments follows (see Tables 2 and 3):

(1) Measure #1: SGRP-305: "For patients referred during an EHR reporting period, referral results generated from the EHR, 50 percent are returned to the requestor and 10 percent of those are returned electronically."

Table 2. List of top concerns expressed by expert panel members about SGRP-305 data elements

Data Element	Major Concerns	%*
Referrals	• Can a referral occur within an EH/CAH? What are the boundaries of a referral? Should the referral be requested by an outside provider relative to EH? How should we treat outpatient clinics that operate within the hospital settings (especially if they provide diagnostic tests for referrals)?	50
	• Does this measure include referrals taking place within the EH setting (a physician asks for a specialist consultation within the hospital)? If that is the case, then the EHR data is already accessible and there is no need for additional transmission of referral results.	50
	• What if the data does not leave the EHR? For example, if both PCP and EH are on the same EHR platform (e.g., they are part of the same health network). In this case, the referral results will be available in the EHR and there will be no need to transmit actual referral results—they are already stored in the EHR and are readily available. Including this type of referral in this measure will only inflate the ratio. The same is true if an ED doctor asks for a consultation referral from an EH physician of the same hospital.	37.5

Data Element	Major Concerns	%*
Referral Results	• What is the timeframe (time limit) to send back the referral results? Can an EH send the referral results a couple months after a referral occurs (when there is less clinical significance in knowing the results)? How would this measure address the timing issue (e.g., within X hours when the referral results become available)? Indeed, the temporality of the process is missing in the measure.	50
	• What are the bare minimum data elements that need to be included in the referral results?	50
Initiator/ Requestor ID (contact information)	• Most of the time the EHR does not have the correct ID of the requestor. Should we ask the patient? Which one is more reliable? Is there a way to get it from the HIE? Who can confirm the validity of the patient-PCP association?	25
Indicators of Referral Process	• Both 'Indicator of Referral Results Returned' and 'Indicator of Referral Return Receipt' are missing in the measure. For example, how can we ensure that the PCP [requestor] has reviewed the referral results? Are we adding extra burden on EHs where the potential outcome-effect is unreliable? PCPs usually review their patient panels once a day—how will the referral results be incorporated in their patient panels?	37.5

* Percentage agreement among panel experts. A total of eight experts participated in the panel.
Only the highest concern for each data element or concerns with percentage agreement of more than 37.5 percent are listed.

(2) Measure #1: SGRP-308: "For 10% of patients with a significant health care event (arrival at an Emergency Department (ED), admission to a hospital, discharge from an ED or hospital, or death), EH/CAH will send an electronic notification to at least one key member of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required, within 2 hours of when the event occurs."

Table 3. List of top concerns expressed by expert panel members about SGRP-308 data elements

Data Element	Major Concerns	%*
Significant health care events (SHCE)	• An issue with accomplishing this measure via an HIE is the penetration of the HIE in outpatient settings and connectivity to care team members.[52] For example, CRISP, Maryland's HIE, has a limited penetration among outpatient settings thus making it of less use for this measure; and also putting more burden on EHs to send the notifications themselves.	50
	• Hospitals can use the HIE's ADT messaging exchange service to notify admission, discharge and transmission (but not death). If we want to make HIEs a viable option for this measure, 'death' needs to be dropped from SHCE as HIEs often do not report it.	37.5
Patient Care Team ID/ Contact Information	• Who will qualify as the patient's care team member? Should we use the PACT (Patient Aligned Care Team) team member definition from the Veteran Affairs (i.e., doctors, nurses, providers who can be assigned patients)? Is there a comprehensive list of care team members by CMS?	62.5

	• How do we know the 'key' person in the care team is the 'right' person to make the 'best' decision for the patient? Should we ask the patient? Ask the payer? Or rely only on the data in the EHR?	50
Indicators of Notification Process	• How can we ensure that the patient's care team member has received, reviewed, and acted upon the notification? There is no way to close the loop.	50
	• Considering that the notification is acting like a reminder to the care team members, should the hospital resend the notification if no response is received in a certain timeframe?	37.5
SHCE hour and minute	• Should we notify the care team member for each SHCE if multiple events occur in less than 2 hours? Or should we send an aggregated one after 2 hours? Shouldn't the notifications be prioritized?	25
Notification hour, minute and who	• Hospitals may not have the exact timing of both SHCE and notification in one place, thus making it impractical to calculate the 2 hour difference.	50
Indicator of Consent	• Wouldn't the consent to share data with decision makers be part of the paper work signed by the patient at the time of admission (i.e., admission consent process)?	75

***** Percentage agreement among panel experts. A total of eight experts participated in the panel.
Only the highest concern for each data element or concerns with percentage agreement of more than 37.5% are listed.

Summary of Overall Concerns Categorized Based on Themes

Results of the comments provided by CMIO/CIOs of participating hospitals during the interviews were collated and categorized into several themes. Following is the summary of concerns and comments about SGRP 305 and 308 categorized based on these themes and prioritized based on the number of comments received in each of the categories:

(1) Health IT Infrastructure beyond EHRs: Care coordination often requires health IT/IT infrastructure that is out of the EHR's scope. For example, many referrals are faxed to hospitals and automating the import of faxes in EHRs (i.e., integration of manual referral scheduling system in EHRs) is not part of the EHR certification process. In addition, the non-electronic care coordination thresholds defined in the measures (i.e., 50 percent regardless of the mode) are not addressed by the type and specification of EHRs adopted by EHs. In this perspective, EHs will be penalized for not having certain health IT/IT infrastructure to facilitate care coordination with other providers, which is irrelevant to their meaningful use of EHRs.

(2) Health care Delivery System Structure: Care coordination is highly affected by the organizational structure that the hospital belongs to. For example, if a hospital is part of a larger health care delivery system (e.g., ACO, HMO, IDS), the chances that the majority of their care coordination occurs within their network is much higher than for a standalone hospital. In this perspective, standalone EHs will be penalized for their lack of integration in a larger health care network, and not because of their meaningful use of the EHR.

(3) Enterprise-level EHR Infrastructure: Hospitals that are part of a larger delivery network have higher chances to be part of an enterprise-level EHR in which all providers use the same EHR infrastructure (i.e., all inpatient and outpatient providers use the same EHR system with one master patient ID). Care coordination in such an environment, where most of care coordination is internal, is simpler than a health care system (or standalone hospital) that uses a

different EHR for their outpatient providers. In this perspective, smaller EHs and some heterogonous health care networks will be penalized for their lack of system-wide EHR integration, not because of the meaningful use of their independent EHRs.

(4) Connectivity to HIE: HIE-connectivity enables certain care coordination functionalities for EHs without putting them under major burden to connect directly to other providers; [53] however, hospitals that do not have an existing regional or state-wide HIE for connectivity will remain disadvantaged regardless of their EHR system. In this perspective, some EHs are penalized for the lack of an HIE in the first place, and not capability or willingness to connect to an HIE.

(5) Ambiguous Definitions for Measures: Most the participating hospitals found the definitions of SGRP 305 and 308 measures ambiguous and without clear-cut boundaries for concepts such as referral or significant health care events. This ambiguity can result in a range of interpretations for denominators and increase the margin of errors in reporting and potentially creating liability for some EHs. In this perspective, EHs are penalized for simply not interpreting the measures correctly.

(6) Overlap and Potential Integration in Other Measures: The SGRP 303 care coordination measure, also part of Stage 2 MU (with lower thresholds), requires that EP/EH/CAHs send a Summary of Care (e.g., CCDA) for >50 percent of their transitions of care or referrals. Although SGRP 303 is an outgoing care coordination measure, there is overlap with both SGRP 305 and 308. For example, both SGRP 305 and 308 can use the Summary of Care format to send the referral results or significant health care events to receiving parties. In this perspective, EHs that are already complying with 303 have to expend additional resources to establish 305 and 308, while merging them together may reduce IT resource utilization.[†]

Results of Stage 3 MU Care Coordination Objectives—Data Elements

The data collection instrument (see Appendix D) included questions on various aspects of the Stage 3 MU-CC measures such as data, EHR functionality, and workflow elements. This section only discusses the results of the feasibility of the participating hospitals to collect and achieve the data elements of the Stage 3 MU-CC objectives (as defined by the evaluation matrix). See next sections for EHR innovation and workflow elements.

To increase the feasibility of data collection from participating hospitals and reduce the ambiguity of Stage 3 MU language, a number of constraints and assumptions were applied to categorize the data elements into smaller and more practical pieces to implement. In addition, to make the data collection pragmatic, a series of difficulty levels were established for the data elements. These levels indicate the difficulty faced by participating hospitals to collect or retrieve necessary EHR data to measure or operationalize Stage 3 MU-CC data sub-elements. These levels range from 1 (easiest) to 10 (hardest). If the level of difficulty to query a specific data sub-element was determined to be equal to or greater than 6, the participating hospital was not required to calculate that sub-element. Follow is the list of these 'difficulty' levels:

Level 1—Variable already exists: Value of this data sub-element (i.e., the variable) is automatically calculated by the EHR and is included in internal reporting (e.g., batch-processed

[†] Based on the latest language of MU3 objectives, SGRP 305 is merged (with some modifications) with SGRP 303.

reports). The participating hospital only needs to retrieve the last report to find the value of this data sub-element (i.e., the variable).

Level 2—Built-in EHR tools: Frequency of this data sub-element can be easily calculated by built-in EHR tools but requires interaction with the tool. The participating hospital needs to spend time to build the reporting process once, but reporting can be automated afterwards with minimal human interaction.

Level 3—Existing third-party tools: Variables can be obtained through third party applications (i.e., not native to the EHR system). The participating hospital needs to locate various EHR fields and then use a third party tool to calculate the numbers.

Level 4—Simple Query: Specifics can be retrieved using a simple query against an EHR database. The participating hospital may need to spend some time to develop these queries. These queries might also be available in an existing library of queries.

Level 5—Customized Query: Variables and their values can be acquired using customized query commands against a data warehouse. This requires technical expertise and knowledge of various data sources. The participating hospital will spend less than an hour to finish the query.

Level 6—Complex Queries and Non-EHR databases: Measures can only be calculated via multiple complex queries that may span across various databases including non-EHR databases. The participating hospital needs to spend multiple hours to finish the query for this specific data sub-element.

Level 7—Non-standardized EHR fields: EHR captures the data sub-element in structured but non-standardized fields. Queries are impractical and require considerable data cleaning before they can be applied.

Level 8—Free-text EHR data: EHR captures the data sub-elements in a non-structured field (e.g., free-text notes), thus making the query-based retrieval of the data sub-element impractical unless the participating hospital uses advanced natural language processing tools to extract the data.

Level 9—Lack of EHR fields: The participating hospital's EHR does not have a field to store, capture, or highlight this data sub-element.

Level 10—No data collected: This data sub-element is not collected in the day-to-day operations or clinical workflow of the participating hospital, regardless of the fact that the EHR includes or does not include a field to store it.

Following is a summary of most important findings for each of the studied Stage 3 MU-CC measures:

SGRP 305—Sending Back Referral Results to Referral Requestor

Due to the ambiguity of the language used for SGRP 305 (at the time the project started) and in order to consolidate potential variations in gathering relevant data across participating EHs, the data collection instrument identified the following assumptions and constraints:

Type of Referral: Referral type was limited to 'Consult' referrals only. This constraint was made due to: the feedback received from CMIOs/CIOs of the participating hospitals, the

inclusion of similar referral concepts in SGRP 303 (also part of Stage 2 MU) for laboratory and imaging results, and the feasibility of accomplishing the data collection in a short timeframe.

Data Extraction Timeframe: After consulting with the participating hospitals, the data collection tool identified a 6-month timeframe (i.e., data captured on events that occurred in the immediate 6 months previous to the data collection) as the standard timeframe. A select number of participating hospitals provided data on a different timescale, which were adjusted accordingly to match other results.

Types of Referral Requestors: To make the data collection feasible and to distinguish potentially unique challenges on sending back referral results to specific types of referral requestors, the data instrument has identified three types of referral requestors that represent distinct on-the-ground workflow and IT infrastructure challenges for care coordination: **(1) Outside provider**: A provider that is not part of the participating hospitals' health delivery network. These providers usually are not on the same IT platform (e.g., same enterprise EHR) that participating hospitals use and infrequently have dedicated care coordination teams that work with them. **(2) In-network provider**: A provider outside of the participating hospital but within the same health delivery network. These providers often use the same EHR platform of the participating hospital or at least have a mechanism to actively share data with them. In addition, these providers have a higher chance to participate in network/system-wide care coordination activities that involve the participating hospital. **(3) Provider within hospital setting**: A provider in the participating hospital or a closely-related entity such as the hospital's ED or outpatient clinic. These providers usually use the same enterprise EHR platform of the participating hospital and are actively engaged and registered in the care coordination efforts with the hospital.

SGRP 305: Data Elements—Quantitative Results

The following table provides a summary of results on the feasibility of collecting/achieving certain data sub-elements of SGRP 305 among the participating hospitals. The objective is broken down into multiple data elements (a-e), and each data element, such as 'Referral Request/Initiation', is further broken down into multiple sub-elements (e.g., a-1). This table summarizes: (1) the difficulty level of collecting data to operationalize each data sub-element; (2) data sources that can be used for that specific data sub-element; (3) the percentage of hospitals that can count/calculate the sub-element; and, (4) the percentage of participating hospitals that recommended the data sub-element to be included in the objective.

Table 4. Feasibility of collecting SGRP-305 data elements at participating hospitals

(a) Referral Request / Initiation	Diff	Data Source*		Denom. Count		Recommended	
(a.1) # of referrals received from an outside provider	9.2	EHR-DW Non-EHR N/A	67% 17% 33%	Y N	0% 100%	Y N NR	0% 67% 33%
(a.2) # of referrals received from an in-network provider	7.6	EHR-DW Non-EHR N/A	67% 17% 33%	Y N	0% 100%	Y N NR	0% 67% 33%
(a.3) # of referrals received from a provider within own hospital setting	3.8	EHR-DW Non-EHR N/A	83% 0% 17%	Y N	50% 50%	Y N NR	33% 50% 17%
(a.4) # of referrals received from any provider but have transferred it to a third party provider	7.2	EHR-DW Non-EHR N/A	83% 67% 17%	Y N	0% 100%	Y N NR	0% 100% 0%
(b) Results Available—Referral Performed	Diff	Data Source*		Denom. Count		Recommended	
(b.1) # of referral results generated for a referral requested from an outside provider	9.3	EHR-DW Non-EHR N/A	83% 17% 17%	Y N	0% 100%	Y N NR	0% 83% 17%
(b.2) # of referral results generated for a referral requested from an in-network provider	7.6	EHR-DW Non-EHR N/A	67% 33% 17%	Y N	0% 100%	Y N NR	33% 50% 17%
(b.3) # of referral results generated for a referral requested from a provider in own hospital setting	6.4	EHR-DW Non-EHR N/A	83% 17% 17%	Y N	0% 100%	Y N NR	50% 50% 0%
(c) Requestor Identification	Diff	Data Source*		Denom. Count		Recommended	
(c.1) # of referrals received from an outside provider that has a valid requestor contact information associated with it	7.6	EHR-DW Non-EHR N/A	50% 33% 67%	Y N	0% 100%	Y N NR	0% 67% 33%
(c.2) # of referrals received from an in-network provider that has a valid requestor contact information associated with it	7.0	EHR-DW Non-EHR N/A	50% 33% 33%	Y N	0% 100%	Y N NR	34% 33% 33%
(c.3) # of referrals received from a provider within own hospital setting that has a valid requestor contact information associated with it	6.2	EHR-DW Non-EHR N/A	50% 33% 33%	Y N	33% 67%	Y N NR	33% 17% 50%
(d) Results Sent Back—Referral Completed	Diff	Data Source*		Denom. Count		Recommended	
(d.1) # of referral results sent back to the requestors when referrals are received from an outside provider	8.4	EHR-DW Non-EHR N/A	50% 83% 17%	Y N	17% 83%	Y N NR	33% 17% 50%

(a) Referral Request / Initiation	Diff	Data Source*		Denom. Count		Recommended	
(d.2) # of referral results sent back to the requestors when referrals are received from an in-network provider	7.4	EHR-DW Non-EHR N/A	67% 50% 17%	Y N	33% 67%	Y N NR	17% 33% 50%
(d.3) # of referral results sent back to the requestors when referrals are received from a provider within own hospital setting	7.2	EHR-DW Non-EHR N/A	83% 17% 17%	Y N	33% 67%	Y N NR	17% 33% 50%
(e) Result Receipt—Referral Loop Completed**	Diff	Data Source*		Denom. Count		Recommended	
(e.1) # of referral result-receipt acknowledgement / confirmations received from an outside provider	9.4	EHR-DW Non-EHR N/A	33% 17% 83%	Y N	0% 100%	Y N NR	17% 33% 50%
(e.2) # of referral result-receipt acknowledgement / confirmations received from an in-network provider	7.8	EHR-DW Non-EHR N/A	33% 17% 50%	Y N	0% 100%	Y N NR	34% 33% 33%
(e.3) # of referral result-receipt acknowledgement / confirmations received from a provider within own hospital setting	7.8	EHR-DW Non-EHR N/A	0% 33% 83%	Y N	0% 100%	Y N NR	50% 50% 0%
Overall Average***	7.5	EHR-DW Non-EHR N/A	58% 28% 36%	Y N	11% 89%	Y N NR	26% 45% 29%

Diff: Average difficulty level to measure specific data sub-element of an objective (out of 10; ranges from easy 1 to hard 10 [see text]); Data Source: Electronic data sources that can be used to calculate the data sub-element; EHR-DW: EHR's transactional or archival data warehouses; Non-EHR: Non-EHR electronic sources of data such as administrative data warehouses, call/fax/scan servers and document management repositories; N/A: Not applicable or not available; Denom. Count: Percentage of participating hospitals that can count the denominator for the specific data sub-element; Y: Yes; N: No; Recommended: Sub-element is recommended by the participating hospital to be part of this objective; NR: No response.
* Each participating hospital could cite multiple sources of data to calculate or operationalize the specific data sub-element, thus the total percentage for all sources may not add up to 100%. ** Not formally part of the SGRP-305 measure but highly recommended by domain experts to be evaluated in this project. *** Excludes a.4 sub-element

The higher the difficulty level to collect data for operationalizing a specific sub-element of this measure, the more infeasible it will be to achieve the objective. Note that most difficulty levels remain above 7—hinting at the fact that without an EHR functionality to attain the sub-elements, the feasibility of this objective remains difficult.

The average difficulty levels for each SGRP 305 data element are as follows (out of 10; excludes a.4 sub-element): (a) Referral Request / Initiation: 6.87; (b) Results Available—Referral Performed: 7.78; (c) Requestor Identification: 6.93; (d) Results Sent Back—Referral Completed: 7.67; and, (e) Result Receipt—Referral Loop Completed: 8.33. The highest difficulty to achieve a specific data element was attributed to completing the referral loop to ensure that the referral results have been received by the referral requestor. The lowest difficulty was attributed to finding out the referral requestor's identification. The overall average difficulty for this objective is 7.52 (out of 10). This means that the participating hospitals found it too hard to calculate the denominator and operationalize this measure even by using complex functions.

The average difficulty levels based on types of referral requestors are as follows (excludes a.4 sub-element): (1) Outside provider: 8.79; (2) In-network provider: 7.48; and, (3) Provider within hospital setting: 6.28. Note that difficulty level decreases as the referral circle narrows from outside providers to in-network and within hospital providers.

In a majority of cases, the participating hospitals were not able to calculate their denominator population for a given data sub-element. The overall rate of failure to calculate the denominator population for each data element is (excludes a.4): (a) Referral Request / Initiation: 83.3 percent; (b) Results Available—Referral Performed: 100 percent; (c) Requestor Identification: 89.0 percent; (d) Results Sent Back—Referral Completed: 72.3 percent; and, (e) Result Receipt—Referral Loop Completed: 100 percent. The average failure rate to calculate the denominator for all elements of the measure is 88.9 percent.

When aggregated by types of referral requestors, the success rate (denoted by a lower failure percentage) to calculate and achieve a data element was higher in providers practicing within the participating hospital compared to either in-network or outside providers: (1) Outside provider: 96.9 percent; (2) In-network provider: 93.4 percent; and, (3) Provider within hospital setting: 76.8 percent (the lowest failure rate).

The recommended inclusion of data sub-elements in SGRP 305 (noted as 'Recommended') included a significant rate of non-responses (NR) which makes the interpretation of these findings difficult. Among the participating hospitals that responded, the overall average of 'Yes' to include each data element has been (excludes a.4): (a) Referral Request / Initiation: 11.0 percent; (b) Results Available—Referral Performed: 27.7 percent; (c) Requestor Identification: 22.3 percent; (d) Results Sent Back—Referral Completed: 22.3 percent; and, (e) Result Receipt—Referral Loop Completed: 33.3 percent. The overall average of recommendation for inclusion is 26 percent, with a non-response rate of 29 percent. Note that these results are based on hospitals' opinions on whether each data element will be important in the care coordination of their patients and not necessarily if they can achieve them.

When calculated based on types of referral requestors, the participating hospitals favored the inclusion of data elements that limit the objectives within the hospital settings compared to in-network or outside providers (noted as 'Y' under 'Recommended'): (1) Outside provider: 10.0 percent; (2) In-network provider: 23.4 percent; and, (3) Provider within hospital setting: 36.6 percent. Note that these results exclude the non-responses (NR).

SGRP 305: Data Elements—Qualitative Results

The data collection instrument also included qualitative questions about the feasibility and implementation outcomes of each data sub-element. Following are the most important findings that are extracted from these qualitative results for SGRP 305 (see Appendix E for further details):

(a) Referral Request / Initiation

- **Definition of referral**: Each participating hospital has a custom and somehow different definition for 'referral'. Most of the definitions fall under the general concept of a referral being requested by an inside or outside entity, but they differ in the origination of a referral, administrative steps involved in a referral process, and the content that is exchanged between the requestor and receiver of a referral.

- **Use of EHR to identify a referral**: Most participating hospitals differ in their use of EHRs to identify, monitor, and facilitate the referral process. Some use built-in EHR indicators to directly identify a referral; some use derived measures/variables from EHRs to identify a referral; and, some hospitals use various external tools depending on types of referral requestor.
- **Dedicated "flag" for referrals**: The participating hospitals could not locate a dedicated flag in their EHRs to mark or monitor referrals requested by out-of-network providers. Most hospitals could find a flag or indicator of referral if the referral was initiated from an in-network provider.

(b) Results Available—Referral Performed

- **Definition of a referral result**: No consensus was available among participating hospitals on what should be the unique type of a referral result. Some of the participating hospitals consider the results as EHR data elements while some consider it as the paper or electronic documents shared with the requestors.
- **Types of data in referral results**: Participating hospitals listed a variety of data elements that should be included in the referral results such as laboratory results (e.g., blood work; pathology reports), procedure results (e.g., pulmonary function test reports; colonoscopy results), imaging interpretations (e.g., echocardiography reports) and diagnostic findings. One distinction that a number of participating hospitals made is the fact that the referral results should include any health data that is deemed critical by the provider who performs the referral consult—even if such referral results were neither requested nor expected by the requestor in the first place.
- **Dedicated flag in EHR for referral results**: None of the hospitals could find an automated flag in their EHRs that would indicate the availability of results for the list of their referral consults. Although some of the hospitals have a flag to mark the availability of new results, none of these flags are exclusively designed for referrals.

(c) Requestor Identification

- **Definition of valid contact information for referral requestor**: Participating hospitals did not elaborate on this definition and considered contact information valid if it is up-to-date and associated with the referral's requestor. No distinction was made as to whether the contact information of the requestor is attributed to the actual care provider of the patient or a representative of the provider (e.g., office staff).
- **Types of data in contact information**: All hospitals agreed that sufficient contact information of the referral requestor should be stored and used to allow effective continuity of care. The following data types of contact information are highly cited by the hospitals: Provider's individual name; Name of the practice; Address; Office phone number; Office fax number; and 'Direct' messaging address. One hospital also mentioned referral requestor's NPI (National Provider Identifier - issued by CMS) and name of the EHR vendors on both sides to facilitate potential interoperability issues.
- **Dedicated contact field in EHR for referral contact information**: More than half of the participating hospitals do not have a dedicated list of their referral requestors. The other half uses a customized flagging system in their master contact list to define a subset

of contact information for their referrals. None of the hospitals has a dedicated standalone database to maintain referral contact information. One hospital uses the NPI list, published and maintained by CMS, as an additional source of data.

(d) Results Sent Back—Referral Completed

- **Format to transfer results**: Most hospitals are able to transmit the referral results internally to ambulatory care providers who are in the same network and use the same enterprise EHR platform. However, none of the hospitals are able to send out the referral results to all referral requestors who are not part of the same delivery network. Hospitals are evaluating the feasibility of using 'Direct' and XDR messaging protocol to transfer the results.
- **Utilizing an HIE infrastructure**: Almost half of the participating hospitals are actively connected to a State HIE while the other half, despite being able to connect to an HIE, is not connected to a State HIE. Some hospitals are also connected to private local HIEs. None of the hospitals are using HIEs as the means to notify referral requestors about the results. The latter is mainly due the fact that these hospitals do not have access to a state or local HIE that can push the results to all potential referral requestors including out-of-network outpatient providers.
- **Dedicated flag in EHR for referral results sent**: None of the hospitals have a clear method to identify and tag if a referral result has been sent back. Some hospitals have created ways to count these occurrences; however, the variation of timestamp differences has generated inconsistent results. For example, it is unclear if a result should be counted after an encounter is closed or as soon as it reaches a 'final result' status.

