3M Health Information Systems

The 3M℠ Value Index Score (VIS)

Measurement and Evidence

What is the 3M Value Index Score?

The 3M Value Index Score (VIS) is a composite measurement tool for health care value assigned to Primary Care Providers. 3M VIS measures effective, accountable primary care, and has been adopted for payment and reporting by a number of providers and payers who want to align incentives and behaviors to achieve the Triple Aim.

Comprised of 16 measures categorized in six claims-based domains, the 3M VIS and its domains and measures summarize the care of patients regardless of their health status (i.e., healthy to chronically ill). As operational indicators of micro and macro system effectiveness, the 3M VIS provides providers and payers with valuable insight into practices and outcomes that can be emulated or improved for lasting positive impact. Some measures are drawn from the National Committee for Quality Assurance (NCQA) and the Healthcare Effectiveness Data and Information Set (HEDIS®) – a nationally recognized approach for measuring important dimensions of health care and service.

The 3M VIS is based on the following principles:

- Consistent with principles of primary care
- Population, not disease centric
- Meaningful impact on the Triple Aim
- Can be influenced by provider intervention
- Supported by evidence
- Rate (not event) driven
- Allows cross-physician comparison
- Supports continuous quality improvement
- Claims based, risk-adjusted, reliable
- Minimizes administrative burden and potential for fraudulent reporting

The following pages contain the measure specifications and citations for evidence in support of each measure.

Note: Potentially Preventable Readmissions, Potentially Preventable Admissions, Potentially Preventable Visits, Potentially Preventable Services and Clinical Risk Groups are copyrighted products of the 3M Corporation.

Primary and Secondary Prevention Domain

Primary and Secondary Prevention has four measures for the physician's performance on screening services designed for early detection or prevention of disease. The metrics for all four measures are percent completion.

Breast Cancer Screening	The denominator for breast cancer screening is the number of attributed women ages 52 – 74 who have not had a bilateral or two separate unilateral mastectomies (19180, 19200, 19220, 19240, 19303-19307, 85.41-85.48, or ICD10 codes 0HTT0ZZ and 0HTU0ZZ, or OHTV0ZZ), absence of both right and left breasts (ICD10: Z9011 and Z9012, or Z9013), and are not in hospice (Type of Bill 81X or 82X). The numerator is the number of attributed members who have had a mammogram in the past 27 months. This measure is identified with the following codes: G0202, G0204, G0206, 77055, 77056, 77057, 87.36, 87.37 and revenue codes 0401, 0403

Supporting documentation for breast cancer screening measure:

- Aligned with NCQA breast cancer screening measure. Refer to NCQA HEDIS 2016 Volume 2: Technical Specifications. http://www.ncqa.org/HEDISQualityMeasurement/HEDISMeasures/HEDIS2016.aspx

Supporting evidence for value of breast cancer screening:

- Practice Bulletin No. 122: Breast Cancer Screening, Obstetrics & Gynecology 118(2, Part 1):372-382, August, 2011. This bulletin contains the most recent ACOG recommendations and rationale.

- Gemignani, ML (2011). Breast cancer screening: why, when, and how many? Clinical Obstetrics and Gynecology, 54(1), 125-132. This article focuses on breast cancer screening in the general population. Abstract: "Using an evidence-based medicine approach, a review of the current literature was undertaken to examine the rationale, risks, and benefits of breast cancer screening. The focus of breast cancer screening is to reduce disease mortality. However, there are additional benefits that are afforded by early detection, such as an early stage of diagnosis and a greater chance of having negative lymph nodes. Currently, we believe mammography offers significant benefits for breast cancer detection and mortality reduction in the general population."

- Nelson HD, Tyne K, Naik A, Bougatsos C, Chan BK, Humphrey L (2009). Screening for breast cancer: an update for the U.S. Preventive Services Task Force. Ann Intern Med 2009;151:727-37.
- Njor, S, Nyström, L, Moss, S, Paci, E, Broeders, M, Segnan, N, and Lynge, E (2012). Breast cancer mortality in mammographic screening in Europe: a review of incidence-based mortality studies. Journal of Medical Screening, 19(suppl 1), 33-41. Abstract: "Based on evidence from the most methodologically sound IBM studies, the most likely impact of European service mammography screening programs was a breast cancer mortality reduction of 26% (95% confidence interval 13–36%) among women invited for screening and followed up for 6–11 years."
- Smith, RA, Kerlikowske, K, Miglioretti, DL, and Kalager, M (2012). Clinical decisions Mammography screening for breast cancer. The New England Journal of Medicine, 367(21), e31-e31. This interactive feature of the Journal presents varying perspectives on breast cancer screening. Of note, Smith writes (and provides references): "One school of thought asserts that progress in therapy has eclipsed the benefit of early detection and that harms associated with screening are excessive and outweighs the benefits. There is substantial evidence to the contrary, however, and the methodological flaws that lead to these claims have been clearly identified."

