Sepsis Workgroup Service Assignment and Refinement (SAR) Meeting Summary

MACRA Episode-Based Cost Measures: Measure-Specific Workgroups Service Assignment and Refinement (SAR) Webinar, January 7, 2020

January 2020

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Project Overview

The Centers for Medicare & Medicaid Services (CMS) has contracted with Acumen, LLC to develop episode-based cost measures for potential use in the Merit-based Incentive Payment System (MIPS) to meet the requirements of the Medicare Access and CHIP Reauthorization Act (MACRA) of 2015. Acumen's measure development approach involves convening clinician expert panels to provide input in cycles of development ("waves").[1] The 4 Clinical Subcommittees (CS) that convened in May-June 2019 for Wave 3 were focused on the following clinical areas: Chronic Condition and Disease Management, Dermatologic Disease Management, General and Colorectal Surgery, and Hospital Medicine.[2] These CS provided input on selecting episode groups for development in Wave 3 and the composition of smaller, targeted workgroups to build out the measure. Acumen convened the following workgroups[3] (each composed of approximately 15 members) in mid-August 2019 for in-person meetings: Diabetes, Asthma/Chronic Obstructive Pulmonary Disease (COPD), Melanoma Resection, Sepsis, and Colon Resection. Following the workgroup in-person meetings, Acumen convened the workgroups again for a Service Assignment and Refinement (SAR) webinar to revisit the specifications recommended during the in-person meeting and refine the measures prior to national field testing.

[1] For information on measure development in Waves 1 and 2 (2017 and 2018), refer to Episode-Based Cost Measure Field Testing Measure Development Process document (https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/2018-measure-development-process.pdf)

[2] Members for these Clinical Subcommittees were recruited through a public nomination period from March 11 to April 12, 2019.

[3] Members for these workgroups were recruited from within the CS as well as a standing pool of nominees between June and July, 2019.

Sepsis Service Assignment and Refinement (SAR) Webinar, January 7, 2020

This meeting summary document outlines the purpose, discussion, and recommendations from the Sepsis workgroup Service Assignment and Refinement (SAR) webinar. Section 1 provides an overview of the webinar goals and process. Section 2 summarizes the discussion and recommendations from the workgroup. Section 3 is an appendix that describes the materials and information provided to workgroup members prior to and at the beginning of the webinar as preparation for discussion on detailed measure specifications.

1. Overview

The goals of the Sepsis workgroup webinar on January 7, 2020, were to provide detailed recommendations on the following:

(i) Episode group definition, including refining trigger codes and scope
(ii) Adjustments to designations for patient sub-populations to ensure that the measure allows for meaningful clinical comparisons (either as episode group sub-groups, variables to include in the risk adjustment model, measure-specific exclusions, or sub-populations to monitor for field testing and future consideration)
(iii) Episode window length
(iv) Further input on categories of services that are associated with the clinician's role in managing care for the condition and that should be assigned to the episode group (i.e., included as costs in the cost measure)

The meeting was held online via webinar, and attended by 12 of the 20 workgroup members. The webinar was facilitated by an Acumen moderator, Nirmal Choradia. The Sepsis workgroup chair was Jennifer Bracey, who also facilitated meeting discussions, and the Hospital Medicine CS co-chairs were Rob Zipper and Carolyn Fruci. The MACRA Episode-Based Cost Measure Workgroup Composition List contains the full list of members, including names, professional roles, employers, and clinical specialties.[4]

Stakeholders beyond the workgroup members had access to a public dial-in number to observe the meeting as part of Acumen's continued effort to increase the transparency of the measure development process.

Prior to the webinar, workgroup members were provided with information and materials to inform their meeting discussions (see Section 3). After the webinar, workgroup members were sent a recording of the webinar and were polled on their preferences to ensure the measures are developed based on well-documented stakeholder input. Mirroring National Quality Forum practices, the threshold for recommendations was >60% consensus on poll responses. This document summarizes the workgroup members' input from both the discussion as well as the polls.

[4] For a list of Sepsis workgroup members in Wave 3, please download the MACRA Episode-Based Cost Measures Measure-Specific Workgroup Composition (Membership) List available on the MACRA Feedback Page (https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/2019-workgroup-comp-list.pdf)

This meeting was convened by Acumen as part of an initial step of the measure development process to gather expert clinical input; as such, these are preliminary discussions and materials, which do not represent any final decisions about the measure specifications or MIPS.

2. Summary of Sessions and Discussion

This section is organized based on meeting sessions and describes workgroup member discussions and recommendations on each topic: refining the episode group definition, addressing patient cohort sub-populations to ensure meaningful clinical comparison, and assigning clinically-related services to the episode group.