(e) Confirmation of Results Receipt—Referral Loop Completed

- **Format to acknowledge receipt**: Multiple formats are proposed by participating hospitals that can be used to achieve the acknowledgement of completed referral loop: Direct, SOAP, XDR/XDM, and timestamp generated by the exchange (e.g., HIE/HISP).
- **Dedicated flag in EHR for referral results received**: None of the hospitals have the capability to achieve this checking mechanism due to both workflow and technical barriers. All hospitals confirmed that this step is vital to complete the referral loop, but also considered this step extremely challenging. Note that this data element is not officially part of the SGRP 305 objective but was highly recommended by the expert panel to be included for evaluation.

SGRP 308—Notifying Patient Care Team Members of Significant Health Care Events

Due to some ambiguity of the language used for SGRP 308 and in order to consolidate potential variations in gathering relevant data across participating EHs, the data collection instrument identified and assumed the following criteria for data collection. The following constraints were applied:

Types of Significant Health Care Events (SHCEs): SHCEs were limited to the five events listed in the draft proposed objectives published by ONC: (1) arrival at an ED; (2) discharge from an ED; (3) admission to a hospital; (4) discharge from a hospital; and, (5) death.

Data Extraction Timeframe: After consulting with the participating hospitals, the data collection tool identified a 6-month timeframe (i.e., data captured on events occurring in the immediate 6 months previous to the data collection) as the standard timeframe. A select number of participating hospitals provided data on a different timescale that has been noted and adjusted accordingly to match the rest of the results.

SGRP 308: Data Elements—Quantitative Results

The following table provides a summary of results on the feasibility of collecting and achieving certain data sub-elements of SGRP 308 among the participating hospitals. The objective is broken down into multiple data elements (a-e) and some data sub-element (e.g., a.1). This table summarizes: (1) the difficulty level of collecting data to operationalize each data sub-element; (2) data sources that can be used for that specific data sub-element; (3) the percentage of hospitals that can operationalize the sub-element; and, (4) the percentage of participating hospitals that recommended the data sub-element to be included in the objective.

Table 5. Feasibility of collecting SGRP-308 data elements at participating hospitals

(a) Significant Health Care Event (SHCE)	Diff	Data Source*		Denom. Count		Recommended	
(a.1) # of SHCEs recorded within own hospital setting	3.4	EHR-DW	89%	Y	67%	Y	67%
		Non-EHR	0%	N	33%	N	11%
		N/A	11%			NR	22%
(a.2) # of SHCEs recorded within own hospital setting that includes a timestamp (HH:MM)	3.4	EHR-DW	78%	Y	56%	Y	67%
		Non-EHR	0%	N	44%	N	11%
		N/A	22%			NR	22%
(b) Care Team Member Identification	Diff	Data Source*		Denom. Count		Recommended	
(b.1) # of SHCEs recorded within own hospital setting that has a valid care team member's contact information associated with it	5.4	EHR-DW	67%	Y	33%	Y	44%
		Non-EHR	22%	N	67%	N	11%
		N/A	11%			NR	44%
(c) SHCE Notification Sent Out	Diff	Data Source*		Denom. Count		Recommended	
(c.1) # of SHCEs recorded within own hospital setting that include a notification sent out to an outside care team member	9.0	EHR-DW	56%	Y	11%	Y	56%
		Non-EHR	44%	N	89%	N	33%
		N/A	22%			NR	11%
(c.2) # of SHCEs recorded within own hospital setting that include a notification with a timestamp (HH:MM) sent out to an outside care team member	9.0	EHR-DW	56%	Y	11%	Y	56%
		Non-EHR	44%	N	89%	N	33%
		N/A	22%			NR	11%
(d) Notification Receipt—Loop Completed**	Diff	Data Source*		Denom. Count		Recommended	
(d.1) # of SHCEs recorded within own hospital setting that include a confirmation-receipt for a notification sent out to an outside care team member	9.8	EHR-DW	44%	Y	0%	Y	44%
		Non-EHR	78%	N	100%	N	22%
		N/A	33%			NR	33%
(e) Indicator of Patient Consent	Diff	Data Source*		Denom. Count		Recommended	
(e.1) # of SHCEs recorded within own hospital setting that include a patient consent to share with a care team member of the patient (outside of network)	6.2	EHR-DW	78%	Y	11%	Y	44%
		Non-EHR	44%	N	89%	N	44%
		N/A	67%			NR	11%
Overall Average	6.6	EHR-DW	67%	Y	23%	Y	54%
		Non-EHR	33%	N	77%	N	24%
		N/A	27%			NR	22%

Diff: Average difficulty level to measure specific data sub-element of an objective (out of 10; ranges from easy 1 to hard 10 [see text]); Data Source: Electronic data sources that can be used to calculate the data sub-element; EHR-DW: EHR's transactional or archival data warehouses; Non-EHR: Non-EHR electronic sources of data such as administrative data warehouses, call/fax/scan servers and document management repositories; N/A: Not applicable or not available; Denom. Count: Percentage of participating hospitals that can count the denominator for the specific data sub-element; Y: Yes; N: No; Recommended: Sub-element is recommended by the participating hospital to be part of this objective; NR: No response.
* Each participating hospital could cite multiple sources of data to [potentially] calculate the specific data sub-element, thus the total percentage for all sources may not add up to 100%. ** Not formally part of the SGRP-308 measure but highly recommended by domain experts to be evaluated in this project.

The higher the difficulty level to collect data for operationalizing a specific sub-element of this measure, the more infeasible it will be to achieve the objective. Note that most difficulty levels remain at more than 6—hinting at the fact that without an EHR functionality to attain the sub-elements, the feasibility of this objective remains low.

The overall average difficulty levels for each SGRP 308 data element are as follows (out of 10): (a) Significant Health Care Event (SHCE): 3.40; (b) Care Team Member Identification: 5.40; (c) SHCE Notification Sent Out: 9.00; (d) Notification Receipt—Loop Completed: 9.80; and, (e) Indicator of Patient Consent: 6.20. The highest difficulty to achieve a specific data element was attributed to completing the notification loop by receiving a notification receipt from the recipient (care team member). The lowest difficulty was attributed to finding the SHCE recorded data in the EHR. The overall average difficulty for this objective is 6.6 (out of 10). This means that hospitals might be able to calculate and operationalize this measure if they apply a series of complex tasks.

In some cases the participating hospitals were able to calculate their denominator population for a given data sub-element. The overall rate of success to calculate the denominator population for each data element is: (a) Significant Health care Event (SHCE): 61.5 percent; (b) Care Team Member Identification: 33.0 percent; (c) SHCE Notification Sent Out: 11.0 percent; (d) Notification Receipt—Loop Completed: 0.0 percent; and, (e) Indicator of Patient Consent: 11.0 percent. The average success rate to calculate the denominator for all elements of the measure is around 23.3 percent.

The recommended inclusion of data sub-elements in SGRP 308 (see 'Recommended' column) included a significant rate of non-responses (NR) which makes the interpretation of these findings difficult. Among the participating hospitals that responded, the overall average of 'Yes' to inclusion of each data element has been: (a) Significant Health Care Event (SHCE): 67.0 percent; (b) Care Team Member Identification: 44.0 percent; (c) SHCE Notification Sent Out: 56.0 percent; (d) Notification Receipt—Loop Completed: 44.0 percent; and, (e) Indicator of Patient Consent: 44.0 percent. The overall average of recommendation for inclusion is 54 percent with a non-response rate of 22 percent. Note that these results are based on hospitals' opinions on whether each data element will be important in the care coordination of their patients and not necessarily if they can achieve them.

Generally there was minimal difference in responses between (a.1) and (a.2), and (c.1) and (c.2). This indicates that the majority of SHCE data captured in participating hospitals' EHRs (or other electronic sources) already record time stamps of such events. This facilitates the calculation of the time requirements of SGRP 308 (i.e., 2 hour window).

SGRP 308: Data Elements—Qualitative Results

The data collection instrument also included qualitative questions about the feasibility and potential implementation outcomes of each data sub-element. Following are the most important findings from these qualitative results for SGRP 308 (see Appendix E for further details):

(a) Significant Health Care Event (SHCE)

- ED admission versus ED arrival: Arrival at ED indicates that a patient has checked in but does not indicate that care has been provided yet. Arrival is often a synonym to 'Check-in' at ED. Admission to ED indicates that 'Triage' assessment is completed and a patient is ready to be visited by ED nurses and physicians. Despite the differences between arrival and admission at ED, the majority of participating hospitals consider the two practically equal.
- Dedicated flag in EHR for ED arrival and discharge: All hospitals have dedicated flags in their EHRs to mark ED arrival/admission and discharge. Most hospitals have both the time of arrival and time of admission to ED. The participating hospitals often capture the arrival flag along with other information such as demographics and chief complaints.
- Dedicated flag in EHR for hospital admission and discharge: All hospitals have independent flags in their EHRs to track inpatient admission and discharge.
- Dedicated flag in EHR for death: Most of the participating hospitals can collect and retrieve death if it occurs in the inpatient setting but do not have a dedicated system to track it. The use of 'discharge disposition' to indicate death has been an alternative method if a dedicated flag for death has not been implemented. One of the hospitals has a dedicated field for death across their entire patient population.
- Time stamp accuracy: SHCEs are considered change of events and are time-stamped by default. All participating hospitals have HH (hour) and MM (minute) time-stamps for their SHCEs (if such an event is recorded). This accuracy is sufficient to calculate the time of events meaningfully and within the 2 hour limiting period as proposed by SGRP 308.

(b) Care Team Member Identification

- Key team member: Participating hospitals have different views on who should be considered the 'key' team member. Most of them concurred that the primary care physician (PCP) of the patient is most likely the 'key' team member. Other key team members identified by the hospitals, depending on the admission status of the patient, are: attending provider, admitting provider, ED provider, referring provider, and family provider. Moreover, participating hospitals have an average of 2.5 care team members listed for each patient, thus making the determination of the 'key' team member confounding.
- Dedicated flag in EHR for key team member: There are multiple fields for care team members in various fields of the EHR system. Hospitals were confused as to which one should be considered the 'key' team member. There are no flags to alarm that the care team member's contact information is missing or should be updated.
- Suggested contact information elements: Most hospitals agreed on the following list of suggested contact information that should be collected for all care team members: Name, practice name, address, office phone number, cellular phone or pager number, fax

number, and email address. Some hospitals also included: NPI and 'Direct' email address.

- Dedicated contact list of patients with a SHCE: More than half of the participating hospitals do not have a dedicated list of contact information for SHCEs. Some of the hospitals have started internal contact lists for certain events such as hospital admission and discharge, but these contact information are often incomplete (i.e., high rates of missing key information).

(c) SHCE Notification Sent Out

- Data elements included in SHCE notifications: The top selections by the participating hospitals are: Patient name, address, date of birth, date and time of SHCE event, service (ED or inpatient), admitting/attending provider, primary complaint, and emergency contact information. Other selections include: diagnosis and chief complaint (reason for visit).
- SHCE notification format: A majority of the participating hospitals selected the CCDA format (e.g., CCD document) as the best format to notify the care team members. Some stressed the fact that embedding free text in the notification will reduce its impact. Most of the hospitals are confused on the best method to send out these notifications. Suggestions varied from built-in EHR functions to 'Direct' messaging, fax servers and text-messaging.
- Potential HIE involvement in SHCE notification: The State HIE in Maryland, CRISP, does offer a notification system to notify a select number of PCPs about ED admissions of their patients, but does not include other SHCE information such as death. Some of the participating hospitals in Arkansas do participate in private HIEs, but do not use the HIE infrastructure for SHCE notification.
- Dedicated flag in EHR to indicate sent out status: None of the participating hospitals have a way to track SHCE notifications in their EHR platforms. However, if an SHCE is recorded, it usually has an HH:MM timestamp associated with the event. The participating hospitals that currently share some of the SHCEs with care team members notify them only via a batched process scheduled on a semi-daily or daily basis (12/24 hours). Feasibility of a two hour window is limited based on the current EHR infrastructure or certification.

(d) Notification Receipt—Loop Completed

- Method to receive the notification receipt: 'Direct' messaging and HISP with inbound/import to EHR is the preferred method of transaction to receive the SHCE notification receipt for hospitals.
- HIE involvement in completing the loop: Participating hospitals that use HIEs actively to retrieve information and send notifications on an ad-hoc basis do agree that HIEs can also be used to complete the notification loop. The main concern is integrating the HIE-based receipts with the current EHR systems.
- Dedicated flag in EHR to indicate notification receipt status: None of the participating hospitals can identify the receipt of an SHCE notification.

(e) Indicator of Patient Consent

- Merging consent forms: Some hospitals proposed merging the patient consent that is required for SHCE notifications in the current paper-based or electronic consent forms,

although the electronic version is preferred. Some hospitals opposed mixing them together as it may produce legal issues or make the management of a centralized consent process complicated. These hospitals also mentioned that this integration may end up adding extra work to the current congested workflow of consent acquisition and management.

- Dedicated flag in EHR to indicate consent status: A few of the hospitals have a centralized consent management system in their EHRs but none have a dedicated system to manage patient's consent for SHCE notifications.

Results of Stage 3 MU Care Coordination Objectives—EHR Functionality Elements

The data collection survey (see Appendix D) included questions on various aspects of the Stage 3 MU-CC measures such as data, EHR functionality, and workflow elements. This section only reports the results of the feasibility of the participating hospitals to utilize innovative EHR functionalities to achieve Stage 3 MU-CC objectives. See the previous section for data elements, and the next section for workflow elements that may affect implementing Stage 3 MU-CC successfully. Following is a summary of most important findings for innovation in EHR functionality that can help operationalizing this measure:

SGRP 305—Sending Back Referral Results to Referral Requestor

The following table provides a mix summary of quantitative and qualitative results on comments made about the EHR functionality challenges of Stage 3 MU SGRP 305 among the participating hospitals:

Table 6. EHR functionality issues with SGRP # 305 among participating hospitals

EHR Function	Available		Feasible		Notable Observation
(1) EHR has visual or textual indications on its interface/screen for 'referral'	Y N NK	11% 56% 33%	High Low	22% 78%	Majority of hospitals do not have an EHR that can visually register a referral process (request made, completion, results returned, and acknowledgement of result receipt) on screen.
(2) EHR records if a patient does not show up for a requested referral	Y N NK	33% 67% 0%	High Low	67% 33%	Most of the participating hospitals have EHR with scheduling modules that can track 'no shows' but few can track them for referral cases.
(3) EHR records if a referral is incomplete due to patient's request	Y N NK	0% 89% 11%	High Low	56% 44%	Participating hospitals can track cancelled diagnostic or treatment procedures but cannot locate referral cases within those cancellations.
(4) EHR contains a master contact list of all referral requestors	Y N NK	11% 78% 11%	High Low	44% 56%	Most of the participating hospitals have a master contact list for general use but rarely flag referral cases in them.
(5) EHR imports referrals made by non-EHR systems (e.g., regular emails, Web portals)	Y N NK	11% 89% 0%	High Low	22% 78%	Only one of the hospitals has the capability to receive referrals via a Web portal that can be used by out-of-network providers.
(6) EHR imports referrals made by non-electronic systems (e.g., phone)	Y N	0% 89%	High Low	11% 89%	There is low feasibility to automate the integration of non-electronic systems in EHR to track referrals. They

EHR Function	Available		Feasible		Notable Observation
	NK	11%			are often imported manually and are not usable (e.g., scanned referral request documents).
(7) EHR includes different fields for receiver and requester of a referral	Y N NK	23% 44% 33%	High Low	56% 44%	Most hospitals cannot send referral results to multiple providers at the same time (even in a manual mode).
(8) EHR tracks referrals that do not produce any reportable results	Y N NK	0% 67% 33%	High Low	33% 67%	Participating hospitals are unable to track referrals that produce no results that should be sent back to the requestor.
(9) EHR includes an automated function to send back the referral results back	Y N NK	11% 67% 22%	High Low	78% 22%	Most hospitals can send results back to providers (e.g., fax laboratory results) through semi-automated mechanisms (e.g., overnight batch) but can rarely distinguish if this was for a specific referral.
(10) EHR can break down a major referral request into multiple smaller referrals	Y N NK	0% 78% 22%	High Low	56% 44%	Some hospitals can break down larger orders into multiple smaller ones, but none are equipped to do so for referral requests.
(11) EHR can prioritize referral requests	Y N NK	0% 78% 22%	High Low	11% 89%	Majority of hospitals do not and cannot prioritize referral requests in their EHR systems.
(12) EHR has an integrated and active HIE connectivity	Y N NK	56% 33% 11%	High Low	78% 22%	More than half of the participating hospitals are actively using their HIE to send and retrieve information.
(13) EHR can exchange patient records with out-of-network providers	Y N NK	22% 67% 11%	High Low	56% 44%	Currently most of the participating hospitals cannot exchange data with out-of-network providers unless through local/state-wide HIEs.
(14) EHR notifies provider when a referral results is ready to be sent back to an in-network requestor	Y N NK	33% 56% 11%	High Low	67% 33%	Some of the hospitals can notify in-network providers about results in general but not flagged as referrals. Most hospitals have the results show up with no specific notifications.
(15) EHR can aggregate multiple results generated from a referral	Y N NK	11% 78% 11%	High Low	56% 44%	Most of the participating hospitals can manage multiple orders and track results but they can rarely identify them as referrals.
(16) EHR can detect and remove duplicated referral requests	Y N NK	0% 89% 11%	High Low	67% 33%	None of the participating hospitals can remove duplicated referral requests, although this is possible with routine orders.
(17) EHR provides the referral results to patients via a patient portal	Y N NK	33% 44% 22%	High Low	78% 22%	Most hospitals provide some results to their patient via their patient portals (part of Stage 2 MU) but they are not sure if these are the same as referral results.
(18) EHR has a comprehensive referral tracking module or component	Y N NK	11% 78% 11%	High Low	11% 89%	Majority of the participating hospitals do not have an EHR-base tracking system for referrals.

Available: an EHR function is available to perform this task; Feasible: a system exists for this task but is not used for referrals specifically (i.e., can be modified for referral); EHR: Electronic Health Record; Y: Yes; N: No; NK: Not known and/or not reported.

SGRP 308—Notifying Patient Care Team Members of Significant Health Care Events

The following table provides a summary of quantitative and qualitative results on comments made about the EHR functionality challenges of Stage 3 MU SGRP 308 among the participating hospitals:

Table 7. EHR functionality issues with SGRP # 308 among participating hospitals

EHR Function	Available	Feasible	Notable Observation
(1) EHR has visual or textual indications on its interface/screen for 'SHCEs'	Y 0% N 44% NK 56%	High 33% Low 67%	Most hospitals have some visual representation for individual SHCEs. None of the hospitals have on-screen indicators for all of the SHCEs. Majority of them did not know if such visual clues are available.
(2) EHR records both arrival and admission to ED	Y 67% N 22% NK 11%	High 67% Low 33%	Majority of participating hospitals record both arrival and admission to ED, but sometimes in two different electronic system (e.g., pre-registration and EHR).
(3) EHR records if SHCE (e.g., discharge) has been cancelled or postponed	Y 0% N 78% NK 22%	High 22% Low 78%	None of the hospitals can track if a SHCE has been postponed. Three hospitals can track cancellation for discharges only (not all SHCEs).
(4) EHR has a centralized contact management system for all SHCEs and is updated regularly	Y 22% N 78% NK 0%	High 67% Low 33%	Only a few of the participating hospitals have updated contact management systems for SHCEs; however, most of them have such systems for some SHCEs.
(5) EHR actively uses HIE mechanism for all SHCE notifications	Y 0% N 56% NK 44%	High 44% Low 56%	None of the participating hospitals actively use an HIE infrastructure to notify care team members of SHCEs. Existing state-HIEs for some of these hospitals have limited penetration among outpatient PCPs.
(6) EHR can automatically generate all SHCE notifications (exclude transmitting it)	Y 22% N 56% NK 22%	High 67% Low 33%	A few of the hospitals can generate SHCE notifications automatically, although most of them can do for some of the SHCEs.
(7) EHR detects and prevents duplicate SHCE notifications originating from various units	Y 0% N 78% NK 22%	High 22% Low 78%	None of the hospitals can merge duplicated SHCE notifications that may be generated from various hospital units or departments.
(8) EHR includes a comprehensive SHCE notification and management system	Y 0% N 89% NK 11%	High 44% Low 56%	None of the participating hospitals have a comprehensive SHCE notification system. All of them are counting on future EHR certification features.

Available: an EHR function is available to perform this task; Feasible: a system exists for this task but is not used for referrals specifically (i.e., can be modified for referral); EHR: Electronic Health Record; Y: Yes; N: No; NK: Not known and/or not reported.

Results of Stage 3 MU Care Coordination Objectives—Workflow Elements

The data collection survey (see Appendix D) included questions on various aspects of the Stage 3 MU-CC measures such as data, EHR functionality, and workflow elements. This section discusses the workflow elements that are deemed essential to achieve Stage 3 MU-CC objectives (as defined by the evaluation matrix). See the previous sections for data and EHR functionality elements that may impact Stage 3 MU-CC adoption.

SGRP 305—Sending Back Referral Results to Referral Requestor

The following provides a qualitative summary of human resource and organizational factors that can affect the effectiveness of the hospitals to implement SGRP 305:

(1) Human Resources Factors

- Referral workflow process and elements: Participating hospitals have scheduling and case management teams to ensure an efficient and effective coordination of care. Often the referral process starts with an out-of-network provider calling or faxing a referral request to a centralized scheduling system. The team members usually complete medical necessity checks, insurance verification and scheduling with the patients. The referrals are often scheduled as routine appointments and no specific flags distinguish them from others. Infrequently the scheduling requests are received via 'Direct' messaging if the out-of-network provider has already achieved Stage 2 MU.
- Workflow routine for cancelled referrals: Most of the participating hospitals do not reschedule cancelled referrals actively. Often patients will call back to reschedule the referral. There is no centralized mechanism or workflow to track the cancelled referrals.
- Process of sending the results back: There is a variation of practice among participating hospitals on how to send the results back to an out-of-network provider. Hospitals use a mix of manual and automated methods. Most of the automated methods are built-in EHR functions. Sometimes laboratory and radiology results are sent back to ordering providers automatically through 'Direct' messages or local exchanges. Most of the diagnostic and procedural results, such as endoscopy or cardiopulmonary reports, are sent through manual channels (e.g., fax).
- Workflow process to notify a referral forward: Participating hospitals do not have a formalized workflow to notify the referral requestors if a referral has been forwarded to another provider or hospital. However, the participating hospitals do record the fact that a referral request has been forwarded to a third party provider.
- Types of referrals accepted: All participating hospitals accept referrals requested by physicians; nonetheless, a few hospitals accept referrals requested by other types of care providers. Self-referral is often unacceptable. Care coordination and scheduling staff are usually trained to check the validity of a referral request.
- HIE access among care coordination staff: Participating hospitals located in Maryland offer HIE access to their care coordination staff members; however, there are no specific distinctions for referral requests. Participating hospitals located in Arkansas do not actively use an HIE for care coordination.

- Care coordination training: Most of the participating hospitals offer generic training to their care coordination staff members. Some of these hospitals also include training modules that cover topics about referral procedures.

(2) Organizational Factors

- Contracted care coordination: None of the participating hospitals have contracted all or part of their care coordination activities with third party entities.
- Dedicated organizational unit for care coordination: All participating hospitals, except two, have dedicated care coordination units. Some have a centralized team for the entire hospital and some have smaller groups for each subspecialty distributed across the hospital.
- Pay-for-quality structure: More than half of the participating hospitals are part of an Accountable Care Organization (ACO) or are planning to join an ACO in the near future. Data on Patient-Centered Medical Home (PCMH) activity is either missing or unknown.
- Coupling Stage 3 MU#305 with reimbursement: There is a mixed view on tying Stage 3 MU # 305 with other reimbursement models; yet, most of the participating hospitals have a positive view of the fact that this measure may reduce referral issues and, in turn, help the hospitals to improve other process or outcome quality metrics.
- Other impactful organizational factors: Two of the participating hospitals expressed concerns with their existing working and collaborative structures with other providers and the fact that the lower EHR penetration among those providers may hinder them in adopting Stage 3 MU # 305.

SGRP 308—Notifying Patient Care Team Members of Significant Health Care Events (SHCE)

The following provides a qualitative summary of human resource and organizational factors that can affect the effectiveness of the hospitals to implement SGRP 308:

(1) Human Resources Factors

- SHCE workflow process and elements: Participating hospitals have case management teams to enhance effective care coordination of their patients. None of the hospitals have similar guidelines on how to deal with SHCEs, or how and when care team members should be notified. In general, the sequence of SCHE starts with the registration of the patient in the ED or inpatient unit. Other events that may occur before or after registration consists of: arrival to ED, ED triage start and stop, ED discharge and disposition, inpatient admission, and inpatient discharge and disposition. Registration clerks capture the patient arrival and the registration events. ED or inpatient nurses perform the discharge and disposition transaction when the patient visit/encounter has concluded and the patient leaves the ED or the inpatient unit of the hospital.
- Qualifying care team member: Care coordination policies of participating hospitals vary on the type of care team members that they assume qualified to receive SHCE notifications. Most of the hospitals concur on the following short list of care team members: PCP and case manager. The longer list of care managers has wide ranging acceptability among hospitals: admitting, attending (both hospital and ED), and referring physicians. Some hospitals also have a nursing routine to add additional care team members, such as a rehab therapist, if a significant need for follow-up care arises.