Colorectal Cancer Screening Index	The colorectal cancer screening index is a weighted average of the rates of FOBT (10%), sigmoidoscopy (50%), and colonoscopy (100%). The denominator is the number of attributed members age 51 – 75 who have not had a total colectomy (44150-44153, 44155-44158, 44210-44212, 45.8x, or ICD10 Procedure 0DTE0ZZ, 0DTE4ZZ, 0DTE7ZZ, 0DTE8ZZ), do not have colorectal cancer in claim history (G0213-G0215, G0231, 153.x, 154.0, 154.1, 197.5, V10.05, V10.06, or ICD10 Dx: C18.0, C18.1, C18.2, C18.3, C18.4, C18.5, C18.6, C18.7, C18.8, C18.9, C19, C20, C21.2, C21.8, C78.5, Z85.038, Z85.048), and are not in hospice (Type of bill 81x or 82x). The numerator is the weighted count of attributed members who have received a colonoscopy, sigmoidoscopy, or FOBT within the evaluation period. This measure is identified with the following codes: 82270, 82274, G0328 (10%); 45330-45335, 45337-45342, 45345, 45346, 45347, 45349, 45350, G0104. 45.24 (50%); and 44388-44394, 44397, 45355, 45378-45393, 45398, G0105, G0121, 45.22, 45.23, 45.25, 45.42, 45.43 (100%)

Supporting documentation for colorectal cancer screening index:

- Aligned with NCQA Colorectal Cancer Screening measure in concept. However, the 3M VIS implementation relies on the annual percentage of eligible panel members

screened derived from claims data. It is our belief based on the literature (see below) that this method is as accurate, perhaps more so, in tracking conformity with screening guidelines given the issues with patient recall and inconsistencies and incompleteness in medical records available to a physician. Refer to NCQA HEDIS 2016 Volume 2: Technical Specifications.
http://www.ncqa.org/HEDISQualityMeasurement/HEDISMeasures/HEDIS2016.aspx

Supporting evidence for value of colorectal screening:

- Espey, DK, Wu, XC, Swan, J, Wiggins, C, Jim, MA, Ward, E, Edwards, BK (2007). Annual report to the nation on the status of cancer, 1975–2004, featuring cancer in American Indians and Alaska Natives. Cancer, 110(10), 2119–2152.

  Abstract: "Colorectal cancer screening is an effective tool to identify colorectal cancer, which is highly curable when detected early. Removal of precancerous polyps contributed to 10-yr decline in incidence rate of colorectal cancer among both men and women. Colorectal cancer death rates (are) also declining, likely due to detection at earlier stage." http://www.
  ncqa.org/portals/0/HEDISQM/CLAS/posters/HarvardPilgrim.pdf

- Holden, DJ, Harris, R, Porterfield, DS, Jonas, DE, Morgan, LC, Reuland, D, Gilchrist, M, Viswanathan, M, Lohr, KN, Lyda-McDonald, B. (2010). Enhancing the Use and Quality of Colorectal Cancer Screening. Evidence Report/Technology Assessment No.190. (Prepared by the RTI International–University of North Carolina Evidence-based Practice Center under Contract No. 290-2007-10056-I.) AHRQ Publication No. 10-E-002. Rockville, MD: Agency for Healthcare Research and Quality. February 2010.

  Abstract: "Our review suggests that the United States is yet some distance from fully realizing the promise of appropriate and high-quality colorectal cancer screening. Problems of underuse, overuse, and misuse are not being adequately addressed at present. By focusing our research effort on the issues that matter most—access to screening, communication between patient and medical staff, the organization of care—and by further researching how to implement effective and cost-effective strategies into actual primary care practice, we will have the greatest opportunity to reduce the burden of suffering of colorectal cancer for the people of the United States."

- Kavanagh AM, Giovannucci EL, Fuchs CS, Colditz GA. Screening endoscopy and risk of colorectal cancer in United States men. Cancer Causes Control 1998 Aug;9(4):455-62.

  This study provides strong evidence for a protective effect of screening endoscopy on colorectal cancer incidence and mortality and supports recommendations for screening endoscopy as an approach to colon cancer prevention.

- Smith, RA, Cokkinides, V, and Brawley, OW (2009). Cancer screening in the United States, 2009: a review of current American Cancer Society guidelines and issues in cancer screening. CA: A Cancer Journal for Clinicians, 59(1), 27–41. doi:10.3322/caac.20008

- U.S. Preventive Services Task Force. (2008). Screening for colorectal cancer: U.S. Preventive Services Task Force Recommendation Statement. Annals of Internal Medicine, 149(9), 627–637.