2.1 Defining the Episode Group

Prior to this session, Acumen reviewed the framework for defining an episode group and outlined the items from the *Update on Refined Episode Group Definition for Sepsis* memo that was shared with workgroup members in advance of the webinar. This section provides a summary of the discussion on the trigger logic for the Sepsis measure.

Based on discussions and poll results from the August 2019 workgroup in-person meeting, a Sepsis episode could be triggered based on: (i) the occurrence of a sepsis Medicare Severity-Diagnosis Related Group (MS-DRG) (i.e., 870-2), or (ii) the occurrence of another infectious disease MS-DRG if there is a sepsis diagnosis code on the trigger claim. Workgroup members discussed refining the current trigger logic and codes to improve patient homogeneity by considering whether or not to implement the following refinements:

(a) align the other infectious (i.e., non-sepsis) MS-DRG trigger codes from trigger approach (ii) above with the high priority sources of infection (SOIs) workgroup members initially preferred to use for sub-grouping,
(b) remove osteomyelitis and septic arthritis as a high priority SOI,
(c) limit the scope to only include medical treatment of sepsis as opposed to surgical treatment of sepsis,
(d) treat cases with sepsis not present on admission separately,
(e) refine the list of sepsis diagnoses used in trigger approach (ii), and
(f) remove sepsis MS-DRG cases [i.e., triggered by trigger approach (i)] with no diagnosis for a high priority SOI.

During the webinar, workgroup members favored initial recommendations they supported in a pre-webinar poll (i.e., Sepsis Episode Group Definition Poll), which included refining the trigger logic by aligning the other infectious MS-DRGs with the high priority SOIs identified by workgroup members during the workgroup in-person meeting (i.e., osteomyelitis and septic arthritis, gastrointestinal infection, respiratory infection, kidney and urinary tract infection, and cellulitis). Workgroup members noted that this would improve the homogeneity of the patient cohort while retaining about 91% of episodes based on preliminary analyses. However, workgroup members generally favored excluding episodes with osteomyelitis and septic arthritis since this SOI has a small number of episodes (i.e., about 2% of episodes) and yields varying lengths of antibiotic treatment as well as variation in medical versus surgical treatment that may introduce heterogeneity in episode costs and outcomes. Similarly, some workgroup members suggested removing cases of gastrointestinal infection (present in about 5% of episodes) due to the split of cases treated medically versus surgically, the corresponding variability of cost/outcomes, and the difficulties in addressing luminal versus biliary disease. Ultimately, the workgroup members voted to remove osteomyelitis and septic arthritis infections from the trigger logic and retain the gastrointestinal infection cases.

The workgroup discussed the possibility of limiting triggers to only medically treated sepsis (i.e., medical MS-DRGs) as opposed to surgical treatment of sepsis to improve clinical homogeneity. The workgroup noted that in some cases with well-studied procedures such as cholecystectomy, surgical and medical treatment could appear comparable; however, in general, surgical treatment of sepsis could differ greatly from medical treatment. Similarly, the workgroup also mentioned that surgical treatment is generally reserved for cases where medical treatment is unable to completely resolve the infection, and thus, workgroup members supported limiting to medically treated sepsis. Some workgroup members observed that removing surgical MS-DRGs would result in a relatively small drop in episodes, as about 91% of episodes would be retained relative to the pool of episodes for the current measure specifications based on preliminary analyses. However, workgroup members noted that coverage should still be an important consideration for these decisions.

Workgroup members also discussed cases where sepsis is hospital-acquired as opposed to present on admission, and whether those cases should be handled separately. Workgroup members discussed potentially limiting the patient cohort to just those with a sepsis present on admission indicator (i.e., excluding hospital-acquired sepsis cases). Workgroup members suggested that in sepsis academic literature, around 80 to 85% of cases are present on admission and that those not present on admission are generally much higher in cost. Some workgroup members discussed how limiting to only present on admission cases would retain over 95% of episodes while improving the clinical homogeneity based on the results of Acumen's investigatory analyses using the current measure specifications. Some workgroup members advocated in favor of simply risk adjusting for hospital-acquired sepsis, since exclusion would result in reduction in coverage and those cases would not be assessed to hold attributed clinicians accountable for the resulting sepsis. Some members expressed that the clinicians treating the sepsis would not necessarily be those who were responsible for its development (e.g., due to hospital transfers), and this may unintentionally result in high cost measure performance for those clinicians.