- Multiple care team members: Most hospitals do not have defined protocols on which of the care team members should be notified when an SHCE occurs. Some hospitals simply notify all care team members on the record that are authorized by the patient to receive the notifications. Also, most of the participating hospitals have limited care coordination protocols on which type of providers should be notified upon an SHCE. For example, in one of the participating hospitals the case management staff members notify home health care and nursing homes for patient placement when needed at discharge, but they are not involved in the patient admission from those external entities; and instead the nursing staff members are responsible to notify the hospitalist or the PCP at the time of admission.
- Care coordination training: Although all participating hospitals have formal training for new case managers, there are no specific training modules to cover all SHCEs. Two hospitals have specific training modules on how to notify care team members (and other family members) of death.

(2) Organizational Factors

- Coupling Stage 3 MU#308 with reimbursement: None of the participating hospitals see a significant impact on SGRP # 308 adoption if matching quality improvement reimbursements are introduced. Indeed, they expressed the fact that reimbursement for SHCE notifications would help but most likely will not cover the expenditure for initial software licensing, implementation, ongoing monthly support, systems team build, test time, initial staff education for the new EHR functionality, ongoing new provider and staff member orientation, and EHR training time.
- Other impactful organizational factors: Three of the participating hospitals expressed a positive impact of SHCE notifications on their population health management programs. These hospitals stated that care coordination related to PCMH or to other high-risk patients (outcome, mortality, utilization, and cost) covered through population management contracts with payers would benefit from SHCE notifications.

Results of Stage 3 MU Care Coordination Objectives—Overall Comments

The data collection instrument (see Appendix D) included general questions on policy recommendations, EHR innovations, and return on investment of SGRP 305 and 308 Stage 3 MU-CC measures. This section discusses the comments provided by participating hospitals to achieve the SGRP 305 and 308 objectives as defined by the evaluation matrix. See the previous sections for data collection, EHR functionality and workflow elements that may affect Stage 3 MU-CC success. Following is a summary of the most important concerns for each of the reviewed measures:

SGRP 305—Sending Back Referral Results to Referral Requestor

The following table provides a summary of key concerns provided by participating hospitals about SGRP 305 that are categorized in three domains of policy recommendations, EHR innovations, and factors to increase value-added to hospitals (see Appendix E for further details).

Table 8. Summary of comments for Stage 3 MU SGRP # 305 by participating hospitals

Domain	Summary of Comments / Concerns
Policy Recommendations	• **Definition of Referral**: There are no unique definitions for 'Referral'. The language of the objective should clearly define what types of referrals are considered in the numerator and denominator of the measures. For example, referrals could refer to a request for expert consult (e.g., specialist), a medical procedure (e.g., surgery), and a diagnostic test (e.g., laboratory test, imaging); however, other types of referrals are not well defined such as consulting requests for a diabetes educator, a nutritionist, physical therapist, and others. The #305 objective needs to be accompanied by a table detailing the types of referrals that should be covered.
	• **Referral of Referrals**: Smaller community hospitals that do not provide all the requested services may use a third party to complete the referral process. If a patient is in one of the community hospital clinics and needs a procedure that cannot be performed at that community hospital, then most often they will be referred to a tertiary facility. This measure should address the referral of referrals.
	• **Delivery Network Boundaries**: Policymakers should have a clear definition on the boundaries of the referral measures. The referral process involves several parties from various providers. There is no way for participating hospitals to motivate or enforce all parties to use the same EHR platform or adopt common standards of message exchanges for this measure. In fact, this measure will be easier for hospitals to achieve if the operational boundaries are smaller. Here are some recommended boundaries to use (sorted from larger to smaller): (1) Measure applied to all outpatient providers requesting a referral regardless of their affiliation with the hospital's care delivery network; (2) Objective should be achieved among all providers that are in a joint venture relationship with the eligible hospital; (3) Objective is applicable to all providers that are part of the hospital's care network (e.g., part of the HMO, ACO); and/or, (4) Measure is designed for all providers that are part of the same hospital system (e.g., ED, outpatient clinic of the hospital). Participating hospitals expect internal referrals (see above #4) to be excluded from the measure as the providers making the consult request presumably have access to the same EHR platform, but at the same time they are doubtful in achieving this measure among out-of-network providers (see above #1).
	• **Types of Providers**: Referral can take place among a variety of provider types including primary care physicians, nurse practitioners, skilled nursing facilities, home health care agency and others. The language of the objective should identify the type of providers that this measure will include. This will help the eligible hospitals to focus their effort on the most important category of referral requestors. Plus, the measure needs to specify what alternatives are appropriate to use if the direct contact information of the requestor is not available (e.g., results can be sent to a staff member of the provider).

Domain	Summary of Comments / Concerns
	• **MU Adoption Rate among Providers**: Currently most of the referrals to the participating hospitals are still accomplished through a manual request/order. Indeed, electronic referrals will not be feasible until a minimum threshold of the eligible providers requesting the referrals from hospitals are advanced enough with their EHR adoption. Thus, it is recommended to limit this measure to referrals taking place among providers that have at least achieved Stage 1 MU or Stage 2 MU.
	• **Types of Referral Results**: In addition to the EHR certification criteria that will determine the terminology and standards used to collect and exchange the referral results, the Stage 3 MU objective should be specific about what to include in the results in the first place. For example, referral results could vary from structured laboratory results with automated annotations to free text report notes. Another complication is when a referral generates additional results that are not primarily asked for or expected by the requestor.
	• **Types of Messages**: The measure should limit the denominator to care coordination cases that were initiated through a limited set of communications (e.g., a subset of fax, mail, phone, email, and EHR-messaging).
	• **Merge with SGRP 303**: This measure has strong similarities with SGRP 303 of Stage 2 MU (and proposed enhanced version of 303 in Stage 3 MU). The measure can be combined or merged with 303 to increase alignment in technical development and workflow implementation of such processes. *Note that SGRP 305 merged with SGRP 308 later during the project, but most concerns and recommendations are still valid.*
EHR Innovation	• **Referral Functions in Stage 3 MU EHR Certification**: Most of the participating hospitals expressed the fact that they are extremely limited in developing or finding EHR innovations that can help them achieve this measure. Unless the EHR certification streamlines the referral process, the hospitals will be unable to achieve this measure from a technical standpoint. Thus, it is imperative to ensure that Stage 3 MU's EHR certifications include all necessary factors to facilitate this objective (e.g., integration of commonly used standards). Most hospitals expressed the fact that EHR certification criteria required for Stage 2 MU/Stage 3 MU #303 will fulfill some of these requirements but will not be sufficient as it is.
	• **Utilizing Innovative Exchange Techniques**: A number of IT staff members of the participating hospitals proposed using existing and newly developed/adopted standards to facilitate the exchange of information in the referral process. Although these techniques/standards of message exchange can facilitate the exchange of data for a referral, it does not warrant the integration of the incoming/outgoing messages in sending/receiving EHR platforms. The integration of 'Direct' /HISP messaging, HIE connectivity, and CCDA compatible result summaries is one of the proposed methods to address the difficulty of message exchange across various EHR platforms.
	• **Using Other Data Types or EHR Functions to Track Referrals**: Most hospitals do not have dedicated flags or data types to mark, collect, and track referrals. Indeed, most of the participating hospitals cannot change the

Domain	Summary of Comments / Concerns
	underlying working database of their EHRs and thus are relying on other measures to calculate their referrals at this time (unless new EHR certifications address those issues). Some hospitals proposed using a combination of data types and functions to track referrals such as: using orders and CPOE logs to track incoming referrals, adding referral patients to a special internal registry semi-automatically, or develop automated natural language processing (NLP) and/or optical character recognition (OCR) tools to mine scanned referral notes.
	• **Centralized Registries of Contact Info**: Collecting and updating the contact information of all referral requestors is a major issue for hospitals. Ultimately this should be addressed through EHR certification and via a standard field added to the referral request messages that can be imported in EHRs automatically. Alternatively, hospitals can build their own database of contact information (beyond the in-network providers) or use state-wide or national contact information to locate requestors (e.g., NPI database from CMS).
	• **Non-EHR Innovations**: Current referral workflows include a number of non-EHR solutions such as: fax servers, email servers, OCR engines, standalone contact information directories, and enterprise administrative systems. Some of the hospitals recommended expanding on these tools to facilitate the referral process. For example, integrating the email servers with EHR messaging may enhance the 'Direct' messaging capabilities within the referral workflow.
Value Added (i.e. internal return of investment)	• **Payment Reform Impact**: Care coordination in general, including referral management, is of high value to hospitals as it will decrease cost and improver outcomes while increasing patient satisfaction. Managing cost and reducing overuse while keeping a high quality of care is imperative for hospitals that operate on a global budget (e.g., the five participating hospitals that operate in Maryland).
	• **Type of Health Care Delivery**: A number of participating hospitals are already part of an Accountable Care Organization (ACO) and/or operate in an HMO structure. The Stage 3 MU SGRP 305 measure can support these hospitals to increase their efficiency in managing referrals and achieve optimal process and outcome quality measures considered vital for these care delivery structures (e.g., reflected by ACO quality measures).
	• **Evaluation and Educational Opportunities**: Hospitals expressed the fact that their staff (clinical and IT) are not well informed about the complexity of the referral process. This measure will enable them to review existing internal policies, educate their staff on referral issues, and provide opportunities to enhance general awareness about potential issues.
	• **Workflow Enhancement and Staffing Needs**: Hospitals often do not have dedicated staff to track referrals, and indeed often do not know where that responsibility would lie. This measure can help reorganize some of the existing hospital workflow to ensure higher efficiency and effectiveness in managing referrals.
Additional	• **Inclusion in Stage 3 MU**: None of the participating hospitals recommended

Domain	Summary of Comments / Concerns
Comments	including SGRP # 305 in Stage 3 MU as a standalone core measure. Five hospitals proposed simplifying it and merging it with other measures (# 303). Two hospitals proposed converting it to a menu measure (i.e., optional measure).
	• **Proposed Modified Version**: Participating hospitals had different views on a modified version. Aggregating their feedback resulted in the following version: "For patients referred for a consultation by an in-network provider during an EHR reporting period, predefined referral results generated from the EHR, 25% are returned to the requestor and 5% of those are returned electronically".
	• **Feasibility of Implementation for Original Version**: Almost half of the hospitals estimated a low feasibility of the measure unless EHR certification addresses all details. The other half of the hospitals expressed a variation of feasibility levels in the next 12 months.
	• **Feasibility of Implementation for Modified Version**: There was insufficient feedback on the feasibility of the proposed modified version of the Stage 3 MU SGRP # 305.

SGRP 308—Notifying Patient Care Team Members of Significant Health Care Events

The following table provides a summary of key comments provided by participating hospitals about SGRP 308 that are categorized in three domains of policy recommendations, EHR innovations, and factors to increase value-added to hospitals (see Appendix E for further details).

Table 9. Summary of Comments for Stage 3 MU SGRP # 308 by Participating Hospitals

Domain	Summary of Comments / Concerns
Policy Recommendations	• **'Key' team member**: Participating hospitals do not agree on how to identify the 'key' member of the care team for a given patient. Several hospitals assume that the primary care physician (PCP) should be considered the 'key' care team member. The confusion of identifying the 'key' care team member is exacerbated when more than one PCP is assigned to the patient, or when the patient identifies a different provider as the 'key' compared to what is stored in the EHR repository. The 'key' identification is a major concern as reconciling it with patients and care team members will be very difficult.
	• **Clarification on Population Denominator**: Participating hospitals were unclear on how to define the denominator of this measure for their patient population. For example, not all patients are admitted through the ED and frequently ED discharge and inpatient admission occur at the same time. In addition, special population of patients may miss one of the admissions or discharges (e.g., newborns do not have an admission record).
	• **Clarification on Patient Consent**: Clarify the relationship between sharing SHCE with care team members and the admission consent process (e.g., are

Domain	Summary of Comments / Concerns
	they independent, inherited, or integrated).
	• **'Death' Event**: The SHCE 'death' type is often not tracked in the EHR (compared to admissions and discharges). This is mainly due to complex workflow and internal policies on how and when to record/finalize the 'death' of a patient. Bounding the 'death' record within the 2-hour time limitation seems unfeasible for most of the participating hospitals. Making 'death' as an optional event to report among SHCEs is favored by the participating hospitals.
	• **Information / Alert Overload**: Some of the participating hospitals are concerned that additional notifications may contribute to information overload and can produce alert fatigue on the receiver's end thus reducing the effect of this objective. These hospitals suggested the aggregation of certain notifications within SHCEs or selecting limited SHCE notifications that are considered high impact. For example, hospitals can identify high risk patients and send the SHCE notifications for them only. Additionally, a few hospitals suggested merging SHCE notifications if they occur in less than the predetermined 2 hour window.
	• **Data Types Included in Notifications**: The objective does not specify the data elements that should be included in the notifications. Some hospitals suggested that the type of data elements that are included in various SHCE types should be different (e.g., data elements included in an ED admission versus death). In addition, there are HIPAA concerns with the data that is being shared via the SHCE notification process.
	• **Format and Methods of Notification**: The format (e.g., CCDA) and method (e.g., Direct) that SHCE notifications will be sent is unknown. Although more details will be revealed when the EHR certifications are finalized, the participating hospitals wanted to find out how feasible this will be considering the fact that many of the care team members of their patients are currently on non-certified EHRs or do not use EHRs at all.
	• **Two-Hour Time Frame**: There needs to be more information on why the time frame is set at 2 hours. Most hospitals questioned the fact that 2 hours may be effective for some urgent care matters, but in most cases the 2-hour time span will have no clinical impact compared to a 12- or 24-hour window. Besides, hospitals raised questions on how the SHCE notifications will be used after business hours and/or the weekend by the PCPs.
EHR Innovation	• **Contact Information Management**: Lack of reliable sources of care team members' name and contact information will be a barrier. Most participating hospitals do not have a centralized contact information management system that includes the care team members of their patients. Indeed, most of these hospitals have various databases that are not well integrated in their EHR platforms (e.g., fax server contact list versus EHR contact database). Future EHR certification should address these issues and offer a contact information management system that has dedicated functionality for identifying care team members.
	• **Consent Management Repository**: Electronic consent management (which includes both paper and electronic consents) is part of the routine practice in

Domain	Summary of Comments / Concerns
	several of the participating hospitals; however, these hospitals are not able to modify and tweak it to suit the requirements of this objective. In addition, the consent management system should be able to record patient's consent in regards to sharing SHCE notifications with each of the care team members. Future EHR certifications should address these issues.
	• **SHCE Event Detection and Aggregation across EHRs**: Larger hospitals often have multiple EHRs working in tandem across various inpatient and ambulatory practices. The multiplication of EHRs often leads in SHCEs being recorded in various databases. Although most hospitals have centralized clinical data warehouses to collect and aggregate all of these events from various EHRs/IT-systems, these repositories do not have the capability to aggregate the SHCE data and notify the care team members in less than 2 hours. EHR certifications should address interoperability issues that can resolve the sharing of SHCE data between EHR systems within the defined time constraints.
	• **Matching Patient IDs**: All participating hospitals agree on the fact that this objective will be useless if the receiving care team member cannot locate the record of the patient associate with an incoming SHCE notification. Indeed, most of the care team members, such as the PCP of a patient, require the entire patient's record to make a meaningful decision. EHRs of the care team members should be able to identify the patient based on the SHCE's notification information. SHCE notifications also should include enough information to ensure a high rate of matching 'patient id' with PCP's local EHR.
	• **EHR-HIE integration**: Currently all participating hospitals that are connected to a state-wide HIE are required to log into a different system to retrieve patient information. This objective will be most effective if SHCE notifications that are sent and received through the HIE are integrated within the EHR's main interface to reduce additional workload.
Value Added (i.e., internal return of investment)	• **Care Coordination**: If effectively generated by hospitals and used and acted upon by care team members, SHCE notification can be a key trigger to start and/or enhance care coordination efforts for patients that are at a higher risk. A number of participating hospitals mentioned that an additional mechanism to flag the high risk patients in SHCE notifications can multiply this effect by focusing resources of the care team members to those patients.
	• **Potential Improved Outcomes**: Notification of initial SHCE would be of value to allow care team members to know if a patient under their current care or population management contract is having a significant clinical event. Although hospitals will not immediately see the value-added of the SHCE notifications, they will indirectly gain from improved outcomes and reduced costs. For example, proper SHCE notifications can inform the care team members in a shorter time frame than usual practice—thus possibly reducing events such as hospitalization and 30-day readmission to hospitals.
	• **Workflow Impact**: Hospitals can use the underlying SHCE notification system to track their patients' status and allocate internal resource accordingly. For example, the notification logs can help hospitals to manage human resources

Domain	Summary of Comments / Concerns
	when a certain event is occurring more frequently than others. The centralized contact management system will enable case management staff and clinicians to easily locate and contact care team members for routine care coordination activities. The centralized consent management system will also enable researchers and clinicians to acquire necessary permission from patients when needed.
Additional Comments	• **Inclusion in Stage 3 MU**: Four of the participating hospitals recommended including SGRP # 308 in Stage 3 MU as a standalone core measure. Three hospitals proposed simplifying it or including it as a menu measure. Two hospitals proposed not including the measure in Stage 3 MU.
	• **Proposed Modified Version**: Participating hospitals had different views on a modified version. Aggregating their feedback resulted in the following version: "For 10% of patients with a significant health care event (admission to ED or hospital, discharge from ED or hospital), EH will send an electronic notification to a member of the patient's care team, with the patient's consent if required, within 24 hours of when the event occurs".
	• **Feasibility of Implementation for Original Version**: More than half of the hospitals expressed the fact that they will be able to roll out SGRP # 308 in the next 12 months if the EHR certification requirements of the objective are available. The remaining hospitals indicated that rolling out this measure will fall beyond their own EHR functionality, and it will require all care team members to have certified EHR as well.
	• **Feasibility of Implementation for Modified Version**: There was insufficient feedback on the feasibility of the proposed modified version of the Stage 3 MU SGRP # 308.

Discussion

Implications of the Findings

The results showed mixed outcomes for different elements of each measure. Results include a various range of responses: positive and negative feedback on the language of the objective; low and high feasibility to implement innovative solutions in the EHRs; and, moderate to large potential value-added to individual hospitals when SGRP 305 and 308 measures are rolled out. Overall, the participating hospitals suggested simplifying the measures or clarifying the details of each one. Following is a short discussion on the overall findings:

- **SGRP 305**: The overall difficulty to calculate or implement this measure is high (7.52 out of 10). This high difficulty level represents a high probability to fail if this measure was in effect today; assuming EHR certifications remain unchanged. The difficulty-level decreases as the measure's span narrows from outside providers to in-network providers. This implies a higher feasibility if the providers were given flexibility to choose their own denominator population. Furthermore, the average success to calculate the denominator for all elements of this measure across the entire patient population of the participating hospitals is only 11.1 percent. Thus, focusing on a specific sub-population might help increase the feasibility of this measure.

In more than half of the cases (64 percent), the participating hospitals had to use a non-EHR system or did not know which system to use to collect the necessary data for the measure or to operationalize it. Most of the hospitals have existing EHR modules that can make this measure feasible; however, none have a dedicated component to manage referral results. These results indicate the fact that hospitals extensively rely on EHR vendors to address the necessary functions needed for this measure. Attention should be paid to Stage 3 MU EHR certification that will cover these functions.

All hospitals have dedicated care coordination teams that facilitate the application of this measure. The interaction between this measure and payment reforms or new delivery systems is not clear and further research is encouraged. In addition, some of the participating hospitals have active connection to a state-wide or local HIE organization and might be able to expand on their connection to accommodate this objective. HIE organizations should be empowered to provide such services to hospitals; however, currently there are no incentives for them to provide such services.

- **SGRP 308**: The overall difficulty to calculate or implement this measure is above average (6.60 out of 10). Although the difficulty level is lower than SGRP 305, given the current EHR capabilities, this measure is still considered by most of the participating hospitals infeasible. Note that the difficulty-level decreases as the 'significant health care event' notification narrows from outside providers to in-network providers, implying the opportunity to customize this measure for various subpopulation of patients. For example, the measure can start with in-network providers in Stage 3 MU and then expand to out-of-network providers in future stages of MU.

In more than half of the cases (67 percent), the participating hospitals can use their EHR systems to collect the necessary data to calculate SGRP 308, but none of them can operationalize it. Most of the participating hospitals have existing EHR modules that can make this measure feasible; however, none have a dedicated component to manage notification of significant health care events to care team members. Similar to SGRP 305, these results indicate that hospitals extensively relay the responsibility to achieve these measures to the EHR vendors. Thus, Stage 3 MU EHR certification is considered critical to the feasibility of this objective.

All of the participating hospitals have contact management systems for various events but none cover all significant health care events. Some of these hospitals have HIE connections and might be able to expand on them to accommodate this objective. Incentives for quality metric and HIE organizations are not aligned with EHR incentives that these hospitals will receive for this Stage 3 MU measure.

Common Themes

Analyzing the comments provided by various stakeholders, including research team members, domain experts, hospital CMIO/CIOs and technical staff members, the following common themes were extracted across both SGRP 305 and 308 measures:

- Need for a clear language of objectives: The 2013 language of both measures refers to terms that are ambiguous and may have different connotations to different stakeholders. For example, the term ‘referral’ does not specify the types of referral (requestor and performer, and type of data exchanged). And, the term ‘arrival at ED’ does not distinguish itself from ‘admission to ED’.
- Potential mergers of objectives: There was consensus among participating hospitals that these measures can be merged with existing ones to reduce confusion and streamline the development necessary for Stage 3 MU implementation. (Note that SGRP 305 and 303 were finally merged at the policy level while this project was underway.)
- Exclusion criteria or optionality for the objectives: Most of the participating hospitals suggested making the more challenging Stage 3 MU measures, including SGRP 305 and 308, optional (i.e., convert from a core measure into a menu measure). Moreover, these hospitals currently cannot achieve SGRP 305 and 308 to their full extent, unless the language of the measures includes exclusions for certain cases or softens the thresholds. For example, the lack of an active state-wide or regional HIE for a given hospital can be considered a factor to make SGRP 305 and 308 measures optional.
- Challenges beyond EHR certification: Despite the fact that EHR certification may automate most of the functions needed to achieve SGRP 305 and 308, participating hospitals stressed the fact that these measures go beyond EHRs. For example, their care coordination team members will probably need considerable workflow changes to accommodate the implementation of these measures. Additionally, these measures use other underlying IT systems that are often not assumed to be part of the EHRs (e.g., a comprehensive ‘patient—care team member—consent management’ platform).
- HIE connectivity: Connectivity to an active HIE organization that has high penetration among both hospitals and outpatient offices is infrequent and not under the control of the hospitals. Additional HIE development on local, regional and state-wide levels is required to facilitate the implementation of Stage 3 MU care coordination measures. In addition to information exchange, HIEs can support the providers to overcome the issues

with ‘patient identification’ to ease the process of care coordination. For example, the receiving provider of a referral result can use an HIE-maintained centralized patient identification service to find the records of a patient listed under the referral results.

- Interoperability: Although standards of health information exchange have become widely available through the efforts of multiple organizations, the adoption of such standards is still in its early stages. EHR certifications should address and adopt these standards to facilitate peer-to-peer EHR-to-EHR exchanges. This will be critical to accomplishing care coordination measures of Stage 3 MU as it will increase the flexibility of the providers to achieve these measures without major changes to their workflow.

Limitations

This project has several limitations and its results should be interpreted while considering these limits:

- Limited sample size and generalizability: This project included a total of 9 hospitals from Maryland and Arkansas. Although these hospitals represented a fair sample, they do not represent a balanced sample of all eligible hospitals nationally. For example, this sample does not include a critical access hospital. Indeed the only critical access hospital enrolled in the project had to drop out due to resource limitations. In addition, all of the participating hospitals had met Stage 1 MU before the start of the project thus not representing any of the eligible hospitals that have not attested to Stage 1 MU yet. No statistically significant correlation should be assumed between the participating hospitals and the larger number of eligible hospitals.
- Descriptive statistics and lack of inference: All results reported in this document are based on descriptive statistics. The results do not constitute and should not be interpreted as causal relationships between Stage 3 MU feasibility and enlisted data elements, EHR innovations or workflow elements.
- Limited number of Stage 3 MU objectives: This project only evaluates two of the Stage 3 MU objectives. Results of this study should not be generalized to other Stage 3 MU measures.
- Resource limitation to implement: At the time this project started, most of the participating hospitals were overwhelmed with Stage 2 MU implementation. Implementation results of SGRP 305 and 308 should be interpreted cautiously considering the fact that the resources were extremely limited at the participating hospitals.
- Stage 3 MU language change over time: Like other Stage 3 MU objectives, the language of SGRP 305 and 308, changed over the course of this project. The results of this project are based on the first version of the Stage 3 MU objectives published by ONC. Some of the recommendations produced in this study are already addressed in the new language of these objectives. In addition, some of the measures are already merged with others, thus further complicating the applicability of the recommendations in other settings (see Overall Recommendations for details).
- Lack of comprehensive quantitative results: Due to the lack of feasibility to implement the measures to their full extent, quantitative results on Stage 3 MU-CC outcomes were infrequently available to be collected. This further complicates the prioritization of the challenges faced by the participating hospitals in various stages of the Stage 3 MU

implementation continuum (i.e., the results and recommendations do not identify priorities in regards to operational phases).