Reliability of claims data as source of data for colorectal cancer screening index:

- Schenck AP, Klabunde CN, Warren JL (2007). Data Sources for Measuring Colorectal Endoscopy Use Among Medicare Enrollees. Cancer Epidemiol Biomarkers Prev. 16(10):2118-2127. doi: 10.1158/10559965.EPI-07-0123.

  "Results: Agreement between claim and medical record regarding whether an endoscopic procedure had been done was high (over 90%). Agreement between self-report and medical record and between self-report and claim was good (79% and 74%, respectively). Conclusion: Medicare claims can provide accurate information on whether a patient has undergone colorectal endoscopy and may be more complete than physician medical records."

- Li, X, Hilsden, R, Hossain, S, Fleming, J, and Winget, M (2012). Validation of administrative data sources for endoscopy utilization in colorectal cancer diagnosis. BMC health services Research, 12, 358. doi:10.1186/1472-6963-12-358

  "Background: Validation of administrative data is important to assess potential sources of bias in outcome evaluation and to prevent dissemination of misleading or inaccurate information. The purpose of the study was to determine the completeness and accuracy of endoscopy data in several administrative data sources in the year prior to colorectal cancer diagnosis as part of a larger project focused on evaluating the quality of pre-diagnostic care. Results: The physician billing was the best single administrative data source with similar completeness to the chart review alone." (Billing actually identified slightly more endoscopies than chart review.)

Challenges with self-reported data and medical records for colorectal screening:

- Hall IH, Van Den Eeden SK, Tolsma DD, et al. (2004). Testing for Prostate and Colorectal Cancer: Comparison of Self-Report and Medical Record Audit. Prev Med.;39:27-35. Cooper GS, Schultz L, Simpkins J, Lafata JE.

  "Background: Self-reported data are often used to determine cancer screening test utilization, but self-report may be inaccurate. Results: For DRE, FOBT, sigmoidoscopy, and colonoscopy, testing rates determined by self-report were higher than those in medical records. Conclusion: Over reporting for some cancer tests should

be considered when using self-reported data to evaluate progress towards reaching national goals for prevention behaviors."

Well-Child Visits for Infants	The percentage of Attributed Members who turned 15 months old during the evaluation period and who had the recommended six well-child visits with a PCP during their first 15 months of life. This measure is identified with the following codes: 99381, 99382, 99391, 99392, 99461, G0438, G0439, V20.2, V20.31, V20.32, V70.0, V70.3, V70.5, V70.6, V70.8, V70.9 or ICD10 Dx Z00.110, Z00.111, Z00.121, Z00.129, Z00.5, Z00.8, Z02.2, Z02.6, Z02.71, Z02.79, Z02.82, Z02.83, Z02.89, Z02.9

Supporting documentation for well-child visits in infants measure:

- Aligned with NQF measure 1392 Well-Child Visits in the First 15 Months of Life http://www.qualityforum.org/QPS/1392
- Additional information available at AHRQ http://www.qualitymeasures.ahrq.gov/content.aspx?id=38929
- Bright Futures Steering Committee and Committee on Practice and Ambulatory Medicine (2007). Recommendations for Preventive Pediatric Health Care. Pediatrics, 120(6), 1376–1376. doi:10.1542/ peds.2007-2901.

Well-Child Visits for Children 3-6	The percentage of Attributed Members 3-6 years of age at the end of the Evaluation Period who had one or more well-child visits with a PCP within the evaluation period. This measure is identified with the following codes: 99382, 99383, 99392, 99393, G0438, G0439, V20.2, V70.0, V70.3, V70.5, V70.6, V70.8, V70.9, or ICD10 Dx Z00.121, Z00.129, Z00.5, Z00.8, Z02.0, Z02.2, Z02.5, Z02.6, Z02.71, Z02.79, Z02.82, Z02.83, Z02.89, Z02.9

Supporting documentation for well-child visit in children 3-6 measure:

- Aligned with NCQA measure Well-Child Visits in the Third, Fourth, Fifth and Sixth Years of Life http://www.ncqa.org/portals/0/Well-Child%20Visits%20in%20the%20Third%20Fourth%20Fifth.pdf

Supporting evidence for value of well-child visit in children 3-6:

- AAP recommendations: http://brightfutures.aap.org/pdfs/Guidelines_PDF/1-BF-Introduction.pdf

- Abdus, S, and Selden, TM (2013). Adherence With Recommended Well-Child Visits Has Grown, But Large Gaps Persist Among Various Socioeconomic Groups. Health Affairs,32(3), 508-515.