Workgroup members also discussed whether to update the list of sepsis diagnoses that are used to trigger episodes for other infectious MS-DRGs. In the current specifications, this list of sepsis diagnoses includes the ones that are billed under the sepsis MS-DRGs (i.e., 870-2). However, 4 of these diagnoses do not mention sepsis in their title (i.e., disseminated herpesviral disease, hypovolemic shock, other shock, and bacteremia). Some workgroup members were in favor of excluding these diagnoses from the sepsis diagnosis list, which collectively would drop about 2.7% of episodes. However, some members also expressed interest in keeping the bacteremia diagnosis since this was the most commonly occurring of these codes which impacts the measure's coverage, and the mean risk-adjusted cost for bacteremia cases was similar to all episodes. One member did express concern that these bacteremia cases may not actually be bacteremia but rather a contaminated blood culture sample being identified as positive blood cultures.

Workgroup members also discussed episodes from the sepsis MS-DRGs where there is no diagnosis for the high priority sources of infection (SOIs), labeled as "Other Sepsis" in the sub-groups. Workgroup members remarked that while removing the "Other Sepsis" cases might improve the clinical homogeneity of the patient cohort, it would also yield a very large reduction in episodes (i.e., about 18%), and the lack of high priority SOI diagnoses in these episodes could be due to coding errors. Additionally, workgroup members noted that the mean risk-adjusted episode cost for these cases (i.e., $17,588 with shock and $17,615 without shock) was similar to all episodes (i.e., $17,551), suggesting the risk adjustment model is already sufficiently adjusting for the differences for the "Other Sepsis" hospitalizations.

Key Takeaways from Discussion and/or Polls for Defining the Episode Group:

- Workgroup members recommended limiting the other infectious MS-DRG codes to ones that are aligned with the previously chosen high-priority SOIs to improve clinical homogeneity.
- Workgroup members recommended removing osteomyelitis and septic arthritis infection cases from the measure's trigger logic.
- Workgroup members agreed that medical treatment of sepsis varied from surgical treatment of sepsis and supported limiting triggers to only medical MS-DRGs.
- The workgroup noted that hospital-acquired sepsis is more costly than sepsis present on admission cases; however, there was no clear consensus on the approach for how to handle these cases during the webinar or in the poll, so hospital-acquired sepsis will be monitored for field testing, after which additional input may be gathered.
- Workgroup members voted to include bacteremia as a sepsis diagnosis and remove the other 3 diagnoses without sepsis in the title from the list of sepsis diagnoses used in triggering when accompanying another infectious MS-DRG for trigger approach (ii).
- Members also recommended to keep the sepsis MS-DRG episodes with no diagnosis for the high-priority SOIs.

2.2 Addressing Patient Sub-Populations for Meaningful Clinical Comparison

Members also held detailed discussions revisiting their initial recommendations from the August 2019 workgroup in-person meeting regarding how to account for various sub-populations within the Sepsis episode group. Sub-populations are patient cohorts as defined by particular characteristics. To ensure meaningful clinical comparisons, specific sub-populations/patient cohorts can be handled in the following ways: (i) stratifying the episode group into mutually exclusive and exhaustive sub-groups to define more homogeneous patient cohorts, (ii) including as a variable in the risk adjustment model, (iii) excluding the sub-population from the measure, and (iv) monitoring and testing the sub-population for future consideration.

After Acumen provided a description of each method and presented analytic data on initial sub-populations (based on recommendations from the workgroup during the August 2019 workgroup in-person meeting), workgroup members discussed their preferences for how to refine given patient cohort sub-populations and confirmed their recommendations in the post-discussion SAR Webinar Poll.

2.2.1 Sub-Groups

The workgroup's previous recommendation to stratify by both presence of septic shock and SOI resulted in 12 mutually exclusive and exhaustive sub-groups, some of which contained low episode counts, posing technical feasibility issues. Therefore, workgroup members discussed whether to simplify the current sub-groups to only sub-group either by the presence of septic shock (i.e., severity) or SOI. Workgroup members were generally in agreement with the approach to sub-group by the presence of septic shock and risk adjust for the SOIs. They noted that sub-grouping by severity is preferable due to the importance of early care in sepsis and the higher burden and cost of septic shock (i.e., longer inpatient stays and more complications); also, this option would result in 2 sub-groups – each with a large number of episodes. Additionally, workgroup members noted that risk adjustment accounts well for the differences in SOIs and for the presence of multiple SOIs on the trigger inpatient claim.