- Other factors: This project only studied the effect of data elements, EHR functionality and workflow issues on SGRP 305 and 308. Other factors might also affect these elements and eventually impact the adoption of Stage 3 MU-CC. For example, perceived usefulness of Stage 3 MU and behavioral challenges on an organizational level can be effective in propelling the adoption of these objectives among eligible hospitals.[54, 55, 56] More research is needed to address these factors.

Overall Recommendations

This project collected feedback from a range of stakeholders including domain experts, hospital CMIOs/CIOs, hospital IT staff and care coordination managers. The overall summary of recommendations includes a combination of these comments and also points out the potential implementation challenges (see). The policy level recommendations include a column denoting if such recommendation has been addressed in the latest language of the measure. The EHR innovation recommendations include a column showing the feasibility perceived by the collective stakeholders to roll out these innovations. The internal value-added recommendations include a column indicating the perceived impact by the stakeholders on using these measures for their organizations.

Table 10. Summary of overall recommendations

Objective	Item / Overall Recommendations
SGRP 305	**2013 Language***
	• **Objective**: EP/EH/CAH to whom a patient is referred acknowledges receipt of external information and provides referral results to the requesting provider, thereby beginning to close the loop. • **Measure**: For patients referred during an EHR reporting period, referral results generated from the EHR, 50% are returned to the requestor and 10% of those are returned electronically. • **Certification Criteria**: Include data set defined by S&I Longitudinal Coordination of Care WG and expected to complete HL7 balloting for inclusion in the C-CDA by summer 2013: Shared Care Encounter Summary (Consultation Summary, Return from the ED to the referring facility, Office Visit). Include standards for referral requests that require authorizations (or pre-certifications) for procedure, surgery, laboratory, radiology, test orders.
SGRP 305	**2014 Language****
	Note that SGRP 305 was merged with SGRP 303. The following is SGRP 303's updated language: • **Objective**: EPs/EHs/CAHs provide a summary of care during transitions of care. • **Measure**: Types of transitions: (1) Transfers of care from one site of care to another (e.g. Hospital to SNF, PCP, HHA, home, etc.; SNF, PCP, etc. to HHA; PCP to new PCP); (2) Consult (referral) request (e.g. PCP to Specialist; PCP, SNF, etc. to ED); and, (3) Consult result note (e.g. ED note, consult note). Summary of care may (at the discretion of the provider organization) include, as relevant: (1) A narrative that includes a synopsis of current care and expectations for consult/transition or the results of a

Objective	Item / Overall Recommendations	
	consult [required for all transitions]; (2) Overarching patient goals and/or problem specific goals; (3) Patient instructions, suggested interventions for care during transition; and, (4) Information about known care team members (including a designated caregiver). No changes in the level of thresholds.	
SGRP 305	**Recommendations to Improve Objective at the Policy Level**	**Addressed**
	• Clarify the definition of terms used in the objective (e.g., types of transitions in a referral)	Yes
	• Explain how the referral of referrals will be applied to this measure	No
	• Discuss and clarify the boundaries of the delivery network that this measure applies to (e.g., in-network versus out-of-network providers)	No
	• List the type of providers that the referral results should be sent to (e.g., PCP, NP, SNF)	Yes
	• Limit the denominator of the measure to referral requestors (providers) that have achieved a certain stage of MU for their EHRs	No
	• List the type of referral results that should be shared and ones that could be optional to share	Yes
	• Make this a menu objective (i.e., an optional objective)	No
	• Merge this measure with existing measures such as SGRP 303	Yes
SGRP 305	**Recommendations on EHR Innovations to Increase Feasibility of the Objective**	**Feasibility**
SGRP 305	• Build this objective on top of existing EHR functionalities and modules	Low
	• Utilize innovative exchange techniques and standards (e.g., Direct messaging) to facilitate sending back the referral results	Medium
	• Use non-EHR IT systems or platforms to facilitate sending back referral results (e.g., using a fax server to automate the process)	High
	• Integrate other hospital IT systems with EHRs to facilitate this objective	Medium
	• Create a centralized registry of contact information that is updated regularly and maintained by the hospital IT staff	Low
	• Use EHR functions or develop modules to automatically remove HIPAA-protected data from referral results (including free text)	Very Low
	• Utilize upcoming Stage 3 MU EHR certification to fully achieve this measure (without changes in workflow and other non-EHR factors)	Medium
	• Create intelligent and automated EHR functions to streamline the referral process and reduce demand for human resources	Low
	• Automate the collection of referral results from multiple heterogonous data sources	Medium
	• Tag referral results with a master patient index that the referral requestors can use to locate patient records in their local EHR	Low
	• Use existing HIE connections to send out referral results	Medium
	• Develop a function to acquire the receipt of the referral results from the	Very Low

Objective	Item / Overall Recommendations	
	requestor	
	• Generate EHR alerts needed to approve the referral results before sending them out (e.g., alerts include visual clues on EHR's interface)	Medium
	• Use existing standards and terminologies to reconcile differences between referral results sent and received by the requestor (e.g., CCDA as format and LOINC as terminology)	Medium
	Recommendations for Organizations to Increase Internal Value from Objective	**Impact**
	• Use this measure as an opportunity to enhance existing care coordination efforts	High
	• Use this measure to impact existing payment reform quality metrics (e.g., ACO metrics; reduced readmissions)	Medium
	• Align this measure with existing clinical quality measures to enhance both process and outcome of care coordination	High
	• Reshuffle the existing workflow process to accommodate referrals and how the results are handled (e.g., how to confirm the receipt of a referral result)	Medium
	• Retrain care coordination staff members and offer educational opportunities for referral management and associated health IT challenges	Medium
	• Analyze workflow and staffing needs for referral management, and then enhance the workforce accordingly	Medium
	• Change internal and cross organizational policies to enhance the referral process	Low
SGRP 308	**2013 Language***	
	• **Objective**: The EH/CAH will send electronic notification of a significant health care event in a timely manner to key members of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required. • **Measure**: For 10% of patients with a significant health care event (arrival at an Emergency Department (ED), admission to a hospital, discharge from an ED or hospital, or death), EH/CAH will send an electronic notification to at least one key member of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required, within 2 hours of when the event occurs.	
SGRP 308	**2014 Language****	
	• **Objective / Measure**: Eligible Hospitals and CAHs send electronic notifications of significant health care events within 4 hours to known members of the patient's care team (e.g., the primary care provider, referring provider, or care coordinator) with the patient's consent if required. Significant events include: (1) Arrival at an Emergency Department (ED); (2) Admission to a hospital; (3) Discharge from an ED; (4) Discharge from hospital; and (5) Death. • The level of threshold has been lowered. This objective is now a 'menu' measure.	
SGRP 308	**Recommendations to Improve Objective at the Policy Level**	**Addressed**

Objective	Item / Overall Recommendations	
	• Remove the 'key' care team member condition from the measure's language to reduce confusion on how to determine the key member	Yes
	• Clarify the population denominator of the objective (e.g., ED arrivals are not considered the same as ED admissions)	No
	• Remove 'Death' as one of the significant health care events (SHCE)	No
	• Consolidate SHCE notifications to reduce information overload and alert fatigue	No
	• List the detailed data types and variables that should be included in SHCE notifications	No
	• Lower the threshold of the measure for electronic notifications	Yes
	• Clarify the format of the notification (e.g., CCDA) and method of exchange (e.g., Direct)	No
	• Provide flexibility to the hospitals to determine the content of the notifications and the care team member who should receive them	No
	• Determine if confirmation of SHCE notification receipt is part of the objective	No
	• Increase the 2 hour time limit to 12 or 24 hours, or simply eliminate the time limit	No***
SGRP 308	**Recommendations on EHR Innovations to Increase Feasibility of the Objective**	**Feasibility**
	• Develop a comprehensive contact information management system that has authenticated and up-to-date patient-provider relationship to identify 'key' care team members	Medium
	• Develop or extend an existing consent management system to be integrated with the EHR	Medium
	• Aggregate multiple data sources, mainly from various parts of the EHR, in real time to detect and notify SHCEs	Low
	• Create or utilize an existing algorithm to provide a master patient index for care team members to retrieve patient information locally	Low
	• Automate SHCE notification by using an existing HIE connection (e.g., assuming that the HIE can notify care team members)	High
	• Develop algorithms to automate the identification of the 'key' care team member	Medium
	• Create a mechanism to pull data from local EHR and other data source to generate the content of the SHCE notification within a reasonable timeframe	High
SGRP 308	**Recommendations for Organizations to Increase Internal Value from Objective**	**Impact**
	• Use this measure as an opportunity to enhance existing care coordination efforts	Medium
	• Use this measure to impact existing payment reform quality metrics (e.g.,	High

Objective	Item / Overall Recommendations	
	ACO metrics; reduced readmissions)	
	• Align this measure with existing clinical quality measures to enhance both process and outcome of care coordination	Medium
	• Improve workflow management by automating various elements of the measures such as the notification detection, generation, transmission, and receipt	Medium
	• Enhance patient consent management by incorporating requirements of this measure into existing consent management protocols	Low

* Language from Jan 2013 ONC documentation was used as the basis for evaluation of the objectives and the recommendations that followed. ** The new language of the measures, published in 2014, is provided for comparison only. Some of the key recommendations were effectively applied in the new language. *** Time limit was increased to 4 hours.

Conclusion

Despite the early success of Stage 1 MU implementation on a national scale, more attention needs to be devoted to the potential challenges that eligible providers may face while rolling out Stage 3 MU objectives. The results of this project indicate that rolling out specific Stage 3 MU measures (SGRP 305 and 308) based on current EHR certification is going to be complex and potentially infeasible among eligible hospitals. Many of these challenges are caused by factors beyond the EHR certification (e.g. workflow issues or the use of non-EHR platforms). Providing guidelines on how to adjust these non-EHR factors, such as a guideline for workflow changes to adopt care coordination measures, will enable eligible hospitals to better prepare themselves for future stages of MU. The Office of the National Coordinator can be a conduit to collect the non-EHR concerns/comments and provide the eligible providers with suggested guidelines to prepare for Stage 3 MU.

The current project did not enroll hospitals that could or have attested to Stage 2 MU. It is recommended to redo an evaluation of the proposed Stage 3 MU measures when the majority of hospitals have attested to the Stage 2 MU objectives. Stage 2 MU objectives are considerably more complex compared to Stage 1 MU and attesting to Stage 2 MU can substantially change the readiness of the hospitals, including the participating hospitals of this project, to adopt Stage 3 MU measures. Indeed, all of the essential elements of Stage 3 MU readiness, including data elements, EHR functionality and workflow factors, can be positively affected by Stage 2 MU measures.

Note that newer versions of the proposed Stage 3 MU SGRP 305 and 308 measures have adopted and implemented many of the recommendations made on the earlier draft languages of these objectives; however, substantial challenges still exist. These challenges mainly relate to the clarity of the language used in the measures, lack of customizable exclusion criteria, absence of optional elements, and existing technical barriers in implementing the Stage 3 MU objectives.

Findings of this project and similar Stage 3 MU evaluation projects will enable policymakers to apply the impending changes necessary to increase the feasibility of Stage 3 MU measures. In addition, these findings will enable the eligible hospitals to prepare their long-term IT strategies and align their resources with upcoming Stage 3 MU measures.

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Appendix A. Evaluation Matrix

Measure #1: SGRP-305

Original language of 2013 draft of Stage 3 MU: "For patients referred during an EHR reporting period, referral results generated from the EHR, 50% are returned to the requestor and 10% of those are returned electronically."

Applicable to Eligible Hospital (EH), Critical Access Hospital (CAH) and Eligible Provider (EP)

Table 11. Evaluation matrix of Stage 3 MU-CC objective # SGRP-305

Data Elements*	**Description of Element****
EHR reporting period	The regular MU reporting period
Referrals	Any request for a referral initiated by a provider different from the provider receiving the referral
Referral results	Results generated from the referral process (both values and interpretive notes)
Initiator/ requestor ID (contact information)	Contact person listed on the referral request
Indicators of referral process	(1) Indicator of Referral Request Received (2) Indicator of Referral Completion (3) Indicator of Referral Results Returned (4) Indicator of Referral Return Receipt
Functional Elements	**Description of Element**
Acquire additional patient records	EHR automatically requests additional information for a referral request from an outside network
Aggregate referral results	EHR can aggregate all pieces of referral results into one batch of notification and send back to the requestor
Automated referral result notification	EHR sends back referral results automatically as soon as they are ready
Comprehensive referral tracking system	EHR has a standalone referral tracking and notification system
Detect repeated versus new referrals	EHR can detect if the referral refers to an existing patient or a new patient
Forking larger referrals to smaller requests	EHR breaks down pieces of a larger referral into multiple tasks (e.g., visits, lab work)
Missed referral indicator	EHR flags that patient have missed a referral appointment
Multi-contact list for various actions	EHR has more than one contact list for referrals (e.g., who requested it, whom should receive the results)
Prevent duplicate referral requests	EHR detects and merges duplicate referral requests
Prioritizing high risk referrals	EHR prioritizes referrals with high risk patients in an automated fashion

Quality of referral results	A mechanism (electronic or manual) to check the completeness and accuracy of data send back during a referral
Referral consent issues	EHR tracks that patient has not agreed to sign the consent form for a referral or the results to be sent back
Referral management through HIE connectivity	EHR receives referrals or send its results through an HIE organization
Referral request made by non-EHR	Referral made by emails or other digital mediums
Referral request made by non-electronic	Referral made by fax or mail
Referral visual cues	EHR has indicators for referral request, referral completion, referral results returned, and referral result receipt
Shared master list	Unified master contact list of providers who send referrals
Track incomplete referrals	EHR tracks if the referral is not completed as scheduled and/or no results were generated
Track rejected referrals	EHR tracks if a request for referral was denied
Workflow Elements	**Description of Element**
Dedicated organizational unit for referrals	Existence of an independent, internal, and dedicated unit in the organization to handle referrals
Integration of HIE portal	Local or regional HIE is accessible to care coordination staff members
Notification checking mechanism	Existence of one or more people to check if referral notifications are sent out
Pay-for-quality integration	Being part of a new health care delivery system that values pay-for-quality (e.g., ACO, PCMH)
Resources involved in referral loops	Human and information resources involved in typical referral loops (receive, process, and notify)
Specialized referral care coordination staff	Existence of trained or expert staff to handle referral cases
Third party contract to handle referrals	Existence of third party organizations to handle the referral process
Work routine to handle rejected referrals	Predefined workflow routines to handle rejected referrals by patients or providers
Work routine to notify referring referrals	Predefined workflow routines to notify the requester of a referral that the referral is referred to another provider
Work routine to reschedule referrals	Predefined workflow routines to reschedule cancelled referrals

* Sub-elements of ‘data’ are not included in this table;
** The reporting period and denominator population categorized based on organizational unit are not included in this table

Measure #2: SGRP-308

Original language of 2013 draft of Stage 3 MU: “For 10% of patients with a significant health care event (arrival at an Emergency Department (ED), admission to a hospital, discharge from an ED or hospital, or death), EH/CAH will send an electronic notification to at least one key member of the patient’s care team, such as the primary care provider, referring provider or care coordinator, with the patient’s consent if required, within 2 hours of when the event occurs.”

Applicable to Eligible Hospital (EH) and Critical Access Hospital (CAH)

Table A-2. Evaluation matrix of Stage 3 MU-CC objective # SGRP-308

Data Elements*	**Description of Element****
Significant health care events (SHCE)	SHCEs are defined as: arrival at an ED, admission to a hospital, discharge from an ED or hospital, or death.
Patient care team ID/ contact information	Key Member of the Patient's Care Team
Indicators of notification process	(1) Indicator that notification has been sent (2) Indicator that notification has been received / reviewed
SHCE hour and minute	Time stamp of SHCE
Notification hour and minute	Time stamp of Notification
Indicator of consent	Indication of a signed or agreed upon consent
Functional Elements	**Description of Element**
SHCE visual cues	EHR has an indicator for SHCE notification (sent and received by the key care team member)
Track ED waiting area	EHR tracks patients not admitted to ED and are still in the waiting room (i.e., admission not happened yet)
Track postponed SHCE	EHR tracks if an admission or discharge is postponed
Shared master list	Unified master contact list of providers for each patient who should receive the SHCE notification
Using HIE for SHCE notification	Using HIE infrastructure or portal to notify patient care team members about all SHCEs
Automated SHCE notification	EHR already has an automated function to notify SHCEs (or parts of it)
SHCE notification acknowledgement	EHR has a mechanism to check if SHCE notification was received/reviewed or not
SHCE notification via patient portal	EHR notifies patient or authorized caregivers to receive SHCE via integrated patient portals
Comprehensive SHCE tracking system	EHR has a standalone SHCE tracking and notification system
Workflow Elements	**Description of Element**
Identify patient's 'key' care team member	Existence of an internal policy / mechanism to identify patient's key care team member
Notification checking mechanism	Existence of one or more people to check if SHCE notifications are sent out
Organizational unit to handle SHCE	Existence of an organizational unit to handle SHCE notification (electronic or manual)
Prioritizing patient's care team members	Existence of an internal policy mechanism to prioritize patient's key care team member
Recognized type of care team members	Internal policy to recognize who can be considered patient's care team member (to receive SHCE notification)
Resources involved in SHCE notification	Human and information resources involved in typical SHCE notification (or any of its components)
Staff members responsible to notify SHCE	Dedicated staff members to notify care team members of SHCE

**** Sub-elements of 'data' are not included in this table***
***** The reporting period and denominator population categorized based on organizational unit are not included in this table***

Appendix B. Sample Concerns Raised by Expert Panel Members

The preliminary phases of this project involved collaboration with a number of MU/health IT experts to define a matrix of data elements that addresses various aspects of the two care coordination measures. Throughout the 'data matrix' development process, a series of concerns were raised by experts. The concerns, which address the ambiguity of the measures, are reflected in the following tables. Each table includes: data elements perceived necessary to collect for each measure, sample concerns expressed by participants about the data elements, and the number of experts agreed upon a certain item in the same theme. See Appendix A for the description of data elements.

Measure #1: SGRP-305

Original language of 2013 draft of Stage 3 MU: "For patients referred during an EHR reporting period, referral results generated from the EHR, 50% are returned to the requestor and 10% of those are returned electronically."

Applicable to Eligible Hospital (EH), Critical Access Hospital (CAH) and Eligible Provider (EP)

Table B-1. Concerns expressed by the domain expert panel about Stage 3 MU-CC objective # SGRP-305

Data Element	Sample Concerns about Data Element	#*
EHR Reporting Period	• It is unclear what EHR fiscal year is this referring to? Is it an internal reporting period or an ONC-mandated period? Is it referring to the MU-reporting period?	2
	• Is this a 12-month period or quarterly? Is it fiscal year? Maybe Oct-1st to Sep-30th.	1
	• This is a confusing and potentially complicated data element to collect if other objectives have a different reporting period.	1
	• Is this an annual period? Is it related to the referral billing period?	1
	• EHR reporting period might be different depending on local settings. This seems to be an unnecessary element.	1
Referrals	• Can a referral occur within an EH/CAH? What are the boundaries of a referral? Should the referral be requested by an outside provider relative to EH? How should we treat the outpatient clinics that are operating within the hospital settings (especially if they provide certain diagnostic tests)?	4
	• Does this measure include referrals happening within the EH setting (a physician asks for a specialist consultation within the hospital)? If that is the case, then the EHR data is already accessible and there is no need for additional transmission of data.	4
	• What if the data does not leave the EHR? For example, if both PCP and EH are on the same EHR platform (e.g., they are part of the same health network through an ACO). In this case, the referral results will be available in the EHR and there will be no need to transmit actual referral results—they are already stored in the EHR and are readily available. Thus, including this type of referral in this measure will only inflate the ratio. The same is true if an ED doctor asks for a consultation referral from an EH physician.	3

	• There seems to be an overlap with Stage 2 MU's care coordination measure [also in Stage 3 MU as SGRP-303].	2
	• What will occur if the EH uses third parties to accomplish certain referrals? For example, the EH has a contract with an imaging center to perform certain referrals. If the third party sends the referral notes directly to the requestor, how should the hospital report this measure?	2
	• There is no way that we can define or calculate the denominator. The measure either needs clear definition on what is considered referral or should provide us with flexibility on defining our own circle [boundary]. Should we exclude self-referrals within our EH setting?	2
	• How can we engage the payers to play a role in this measure? For example, if a radiology referral does not include notes (in the results) the payer will not reimburse the EH.	2
	• Counting the non-electronic referrals is impractical. How can we count all of the faxes that request a referral? Most of our requestors want to receive the results by fax!	2
	• Are referrals within EHs in the scope of this measure? In order to generate the complete denominator, we will need to aggregate data across various EHRs and services (which may generate a considerable amount of duplicates).	2
	• Would a referral requested by a nurse (acting as the PCP), case manager, social worker, or community health worker be included in this measure? What are the boundaries?	2
	• This measure does not specify if 'follow-ups' of a referral are considered referral by themselves. For example, if a patient is required to come back in 3 months to do an additional test (as something was detected in the first referral visit), should the results of the follow-up visit be sent back to the requestor (as well as the first referral did)?	2
	• What are the types of referrals? Referrals can include a long list of items such as: Specialist consultation; Procedures including elective surgeries, biopsies, and etc.; and, Diagnostic tests including imaging, labs, pathology and etc.	1
	• How is this related to eCQM50v1? Not sure how this is going to close the loop?	1
	• Most EHs are using a hodge-podge of the various HIT systems that are involved in care coordination including referrals. It is almost impossible to calculate the accurate denominator of referrals for this measure.	1
	• We should limit the referrals to inpatient setting of EHs. EHs often have outpatient clinics and other units (such as ED) that may or may not be part of the hospitals' IT system. Limiting the measure to inpatient activities of EHs will facilitate the comparison of measures reported by different EHs. How should we incorporate organization variables in this measure?	1
	• How should we exclude non-EHR care coordination infrastructure from EHR ones? The measure is asking for both while they are treated differently in EH's organizational structure.	1
	• Some quality measures covering care coordination will have some overlap with this measure. Is there a comparison chart to show which eCQMs, MUs and other QMs will use the same denominator or numerators?	1
	• Some referrals can only occur in outpatient settings of an EH (e.g., PET scan is usually performed in outpatient clinics of an EH). Sometimes referral patients are bounced between the inpatient and outpatient settings of an EH. Where should be the boundaries of the EH for this measure?	1
	• If consequent to a referral, a patient is being admitted, should all results be sent back to the requestor?	1

	• Is there a CMS definition for 'referrals' in the EH context?	1
	• How will this measure control for various human-factors issues that might affect the outcomes?	1
Referral Results	• What is the timeframe (time limit) to send back the referral results? Can an EH send the referral results couple months after a referral occurred (when there is minimal clinical significance in knowing the results)? How would this measure address the timing issue (e.g., within X hours when the referral results become available)? Indeed, the temporality of the process is missing in the measure.	4
	• What are the bare minimum data elements that need to be included in the referral results?	4
	• Should we exclude simple lab tests or other diagnostic tests that do not need an additional note from the EH? Is this measure focusing on sharing the 'human' interpretation of a referral result with the requestor, the actual value, or both? Is there a separate billing mechanism for adding the interpretation of results to this objective?	2
	• Should the top referral results be lab tests, procedures, surgery, radiology, specialist notes/summary, in which all have a 'requirement for interpretation'?	1
	• How complete the results should be? The measure does not include any provisions for the quality of information. This is very important if part of the referral results will include free text. Will the free text be understandable, readable (in the manual formats), accurate, complete or timely?	1
	• Should the insurers/payers play a role in reporting some of these referral results? Different payers may have different requirements?	1
Initiator/ Requestor ID (contact information)	• Most of the time the EHR does not have the correct ID of the requestor. Should we ask the patient? Which one is more reliable? Is there a way to get it from the HIE?	2
	• Often the ID and contact information of the requestor resides on a paper trail (especially when referred from an out-of-network provider). Importing these contact information will be challenging.	1
	• The measure does not differentiate among referrals with existing records versus no records at all. For example, if the referral is a repeat (i.e., has a prior record) it will be easier for the EH to identify the potential requestor compared to a brand new referral.	1
	• Often a clinical staff on behalf of a physician or eligible provider is listed as the requester of a referral. How much EHs should try to find the direct/correct contact information of the requestor who has the highest impact on patient care? For example, [our EHR] has a central physician directory but its completeness and accuracy needs to be evaluated.	1
Indicators of Referral Process	• Both 'Indicator of Referral Results Returned' and 'Indicator of Referral Return Receipt' are missing in the measure. For example, how can we insure that the PCP [requestor] has read the referral results? Are we adding some additional tasks to EHs where the potential outcome-effect is unreliable? PCPs usually review their patient panels once a day—how will the referral results be incorporated in their patient panels?	3
	• What modes of referral request are included in this measure? Is it limited to: phone, fax, mail, email, EHR-messaging?	2
	• Some EHRs track referrals, in some way. For example, [a specific function of our EHR] identifies referrals and referral completion. Some outside referrals that are faxed are marked in [our EHR] as well; but some paper-based referral processes may not enter the system—this differs by service/department. However, some EHRs do not track the referral process at all. It will be very complicated for EHs to do the	1

	tracking themselves unless it is mandated through CEHRT.	
	• Some EHRs do not flag referrals. You simply recognize a referral through a request (e.g., scanned paper request) that is attached to a patient's record. In those cases, calculating the referrals [denominator] is almost impossible.	1
	• Does this measure mean that we only need to know that results of referral have been sent out, and we do not need to ensure that something has been done with the results?	1
	• Various organizational issues may change the indicators. For example, for an existing well-developed relationship the EHs may not need certain confirmations while in others they may ask for additional steps.	1
	• In some settings, the case managers include the indication of a referral in their free text notes. It will be impractical for EHs to use NLP techniques to extract such information from care coordinator's notes.	1

**** Number of panel experts indicating the same comments / pointing to the same concern. Total number of experts was 8.***

Measure #2: SGRP-308

"For 10% of patients with a significant health care event (arrival at an Emergency Department (ED), admission to a hospital, discharge from an ED or hospital, or death), EH/CAH will send an electronic notification to at least one key member of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required, within 2 hours of when the event occurs."