  "Well-child visits are an important component of high-quality health care for children. These visits may provide children with preventive and developmental health services, help ensure timely immunizations, help reduce the use of acute care services, and offer parents an opportunity to discuss their health-related concerns with providers."

Tertiary Prevention Domain

The Tertiary Prevention Domain evaluates the effectiveness of a provider in addressing "sick" care. By this, we mean how well the PCP manages the level of urgency associated with member health issues. The metrics for both measures are percent difference between actual and expected.

3M™ Potentially Preventable Admissions (Risk adjusted)	Percent difference between the rate of initial hospital admissions that are potentially preventable and the risk-adjusted expected rate.
3M™ Potentially Preventable ED Visits (Risk adjusted)	Percent difference between the rate of qualified emergency room visits that are potentially preventable, and the risk-adjusted expected rate.

Supporting documentation for potentially preventable admissions and visits:

- Canadian Institute for Health Information (CIHI). Health indicators 2012: definitions, data sources and rationale. Ottawa (ON): Canadian Institute for Health Information (CIHI); 2012 May. 93 p. http://www. qualitymeasures.ahrq.gov/content.aspx?id=35186
- Goldfield, N, Kelly, WP, and Patel, K (2012). Potentially preventable events: an actionable set of measures for linking quality improvement and cost savings. Quality Management in Healthcare, 21(4), 213-219.
- http://solutions.3m.com/wps/portal/3M/en_US/Health-Information-Systems/HIS/Products-andServices/Products-List-A-Z/PPR-and-PPC-Grouping-Software/
- http://multimedia.3m.com/mws/mediawebserver?mwsId=SSSSSuH8gc7nZxtUoYtZMx_ xevUqe17zHvTSevTSeSSSSSS--&fn=Preventables%20eBook.pdf

Supporting evidence for validity of using ambulatory sensitive conditions to measure quality and access to primary care:

- Basu, J, Friedman, B, and Burstin, H (2002). Primary Care, HMO Enrollment, and Hospitalization for Ambulatory Care Sensitive Conditions: A New Approach. Medical Care, 1260-1269, Principal Findings: Higher primary care density was associated with a lower likelihood of ACS admission, compared with marker admissions, without increasing referral-sensitive admissions.

- Billings, J, Zeitel, L, Lukomnik, J, Carey, TS, Blank, AE, and Newman, L (1993). Impact of Socioeconomic Status on Hospital Use In New York City. Health Affairs, 12(1), 162-173. One of the seminal articles demonstrating evidence for the proposition of ACSCs.

- Caminal, J, Starfield, B, Sánchez, E, Casanova, C, and Morales, M (2004). The Role of Primary Care In Preventing Ambulatory Care Sensitive Conditions. The European Journal of Public Health, 14(3), 246251. Methodological approach to ratifying existing ACSC relationship to primary care and identifying new ACSC.

- Flores, G, Abreu, M, Chaisson, CE, and Sun, D (2003). Keeping Children Out of Hospitals: Parents' And Physicians' Perspectives on How Pediatric Hospitalizations for Ambulatory Care-Sensitive Conditions Can Be Avoided. Pediatrics, 112(5), 1021-1030.

  Interesting demonstration of need for patient/physician collaboration given their divergent perspectives. "Results: PCPs (83%) and IAPs (67%) significantly more often than parents (44%) cited parent/patient-related reasons for how hospitalizations could have been prevented, including adhering to and refilling medications, better outpatient follow-up, and avoiding known disease triggers. Parents (27%) and IAPs (26%) significantly more often than PCPs (11%) cited physician-related reasons for how hospitalizations could have been avoided, including better education by physicians about the child's condition, and better quality of care. Multivariate analyses revealed that an age > or =11 years and no physician contact before the hospitalization were associated with approximately two times the odds of a preventable asthma hospitalization. Conclusions: The proportion of asthma hospitalizations assessed as preventable varies from 15% to 54%, depending on the source. Adolescents and families who fail to contact physicians before hospitalization are at greatest risk for preventable hospitalizations. Many pediatric asthma hospitalizations might be prevented if parents and children were better educated about the child's condition, medications, the need for follow-up care, and the importance of avoiding known disease triggers."

- Freund, T, Campbell, SM, Geissler, S, Kunz, CU, Mahler, C, Peters-Klimm, F, and Szecsenyi, J (2013). Strategies for Reducing Potentially Avoidable Hospitalizations for

Ambulatory Care Sensitive Conditions. The Annals of Family Medicine, 11(4), 363-370.