Key Takeaways from Discussion and/or Polls for Sub-Groups:

- Members recommended to revise the sub-groups and stratify by severity (while risk adjusting for the SOIs).
- This results in the mutually exclusive and exhaustive sub-groups listed below:

- Sepsis with Septic Shock
- Sepsis without Septic Shock

2.2.2 Other Sub-Populations of Interest

During the webinar, workgroup members did not have sufficient time to discuss certain sub-populations currently designated for monitoring that the Acumen team identified for potential change in designation for either risk adjustment or exclusion; these include the following:

- Hospice or Comfort Care on Admission
- Intubation Less than 24 Hours with Sepsis Diagnosis
- Intubation 24 to 96 Hours with Sepsis Diagnosis
- Intubation Greater Than 96 Hours with Sepsis Diagnosis
- Leaving Against Medical Advice
- Patients on Clinical Trial
- IV Antibiotics 14 Days Before Admission
- Recent All-Cause Admission In 30 Days

Workgroup members were able to provide their input via the SAR Webinar Poll, which included data on these sub-populations to assist in member recommendations. Ultimately, members recommended excluding Hospice or Comfort Care on Admission, Leaving Against Medical Advice, and Patients on Clinical Trial, while continuing to monitor the remaining sub-populations for future consideration. Workgroup members also recommended that the Acumen team identify cases where patients receive interventional radiology treatment for their infection as there was concern this would be similar to those infections requiring surgical treatment and may need to be risk-adjusted or excluded in the future. Therefore, a sub-population for patients receiving interventional radiology treatment will be created and monitored. In the poll, workgroup members also provided input on whether we should continue risk adjusting for heroin use as a surrogate for IV drug use. This is due to issues with reliable identification and coding of these patients, a low prevalence (e.g., present in about 0.04% of episodes), and investigation results indicating that this sub-population has no consistent impact on the risk adjustment model.

Key Takeaways from Discussion and/or Polls for Other Sub-Populations of Interest:

- Members recommended changing the designation for the following sub-populations from monitor to exclusion:
  - Hospice or Comfort Care on Admission
  - Leaving Against Medical Advice
  - Patients on Clinical Trial
- Members recommended to keep monitoring the following sub-populations:
  - Intubation Less than 24 Hours with Sepsis Diagnosis
  - Intubation 24 to 96 Hours with Sepsis Diagnosis
  - Intubation Greater Than 96 Hours with Sepsis Diagnosis
  - IV Antibiotics 14 Days Before Admission
  - Recent All-Cause Admission In 30 Days
- Heroin use will be removed as a risk adjustor and instead designated as a sub-population for monitoring during field testing, and this topic may be revisited in the next workgroup meeting after more testing data is gathered.

2.3 Assigning Services to the Episode Group

Acumen described the purpose of service assignment so that members could identify and discuss which services associated with the clinician's role in managing the condition should be included in the cost measure. These assigned services should be inclusive enough to identify a

measureable performance difference between clinicians but also not introduce excessive noise. Acumen also re-introduced the concept of the episode window to facilitate this session's discussion. Section 2.3.1 presents the discussion of episode window length, and Section 2.3.2 summarizes the assigned services discussion.

2.3.1 Discussion of Episode Window Length

At the August 2019 workgroup in-person meeting, workgroup members discussed and recommended to use a 30-day post-trigger period and no pre-trigger period for this measure. During the webinar, workgroup members revisited this topic since the Acumen team noticed there may have been confusion regarding the start of the post-trigger period. Acumen clarified that the post-trigger period looks forward from the inpatient admission date rather than the discharge date. Workgroup members noted that 45 days after the admission date would enable the measure to capture the traditional timeframe for post-discharge readmissions and post-acute care utilization, so they favored expanding the post-trigger period from 30 to 45 days. Some workgroup members mentioned that expanding the episode window would hold clinicians accountable for more time on a condition that is difficult to treat, though a member noted that the overall need to capture more services outweighs this concern. Ultimately, workgroup members voted to expand the episode window to 45 days.

Key Takeaways from Discussion and/or Polls for Episode Window:

- Post-trigger period: 45 days

2.3.2 Discussion of Assigned Services

The workgroup discussed some services that the Acumen team identified and are not currently part of the service assignment rules for the Sepsis measure. Some workgroup members were in favor of not assigning any of these services in order to simplify the measure, focus on the disease process itself, and mitigate the adverse impact of these costs on measure score for certain types of providers (e.g., small facilities).