Applicable to Eligible Hospital (EH) and Critical Access Hospital (CAH)

Table B-2. Concerns expressed by the domain expert panel about Stage 3 MU-CC objective # SGRP-308

Data Element	Sample Concerns about Data Element	#*
Significant health care events (SHCE)	• An issue with accomplishing this measure via an HIE is the penetration of the HIE in outpatient settings and connectivity to care team members. For example, CRISP, Maryland's HIE, has a limited penetration among outpatient settings thus making it of less use for this measure; and also putting more burden on EHs to send the notification themselves.	4
	• Hospitals can use the HIE's ADT messaging exchange service to notify admission, discharge and transmission (but not death). If we want to make HIEs a viable option for this measure, 'death' needs to be dropped from SHCE as HIEs often do not report it.	3
	• Does notification of SHCE in an internal EHR system count toward the denominator/numerator?	2
	• The definition of 'arrival' at an ED is different from 'admission' to an ED. How can we capture arrival when the patient is not being admitted to the ED yet? Plus, would all EHs be in control of the ED's EHR system considering the fact that EDs are categorized as ambulatory care.	1
	• What is the denominator, the notification event or the number of patients in total? The latter will be hard to measure, specifically when a patient is in midst of an inpatient stay.	1
	• How does this measure relate to other measures for ACOs and PCMHs? How does it relate to SGRP-303?	1
	• Which format should SHCE have? Direct, CCDA or only HIE exchange? Is there a standard for SHCE's content or it will be all free text? Should it adhere to any of the S&I frameworks?	1
	• Who will be responsible to ensure that SHCE is sent? Will there be a human check? Or it will be all electronic?	1
Patient Care Team ID/ Contact Information	• Who will qualify as the patient's care team member? Should we use the PACT (Patient Aligned Care Team) team member definition from VA (i.e., doctors, nurses, providers who can be assigned patients) or any other lists provided by CMS?	5
	• How do we know the 'key' person in the care team is the 'right' person to make the 'best' decision for the patient? Should we ask the patient? Ask the payer? Or rely only on the data in the EHR?	4
	• Note that there will a high number of patients with no care team member information arriving at the EDs!	2
	• Are care team members from outpatient settings? What if the PCP is in an outpatient setting but still within the EH's organization?	1
	• Some states or large health care network providers have a central physician directory that includes standard office number or contact information of all participating providers. How can these centralized contact databases be shared among all providers? Should the HIE	1

	provide this capability for EHs? Should CMS provide that? Who will evaluate and warrant the completeness and accuracy of these contact databases?	
	• If there are more than one 'key' members (e.g., two PCPs listed), should the EH send the notification to both? Would notifying one of the PCMH members be sufficient? What if the care team members change over time (e.g., rotations)?	1
	• How can we make sure that the 'right' person has received the notification? How can we stop resending it to the wrong person? Should there be a checking mechanism?	1
Indicators of Notification Process	• How can we ensure that the patient's care team member has received, reviewed, and acted upon the notification? There is no way to close the loop.	4
	• Considering that the notification is acting like a reminder to the care team members, should the hospital resend the notification if no response is received in a certain timeframe?	3
	• Can this measure be combined with SGRP 303 in which a summary of care is produced at the time of care transition? After all, four of the five SHCEs are care transition events.	2
	• This measure focuses heavily on notification of the event, what happens after notification is out of scope of this metric.	1
	• Why 2 hours? Why not instantly? What was the decision behind the 2 hour timeframe? This seems to be arbitrary.	1
SHCE hour and minute	• Should we notify the care team member for each SHCE if multiple events happen in less than 2 hours? Or should we send an aggregated one after 2 hours? Should the notifications being prioritized?	2
Notification hour, minute and who	• Many hospitals may not have the exact timing of both SHCE and notification in one place, thus making it hard to calculate the 2 hour difference.	4
	• EHs should log whom they sent the notification to, and whether they changed the contact person.	1
Indicator of Consent	• Wouldn't the consent to share data with decision makers be part of the paper work signed by the patient at the time of admission (i.e., admission consent process)?	6
	• Does patient consent require an actual paper trail? Are we expecting to add a new form to the patient's admission consent package (in order to share their SHCE with their care team members)?	1

* Number of panel experts indicating the same comments / pointing to the same concern. Total number of experts was 8.

Appendix C. Additional Specification of Participating Hospitals

A total of 9 hospitals participated in this project. Hospitals were selected from an initial group of hospitals recommended by both Maryland and Arkansas' Hospital Associations. The research team attempted to select a number of hospitals that represent a broad range of hospitals; however, none of the Critical Access Hospitals were able to participate and/or complete the study due to their limited resources.

Summary of Organizational Specifications

A total of 5 hospitals from Maryland and 4 hospitals from Arkansas participated in this evaluation project. One of the hospitals is considered a 'Rural' hospital. Two hospitals consider themselves as Urban-Rural hospitals while officially are designated as Urban. One of the hospitals is part of a major academic medical school, two of them offer minor teaching opportunities, while the rest of them are not considered teaching hospitals. Five of the hospitals are part of a larger network. Two pairs of the participating hospitals are part of the same network. All of the hospitals, except two, are part of or are directly contracting with an HMO network. Participating hospitals have a wide range of sizes varying from a bed-count of approximately 950 and an annual operating expense of almost approximately $1.7 billion to a bed-count of approximately 115 and operating expenses of $130 million. The overall average bed-count is approximately 349 and average operating expenses is approximately $413.5 million. The 2013 average annual inpatient admission for the participating hospitals has been approximately 17.2k with approximately 56.6k ED visits and a total of approximately 239.9k outpatient visits.

Table C-1. Summary of specification, organizational structures and services offered by participating hospitals

#	Hospital	State	U/R	Teach	Net.	HMO	PPO	MH	Beds	Adm.	ED	Out V.	Expenses
1	Johns Hopkins Hospital	MD	U	Maj	Y	Y/C	Y/C	-	951	46,673	93,194	538,609	1,690,857,000
2	Western Maryland Regional	MD	U	-	-	-	-	Y	371	13,932	57,146	527,275	305,798,800
3	Sinai Hospital of Baltimore	MD	U	Min	Y_A	C	C	-	460	27,229	81,424	180,943	691,053,000
4	Calvert Memorial Hospital	MD	U	-	-	Y/C	Y/C	Y	116	7,764	41,518	135,950	130,770,400
5	Northwest Hospital	MD	U	-	Y_A	C	C	-	244	14,462	62,587	120,341	201,990,000
6	Washington Regional Med Center	AR	U	-	-	Y/C	Y/C	Y	270	12,474	48,919	159,077	194,260,366
7	Mercy Hospital Fort Smith	AR	U	Min	Y_B	C	C	Y	383	13,809	51,620	228,098	221,851,181
8	Baxter Regional Med Center	AR	R	-	-	-	C	-	209	9,984	29,227	97,754	156,080,476
9	Mercy Hospital Rogers	AR	U	-	Y_B	Y/C	C	-	141	8,655	44,207	171,469	128,846,573
	Total average (rounded)	-	-	-	-	-	-	-	349	17,220	56.649	239,946	413,500,866

MD: Maryland; AR: Arkansas; U: Urban; R: Rural; Teach: Teaching role; Maj: Major; Min: Minor; Net: Part of a larger network; Y: Yes; Y_X: Yes and part of network X;
HMO: Health Maintenance Organization; C: Contractual; MH: Medical Home; Adm.: Admissions per reporting period (annual);
ED: Emergency department admissions per reporting period (annual); Out V.: Outpatient visits annually; Expenses: Overall annual operating expenses in dollars

Summary of IT Specifications

By average the participating hospitals have had their inpatient EHRs in place since 2002. During this study, four of the hospitals used Cerner, two used Epic, two used Meditech, and one used Allscripts for their inpatient EHRs. For the outpatient facilities, three of the participating hospitals used Cerner, three used Epic, and the remaining used eCW, NextGen and Allscripts. Based on the data extracted from the 2013 AHA IT survey, four of these hospitals have mentioned capital and maintenance cost as the main challenge to install additional EHR functionalities. All hospitals, except one, have also mentioned the burden of MU implementation as a barrier to implement new EHR functionalities. By average approximately 67 percent of the hospitals were capable to electronically exchange laboratory data with outside entities, approximately 61 percent could exchange radiology data with external centers, and approximately 56 percent could exchange summary of care documents.

Table C-2. Summary of IT specification, data exchange capabilities and challenges in adopting new EHR functionalities by participating hospitals

#	Hospital	Year	IP-EHR	OP-EHR	Capital	Mtn.	MU	Ex Lab	Ex Rad.	Ex Sum.	Sum. Out.	CDA Form.	HIE Part.	PCP ED	Qry. Out.
1	Johns Hopkins Hospital	2004	Allscripts*	Epic	Y	Y	Y	.50	.50	.50	Elec.	Y	P	Y	Y
2	Western Maryland Regional	1992	Meditech	eCW	Y	-	Y	1.0	1.0	.25	Man.	Y	P	N	Y
3	Sinai Hospital of Baltimore	2000	Cerner	Cerner	-	-	Y	.75	.50	.75	Man.	Y	P	Y	Y
4	Calvert Memorial Hospital	1995	Meditech	NextGen	-	-	Y	.75	.75	.75	Elec.	Y	P	Y	Y
5	Northwest Hospital	2002	Cerner	Cerner	-	-	Y	.75	.75	.50	Man.	Y	P	Y	Y
6	Washington Regional Med Center	2005	Cerner	Allscripts	Y	Y	-	.50	.50	.50	Elec.	Y	TF	Y	N
7	Mercy Hospital Fort Smith	2010	Epic	Epic	-	-	Y	1.0	.75	1.0	Elec.	NK	TF	Y	Y
8	Baxter Regional Med Center	2001	Cerner	Cerner	Y	Y	Y	.50	.50	.00	Elec.	Y	TF	N	N
9	Mercy Hospital Rogers**	2008	Epic	Epic	NA	NA	NA	.25	.25	.25	Man.	NK	NP	Y	N
	Total average (rounded)	2002	-	-	-	-		.67	.61	.50	-	-	-	-	-

EHR: Electronic Health Record system; IP-EHR: Inpatient EHR vendor; OP-EHR: Outpatient EHR vendor; Y: Yes; N: No; NA: Data not available; Capital: Lack of capital to install additional EHR functionalities; Mtn.: Cost of EHR maintenance as a challenge; MU: Meaningful Use implementation challenges; Ex-Lab: Capability to exchange laboratory results within the same hospital system, with outside hospitals, and/or with outside ambulatory system; Ex-Rad: Capability to exchange radiology results within the same hospital system, with outside hospitals, and/or with outside ambulatory system; Ex-Sum: Capability to exchange clinical summary of care results (any format) within the same hospital system, with outside hospitals, and/or with outside ambulatory system; Sum Out: Sharing of clinical/summary care records with other providers; Elect.: Electronic; Man.: Manual; CDA Form.: Clinical Document Architecture Format; NK: Not known; HIE Part.: Heath Information Exchange participation level; P: Participate in a local HIE/RHIO; TF: Have the technical framework but does not participate; NP: Neither has the framework nor participate in a local HIE/RHIO; PCP ED: Has the capability to electronically notify the primary care physician about the ED admission of their patients; Qry. Out: Can automatically query patient data from outside providers.

* Planned for a major EHR migration to Epic Systems in the next 2 years.
** No data in AHA 2013 IT supplement survey. Data obtained from AHA 2012 IT supplement instead.

Summary of Core Stage 1 MU Attestations

All participating hospitals have had attested to Stage 1 MU (Meaningful Use stage 1) before starting this project. Most of the hospitals had not only achieved the thresholds specified by the MU objectives, but also topped out the measures. For example, the average percentage for Core Measure #3 (CM3), documenting patient's problem lists, was 96.6 percent at the beginning of this study. The highest achieved measure was CM6 (documenting demographics) with a 98.7 percent rate of coverage among participating hospitals. The lowest achieved measure was CM1 (CPOE for medication orders) with 86.2 percent coverage among the participating hospitals. These topped out measures are significantly higher than the thresholds set by the objectives (e.g., CM3 requires an 80 percent minimum threshold).

Table C-3. Summary of Core MU attestation among participating hospitals

#	Hospital	CM1	CM2	CM3	CM4	CM5	CM6	CM7	CM8	CM10	CM11	CM12	CM14	CM_{AVG*}
1	Johns Hopkins Hospital	.999	Y	.997	.999	.943	.997	.841	.923	Y	.984	ex**	Y	.960
2	Western Maryland Regional	.634	Y	.999	1.00	.995	.962	.921	.989	Y	1.00	ex	Y	.937
3	Sinai Hospital of Baltimore	.976	Y	.959	.925	.985	.984	.834	.918	Y	1.00	1.00	Y	.954
4	Calvert Memorial Hospital	.586	Y	.994	.999	.999	.995	.991	.982	Y	Ex	ex	Y	.935
5	Northwest Hospital	.977	Y	.948	.946	.974	.973	.745	.830	Y	1.00	1.00	Y	.932
6	Washington Regional Med Center	.990	Y	1.00	.963	.988	.989	.962	.845	Y	Ex	ex	Y	.962
7	Mercy Hospital Fort Smith	.888	Y	.987	.995	.997	1.00	.926	1.00	Y	.985	.976	Y	.973
8	Baxter Regional Med Center	.848	Y	.895	.937	.974	.987	.984	.996	Y	1.00	ex	Y	.953
9	Mercy Hospital Rogers	.857	Y	.915	.998	.998	1.00	.895	.996	Y	.988	.983	Y	.959
	Total average (rounded)	.862	-	.966	.974	.984	.987	.900	.942	-	.994	.990	-	N/A

CM: Core Measure; CM1: computerized physician order entry system adoption for medication orders; CM2: drug-drug and drug-allergy checks; CM3: documenting problem lists; CM4: documenting medication lists; CM5: documenting allergy lists; CM6: documenting demographics; CM7: documenting vital signs; CM8: documenting smoking status; CM10: clinical decision support system [one-rule]; CM11: e-copy of records to patients in 3-days; CM12: e-copy of discharge summary; CM14: conduct security risk review.
Note that CM9 (electronic clinical quality measure reporting) and CM13 (exchange of clinical information) are included in the CMS attestation data but are excluded from this table as they are dropped in the latest MU attestation year.

* CM_{AVG} only includes numerical CMs (e.g., CM1 and CM3) from last year of attestation and excludes categorical CMs (e.g., CM2 and CM10) or other years
** EX: exclusion has applied to that hospital (e.g., no request has been made from patients to receive a discharge summary)

Summary of Menu Stage 1 MU Attestations

Most of the participating hospitals had achieved moderate to low levels of attestation for Menu Measures (MM). For example, the average percentage for Menu Measure #5 (MM5)—patient specific education—was 73.9 percent at the beginning of this study (calculated based on reported numbers only). The highest reported MM among participating hospitals was MM2 (advanced directives) with 99 percent overall coverage. MM8, MM9 and MM10 (sharing immunization data, laboratory data, and syndromic surveillance data with public health departments) were the lowest reported measures. MM7 (summary of care shared during a transition of care) was not reported by any of the participating hospitals. Due to the fact that MMs are optional, a number of menu measures were not reported by hospitals thus making the average calculations impractical to interpret.

TableC-4. Summary of Menu [Optional] MU attestation among participating hospitals

#	Hospital	MM1	MM2	MM3	MM4	MM5	MM6	MM7	MM8	MM9	MM10	MM_{AVG*}
1	Johns Hopkins Hospital	Y	.976	.865	Y	-	-	-	N	Y	N	.691
2	Western Maryland Regional	Y	.998	-	Y	-	-	-	Y	Y	N	.833
3	Sinai Hospital of Baltimore	N	.993	.967	Y	.887	-	-	Y	N	N	.606
4	Calvert Memorial Hospital	N	.991	1.00	N	.196	.895	-	N	N	Y	.454
5	Northwest Hospital	N	.971	.988	Y	.926	-	-	Y	N	N	.611
6	Washington Regional Med Center	N	.998	.923	N	.947	.981	-	N	Y	N	.539
7	Mercy Hospital Fort Smith	Y	.990	.998	N	-	.879	-	N	N	Y	.608
8	Baxter Regional Med Center	Y	.993	.839	Y	-	-	-	Y	N	N	.690
9	Mercy Hospital Rogers	Y	.997	.998	N	-	.912	-	N	N	Y	.613
	*Total average (rounded)**	.556	.990	.947	.556	.739	.917	-	.444	.333	.333	N/A

MM: Menu Measure; MM1: drug formulary checks; MM2: advance directives; MM3: structured clinical laboratory results; MM4: patient list by condition; MM5: patient specific educational resources; MM6: medication reconciliation; MM7: summary of care shared for transition of care; MM8: immunization registry; MM9: reportable laboratory results; MM10: syndromic surveillance.

* MM_{AVG} only includes last year of Stage 1 MU attestation and excludes other years. To calculate the overall average, 'Y' was considered as 1 and 'N' as 0 (zero) in categorical measures such as MM4. MM_{AVG} should be interpreted with caution as menu measures with no responses, denoted by '-', are excluded in the average calculations.

Appendix D. Data Collection Instrument

Evaluating Stage 3 Meaningful Use (Stage 3 MU) Objectives (305 & 308)—Data Request Form

The Project

Thanks again for your interest and participation in the AHRQ-funded Stage 3 MU evaluation project. Our aim is to identify operational challenges in collecting necessary data to measure two Stage 3 MU objectives (305 & 308). These measures are focused on care coordination (Stage 3 MU-CC). The results of this project will inform policy makers on existing Stage 3 MU-CC challenges and help them adjusting these measures if deemed too complex to implement.

The two measures for this study are (abbreviated versions):

- **SGRP 305**: Sending referral results to >50% of requestors (>10% electronically)
- **SGRP 308**: Notifying key care team member about significant health care events within 2hrs (>10%)

Our interest is to find key challenges in collecting the Stage 3 MU-CC measures and NOT simply calculated ratios of these measures (means and not ends). Your comments on various challenges and opportunities in collecting the Stage 3 MU-CC data elements, and functional or workflow limitations are highly valuable to this project. This form includes these sections:

- **Background**: Reviews the 305/308 Stage 3 MU measures and explains their similarities and differences with other MUs
- **Existing Surveys**: Includes a list of common questionnaires to share if you already have them on-file
- **Measures**: Includes three sections for each of the 305 and 308 measures:
    - **Data Elements/Sub-Elements**: Each measure is broken down into data elements and sub-elements
    - **Functional Elements**: Each measure includes questions on EHR's care coordination functionalities
    - **Workflow Elements**: Each measure includes questions on workflow issues affecting care coordination

Our Contact Information / Questions

Please direct any questions to:

- If you are affiliated with a hospital in Maryland: **Vipra Ghimire** (****) - MD Field Coordinator
- If you are affiliated with a hospital in Arkansas: **Pam Brown** (****) - AR Field Coordinator
- If you have technical/conceptual questions: **Hadi Kharrazi** (****)—Principal Investigator

If you prefer discussing any questions on the phone, please call **** anytime 9am-6pm EST. A short notice via email is appreciated (****).

Your Contact Information

Name		**Hospital providing the data**	
Email		**Date data collection started**	YYYY-MM-DD
Phone		**Date data collection ended**	YYYY-MM-DD
Affiliation		**Others involved - 1 (name)**	
Position		**Others involved - 2 (name)**	

Background Information on the Measures

Stage 3 MU includes a long list of objectives, some are simply continuations/upgrades of Stage 2 MU objectives but some are completely new objectives. When this project was funded, both SGRP 305 and 308 were considered new objectives introduced in Stage 3 MU. There has been some discussion to merge some of Stage 3 MU measures together but none have finalized yet (e.g., consolidating 305 in 303). Following is a short description of the measures studied in this project. Note that this section only provides a high-level description of the measures and does NOT entail any details. Indeed, the purpose of this project is to collect the necessary information that can help shaping the details of 305/308 measures.

SGRP 305 Measure: "For patients referred during an EHR reporting period, referral results generated from the EHR, 50% are returned to the requestor and 10% of those are returned electronically"

SGRP 305 Critical Discussion: SGRP-305 is proposed to close the referral loop initiated by 303. Outgoing referral-requests are measured by SGRP303 (also available in Stage 2 MU) which requires the eligible hospitals and/or professional to send a summary of care record if a referral is requested by them. However, there are no mechanisms to ensure that the result of a referral is sent back to the requestor of the referral (which 305 will mandate). The 305 measure has the following limitations: (1) does not identify what is considered a referral or how to define boundaries of care; (2) does not list what items should be included in the results or how they need to be transmitted, and (3) does not explain how to identify the true requestor of the referral or how to ensure that the requestor has received the results. This document will enable the project team to translate these issues into specific recommendations for the MU committee.

SGRP 308 Measure: "For 10% of patients with a significant health care event (arrival at an Emergency Department (ED), admission to a hospital, discharge from an ED or hospital, or death), EH/CAH will send an electronic notification to at least one key member of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required, within 2 hours of when the event occurs."

SGRP 308 Critical Discussion: SGRP-308 is proposed to ensure a base-level notification system to enhance care coordination efforts across providers. The 308 measure has the following limitations: (1) does not identify how to measure 'arrival' at ED or death in EHR; (2) does not explain what information the notification should include; (3) does not define who is considered the key member of a care team; and, (4) does not describe how patient's consent relates to the notification process.

The original description of Stage 3 MU measures, including 305 and 308, can be found at: *******

The project team is aware of the relative ambiguity of the language used for these measures. The purpose of this document is to evaluate and identify feasible components of the 305 and 308 measures that can help us reducing such ambiguities.

Existing Surveys / Data Reports

Please see the following commonly reported hospital surveys / data forms. You can download a sample PDF of each survey under 'Download Link' to assure that you have identified the correct survey (hold Ctrl and left click on 'PDF format' link). If you have already responded to a survey in the past, please indicate with an 'X' under 'Available' and attach the latest completed survey/report in your email (along with this form). If you have not reported a particular survey in the past, please indicate under 'Not Available' column with an 'X', and then see the 'Partial Report' column for instructions on how to partially fill the form (instead of a full report). If the data is not available at all or cannot be reported due to operational limitations, please indicate so and explain under 'Comments'. Example responses (in orange) are included at the end of the table to help you understand various possibilities.

Survey	Download Link*	Attached	N/A	Partial Report	Comments
AHA Annual Survey	PDF format			See comments and highlights inside PDF	
AHA IT Supplement	PDF format			See comments and highlights inside PDF	
CMS Stage 1 MU Attestation	PDF format** *Your format***			Provide num/denom for CC measures only	
CMS Stage 2 MU Attestation	*Your format****			Provide num/denom for CC measures only	
ACO CC Readiness	PDF format Word format			See comments and highlights inside PDF	
NQF CC Measures	PDF format Word format			Skip measures not readily available	

** Please Ctrl+Click to download the file. If the file is in PDF format, please complete the forms by either (1) using Adobe Acrobat's Type Writer tool; or (2) printing the form, filling it manually, and then scanning the form as a new PDF file. For some surveys a Word version is available that can be used as an alternative option. Please email the completed forms (PDF or Word) as instructed on the first page of this document.*

*** This is a smart PDF file and you can directly type in it. Alternatively, if you have already attested to Stage 1 MU, you can share your internal report (Excel sheet or other formats) or the CMS printout. Only the last year of your Stage 1 MU attestation is required (please indicate the year of Stage 1 MU in your file).*

**** If you have attested to Stage 2 MU, please share your internal report (Excel sheet or other format) or the CMS printout. There are no PDF files available for Stage 2 MU at this time. Only the last attestation is required (please indicate the year of Stage 2 MU in your file).*

Instructions / Guide

Please read these instructions before completing the tables included on next pages:

■ **Data Elements / Sub-Elements**: Each measure is broken down into data elements and sub-elements. Sub-elements often start with a broader concept and are narrowed down into smaller data pools as the table continues. Make sure to answer the sub-elements in the order listed on each table.