Abstract: "Purpose: Hospitalizations for ambulatory care-sensitive conditions (ACSCs) are seen as potentially avoidable with optimal primary care. Little is known, however, about how primary care physicians rate these hospitalizations and whether and how they could be avoided. This study explores the complex causality of such hospitalizations from the perspective of primary care physicians. Conclusions: Primary care physicians rated a significant proportion of hospitalizations for ACSCs to be potentially avoidable. Strategies to avoid these hospitalizations may target after-hours care, optimal use of ambulatory services, intensified monitoring of high-risk patients, and initiatives to improve patients' willingness and ability to seek timely help, as well as patients' medication adherence."

- Gibson, OR, Segal, L, and McDermott, RA, (2013). A Systematic Review Of Evidence On The Association Between Hospitalizations For Chronic Disease Related Ambulatory Care Sensitive Conditions and Primary Health Care Resourcing. BMC Health Services Research, 13(1), 1-13.

  "Background: Primary health care is recognized as an integral part of a country's health care system. Measuring hospitalizations that could potentially be avoided with high quality and accessible primary care, is one indicator of how well primary care services are performing. This review was interested in the association between chronic disease related hospitalizations and primary health care resourcing. Results. The association between medical workforce numbers and ACSC hospitalizations was mixed. However, when results were categorized by Primary Health Care (PHC) access (e.g. GPs/capita, range of services) and use (e.g. no out-patient visits), better access to quality PHC resulted in fewer ACSC hospitalizations. This finding remained when only studies that adjusted for health status were categorized."

- Laditka, JN, Laditka, SB., and Probst, JC (2005). More May Be Better: Evidence Of A Negative Relationship Between Physician Supply And Hospitalization For Ambulatory Care Sensitive Conditions. Health Services Research, 40(4), 1148-1166. "Conclusions: Physician supply is positively associated with the overall performance of the primary health care system in a large sample of urban counties of the United States."

Panel Health Status Change Domain

Panel Health Status Change has two measures for the health status change of the physician's attributed members with chronic conditions. The metrics for both measures are percent difference between actual and expected. In order to calculate these measures, two years of data are required. The evaluation period will be compared to the year immediately prior. The denominator for both measures is members with chronic conditions attributed to the same PCP in both years.

Chronic Complexity Status Jumpers (Risk adjusted)	Risk adjusted measure of the attributed members' increases in dominant chronic conditions. The numerator is attributed members with chronic conditions who acquire additional dominant chronic conditions in the evaluation period. The denominator is all members with chronic conditions eligible to jump status.
Chronic Severity Jumpers (Risk adjusted)	Risk-adjusted measure of attributed members with chronic conditions who have significant changes in severity. The numerator is attributed members with chronic conditions whose severity moves two or more levels as measured by 3MTM ACRG3s in the evaluation period. The denominator is all members with chronic conditions eligible to jump two or more severity levels.

Supporting documentation for panel health status change:

- Both of these metrics use the technology of 3M™ Clinical Risk Groups (CRGs) (Hughes, 2004) to assess disease progression, an idea first presented in the literature by Bernstein and consistent with earlier suggestions by Zhao and drawing inspiration from the decades of work on measuring patient health status via numerous self-report and expert assessment tools.

- Bernstein, RH, New Arrows in the Quiver for Targeting Care Management: High-Risk Versus High-Opportunity Case Identification, J Ambulatory Care Management 2007; 30(1):39–51.

  "Predictive models that create burden of illness (BOI) scores (Zhao et al., 2002) can also be used to show disease progression. As discussed in the next section, this relatively novel use of predictive models can highlight individuals who are clinically deteriorating since the last measurement period. Care managers should look more closely at such individuals. Targeting By Recent Clinical Deterioration: Changes in BOI Over Time-- Each refresh of claims data run through the CRG grouper generates a new BOI score. An increase of several BOI points can identify those who have moved to a higher severity level and/or to a higher status (case-mix complexity level). This Disease Progression Index (DPI) is another extension of CRGs and can help care managers target those who have recently shown recent and significant clinical deterioration. This is a group that may benefit from a detailed review of factors that are remediable to prevent further clinical decline and avoidable costs.

- Hughes, JS, Averill RF, Eisenhandler J, et al. (2004). Clinical Risk Groups (CRGs): A Classification System for Risk-Adjusted Capitation-Based Payment and Health Care Management. Medical Care, 42(1):8190.

  A thorough explanation of CRGs.

- Fuller, RL, Goldfield, NI, Averill, RF, Eisenhandler, J, and Vertrees, JC, (2013). Adjusting Medicaid Managed Care Payments for Changes in Health Status. Medical Care Research and Review, 70(1), 68-83.

  An example of using disease progression

Chronic and Follow-up Care Domain

Chronic and Follow-up Care has three measures for the physician's provision of post-hospital care and engagement with attributed members who have chronic conditions. The metrics for these measures are percent difference from expected for 3M™ PPRs and percent completion for the other two measures.