Generally, workgroup members felt durable medical equipment (DME) outside of infusion equipment, wound care supplies, and wheelchairs/canes/walking aids should not be assigned. One workgroup member mentioned possibly including vacuum-assisted closure of a wound treatment after discharge, as it could relate to post-acute care services or readmissions, which are costly. Another member noted that many of these items are low on cost and could be unrelated to the sepsis admission, so not assigning these may be preferable to simplify the measure. Workgroup members also discussed services related to treatment of hypertensive crisis, myocardial infarction, stroke, and chronic heart failure exacerbation. Some members suggested that appropriate medication reconciliation may be under the purview of the attributed clinician, while others felt that these services could be out of scope as it relates to sepsis and may potentially penalize small facilities. Members did not have time during the webinar to discuss the remaining services in detail (i.e., non-specific symptoms like dizziness/nausea/abdominal pain, ileus and bowel obstruction, and treatment for electrolyte abnormalities). In the follow-up poll, workgroup members ultimately recommended not to assign any of these services in the post-trigger period.

Key Takeaways from Discussion and/or Polls for Assigned Services:

- Workgroup members recommended not to assign the following categories of services in the post-trigger period:
    - Any DME outside of Infusion Equipment (e.g., home oxygen, catheters, diabetic supplies)
    - Wound Care Supplies

- Wheelchairs, Canes, and Walking Aids
- Treatment of Hypertensive Crisis
- Myocardial Infarction
- Stroke
- Congestive Heart Failure (CHF) Exacerbation
- Non-Specific Symptoms (e.g., dizziness, nausea, abdominal pain)
- Ileus and Bowel Obstruction
- Treatment for Electrolyte Abnormalities

2.4 Next Steps

In the final session, Acumen provided an overview of the next steps in the measure development process. After the meeting, Acumen distributed the *SAR Webinar Poll* to gather input from members on the discussions held during the webinar. The survey also consisted of open comment boxes to provide additional thoughts on how to build opportunities for measure performance improvement into the measure specifications and to share any additional thoughts on the measure.

Acumen will gather and review the input provided during the SAR webinar discussions and poll to create updated measure specifications. These specifications will be posted publicly as a part of upcoming national field testing. During the field testing period, Field Test Reports for the Wave 3 measures under development will be available to clinicians and will contain information showing how clinicians would perform for the measures, based on the measure specifications at that time. There will also be an opportunity for all stakeholders to provide detailed feedback about the measures during field testing.

3. Appendix: Overview of Workgroup Member Preparation and Shared Materials

3.1 Introduction

Section 3.2 provides an overview of materials shared with the workgroup members prior to the SAR webinar, and Section 3.3 provides a recap of the main concepts of the measure development process and measure framework presented by Acumen.

3.2 Overview of Meeting Materials

Prior to the meeting, workgroup members were provided with the following information to inform their discussions and votes during the meeting:

- *Update on Refined Episode Group Definition for Sepsis* memo, which was provided to workgroup members 3 weeks prior to the webinar and summarized Acumen's recommendations on refining the triggering logic, addressing cases of osteomyelitis and septic arthritis, and revisiting the current sub-groups; members also provided preliminary feedback on the memo prior to the webinar via the *Sepsis Episode Group Definition Poll.*
- *Agenda* and *Slide Deck*, which was sent 2 weeks prior to the meeting and included a list of discussion questions to be considered prior to meeting and discussed during the webinar.
- Investigation workbooks sent 2 weeks prior to the meeting which presented detailed findings from empirical analyses:
    - A re-run of *Sub-Population Summary Investigation Workbook,* which provided updated data on the frequency and cost associated with an initial set of potential sub-populations as recommended by the workgroup during the August 2019 in-person meeting.
    - A re-run of *Candidate Services Over Time Investigation Workbook,* which contained updated information on frequency, cost, and timing for up to 200 of the most commonly performed services after a trigger event to inform discussions on service assignment and included the share of episodes where the service was assigned based on the service assignment rules.

The materials shared were based on analyses run on triggering methodologies with trigger codes and specifications developed based on input from the August 2019 workgroup in-person meetings.

3.3 Overview of Cost Measure Development and Framework

At the beginning of the meeting, Acumen presented a very brief introductory session as a refresher on the following framework topics:

- The 5 essential components of episode-based cost measures (defining the episode group, attributing the episode group to clinicians, assigning costs to the episode group, risk adjusting episode groups, and aligning cost with quality) along with an example illustration of how episodes work
- The steps for construction of an episode-based cost measure and goals that cost measures are meant to accomplish in distinguishing good from poor performance
- A recap on the different sources of information for the workgroup to consider in addition to their clinical expertise, including analyses and data as well as the perspectives of patients and caregivers through Person and Family Engagement (PFE)