■ **Difficulty**: Levels of difficulty to collect or retrieve EHR data to measure Stage 3 MU data sub-elements (1 easiest—10 hardest). Note that if 'level of difficulty' is equal or more than 6 for a data sub-element, you do NOT need to calculate the sub-element and enter it under the '#' column. You only calculate the # if the level of difficulty is between 1 and 5. Follow is the list of these levels. Note that the word 'Numbers' is used to refer to '#' column in the tables:

- **Level 1—Numbers already exist**: Numbers of this data sub-element are automatically calculated by the EHR and are included in internal reporting. You only need to retrieve the last report to find the numbers.
- **Level 2—Built-in EHR tools**: Numbers can be easily calculated by various built-in EHR tools but requires your interaction with the tool. You need to spend some time to build the reporting process but it can be automated after that.
- **Level 3—Existing third-party tools**: Numbers can be calculated through third party applications (i.e., not native to your EHR system). You need to locate various EHR fields and then use the third party tool to calculate the numbers.
- **Level 4—Simple SQL**: Numbers can be calculated using a simple SQL command against a database. You may need to spend some time to develop these SQL queries. These queries might also be available in your existing library of SQL commands.
- **Level 5—Customized SQL**: Numbers can be calculated using customized SQL commands against a data warehouse. This requires technical expertise and knowledge of various databases. You will spend less than an hour to finish it.
- **Level 6—Complex SQL & Non-EHR databases**: Numbers can only be calculated via multiple complex SQL queries that may span across various databases including non-EHR databases. You need to spend more than an hour to finish it.
- **Level 7—Non-standardized EHR fields**: EHR captures the data sub-element in structured but non-standardized fields. SQL queries are impractical and require considerable data cleaning before they can be applied.
- **Level 8—Free-text EHR data**: EHR captures the data sub-elements in a non-structured field (e.g., free-text notes), thus making the SQL-based retrieval of data sub-elements impractical unless you use advanced NLP tools to prepare the data.

- **Level 9—Lack of EHR fields**: Your EHR does not have a field to store, capture, or flag this data sub-element.
- **Level 10—No data collection**: This data sub-element is not collected in the day-to-day operations or clinical workflow of your hospital (regardless of the fact that the EHR includes or does not include a field to store it)

■ **Data Source**: Include the complete name of data sources you used to find the # for the sub-element. These sources can be: EHR database (e.g., Clarity of Epic), PHR module (e.g., MyChart of Epic); Data Warehouse (e.g., Cogito of Epic); Internal or External Surveys (e.g., care coordination tools); Other IT tools (e.g., fax server); or a combination of them.

■ **Number (#)**: Include the count of the population that fits the data sub-element description. You can count based on patients, episodes of care, or encounters (if not encounter please mention which method you have used). Note that data sub-elements do NOT have a denominator. Report the #s if the difficulty level of finding the information is less or equal to 5. In contrast with typical data extraction requests, there are NO value sets, ICD codes or other terms listed for your queries (i.e., inclusion and exclusion criteria). The aim is to find out what is possible and what is not.

■ **Include**: Do you suggest including this sub-element in the measure? Respond by 'Y', 'N' or '?' (i.e., no comment)

■ **Comments**: Provide your:

(1) Concerns or suggestions about a specific sub-element (e.g., suggestions to modify it);

(2) Innovative HIT workarounds to improve the collection, aggregation, retrieval and automation of this specific data sub-element; and,

(3) Suggestions for future EHR certifications to accommodate this data sub-element.

Further instructions on comments/questions are also provided for each measure separately (see each measure). Providing your comments is the most critical part of this questionnaire.

Measure SGRP 305

SGRP 305 Measure: "For patients referred during an EHR reporting period, referral results generated from the EHR, 50% are returned to the requestor and 10% of those are returned electronically."

(a) Data Elements

Remember that this project evaluates the feasibility of this measure. Your comments are highly valuable especially when a data sub-element cannot be calculated. Ignore the grayed out cells with an 'N/A' text as they are not applicable for that specific sub-element. Please consider these assumptions for all of the data pulls (rows) of the following data element table (except for 'EHR Reporting Period' rows):

- **Timeframe**: All data pulls should use a 6-month time period (e.g., number of referrals in the last 6 months starting YYYY/MM/DD). If you decide to change the timeframe, make sure to mention it in your comments and state why you had to do this (e.g., referral data were only collected in the last 3 months). Please try to keep the same timeframe for all of your data pulls.
- **Organizational Unit**: All data pulls should consider your hospital as a unique entity which is comprised of the inpatient setting, ED, hospital's outpatient clinic, and other units operating under the 'eligible hospital' umbrella. If due to operational limits you cannot accomplish a cross-organization (cross-hospital) data pull, please do the data pull for the most suitable organizational unit (inpatient, ED, or outpatient clinic) and explain your choice in the comments (e.g., only the outpatient clinic's EHR gathers referral data).
- **Type of Requestor**: All data pulls that include the 'referral requestor' should include all types of 'authorized' providers as requestors (e.g., physician, nurse, case manager or staff authorized to request a referral). These requests may originate from a PCP, Skilled Nursing Facility, Home Health care Agency, [Other] Hospitals or other provider organizations). If you are unable to calculate all possibilities, please include the most common one that is feasible, and explain in the comments what type of providers you have included or excluded, and why.
- **Types of Referral**: All data pulls focus on 'consult' referrals. You will define the boundaries of 'consult' referrals yourself and explain your assumptions in one of the comments (i.e., first row after EHR reporting period). In addition to 'consult' referral, please include in your comments your capability to calculate diagnostic (e.g., laboratory, pathology, imaging) or therapeutic/procedural (e.g., endoscopy) referrals as well (no need to actually calculate them—just comment).

SGRP 305 Measure—Sending Referral Results					
Data Element	**EHR Reporting Period**				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
# of months you use for MU reporting period (3, 6, 9, or 12m)	N/A	N/A	__m		• Concerns or suggestions:
Max # of months you have collected data about referrals				N/A	• Have you adopted a new EHR in this time period? • Concerns or suggestions:
Data Element	**(a) Referral Request / Initiation**				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**

(a.1) # of 'consult' referrals you have received in a given time frame from an outside provider (not part of your health delivery network)					• What do you define as a 'consult' referral? Why? • How do you find a 'consult' referral in your EHR? • Do you have a dedicated indicator/flag for referral requests / initiations in your EHR database? • Data pull specs: o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Type of requestor: Out of your network PCP, SNF, HHA, CM, hospital or all? o Feasibility to calculate for other referrals: diagnostics, or procedures? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(a.2) # of 'consult' referrals you have received in a given time frame from another provider in your own health delivery network (but outside your own hospital setting)					• Data pull specs: o Timeframe (duration and start date): 6-months? o Inside your delivery network: inpatient, ED, or outpatient clinic (but not part of your hospital)? o Type of requestor: Your network PCP, SNF, HHA, CM, hospital or all? o Feasibility to calculate for other referrals: diagnostics, or procedures? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:
(a.3) # of 'consult' referrals you have received in a given time frame from within your own hospital setting (e.g., inpatient setting, ED, and hospital's outpatient clinic)					• Data pull specs: o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Feasibility to calculate for other referrals: diagnostics, or procedures? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(a.4) # of 'consult' referrals you have received in a given time frame from any provider (outside or inside your network) but have transferred it to a third party provider					• What are the most common types of referral transfers/redirections initiated by your hospital? Why? • How can you make sure that the third-party will send the results back to you or the original referral requestor? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:
Data Element	**(b) Results Available—Referral Performed**				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**

(b.1) # of 'consult' referral results you have performed and are available for referrals requested by an outside provider in a given time frame *(b.1 is a subset of a.1)*					• What do you define as a 'consult referral result'? • What types of data should 'consult result' include (name some of your data elements)? • What format should 'consult result' have (CCDA, free-text)? • Do you have a dedicated indicator/flag for referral results performed/ready in your EHR database? • Data pull specs: *(answer if not similar to a.1)* o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Type of requestor: Out of your network PCP, SNF, HHA, CM, hospital or all? o Feasibility to calculate for other referrals: diagnostics, or procedures? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(b.2) # of 'consult' referral results you have performed and are available for referrals requested by another provider in your own health delivery network (but outside your own hospital setting) in a given time frame *(b.2 is a subset of a.2)*					• Data pull specs: *(answer if not similar to a.2)* o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Type of requestor: Your network PCP, SNF, HHA, CM, hospital or all? o Feasibility to calculate for other referrals: diagnostics, or procedures? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:
(b.3) # of 'consult' referral results you have performed and are available for referrals requested by some provider within your own hospital setting (e.g., inpatient setting, ED, and hospital's outpatient clinic) *(b.3 is a subset of a.3)*					• Data pull specs: *(answer if not similar to a.3)* o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Feasibility to calculate for other referrals: diagnostics, or procedures? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	(c) Requestor Identification				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
(c.1) # of 'consult' referrals you have received in a given timeframe from an outside provider that has a valid requestor contact information associated with it *(c.1 is a subset of a.1)*					• What do you define as 'valid requestor contact information'? • What types of data should 'requestor contact information' include (name some of your data elements)? • Can you calculate the overlap between this # and b.1 (assuming the same data pull specs)? If yes, please indicate the overlap #. • Do you have a dedicated contact field for referral requestors in your EHR database? • Data pull specs: *(answer if not similar to a.1)* o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Type of requestor: Out of your network PCP, SNF, HHA, CM, hospital or all? o Feasibility to calculate for other referrals: diagnostics, or procedures? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(c.2) # of 'consult' referrals you have received in a given timeframe from another provider in your own health delivery network (but not within your own hospital setting) that has a valid requestor contact information associated with it *(c.2 is a subset of a.2)*					• Can you calculate the overlap between this # and b.2 (assuming the same data pull specs)? If yes, please indicate the overlap #. • Data pull specs: *(answer if not similar to a.2)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(c.3) # of 'consult' referrals you have received in a given timeframe from some provider within your own hospital setting (e.g., inpatient setting, ED, and hospital's outpatient clinic) that has a valid requestor contact information *(c.3 is a subset of a.3)*					• Can you calculate the overlap between this # and b.3 (assuming the same data pull specs)? If yes, please indicate the overlap #. • Data pull specs: *(answer if not similar to a.3)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	(d) Results Sent Back—Referral Completed				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
(d.1) # of 'consult' referral results you have sent back to the requestors when you have received the referrals in a given time frame from an outside provider *(d.1 is a subset of b.1)*					• How do you transfer the results (e.g., simple email, direct messaging, SOAP, XDR/XDM)? • Is your local/regional HIE involved in transferring the 'consult' results? • By average, how long does it take to send back the 'consult' results from the time you complete the referral process? • By average, how long does it take to send back the 'consult' results from the time you receive the original referral request? • Do you have a dedicated flag/field in your EHR database to show a referral result has been sent out to the original requestor (or some other party)? • Data pull specs: *(answer if not similar to b.1)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(d.2) # of 'consult' referral results you have sent back to the requestors when you have received the referrals in a given time frame from another provider in your own health delivery network (but not within your own hospital setting) *(d.2 is a subset of b.2)*					• Data pull specs: *(answer if not similar to b.2)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:
(d.3) # of 'consult' referral results you have sent back to the requestors when you have received the referrals in a given time frame from a provider within your own hospital setting (e.g., inpatient setting, ED, and hospital's outpatient clinic) *(d.3 is a subset of b.3)*					• Data pull specs: *(answer if not similar to b.3)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	(e) Confirmation of Result Receipt—Referral Loop Completed				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
(e.1) # of 'consult' referral result-receipt acknowledgement / confirmations you have received in a given time frame from an outside provider *(e.1 is a subset of d.1)*					• How should the result-receipt acknowledgement be transferred (e.g., simple email, direct messaging, SOAP, XDR/XDM)? • Should the local/regional HIE be involved in sending back the confirmation of result receipt? How? • Do you have a dedicated indicator/flag for confirmation of 'referral results received by requestor' in your EHR database? • Data pull specs: *(answer if not similar to d.1)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(e.2) # of 'consult' referral result-receipt acknowledgement / confirmations you have received in a given time frame from another provider in your own health delivery network (but not within your own hospital setting) *(e.2 is a subset of d.2)*					• Data pull specs: *(answer if not similar to d.2)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:
(e.3) # of 'consult' referral result-receipt acknowledgement / confirmations you have received in a given time frame from within your own hospital setting *(e.3 is a subset of d.3)*					• Data pull specs: *(answer if not similar to d.3)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	**(a) to (e)**

- Please include any further comments on any of the (a) to (e) data elements here:

(b) EHR Functional Elements

(1) Does your EHR (on screen—not necessarily in the database) have visual or textual indicators for any of the following 'referral' items? If yes, please indicate: (1) what is the indicator (e.g., image of a flag; red text showing a new referral request), (2) in which step of the referral process it shows up, and (3) if possible include an anonymous screenshot of it (make sure no personal identifiers are visible in it)?

- Indicator of consult referral request received by your hospital (what indicator, where in the process, screenshot)
- Indicator of consult referral completion by your hospital (what indicator, where in the process, screenshot)
- Indicator of consult referral results returned to the requestors (what indicator, where in the process, screenshot)
- Indicator of consult referral result receipt/acknowledgement by the requestor (what indicator, where in the process, screenshot)

(2) Does your EHR have a data element to record if a patient did not show up for the referral despite the request made by the PCP (e.g., change of mind, going elsewhere for referral, death of the patient)?

(3) Does your EHR have a data element to record if a patient showed up for a referral but did not accept to complete it (e.g., didn't consent to undergo the medical procedure)?

(4) Does your EHR include a master contact list that can be shared across your health network? How about sharing the contact information with other providers? Or accessing a regional/national database of contacts?

(5) Does your EHR import referral requests made by non-EHR electronic systems (e.g., HIEs, regular emails)?

(6) Does your EHR import referral requests made by non-electronic mediums (e.g., paper charts, fax, phone, and mail)?

(7) Does your EHR have a different field for requestor of a referral than the receiver of the referral (e.g., requested by nursing home 'A' but results should be sent to PCP 'B')?

(8) Does your EHR keep track of referrals that do not produce any results due to unforeseeable reasons (e.g., device malfunction)? Does it schedule next appointment for the referral automatically?

(9) Does your EHR capture a referral rejected by your hospital (e.g., due to the ambiguity of the request/requestor; unavailability of the referral's procedure)?

(10) Does your EHR have a function to send back the referral results as soon as they become available? Is this an automated function or needs a manual confirmation (excluding the patient's or hospital's authorization to release the data)? If yes, who confirms what?

(11) Does your EHR have the capability to generate multiple referral requests (internally) based on one single request?

(12) Does your EHR have a function to prioritize referral requests (e.g., scheduling the higher risk patients sooner than others)?

(13) Do you have an HIE (Health Information Exchange) connectivity?

- Can you send your referral results through the HIE connectivity?
- Is the HIE connectivity a seamless built-in EHR function? Or you have to sign into a different system/screen to use it?

(14) Is there a way for your EHR to acquire the patients' records from an out-of-your-network requestor (manually or automatically; directly or indirectly)?

(15) Stage 2 MU measures include transmission of 'Summary of Care' during care transition. If you currently conform to this measure, what data elements are you currently including in the summary of care record?

(16) Have you investigated the quality of information reported in 'consult' referral results (e.g., data accuracy)? If yes, briefly explain your findings.

(17) Does your EHR indicate if a referral is brand new? Or if this is a repeated request for the same referral?

(18) If a referral requestor uses the same EHR infrastructure as yours, is there functionality in the EHR indicating that the referral results have been delivered? Or have been read by the requestor?

(19) If the results of a referral are coming from various parts of your hospital, does your EHR have the capability to aggregate all results in one report to send back to the requestor? Or this is a manual process?

(20) Does your EHR have a way to detect and prevent duplicate referral requests?

(21) Does your EHR provide a copy of 'consult' results to patients via a patient portal / personal health record system? If yes, explain what system and how.

(22) Does your EHR include a comprehensive referral tracking system (e.g., as an internal or external module) that fulfils all data requirements of the SGRP-305 measure?

(c) Workflow Elements

- *Human / Workflow Elements*

(1) Describe your workflow elements such as human resources (e.g., nurses/case managers/staff) and information mediums (e.g., paper, phone, fax, EHR) involved in care coordination of your referrals:

  - Describe your workflow steps and elements to schedule the referrals proactively (e.g., calling the patient to set an appointment date as soon as you receive the request)
  - Describe your workflow steps and elements to detect completed reports and to send the results to the requestor of the referral (e.g., calling the PCP office as soon as the results are ready)
  - Describe your workflow steps and elements to confirm that the requestor has received the results (e.g., calling the PCP office to ensure the results were reviewed)?

(2) Do you have a predefined workflow routine to reschedule a cancelled referral (requested by either the patient or the provider)?

(3) Do you have a predefined workflow routine to record if a patient has rejected a referral after being admitted (e.g., patient did not accept the consent)?

(4) Do you have a predefined workflow routine to let the requestor of the referral know that the referral is being forwarded to another provider?

(5) Do you have a workflow checking mechanism to find out if the referral was made by a care team member of the patient or initiated by the patient him/herself?

(6) Is your 'referral care coordination' staff responsible for all types of provider requests (PCP, home health care, nursing homes)? Or you have different/specialized staff members for each category?

(7) If you have more than one person to assure referral results are sent, do they interact regularly with each other (i.e., coordination of care coordinators)?

(8) Does your care coordination staff have access to your local/regional HIE portal?

(9) Do you have care coordination training for your staff? Does your care coordination training include specific items on how to handle referrals?

- *Organizational Factors*

(10) Do you have an existing contract with a third party agency to provide care coordination services, including referral management, for your hospital?

(11) Do you have separate / dedicated unit within your hospital to perform care coordination or handle care management efforts? Who evaluates the performance of this group?

(12) Are you part of a larger health care delivery system that incentivizes pay-for-quality (e.g., Accountable Care Organization)?

(13) Do you collaborate closely with health care providers (i.e., referral requestors) that are part of a larger quality care groups (e.g., Patient Care Medical Home)? What percentage of them?

(14) Do you think direct payer reimbursement (e.g., Medicare/Medicaid) for referral results may increase the likelihood of success for SGRP 305?

(15) Are there any organizational factors that can propel your hospital to achieve SGRP 305?

(d) Your Final Comments

(1) Will you include SGRP-305 in Stage 3 MU measures as it is? Explain why?

(2) Will you include a modified version of SGRP-305 in Stage 3 MU? If yes, please write down the language of the new measure in one sentence:

(3) Do you support consolidating SGRP-305 in SGRP-303 Stage 3 MU? (see Stage 3 MU link on page 2)

(4) Can you roll out the original SGRP-305 in your hospital setting (in a limited scale such as a sub-population or part of the hospital)?
What timeline do you require for the rollout (already rolled out, 1m, 2m, 3m, 6m, 9m, and 12m)?

(5) Can you roll out your modified version of SGRP-305 in your hospital setting (in a limited scale such as a sub-population or part of the hospital)?
What timeline do you require for the rollout (already rolled out, 1m, 2m, 3m, 6m, 9m, and 12m)?

Measure SGRP 308

SGRP 308 Measure: "For 10% of patients with a significant health care event (SHCE) (arrival at an Emergency Department (ED), admission to a hospital, discharge from an ED or hospital, or death), EH/CAH will send an electronic notification to at least one key member of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required, within 2 hours of when the event occurs."

(a) Data Elements

Remember that this project evaluates the feasibility of this measure. Your comments are highly valuable especially when a data sub-element cannot be calculated. Please consider these assumptions for all of the data pulls (rows) of the following data element table:

- **Timeframe**: All data pulls should use a 6-month time period (e.g., number of SHCE notifications in the last 6 months starting YYYY/MM/DD). If you decide to change the timeframe, make sure to mention it in your comments and state why you had to do this (e.g., SHCE notifications were only collected in the last 3 months). Please try to keep the same timeframe for all of your data pulls.
- **Organizational Unit**: All data pulls should consider your hospital as a unique entity which is comprised of the inpatient setting, ED, hospital's outpatient clinic, and other units operating under the 'eligible hospital' umbrella. If due to operational limits you cannot accomplish a cross-organization (cross-hospital) data pull, please do the data pull for the most suitable organizational unit (inpatient, ED, or outpatient clinic) and explain your choice in the comments (e.g., only the outpatient clinic's EHR generate SHCE notifications).
- **Type of Care Team Member**: All data pulls that include the 'care team member' should include all types of 'authorized' providers as care team members of the patient (e.g., physician, nurse, case manager or staff authorized to receive a notification). Exclude the patient's caregiver (e.g., family member providing care) from the list of care team members. If you are unable to calculate notifications sent to all care team members, please include the ones that are feasible and explain in the comments.
- **Types of Significant Health care Events (SHCE)**: All data pulls should include an aggregate of all five types of SHCEs (ED arrival and discharge, hospital admission and discharge, and death). If for any reason any of the SHCE types is not applicable to your setting, not captured by your organization, or not recorded in the EHR, please exclude it from this list and explain in your comments.

SGRP 308 Measure—Significant Health care Events (SHCE)					
Data Element	**(a) Significant Health care Event (SHCE)**				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
(a.1) # of SHCEs you have recorded in a given time frame in your hospital (e.g., inpatient setting, ED, and hospital's outpatient clinic)					• Do you consider 'arrival' at ED equal to 'admission' to ED? • Do you have a dedicated indicator/flag for ED arrival in your EHR database? Explain. • Do you have a dedicated indicator/flag for ED discharge in your EHR database? Explain. • Do you have a dedicated indicator/flag for hospital admission in your EHR database? Explain. • Do you have a dedicated indicator/flag for hospital discharge in your EHR database? Explain. • Do you have a dedicated indicator/flag for death in your EHR database? Explain. • Data pull specs: o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Type of SHCE recorded: Any exclusions? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(a.2) # of SHCEs you have recorded in a given time frame in your hospital that includes a timestamp (HH:MM) *(a.2 is a subset of a.1)*					• Do you collect both HH (hours) and MM (minutes) in your SHCE records? • Data pull specs: *(answer if not similar to a.1)* o Timeframe (duration and start date): 6-months? o Your organizational unit: inpatient, ED, or outpatient clinic? o Type of SHCE recorded: Any exclusions? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	(b) Care Team Member Identification				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
(b.1) # of SHCEs you have recorded in a given time frame in your hospital that has a valid care team members' contact information associated with it *(b.1 is a subset of a.1)*					• Who do you consider the 'key' team member? • Do you have a flag in your EHR database to identify the key care team member? • What types of data should 'care team member contact info' include (name some of your data elements)? • Do you have a dedicated contact list for patients having SHCEs in your EHR database? • By average, how many care team members you have for each patient with SHCE? • Data pull specs: *(answer if not similar to a.1)* o Timeframe (duration and start date): 6-months? o Type of care team member listed: Out of your network physician, nurse, case manager, or staff member? o Type of SHCE recorded: Any exclusions? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	(c) SHCE Notification Sent Out				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
(c.1) # of SHCEs you have recorded in a given time frame in your hospital that include a notification sent out to an outside care team member *(c.1 is a subset of a.1)*					• What type of information should be included in the SHCE notification (list your data elements)? • What format should the SHCE notification have (e.g., CCDA, free-text)? • How do you notify the care team member (e.g., simple email, direct messaging, SOAP, XDR/XDM)? • Is your local/regional HIE involved in notifying the care team member of an SHCE? • Do you have a dedicated flag/field in your EHR database to show an SHCE notification has been sent out to a care team member? • Can you calculate the overlap between this # and b.1 (assuming the same data pull specs)? If not, explain why. • Data pull specs: *(answer if not similar to a.1)* o Timeframe (duration and start date): 6-months? o Type of SHCE recorded: Any exclusions? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

(c.2) # of SHCEs you have recorded in a given time frame in your hospital that include a notification with a timestamp (HH:MM) sent out to an outside care team member *(c.2 is a subset of a.2)*					• Do you collect both HH (hours) and MM (minutes) in your notification time stamps? • By average, how long does it take from the time the SHCE occurs to the time a notification is sent out? • Should separate SHCE notifications be sent out if a patient faces series of SHCE events in less than 2-hrs (i.e., one notification for all events, or one notification per each event)? • Data pull specs: *(answer if not similar to a.2)* o Timeframe (duration and start date): 6-months? o Type of SHCE recorded: Any exclusions? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	(d) Confirmation of Notification Receipt—Notification Loop Completed				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**
(d.1) # of SHCEs you have recorded in a given time frame in your hospital that include a confirmation-receipt for a notification sent out to an outside care team member *(d.1 is a subset of c.1)*					• How should the notification-receipt acknowledgement be transferred (e.g., simple email, direct messaging, SOAP, XDR/XDM)? • Should the local/regional HIE be involved in sending back the confirmation of notification receipt? How? • Do you have a dedicated indicator/flag to confirm the 'receipt of notification by a care team member' in your EHR database? • Data pull specs: *(answer if not similar to c.1)* o Timeframe (duration and start date): 6-months? • Concerns or suggestions: • Innovative HIT workarounds: • EHR certification suggestions:

Data Element	(e) Indicator of Patient Consent				
Data Sub-Element	**Difficulty (1-10)**	**Data Source**	**#**	**Include (Y/N/?)**	**Comments / Questions**

(e.1) # of SHCEs you have recorded in a given time frame in your hospital that include a patient consent to share with a care team member of the patient (outside of your health delivery network)
 	
(e.1 is a subset of a.1)
					• Should there be a separate patient consent process for SHCEs?
					  o If yes, how should it be implemented in the workflow?
					  o If no, which consent form should include the SHCE consent requirements?
					• Do you have a dedicated indicator/flag for SHCE-related patient consent approval in your EHR database?
					
					• Data pull specs: *(answer if not similar to a.1)*
					  o Timeframe (duration and start date): 6-months?
					
					• Concerns or suggestions:
					• Innovative HIT workarounds:
					• EHR certification suggestions:

Data Element	(a) to (e)
Please include any further comments on (a) to (e) data elements here:	

(b) EHR Functional Elements

(1) Does your EHR (on screen—not necessarily in the database) have visual or textual indicators for any of the following SHCE items? If yes, please indicate: (1) what is the indicator (e.g., image of a flag; red text showing a new SHCE has occurred), (2) in which step of the workflow process it shows up, and (3) if possible include an anonymous screenshot of it (make sure no personal identifiers are visible in it)?