3M™ Potentially Preventable Readmissions (Risk adjusted)	The measure is the percent difference between actual and expected potentially preventable (PPR) rates. PPR rates are defined as the number of PPR Chains divided by the number of candidate admissions. The chains are based upon a readmission to the hospital within 30 days for a related reason. If the discharge data includes mental health/chemical dependency (MH/CD) diagnoses, the PPR expected rate is modified to reflect the increased probability of readmission associated with these conditions. For more information see Goldfield et.al. (2008) below.

Supporting documentation for potentially preventable readmissions measure:

- Differs from CMS all cause readmission: Centers for Medicare & Medicaid Services. Accountable Care Organization 2013 Program Analysis: Quality Performance Standards Narrative Measure Specifications. http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ sharedsavingsprogram/Downloads/ACO-NarrativeMeasures-Specs.pdf

- Goldfield, N, Kelly, WP, and Patel, K (2012). Potentially Preventable Events: An Actionable Set of Measures for Linking Quality Improvement and Cost Savings. Quality Management in Healthcare, 21(4), 213-219.

3M Health Information Systems

- http://solutions.3m.com/wps/portal/3M/en_US/Health-Information-Systems/HIS/Products-andServices/Products-List-A-Z/PPR-and-PPC-Grouping-Software/
- http://multimedia.3m.com/mws/mediawebserver?mwsId=SSSSSuH8gc7nZxtUoYtZMx_ xevUqe17zHvTSevTSeSSSSSS--&fn=Preventables%20eBook.pdf
- Goldfield, NI, McCullough, EC, Hughes, JS, Tang, AM, Eastman, B, Rawlins, LK, and Averill, RF (2008). Identifying Potentially Preventable Readmissions. Health Care Financing Review,30(1), 75.

  Describes a method for identifying potentially preventable hospital readmissions using computerized discharge abstract data. A method for judging preventability was developed based on the relationship between the reason for the original admission and the reason for the readmission. A readmission is considered to be clinically related to a prior admission and potentially preventable if there was a reasonable expectation that it could have been prevented by one or more of the following: (1) the provision of quality care in the initial hospitalization, (2) adequate discharge planning, (3) adequate post discharge follow up, or (4) improved coordination between inpatient and outpatient health care teams. A readmission is considered to be clinically related to the initial admission if it belonged to one of five different categories:

  1. A medical readmission for a continuation or recurrence of the reason for the initial admission, or for a closely related condition (e.g., a readmission for diabetes following an initial admission for diabetes).
  2. A medical readmission for an acute decompensation of a chronic problem that was not the reason for the initial admission, but was plausibly related to care either during or immediately after the initial admission (e.g., a readmission for diabetes in a patient whose initial admission was for an acute myocardial infarction).
  3. A medical readmission for an acute medical complication plausibly related to care during the initial admission (a patient with a hernia repair and a perioperative Foley catheter readmitted for a urinary tract infection 10 days later).
  4. A readmission for a surgical procedure to address a continuation or a recurrence of the problem causing the initial admission (a patient readmitted for an appendectomy following an initial admission for abdominal pain and fever).
  5. A readmission for a surgical procedure to address a complication resulting from care during the initial admission (a readmission for drainage of a postoperative wound abscess following an initial admission for a bowel resection).
  6. A readmission that did not fit one of these categories was classified as a clinically unrelated readmission and therefore, not potentially preventable (i.e., not a PPR).

Supporting evidence for value of tracking readmissions and potential for improving rates:

- Averill, RF, Goldfield, N I, Vertrees, JC, McCullough, EC, Fuller, RL, and Eisenhandler, J (2010). Achieving cost control, care coordination, and quality improvement through incremental payment system reform. The Journal of Ambulatory Care Management,33(1), 2-23.

- Balaban, R, Galbraith, A, Burns, M, Vialle-Valentin, C, Friedman, E, and Ross-Degnan, D (2013). C2-1: A Randomized Controlled Trial of a Patient Navigator Intervention to Reduce Hospital Readmissions in a Safety Net Health Care System. Clinical Medicine and Research,11(3), 157-158.

  "Poor care coordination at hospital discharge can result in avoidable hospital readmissions. This study's aim was to evaluate the effect of a community health worker (CHW) intervention, the Patient Navigator (PN), on readmission rates and post-discharge health care use in a safety net population. Conclusions: Preliminary results show a trend toward a reduction in probability of 30-day readmission, number of readmissions, and total hospital days for safety net patients receiving a PN intervention, and a trend toward greater probability of a primary care visit within 30 days of discharge."