- Indicator that SHCE has happened to a patient (what indicator, where in the process, screenshot)
- Indicator that SHCE notification has been sent to a care team member (what indicator, where in the process, screenshot)
- Indicator that SHCE notification has been received/reviewed by a care team member (what indicator, where in the process, screenshot)

(2) Does your EHR have a data element to record if a patient has arrived at the ED but has not been admitted to ED yet?

(3) Does your EHR have a data element to record if a SHCE event (e.g., admission or discharge) has been postponed or cancelled?

(4) Does your EHR include a centralized contact list of care team members for patient? How often this contact list get updated (if contact information changes overtime)?

(5) Does your EHR uses HIE connectivity to notify SHCE events to care team members? How about events similar to SHCEs?

(6) If you can add to five SHCEs, what other events would you add to them? Does your EHR already support the collection of your additional SHCEs?

(7) Does your EHR have a function to send out the SHCE notifications as soon as they become available? Is this an automated function or needs a manual confirmation? If yes, who confirms what?

(8) If a care team member uses the same HIT infrastructure as you (e.g., same EHR), is there functionality in the EHR indicating that SHCE notification has been delivered? Or have been read / reviewed?

(9) Does your EHR have a way to detect and prevent duplicate SHCE notifications originating from various hospital units?

(10) Does your EHR provide a copy of SHCE-notification to patients' caregivers via a patient portal / personal health record system? If yes, explain what system and how.

(11) Does your EHR include a comprehensive SHCE notification system (e.g., as an internal or external module) that fulfils all data requirements of the SGRP-308 measure?

(c) Workflow Elements

- *Human / Workflow Elements*

(1) Describe your workflow elements such as human resources (e.g., nurses/case managers/staff) and information mediums (e.g., paper, phone, fax, EHR) involved in care coordination of your SHCEs:

- Describe your workflow steps and elements to record SHCEs in the EHR (e.g., nurse enters hospital discharge in the record)

- Describe your workflow steps and elements to send out SHCE notifications to care team members (e.g., calling the PCP office as soon as an SHCE is detected)
- Describe your workflow steps and elements to confirm that the care team member has received the notification (e.g., calling the PCP office to ensure the notification was reviewed)?

(2) Who do you qualify as the patient's care team members?

(3) What is the protocol while notifying multiple care team members of a patient about an SHCE (or other event)? Who should be notified first (i.e., identifying the key member), second and third?

(4) Is your 'referral care coordination' staff responsible to notify SHCEs to all types of providers (PCP, home health care, nursing homes)? Or you have different/specialized staff members for each category?

(5) Does your care coordination staff have access to your local/regional HIE portal?

(6) Do you have care coordination training for your staff? Does your care coordination training include specific items on how to handle SHCE notifications?

- *Organizational Factors*

(7) Do you think direct payer reimbursements (e.g., Medicare/Medicaid) for notifying SHCEs to care team members may increase the likelihood of success for SGRP 308?

(8) Are there any organizational factors that can propel your hospital to achieve SGRP 308?

(d) Your Comments

(1) Will you include SGRP-308 in Stage 3 MU measures as it is? Explain why?

(2) Will you include a modified version of SGRP-308 in Stage 3 MU? If yes, please write down the language of the new measure in one sentence:

(3) Do you support consolidating SGRP-308 in any other Stage 3 MU measure? (see Stage 3 MU link on page 2)

(4) Can you roll out the original SGRP-308 in your hospital setting (in a limited scale such as a sub-population or part of the hospital)?
What timeline do you require for the rollout (already rolled out, 1m, 2m, 3m, 6m, 9m, and 12m)?

(5) Can you roll out your modified version of SGRP-308 in your hospital setting (in a limited scale such as a sub-population or part of the hospital)?
What timeline do you require for the rollout (already rolled out, 1m, 2m, 3m, 6m, 9m, and 12m)?

Appendix E. Additional Results

Followed are additional results that were collected throughout the project (interviews, focus groups, and data collection instrument) for SGRP 305 and 308. Note that additional results of other Stage 3 MU-CC measures (i.e., SGRP 303) are limited to the exit interviews of the CMIO/CIOs and are only included in this appendix.

Measure #1: SGRP 305—Sending Back Referral Results to Referral Requestor

Table E-1. Summary of selected notable responses to qualitative questions of SGRP # 305 data elements

Question	Notable Responses
Data Element	**(a) Referral Request / Initiation**
What do you define as a 'consult' referral?	• A patient [who] is referred to another provider and receives care in our facility. We define it this way because that is how our providers define it. • An external/incoming consult order would require establishing flag/data field to document that appointment/admission as an external source consult. • In the acute workflow for direct "bedded" care an order is generated by the attending/admitting for a "consult" to a defined specialty or identified provider. Post discharge, the referral is noted as a follow-up appointment. • Any service requested of a clinic, service, or another provider that is initiated from the provider of record (PCP or when being discharged the attending provider). We also define consult referrals within the inpatient stay as needing a consult with a specialty provider such as Cardiology, Neurology, Dietary, etc. • One provider sending a patient to another provider to get an expert evaluation or specialized care for a medical condition /conditions to determine necessary treatment / next steps. • Technically speaking, a consult referral is a record in a master file which includes fields typically defined by category lists that distinguish the referral in some way (e.g. external vs internal).
How do you find a 'consult' referral in your EHR?	• Internal consults will have an order (i.e., inpatients/observation patients). External consults may or may not be documented in physician's history and physicals - not discrete data. We do not define outside provider "consult" referrals in our EHR.

Question	Notable Responses
	• [Consult referrals are] part of available orders. Referrals/consults within the acute care setting are only defined as orders. There is not an ANSI type transaction associated with the referral process today. Providers enter orders to request other specialties to also round on their patients and provide suggested next steps in care recommendations. • Currently there is a type of "order" that identifies a "consult" while the patient is an inpatient. Post discharge, there is not an order or transaction—just documentation regarding the follow-up appointment to the next provider. • For outpatient and clinics the provider will often send an electronic order and that is available in an external program separate from our main EHR. That electronic order is used to put an appointment in our EHR system. The patient will present to the clinic and the order has to be manually viewed and printed from that other system. Other times patients present with a written order, that order will eventually be scanned into our EHR system under "orders" data source. An electronic order for diagnostic tests would be entered, but if it is an order to a provider visit in a clinic those do not usually have an actual order placed. If a referral was created when an inpatient is being discharged, those can be seen within that documentation. This process has the ability to send an electronic referral via the 'Direct' project. • [There are three location to find this information:] End-users Chart Review > Referrals (tab), Referral Work Queues, and Referral Reports or Referral lookup. Getting to any of the 3 locations is based on where the menu to open the activity is located consult referrals are stored in the referral master file in the database.
Do you have a dedicated indicator/flag for referral requests / initiations in your EHR database?	• For inpatients, authorizations are created for inpatients, but we are not sure how the authorization is stored. Sometimes CPOEs are used by provider or end-user with ordering access places consult referral order. Based on the information entered into the order, a referral record gets generated automatically. The referral record then is pulled onto an appropriate referral work queue for the necessary specialty/department/group to authorize for the patient. • For outgoing referrals, yes. For incoming, no. • For Outpatients/Clinics—no. For Inpatients when a consult is placed for a particular provider there is a consult flag is in the rounding list and they can also see the consult order. For inpatient when a general referral is placed (i.e., Nutrition, Respiratory) these consult orders print out in the department and the order is viewable online. • For outpatient, consult referrals from outside providers (i.e. that are not on the same EHR platform) are entered manually in our EHR. In this case, a user simply creates the referral record manually and once created, the referral populates a work queue or report if not authorized immediately upon creation. This is generally a manual process. • No—it is impossible for our EHR to flag the referrals due to the variety of inputs.
What are the most common referrals that you receive / send?	• The typical referral transfers include patients that are transferred due to regional "smaller" medical centers not able to provide the level of care or specialty care as needed. • [Consult referral] transfer "ins" typically include: Cardiology, Neurosurgery, Infectious Disease, Pulmonary, Urology, Nephrology, and Neurology. • We are a small community hospital that does not provide all the services required. If a patient is in one of our clinics and then needed a procedure that we cannot perform at our hospital then we would have to refer to a tertiary facility.

Question	Notable Responses
How can you make sure that a third-party that you send a referral to, will send the results back to you or the original referral requestor?	• No way to be sure that this is done, no control over whether or not they have the ability to send these results back. We would include a Transfer of Care record with the provider information if they were being transferred from an inpatient. [This is] very difficult for a community based hospital that transfers many patients to multiple states. We cannot force providers outside our active staff to document in our system. • Sending the referring provider along to the third-party. It should then become his/her responsibility to follow-up. • We do not track any forwarding transfer providers. • We cannot require them to log into our system and document following a transfer and they do not have access if they do not practice here. • Since we refer to a variety of providers with a large spectrum of electronic systems, this is near impossible.
Data Element	**(b) Results Available—Referral Performed**
What do you define as a 'consult referral result'?	• Procedural report (cardiac catheterization report, sleep study, endoscopy report), consultative report (from a clinic visit), diagnostic report (labs, vascular clinic, radiology report) or treatment documentation. • Any discrete, non-null value that indicated that the referral was scheduled to be performed. • It could be defined in many different ways, but generally speaking in [our EHR] that means sending a letter to the referring provider/PCP [that contains the results].
What types of data should 'consult result' include?	• A portion of the result will need to be free text (e.g. progress notes). It would certainly make sense to send a CCDA file back to the referring provider in case additional information was collected about a patient (e.g. allergies, medications). • Encounter demographic information, labs, diagnostic results, medications, rad reports, narrative consult, nursing notes/assessments, procedure performed, background or presenting information, treatment options. • Interpretation, impression, diagnosis, and similar final decision judgments the consulting provider could make. • Lab, Rad, Cardiac Echocardiograms, Pulmonary Function tests, Colonoscopy, Biopsy, Cath. Lab reports • Assessment & Plan; CCDA data; varies based on specialty. For example, ophthalmologists will generally send basic components of the eye exam to primary care providers because sending the entire eye exam is unnecessary or can be viewed by the PCP as an unnecessary amount of information. • The assessment and plan are likely to be the most important pieces of information to include in the result from the referring providers perspective. • A mix, since some are numeric, positive/negative, and some are based on a report. • Discrete fields [that are] present in order to reasonably categorize and quantify the result(s). Understand that a narrative may be useful for some purposes, but not at the expense of discrete fields. • [We plan on using a customized] CCDA [to transmit referral results]

Question	Notable Responses
Do you have a dedicated indicator/flag for referral results performed/ready in your EHR database?	• Cannot calculate the actual consult results provided because we do not have a mechanism in place to know when it is complete. Some departments will take a consult to "complete" but there is nothing that requires the provider who is providing consultative services to "mark" the consult order "complete". We cannot calculate the reports that the providers create within the EMR without complicated means. • We have no way to track this information. We do of course have many results on patients that are referred to us, but no way to differentiate these orders from all others. For example a CBC ordered on an inpatient is not marked and differently in the system than a CBC ordered on a patient was referred to us. • Results that are performed within our hospital network, such as diagnostic reports, consultative reports, and procedural reports are available within the EMR. Once the provider reviews a patient record online they can see the results, and there is a flag that indicates "new" results are available. • There is not a singular indicator of flag that we are aware of that record whether or not you sent a referral result. There is a collection of items that can be used as EHR flags. • There is not a current indicator to track this type of transaction [in our EHR system]. • This would be hard to numerate since we have multiple systems for documentation of results procedures.
Data Element	**(c) Requestor Identification**
What do you define as 'valid requestor contact information'?	• Our library of known providers and facilities. [It] would require basic contact information in order to return the results—phone, mailing address, 'Direct' address, fax, etc.
What types of data should 'requestor contact information' include?	• Enough information to allow the referred to provider to easily provide continuity of care: Name of provider, 'Direct' email address, practice/group name, address, office phone number, cell phone number; reason for referral—clinical specifics. Name, Practice, Address, Office Phone number, Office fax Number, Direct Messaging Address of the practice. Provider's credential, NPI, organization type, EHR vendor, and other information.
Do you have a dedicated contact field for referral requestors in your EHR database?	• Yes, referring provider that does not exist in the provider's master file can be added on the fly [and tagged by a custom flag as referral type]. All of our providers that are available to have a consult ordered on our inpatients would have valid requestor contact information because they are built in our provider master table. • Yes, we capture the referring provider's information [including contact information] in a separate database [table]. All of our providers that are available to have a consult ordered on our inpatients would have valid requestor contact information because they are built in our provider master table. • […from] a national database [that includes] date of last update (e.g., the CMS NPI database) • Type [and contact info] of requestor is currently not tracked.
Data Element	**(d) Results Sent Back—Referral Completed**

Question	Notable Responses
In what format do you transfer the results?	• We currently send results on outpatients to the ordering physician via fax, or by direct mail. Our providers can also log into the system and see results. A few providers get results sent to them in 'Message Center', an internal messaging program within our clinical system. • We do have all of our medical record reports, lab reports, and radiology reports transmitting to our ambulatory EHR through interfaces. We do not have the ability to calculate the numbers [throughout our EHR if providers are out of our system]. • Ideally, Direct, or EHR-facilitated exchange (like Direct). [We] could also do a secure file transfer method (custom) where the receiver downloads the file from a secure site that we provide. • We are still in the testing phase of MU Stage 2 but we have 'Direct' messaging set up with XDR for sending a referral request. I have not seen the system capabilities to send the results back to the requestor at this time. • [Our EHR has a unique capability in] which [it] will work for organizations [that have the same EHRs]. • [We are] planning on doing a HISP with SureScripts. I think direct messaging is included with a HISP. If we're only talking about the 10% of electronic results, then we can include our State-HIE.
Is your local/regional HIE involved in transferring the 'consult' results?	• We do provide medical record reports (consult, history, plans, and discharge summary), lab reports, and radiology reports to our HIE. Providers within our state have access to the HIE but they do not push the information. • [Our local HIE] is not setup to allowing storing of discrete data or sending messages to providers. • [Not through our State-HIE, but] under our private HIE if an order is received with a "resultable" result, result will electronically be submitted back to ordering provider.
Do you have a dedicated flag/field in your EHR database to show a referral result has been sent out to the original requestor (or some other party)?	• [We] need to define completing the referral process. We assume [the process is completed] when the encounter is closed (i.e. documentation for a visit is complete and charges are dropped to the billing system) or a test reaches a status of "Final Result". You could also define it in different ways such as when the patient checks out for the appointment for the visit/test. • The status of "result" for a referral is not currently tracked by [our EHR] database. • Accounting for all of the various methods of sending back results will not be simple to track when you include EHR indicators and HISP (Health Information Service Providers) receipts. • Can use referral creation time stamp here, but this also does not account for when you actually receive the paper referral itself. I don't believe there is specific fields in the referral record that track when you actually received the paper referral. • We send outpatient results to ordering physicians [in our network, but] they are not marked as referral results in any way. Also for patients within our hospital, results are viewable to the provider by logging into the system. A few of our physicians get the results in 'Message Center' post discharge.
Data Element	**(e) Confirmation of Results Receipt—Referral Loop Completed***

Question	Notable Responses
How should the result-receipt acknowledgement be transferred?	• Direct, SOAP and XDR/XDM would be acceptable acknowledgements (although proxy data may be available—e.g. a download timestamp when the file is retrieved from the HIE/HISP) • Direct messaging or via defined ANSI standard transaction. • A timestamp can be obtained when a file was either confirmed received (e.g. the message was successfully delivered) and/or opened.
Do you have a dedicated indicator/flag for confirmation of 'referral results received by requestor' in your EHR?	• No. As the very surface, this seems really, really hard when the referral result goes outside of [our EHR platform]. If a [result] gets sent, this will be extremely difficult to track unless you send it with a delivery receipt. Even if that is possible, getting that data into reports would be a challenge. To make this really easy for providers, [EHR vendors] would need to develop a read receipt item to track this information. • There is nothing that requires the provider who is providing consultative services to "mark" the consult order "complete".

* Not formally part of the SGRP-305 measure but highly recommended by domain experts to be evaluated in this project.

Table E-2. Summary of selected comments about SGRP # 305's data elements

Question	Selected Comments
Do you have an overall concern with this measure and/or recommendation for policy makers?	• Most of the referrals to our clinics are still made with a manual request/order. Until all eligible providers are advanced enough with Meaningful use will be start to see more electronic referrals. There should be clear definitions of what portions of outpatient clinics should be included. Some of our clinics are joint ventures with other facilities and those clinics do not use our hospital information system for documentation but instead use that of the affiliated facility. It would be difficult to meet this measure if those were included since we have no control over the other facilities documentation system. • Even though our ambulatory EMR is sending many types of electronic orders, not all referrals from that system are sent electronically. Until the eligible providers reach the same level of stage of Meaningful Use we will still have a mixed environment of electronic and paper. • [The objective does not] clearly differentiate in the standard which consults to include/exclude. For example do service department consults get ruled out? Diabetes education, nutrition, PT, ST, OT etc. These are providers, but not physicians. • Be specific about what to include [in the results that should be sent back]. For example a patient is referred to us from a critical access hospital for fracture of femur. In the course of initial testing it is found that the patient needs treatment for severe CHF and a lung mass. Is the metric going to account for the ability to separate just the testing that the patient was referred with? It would be difficult to separate out all of the other results as it will be one encounter. In this case it would almost mean creating a field on every order in our catalogue asking if this is order is a referred order or not. The encounter started out as a referral, but wound up as an inpatient visit for CHF. • [This measure could add a burden to the existing busy workflows]. Keep in mind the availability of "consult/referral to" provider whom already has a busy patient schedule with clinic, bedded patients, and operating room/cath. lab. • We will have difficulty in identifying the denominator if the definition stays inclusive of all types of referrals. Adding a reference to define or list what actions are considered referrals is recommended. The measure's additional notes should explain how referrals mentioned in SGRP-303 are different from SGRP-305 referrals. • Include a list of referral results and explain what constitutes the referral results: the values, the human interpretation of the results, or both. • Referral results need to be sent back within a time window that is considered clinically effective. Explain the timeframe that referral results need to be sent back to the requestor. • Measure needs to clarify whether 'Indicator of Referral Return Receipt' is needed (i.e., confirmation that the requestor has received the referral results).

Question	Selected Comments
Do you have any suggestions for EHR certification to facilitate this measure?	• The only way I see this working is to make a requirement with admission order on every patient with every admit order. […] It makes a difficult workflow with routine outpatients. • Use a universal ANSI transaction type so all EMRs can crosswalk the type of reporting event. • Strongly suggest all EMR vendors use a "provider registry" like service so all contact information is maintained and allow an individual hospital level the granular "in network" designation. Today if there is a specialist in the region, but does not have medical privilege at our hospital that provider will not be available in the provider search functions. If provider does not have privileges then their name and contact information is free text typed into the comment areas in the discharge documentation—therefore becoming different to track/count. • Generally, patients that have procedures performed outside [of our hospital] would present with that information in-hand (e.g. paper order results) or it would be received via fax from the performing provider (fewer would exchange data via EHR vendor process and eventually, hopefully, 'Direct' messaging would facilitate this transfer). • We have no way to track this [referral] information. We do of course have many results on patients that are referred to us, but no way to differentiate these orders from all others. [The EHR vendors have to implement a dedicated module to tag, handle and track the referrals and their results.] • Explain when (within X hours, clinically relevant timeframe), how (CCDA, Direct, SOAP, XDR, HIE), what (CCDA, Share Care Encounter Summary), and in which format (free text, structured) the referral results should be transmitted.
Do you have any suggestions to improve this measure [to add value to your outcome]?	• Would expect CMS to include a provision that if the referring provider had access to the EHR (as could be implied by being part of the same health delivery network) these providers would/could be excluded from the measure given that the results of any consultation are likely available in the EHR. • Would expect internal referrals to be excluded as the providers making the consult request presumably have access to the EHR. • Develop standard for consult/referrals so organizations can use for both internal consult and external referral orders/consults. • We are a small community hospital that does not provide all the services required. If a patient is in one of our clinics and then needed a procedure that we cannot perform at our hospital then we would have to refer to a tertiary facility. This measure should address the referral of referrals. • There is no one in our organization that is responsible for [sending referral results back], and I don't know where that responsibility would lie [as] results get completed from numerous clinical areas. [This measure can help reorganize some of our workflow to ensure efficiency and effectiveness.]

Measure #2: SGRP 308—Notifying Patient Care Team Members of Significant Health care Events

Table E-3 Summary of selected notable responses to qualitative questions of SGRP # 308 data elements

Question	Notable Responses
Data Element	**(a) Significant Health care Event (SHCE)**
Do you consider 'arrival' at ED equal to 'admission' to ED?	• Yes, but we do have the ability to capture the arrival time as a separate data field if needed. • Yes, but this is considered different from admission. Additional clarification is needed. • Arrival at ED indicates patients has checked in, but no care yet provided. At Triage, checked in patient is quick registered and first care assessment is performed including: chief complaint and vital signs. Admission to ED indicates Triage assessment is complete and patient is ready to see ED Nurse and Physician.
Do you have a dedicated flag in EHR for ED arrival and discharge?	• Yes. When the patient is quick-registered the arrive event fires the time stamp. • Yes. This is a standard ED "event". [Note that] 'Check-in' (arrival) has a separate indicator. • Yes. Upon patient arrival to ED the patient is "checked in" with basis demographic information and initial "chief complaint". Check in is the first step in the ED patient admission workflow. • Yes, ED 'Track Board' is the central hub in the ED for updating Patient Events including ED arrival. Event tracking shows up in many different places in the application.
Do you have a dedicated flag in EHR for hospital admission and discharge?	• Yes. Registration/admission is a separate indicator in the database. • Yes we have the Admission Date and Time as data fields. The status will indicate also that he patient is an admitted inpatient. • Yes we have the discharge time documented. • Yes we have the discharge Date and Time as data fields. The status will indicate the patient is a Discharged Inpatient.
Do you have a dedicated flag in EHR for death?	• Expiration documentation is made by the clinical staff, but there is no death flag. • Yes, discharge disposition or "expired" is a distinct discharge status in the database. • Yes, we use the discharge dispositions of EXP and EXP24 (expiration within 24 hours of admission) and we also associate a project in Abstracting that denotes the patient was expired and the preliminary cause. We also have a status indication that the patient is expired. When a patient expires any current encounters, such as a scheduled future appointment will update with the "X" in the status to indicate the patient has expired.
What is the accuracy of your time stamp?	• Yes. All changes of events are time-stamped. • We capture HHMM on all data fields for the SHCE records except TIME of Death (as far as admissions types of statistics). The time of death is documented separately.

Question	Notable Responses
Data Element	**(b) Care Team Member Identification**
Who do you consider the 'key' team member?	• PCP when not admitted. Admitting/Attending when in-house. • Any discretely documented provider that has expressly been associated to the patient (e.g. PCP, Admitting provider, those that have expressly been added to the "Care Team" list, maybe attending.) Likely not broader approaches like any provider that has written an order in X previous hours. • A community provider that holds relationship with patient of: Primary Care Provider or Referring Provider (Specialist which patient is under current treatment). • Primary Care provider, Attending Provider, Admitting provider, ED provider, Referring Provider, Family Provider, or Other Providers. • Varies based on the patient. PCP in majority of cases, but not a comprehensive key member role. • To be most effective, the SHCE notification should go to the PCP at the physician office. • None of these relationships to patient is currently captured as part of the "provider relationship" data capture.
Do you have a flag in your EHR database to identify the key care team member?	• The identification or Primacy Care Provider or Referring Provider is entered into the separate, defined field for each relationship. There is not a separate flag attached to a provider that identifies the provider type (relationship to the patient). For instance only one PCP and one Referring Provider can be entered. The EHR provides the following 4 provider relationship entries: Admitting, Attending, Referring, PCP. • We identify each of the providers listed above as such (PCP, Attending, Admitting, ED, Referring, Family, or Other). We can also list other members of the care team through a routine in nursing to identify other significant hospital caregivers as well as home caregivers. • The 'Care Team' activity is used to assign key team members to a patient. There are PCP Care Team members, Other Care Team members, Visit Treatment Team members (for a single visit), and Episode Treatment Team members (e.g. transplant). • On average there are 2 care team members listed on admission to ED or in –patient: Admitting and PCP. Referring physician is asked, but not always known by the patient or written as part of the "admit to" order. Attending is not initially defined until morning of following day shift (e.g. Hospitalist—weekend physician will be admitting/attending, until Monday AM when "week-day" hospitalist will change attending physician).
What types of data should 'care team member contact info' include?	• EHR messaging account, mobile, email. • Name, Practice Name, Address, Office Phone Number, Cell Phone/Pager phone number, FAX number, Email address, and DIRECT email address. • Name, Address, NPI, DEA #, Phone, Fax, email, specialty, provider group. • The information displayed pulls from the provider record. An organization can configured different columns to display information, but it typically includes "Relationship" (e.g. PCP—General, PCP—OB GYN, Consulting Provider and more) to patient, Specialty, Phone/Pager/Fax Numbers, Start Date, End Date, Updated Date.
Do you have a dedicated contact list for patients	• No, not specifically for this measure. • No, these contact information are distributed among various fields in our EHR.

Question	Notable Responses
having SHCEs in your EHR database?	• Yes. The provider master database file is built and maintained by [by our corporate information system] staff through coordination/notification by Medical Staff Office of provider additions, updates, or inactivation. • Not dedicated. An 'Attending Provider' is typically required to be assigned during registration before getting admitted. Referring provider can also be entered, but is not typically required. Thus, if a referring provider was listed, then that information could be used to fulfill this measure. Otherwise, the system would rely on providers in the 'Care Teams' activity if available. • Reference to approximate data capture for PCP and referring provider is due to the fact 40%+ ED patients do not list a PCP, and 20%+ hospital admitted patients do not have a referring provided identified as part of the admission order (typically just the admitting/attending is known). • We have providers built in our provider table. We do have the ability to capture "new" providers on an ad hoc basis for Family, Referring, and Other providers. We capture Name, Address, Phone and Fax immediately during the registration and then follow up and complete the table after the NPI is researched.
Data Element	**(c) SHCE Notification Sent Out**
What type of information should be included in the SHCE notification?	• Patient Name, Address, Date of Birth, Date/time of SHCE event, service (ED or inpatient), admitting/attending provider, primary complaint, and emergency contact information. • [The receiving] provider [should have an] office EHR to make the correlation of patient identification. • Date/Time of SHCE, Provider of SHCE, diagnosis/Reason for visit, Name, DOB • Minimal, depending on mode of communication (e.g. to protect PHI). Likely, if text message, it's probably only a notice/alert. Secure system messaging (e.g. within EHR) could be more robust messaging (patient name, condition, location, time) • We currently send a report of all Admissions and Discharges to all the Primary Care Providers that participate in our hospitalist program so that they can follow their patients. I do not have an easy way to calculate how many patients we communicate to those PCP doctors. Since the report we provide is user written within our transactional system there is not a standard data field that could be captured (i.e., it is free text). • Notification of a SHCE at the start of the event would not be helpful, rather notification at conclusion of event once patient care needs have been identified and resolved (if applicable) would be more help to understand the patient's current clinical condition.
What format should the SHCE notification have?	• Direct email address necessary for CCD is best. • Would assume at least EHR messaging account (sort of like email), perhaps mobile for texting, maybe email address. [It] would obviously have to protect PHI on non-secure methods. • Short basic info to follow up for details as described above. (Not free-text, certainly, but CCDA is probably overkill) • If we were required to notify the PCP then perhaps the format should be CCDA.
How do you notify the care team members?	• Today there is not an automated or manual workflow that notifies care team members of a SHCE. Post discharge from the ED or Inpatient setting a CCD is sent out-bound via FAX and/or DIRECT (if applicable to provider's MU Stage 2 participation) to the primary care

Question	Notable Responses
	provider, referring provider, or providers listed with follow-up appointments. • Currently we send a fax or print directly to the office. In Meaningful Use Stage 2 our referrals will be have a CCDA sent via Direct Messaging XDR. • To be determined. System/EHR messaging would be easiest. Text messaging would be reasonably easy. Beyond that, not sure. Would probably have to investigate the costs/effort associated with each and potentially the need for additional software. • [We have multiple potential approaches such as] embedded EHR functions, HISP, Direct Messaging, Fax (via fax server), and mail. The difficulty here is the 2 hour time. If the system doesn't automate the notification for the provider (assuming the Care Team is populated), then it will probably be perceived as too short of a time frame. • [There should be] one notification for each event. Waiting 2 hours for consolidated events might be perceived by providers of no value, if desired to receive notifications at all.
Is your local/regional HIE involved in notifying the care team member of an SHCE?	• [Although we support] a private HIE and notification of SHCE is not a currently supported transaction type. • Our state-HIE does not provide such service for all SHCE events. • The Maryland State HIE, CRISP, does offer a notification system to notify the PCP of admissions or ED visits.
Do you have a dedicated flag/field in your EHR database to show an SHCE notification has been sent out to a care team member?	• No—our EHR cannot store or track it. • Contained within [our enterprise EHR] is easy since it will be tracked via [a built-in mechanism]. If automated letter creation is available to send via fax, then it should be able to be tracked although we need to see what is possible here. Several different ways to go about doing it so would need to evaluate each one. • There might be ways to track certain SHCEs, but we cannot automate them and make sure that everything happens in less than 2 hours. This will require dedicated EHR functions that would generate SHCE notifications in real time.
Data Element	**(d) Notification Receipt—Loop Completed***
How should the notification-receipt acknowledgement be transferred?	• Secure EHR messaging would provide more robust information; text messaging would provide mobile accessibility. Not sure what technologies might be involved for all/each outside of the core EHR messaging. • Direct messaging with inbound/import to EHR would be preferred method. • Within [our enterprise EHR platform], you can say the "Read" status of a message is a confirmation, but it's not really a "receipt" sent back to the attending provider for the admission. • Notification of initial SHCE would be of value to allow care team members to know a patient under their current care or population management contract is having a significant clinical event. However verification of notification receipt by the receiving care team member would not be perceived of value in enhancing patient care.
Should a local/regional HIE be involved in sending back the confirmation of	• Perhaps. Not sure what that looks like for the HIE/HISP to send the message (to what device?) and how that works together. • State or private HIE, or DIRECT HISP should be used in the confirmation transaction. The "how" would utilize a new transaction type via the DIRECT method with inbound/import capabilities into the EHR.

Question	Notable Responses
notification receipt?	• If they HIE was handling that communication it might be possible for them to send back the confirmation. • Certainly would need to be, but the EHR vendors must be able to process/store the confirmation of notification receipt in a logical place in the database as well.
Do you have a dedicated indicator/flag to confirm the 'receipt of notification by a care team member' in your EHR database?	• Too complex. None at this time. • There might be ways to find out in the EHR but no standalone modules for SHCE events at this time. • It is impractical at this time.
Data Element	**(e) Indicator of Patient Consent**
Should this data element merged with other consent forms? If yes, which consent form?	• No. A [separate] general form [should be used] to ask permission to send SHCE to PCP. • Unknown. This information would presumably only be distributed to health care professionals actively caring for the patient and only sending minimal information. Fully detailed information would have to be obtained by accessing the (presumably) secure/authenticated EHR. • [Maybe, but] no paper-based form should be used. No consent should be required. Suggestion would be to make it an implied "consent" to all members of the patient's caregiver team. • It could be listed in the 'Notice of Privacy' practices and the patient treatment consent form that the information is going to be shared with the care team members that they provide to the facility. • Yes, this could not be included in a consent form that already exists (either digital or paper).
Do you have a dedicated indicator/flag for SHCE-related patient consent approval in your EHR database?	• Yes, for general consent management purposes. It's not necessarily dedicated to SHCE consent approval, but you can create a type of document specific to SHCE is necessary although as stated above. • We have a query that can be reviewed it is NOT a flag.

* Not formally part of the SGRP-308 measure but highly recommended by domain experts to be evaluated in this project.

Table E-4 Summary of selected comments about SGRP # 308's data elements

Question	Selected Comments
Do you have an overall concern with this measure and/or recommendation for policy makers?	• If we are sending a notification upon ED arrival and departure, Inpatient Admission and Discharge will that be notification overload? If a patient arrives at the ED and then is admitted in our system we will still enter in a ED departure, so it could be notification overload if we are notifying 3 times within a short timeframe (once for the ED arrival, once for the inpatient admission, and once for the ED departure. • [We suggest that] either we should notify of admission (arrival) or discharge (departure) and not both. • There would need to be a clarification if newborns are to be included in these notifications. • Clearly define types of data capture to support MU specification—e.g. Patient Arrival to ED = Date/Time patient name, sex, age (DOB), and chief complaint are captured upon patient's check in to the ED. • We do not capture a record of death [in our EHR]. This will require significant changes in our policies on how to record death (chain of events and clinicians involved in documenting it). In addition, time of death often requires additional checks that may end up crossing the 2 hours limit of this measure. Removing death from SHCE, or making it optional, will make this measure feasible. • Since all patients admitted to an ED get discharged from the ED, why have both SHCE? This is duplicate notifications to the provider for each patient. The shorter [notification] for the ED would send 2 notifications for each ED visit. • 'Key' team member is an ambiguous term and need clarification. If this measure was rolled out today, we will assume the 'key' team member is the primary care physician of the admitted patient. • What if two SHCEs occur in less than 2 hours? Should we send one summary notification or separate notifications? The measure should clarify the overlapping SHCEs within the 2 hour window. • The 2 hour time frame is too strict and may not be effective for patient care. Throughout the day when providers and their staff are seeing patients, a 2 hour notification will not even been seen until the office has time to see the information. Nights, weekends and holidays will have no one present to review the information. For example, a patient is injured on a Friday night and comes to the ED. The determination is made to admit the patient. The patient has a minor procedure and is discharged. This will result in 4 separate SHCE alerts for the provider to address for a single one event patient. Multiply this time for several patients and the extra time that the provider spends verifying receipt could be burdensome for providers. • This measure has the potential to cause an increase in HIPPA violations for all hospitals. The "care team" or PCP information is not always updated or correct, particularly during emergent episodes. Information can easily be sent to the incorrect provider. Many of our patients do not have a PCP documented, so there is no one to send the information to. Would this count against us?
Do you have any suggestions for EHR certification to facilitate this measure?	• Pulling this data across our enterprise would be difficult since there are several different EHRs that collect SHCE information. There needs to be some EHR certification that would enable the collection of SHCE information across various EHR systems. • We do not have a record of death [in our EHR]. One way to deal with 'death' event is to generate a discharge summary for it (which will be merged with discharge event of SHCE). If the notification for the discharge event includes a CCD document then all necessary information about 'death' will be included in the report for the care team members. • There are multiple fields in the EHR to collect care team members' contact information. The EHR certification should consolidate these

	fields into specific fields required for this measure. Separate related notifications into individual transactions per SHCE events. • There are more immediate means of communication (like text) but [care team] providers need to be able to correlate data with their office EHR to be meaningful. EHR certification should address ways to communicate a common master patient index so that the PCP (care team member) can locate the patient and retrieve local information as well as the data in SHCE notification. • [We need to] capture patient authorization to notify care team member. If patient does not want care team member notified there must be documentation of the patient refusal. The EHR certification should include functions to automatically track and flag the cases that are missing authorization. • If HIEs are an option to send the SHCE notification, or receive the receipt of it, then we need more EHR-HIE integration in future EHR certifications. • Notification is an implied consent and all providers of the patient's care giver team would be notified, unless the patient states otherwise. If the patient declines certain providers, that should be captured as "Patient Declined" next to name of each applicable care team member. • The automated notification would require coding and software changes from our EHR vendor. We can start collaborating with our vendor to achieve this goal.
Do you have any suggestions to improve this measure [to add value to your outcome]?	• The concern would be the desire of a provider to be notified on admission/discharge to ED or hospital, or death. Today, providers are faxed a copy of the ED report and accompanying CCD. In addition for hospital discharge a provider is sent up to three documents: Clinical Summary via fax, CCD via fax, and CCD via DIRECT if provider participates in Stage 2 MU. What would a care provider do with this notification information: (a) drop everything and call the ED to speak to the attending physician; (b) ask a staff nurse to call the ED for more information? We need to create internal policy on how to deal with repeated notifications and how to reduce information overload. • What value would there be for a provider to be notified on admission when the care status/situation for the patient have yet to be determined? • This measure requires patient authorization before notifying care team members. Currently the process to acquire and record patient consent is intertwined with other workflow processes that may take more than 2 hours at some point. We need to streamline some of the workflow issues to reduce the cases that patient authorization is missing while an SHCE has occurred. • SHCE is a stand-alone transaction and is not similar to other current MU Stage 3 core or menu functions. This measure should not be merged with other MU measure in order to increase the value-added by evaluating SHCE notifications only. • We have tools like ACGs and DxRGs to determine high risk patients and make sure that the SHCE notifications have additional data about them. This will enable us to improve care coordination for our high risk population while implementing this measure.

Measure #3: SGRP 303—Provide a Summary of Care Record for Each Transition of Care or Referral *(Exit Interviews Only)*

While the project was in process, partly reflected by the finding of this project, SGRP 305 was merged in SGRP 303 at the policy level. The main data collection period was finished by the time the merger was finalized and excluded questions and/or opportunities to assess SGRP 303 in a pilot form. However, the project team included SGRP 303 questions in the final interviews and/or site visits of the project. These additional questions

collected subjective information about the potential feasibility of the hospitals to achieve SGRP 303. Please note that this measure was not assessed using rigorous methods such as questionnaires or roll-out evaluations, thus the results included in the overall recommendations should be treated cautiously.

This project collected feedback from a range of stakeholders including domain experts, hospitals CMIO/CIOs, hospitals IT staff and care coordination managers. In addition to SGRP 305 and 308 objectives, the project team collected information from CMIO/CIO interviews for SGRP 303 objective. A summary of these findings are included in the next table as overall challenges and recommendations. The policy level recommendations include a column denoting if such recommendation has been addressed in the latest language of the measure. The EHR innovation recommendations include a column showing the feasibility perceived by the collective stakeholders to roll out these innovations; however, this column in left empty for SGRP 303 as roll-out feasibility was not measured for SGRP 303. The internal value-added recommendations include a column indicating the perceived impact by the stakeholders on using this measure for their organizations. These impact levels should be interpreted with caution as no systematic approach was used to collect, aggregate or analyze this information.

Table E-5 Summary of Overall Recommendations for SGRP 303

Objective	Item / Overall Recommendations
SGRP 303	**2013 Stage 2 MU Language**
	• **Objective**: The EP/EH/CAH who transitions their patient to another setting of care or provider of care or refers their patient to another provider of care provides summary care record for each transition of care or referral. • **Measure**: (1) The EP, eligible hospital, or CAH that transitions or refers their patient to another setting of care or provider of care provides a summary of care record for more than 50 percent of transitions of care and referrals. (2) The EP, eligible hospital or CAH that transitions or refers their patient to another setting of care or provider of care provides a summary of care record for more than 10% of such transitions and referrals either (a) electronically transmitted using CEHRT to a recipient or (b) where the recipient receives the summary of care record via exchange facilitated by an organization that is a NwHIN Exchange participant or in a manner that is consistent with the governance mechanism ONC establishes for the nationwide health information network. (3) An EP, eligible hospital or CAH must satisfy one of the two following criteria: (A) conducts one or more successful electronic exchanges of a summary of care document, as part of which is counted in "measure 2" (for EPs the measure at §495.6(j)(14)(ii) (B) and for eligible hospitals and CAHs the measure at §495.6(l)(11)(ii)(B)) with a recipient who has EHR technology that was developed by a different EHR technology developer than the sender's EHR technology certified to 45 CFR 170.314(b)(2); or (B) conducts one or more successful tests with the CMS designated test EHR during the EHR reporting period.
SGRP 303	**2013 Stage 3 MU Language***
	• **Objective**: EP/EH/CAH who transitions their patient to another setting of care or refers their patient to another provider of care, provide a summary of care record for each site transition or referral when transition or referral occurs with available information. Must include the following four for transitions of site of care, and the first for referrals (with the others as clinically relevant): (1) Concise narrative in support of care transitions (free text that captures current care synopsis and expectations for transitions and / or referral); (2) Setting-specific goals; (3) Instructions for care during transition and for 48 hours afterwards; and, (4) Care team members, including primary care provider and caregiver name, role and contact info (using DECAF (Direct care provision, Emotional support, Care coordination, Advocacy, and Financial) • **Measure**: The EP, eligible hospital, or CAH that site transitions or refers their patient to another setting of care (including home) or provider of care provides

Objective	Item / Overall Recommendations	
	a summary of care record for 65% of transitions of care and referrals (and at least 30%* electronically). • **Certification Criteria**: (1) EHR is able to set aside a concise narrative section in the summary of care document that allows the provider to prioritize clinically relevant information such as reason for transition and/or referral. (2) Ability to automatically populate a referral form for specific purposes, including a referral to a smoking quit line. (3) Inclusion of data sets being defined by S&I Longitudinal Coordination of Care WG, which and are expected to complete HL7 balloting for inclusion in the C-CDA by Summer 2013: (a) Consultation Request (Referral to a consultant or the ED); (b) Transfer of Care (Permanent or long-term transfer to a different facility, different care team, or Home Health Agency)	
SGRP 303	**2014 Stage 3 MU Language****	
	Note that SGRP 305 was merged with SGRP 303. The following is SGRP 303's updated language: • **Objective**: EPs/EHs/CAHs provide a summary of care record (preferably electronically) pertaining to the type of transition when transferring patients to another setting of care (including home), requests a consult from a provider in another setting of care, or provides consultation results to a provider in another setting. Types of transitions: (1) Transfers of care from one site of care to another (e.g.. Hospital to SNF, PCP, HHA, home, etc…; SNF, PCP, etc… to HHA; PCP to new PCP); (2) Consult (referral) request (e.g., PCP to Specialist; PCP, SNF, etc… to ED); and, (3) Consult result note (e.g. ER note, consult note). Summary of care may include: (1) A narrative that includes a synopsis of current care and expectations for consult/transition; (2) Overarching patient goals and/or problem specific goals; (3) Patient instructions, suggested interventions for care during transition; and, (4) Information about known care team members (including a designated caregiver). • **Measure**: The EP, eligible hospital, or CAH that site transitions or refers their patient to another setting of care (including home) or provider of care provides a summary of care record for 65% of transitions of care and referrals (and at least 30%* electronically).	
SGRP 303	**Challenges → Recommendations to Improve Objective at the Policy Level**	**Addressed**
	• Outbound summaries may go to many providers whom some may not have a certified EHR → Limit the denominator of the measure to referral requestors (providers) that have achieved a certain stage of MU for their EHRs	No
	• Some outbound summaries go to entities not covered under the MU program (e.g., nursing homes or to the home for post-acute care) → (1) Need to develop and/or extend EHR incentives to those entities; and/or, (2) Allow the use of care summary transmission through HIEs or portals, especially for post-acute care	No
	• Some of the terminology used in the language seems ambiguous → Clarify the definition of terms used in the objective (e.g., what constitutes a consult result)	Yes *(partially)*
	• SGRP 305 seems highly correlated with 303 and may create duplicate work for care coordinators given their similar contexts → Explain how SGRP 305 relates to SGRP 303	Yes***
	• The boundaries of the delivery network that this measure applies to is ambiguous → Discuss and clarify the boundaries of the delivery network that this measure applies to (e.g., in-network versus out-of-network providers)	Yes *(partially)*
	• It is unclear which types of providers should receive the summary of care record → List the type of providers that the referral results should be sent to (e.g., PCP, NP, SNF)	Yes
	• The type of data included in the summary of care record could include a variety of information → List the type of data that should be shared in	Yes

Objective	Item / Overall Recommendations	
	the summary of care record and the ones that could be optional to share	*(partially)*
	• The content of the summary of care record should be focused on the underlying clinical context → (1) SGRP 303 objective should allow additional standards for care summary to be related to episodic care plan; and/or (2) Provide a set of tailored CCDA content standards for the summary of care to be relevant to the care context and specialty department.	No
	• Considering that the circle of providers was expanded significantly the electronic thresholds should be reduced → Reduce electronic care summary threshold from 30% back to 10%-15%	No
	• Among enterprises receiving care summaries, the measure underspecifies which specific providers or departments are intended recipients → Include an exhaustive list of providers that should be included in the measure	No
	• Summary of care electronic standards (CCDA) involve extra conversions of past events data from ICD-9 to SNOMED thus adding extra burden → Allow past medical history or past episode data to be reported using past standards such as ICD-9	No
	• The 48 hour timeframe is not clinically justified, and indeed in some cases there might be a need to transfer the summary of care record instantly → Allow the hospitals and the clinical providers (including the care coordination staff) to determine the time lag between the occurrence of an event and the transmission of summary of care record	Unclear
SGRP 303	**Challenges → Recommendations on EHR Innovations to Increase Feasibility of the Objective**	**Feasibility**
	• Hard to find providers who are connected to NwHIN (Nation-wide Health Information Network) and can receive electronic care summaries → (1) Need EHR functionality to exchange data among providers via other protocols (e.g., 'Direct' protocol using end-to-end HISP (Health Information Service Providers)); and/or, (2) Create a national directory of providers with NwHIN connections that is current and usable	?
	• Some providers and outbound summaries go to entities outside MU program such as nursing homes or to the home for post-acute care → Need to innovate new EHR functionalities that can send the summary of care record to non-MU EHRs (or other technologies such as secure emails)	?
	• Summary of care has too much raw EHR data but needs to be focused around an episode's "care plan or pathway" or "story template" → Need to clarify what data elements should be included in the CCD/CCR, and should be implemented in the EHR certification criteria	?
	• Since other faster methods for electronic summary of care are often used, such as physician and patient-specific portals, HIEs, direct EHR native messages, and e-referral systems, the MU-compliant electronic information is often not timely and post-hoc → Create innovative solutions to facilitate the use of care summary transmission through HIEs or portals, especially for post-acute care	?
	• Sending the CCDA and receiving a confirmation will be a major challenge given the current EHR certifications → Utilize innovative exchange techniques and standards (e.g., Direct messaging) to facilitate sending back the summary of care records	?
	• Most of the care coordination efforts utilize non-EHR or non-EHR-integrated systems → Integrate other hospital IT systems with EHRs to facilitate this objective	?
	• In most cases hospitals do not have a complete list of the receiving providers → Create a registry of contact information that is updated regularly	?
	• Not sure if all receiving providers should see all types of data which may raise HIPAA issues → Develop EHR functions to automatically wipe out HIPAA-protected data from free text included in the CCDA-formatted summary of care reports (e.g., narrative piece may potentially	?

Objective	Item / Overall Recommendations	
	include HIPAA information about others)	
	• To operationalize this objective, hospitals will need to introduce new human resources that may be beyond their capacity → Hospitals should create automated functions to streamline the care coordination process and reduce the workforce demand	?
	• Exchanging summary of care record with all types of providers will be challenging → Hospitals should try using existing HIE connections to send out the records	?
	• In some cases, it will be important to assure that the receiving party has received the summary of care (and perhaps has read it) → Hospitals should work with their EHR vendors to develop a mechanism to acquire an acknowledge of summary of care receipt	?
	• The number of summary of care records that will be received by a given hospital (and consequently per individual provider) will be increased multifold → Need to create smart EHR capability to filter through the incoming summary of care reports and alert the individual provider (e.g., nurse or physical) about the most important ones	?
	• Some summary of care records will be too long and will add workflow burden for the receiving party to review them (e.g., a 10-page CCD) → Need to create intelligent EHR functionality to summarize long CCD records without losing critical information	?
SGRP 303	**Challenges → Recommendations for Organizations to Increase Internal Value from Objective**	**Impact**
	• It will challenging to specify which clinical workflows and clinical practice models are intended for care summary transmission → Hospitals should work on internal care coordination policies and identify workflow-change opportunities to accommodate summary of care record transmission for all cases	Medium
	• Hospitals have challenges automating their care coordination efforts → Hospitals can use this measure as an opportunity to enhance existing care coordination efforts	High
	• There is not enough "value-add" in the CCDA data for clinical use case or clinical workflows → Clinicians should be involved in making a decision on what type of information is needed to be included for each of the cases (i.e., minimal set of information needed)	Medium
	• Most care coordinators are unaware of such EHR-based mandates/objectives → Train and educate care coordination staff about the new Stage 3 MU SGRP 303 requirements and challenges	Medium
	• Summary of care records received from other providers may overwhelm providers in a hospital setting → Hospitals should train their clinical staff members on how to filter through all of the summary of care records they will be receiving from other providers	Low

* Language from Jan 2013 ONC documentation was used as the basis for evaluation of the objectives and the recommendations that followed. ** The new language of the measures, published in 2014, is provided for comparison only. Some of the key recommendations were effectively applied in the new language. *** SGRP 305 was merged into SGRP 303.

Appendix F. Glossary of Acronyms

Acronym	Full Term	Acronym	Full Term
ACA	Affordable Care Act	HITECH	Health Information Technology for Economic and Clinical Health
ACO	Accountable Care Organization	HITPC	Health Information Technology Policy Committee
ADT	Admission Discharge and Transfer	HL7	Health Level 7
AHA	American Hospitals Association	HMO	Health Maintenance Organization
AHRQ	Agency for Healthcare Research and Quality	IDS	Integrated Delivery System
AR	Arkansas	JH-AI	Johns Hopkins Armstrong Institute
CAH	Critical Access Hospital	JH-CPHIT	Johns Hopkins Center for Population Health IT
CC	Care Coordination	JH-DHSI	Johns Hopkins Division of Health Sciences and Informatics
CCDA	Consolidated Clinical Document Architecture	JHH	Johns Hopkins Hospital
CIO	Chief Information Officer	JH-SOM	Johns Hopkins School of Medicine
CMIO	Chief Medical Information Officer	JH-SON	Johns Hopkins School of Nursing
CMS	Centers for Medicare & Medicaid Services	JH-SPH	Johns Hopkins School of Public Health
CPOE	Computerized Physician Order Entry [System]	MD	Maryland
eCQM	Electronic Clinical Quality Metric	MU	Meaningful Use
ED	Emergency Department	Stage 1 MU	Meaningful Use—Stage 1
EH	Eligible Hospital	Stage 2 MU	Meaningful Use—Stage 2
EHR	Electronic Health Record	Stage 3 MU	Meaningful Use—Stage 3
EP	Eligible Provider	NLP	Natural Language Processing
GAO	Government Accountability Office	NPI	National Provider Identifier (issued by CMS)
HHA	Home Health Care Agency	OCR	Optical Character Recognition
HIE	Health Information Exchange	ONC	Office of the National Coordinator for Health IT
HIPAA	Health Insurance Portability and Accountability Act	PCMH	Patient Centered Medical Home
HISP	Health Informatics Service Provider	PCP	Primary Care Physician
HIT	Health Information Technology	SHCE	Significant Health Care Event