- Giordano, A, Scalvini, S, Zanelli, E, Corrà, U, Ricci, VA., and Glisenti, F (2009). Multicenter randomized Trial on Home-Based Telemanagement to Prevent Hospital Readmission of Patients with Chronic Heart Failure. International Journal of Cardiology,131(2), 192-199.

  "The aim of the study was to determine whether a home-based telemanagement (HBT) program in CHF patients decreased hospital readmissions and hospital costs in comparison with the usual care (UC) follow-up program over a one-year period. The intervention was associated with a 36% decrease in the total number of hospital readmissions (HBT group: 91 readmissions; UC group: 142 readmissions) and a 31% decrease in the total number of episodes of hemodynamic instability (101 in HBT group vs. 147 in UC group). Mean cost for hospital readmission was significantly lower in HBT group (euro 843+/-1733) than in UC group (euro 1298+/-2322), (-35%, $p<0.01$)."

- Goldfield, N (2011). How Important is it to Identify Avoidable Hospital Readmissions with Certainty? Canadian Medical Association Journal,183(7), E368-E369.

  A concise review of the ideas, measurement, and action strategies for preventable readmissions. Key points:

  - Readmissions to hospital can occur for clinical, socioeconomic and administrative reasons.
  - Randomized trials show that readmissions can be reduced.

- We know today the approximate percentage of readmissions that are potentially preventable.
- Given approximate rates, policy-makers can use confidential feedback, public reporting and payment incentives to reduce readmissions.

- Jackson, CT, Trygstad, TK, DeWalt, DA, and DuBard, CA (2013). Transitional Care Cut Hospital Readmissions for North Carolina Medicaid Patients with Complex Chronic Conditions. Health Affairs,32 (8), 1407-1415.

  Those who received transitional care were 20 percent less likely to experience a readmission during the subsequent year, compared to clinically similar patients who received usual care. Benefits of the intervention were greatest among patients with the highest readmission risk. One readmission was averted for every six patients who received transitional care services and one for every three of the highest-risk patients. This study suggests that locally embedded, targeted care coordination interventions can effectively reduce hospitalizations for high-risk populations.

- Tang, N (2013). A Primary Care Physician's Ideal Transitions of Care—Where's The Evidence? Journal of Hospital Medicine,8 (8), 472-477.

  "Reducing hospital readmissions is a national healthcare priority. Most of the interventions to reduce hospital readmission have been concentrated in the inpatient setting. However, there is increasing attention placed on the role of primary care physicians (PCPs) in improving the transition from hospital to home. In this article, a primary care physician's perspective of how inpatient and outpatient providers can partner to create the ideal care transition is described. Seven steps that occur during the hospitalization are highlighted: communicate with the PCP on admission, involve the PCP early regarding discharge planning, notify the PCP on hospital discharge, complete the discharge summary at time of discharge, schedule follow-up appointments by discharge, ensure prescriptions are available at the patient's pharmacy, and educate the patient about self-management. Another 7 are described as the role of the PCP and clinic staff: call the patient within 72 hours of discharge, ensure follow-up appointments with the PCP, coordinate care, repeat above until medically stable, create access for patients with new symptoms, track readmission rates, and track and review frequently admitted patients."

Post-discharge follow-up	• The denominator is the count of hospital discharges to home, home health or members who left hospital against medical advice. The numerator is the sum of the count of discharges followed by a visit to the OB-GYN or PCP within 45 days for a normal birth without a medical complication AND the count of discharges to home, home health or who left hospital against medical advice followed by a qualified physician visit within 30 days for reasons other than normal birth.

Supporting documentation for post- discharge follow-up measure:

- This metric is similar in concept to the HEDIS measure, Follow-Up After Hospitalization for Mental Illness. Refer to NCQA HEDIS 2016 Volume 2: Technical Specifications, or http://www.ncqa.org/portals/0/Follow-Up%20After%20Hospitalization%20for%20Mental%20Illness.pdf
- In 3M VIS the concept is extended to any hospitalization, in part drawing on both the Coleman Model (The Care Transitions Program®) and Naylor Model for care transition, which highlights the importance of follow-up post discharge for most patients. The concept is also consistent with the NCQA suggestions for physicians who wish to meet standards for Person Centered Medical Homes, that they provide or coordinate follow-up care to discharged patients. http://www.ncqa.org/ portals/0/PPC-PCMH%20standards%20workshop.pdf

Supporting evidence for the importance of discharge follow-up:

- Coleman, EA http://www.caretransitions.org/ (accessed 11/6/13).
- Hernandez, AF, Greiner, MA, Fonarow, GC, Hammill, BG, Heidenreich, PA, Yancy, and Curtis, LH (2010). Relationship Between Early Physician Follow-Up and 30-Day Readmission Among Medicare Beneficiaries Hospitalized for Heart Failure. The Journal of the American Medical Association, 303(17), 1716-1722.
- Jencks, SF, Williams, MV, and Coleman EA (2009). Rehospitalizations among patients in the Medicare fee-for-service program. New England Journal of Medicine, 360(14), 1418-1428.
- Ryan, J, Kang, S, Dolacky, S, Ingrassia, J, and Ganeshan, R (2013) Change in Readmissions and Follow-up Visits as Part of a Heart Failure Readmission Quality Improvement Initiative. The American Journal of Medicine, 126(11), 989-994.
- Naylor, M, Transitional Care Model http://www.transitionalcare.info/ (accessed 11/6/13).

3 Chronic Care Visits (Risk adjusted)	The chronic care visits denominator is the count of attributed members who have dominant chronic conditions (ACRG3 Base 50, 60 and 70) and the numerator is the count of these Attributed Members who have received three physician visits on distinct days within the evaluation period.

Supporting documentation for 3 chronic care visits measure:

- This metric is derived from concepts expressed in the Chronic Care Model (CCM) by Wagner, et al. (2009). Evidence on the Chronic Care Model in the New Millennium. Health Affairs, 28(1), 75-85.
- Nolte, E, McKee, M (2008). Integration and Chronic Care: A Review. In: Caring for People with Chronic Conditions. European Observatory on Health Systems and Policies Series, Open University Press, McGraw Hill, p.75. The CCM is based on the premise that high-quality chronic care is characterized by productive interactions between the practice team and patients, involving assessment, self-management support, optimization of therapy and follow-up. http://www.euro.who.int/__data/assets/pdf_file/0006/96468/E91878.pdf
- After consultations with clinicians it was determined that a reasonable estimate of the number of visits to achieve this model would be at least three to conduct an annual exam, manage complications/comorbidities/exacerbations, monitor and manage recurring and complex medication regimens, conduct case management sessions with the patient, and to educate/ encourage/support self-management. This estimate may be at the low end of what is required based on extensive simulations of the time and visits required for managing chronic diseases so it should be considered a threshold. For a thorough review of visits required for chronic care to meet guidelines see: Østbye, T, Yarnall, KS, Krause, KM, Pollak, KI, Gradison, M, and Michener, JL (2005). Is There Time for Management of Patients with Chronic Diseases in Primary Care? The Annals of Family Medicine,3(3), 209-214.

Continuity Domain

Continuity has three measures for the concentration and consistency of physician visits. The metrics are percent completion for PCP visits and qualified provider visits and percent difference between actual and expected for the continuity of care index.

Qualified Provider Visit	Percentage of attributed members with a qualified physician visit, in a qualified setting (excludes inpatient, lab, ambulance, ER, and "other", such as pharmacy, DME). The denominator is all attributed members. The numerator is attributed members who had a visit with a qualified provider. Qualified providers are MDs, DOs, NPs and PAs (as defined by the client) who directly interact with patients to provide diagnosis, treatment, and consultation of illnesses.

Supporting documentation for qualified provider visit measure:

- This metric is similar in concept to the HEDIS Measure "Mental Health Utilization" which assesses percentage of members with mental health conditions receiving any mental health service during the measurement year. In 3M VIS, this concept is extended to all members of the provider's panel, regardless of known condition, and "services" are limited to face-to-face visits with VIS eligible providers (e.g., physicians, NP, etc.) except in hospitals or emergency rooms. This measure is influenced by the non-user user rate of a provider and incents outreach to panel members.

PCP Visit	The denominator is all attributed members and the numerator is number of attributed members with at least one visit to a PCP in a qualified service location.

Supporting documentation for PCP visit measure:

- This metric is considered to be a threshold requirement for high value primary care. Without at least one contact with a PCP it is difficult to understand how any primary care can take place.

Continuity of Care Index (Risk adjusted)	The continuity of care (COC) index is first calculated for each attributed member who has at least four physician visits, including emergency room and urgent care visits. For each attributed member, $$COC = \frac{\sum\left(\begin{matrix} number\ of\ visits\ to \\ each\ distinct\ provider \end{matrix}\right)^2 - (total\ visits)}{(total\ visits) \times (total\ visits - 1)}$$ An example for an attributed member who saw one provider for four visits, another provider for two visits and two more providers for one visit each, for a total of 8 visits: COC = ((16+4+1+1) – 8) ÷ (8 × (8-1)) = 0.250 If an attributed member sees another PCP provider in the PCP's group practice, that visit is counted as if it was a visit to the PCP, not to a separate provider. Members in the malignancy and catastrophic 3M™ Clinical Risk Groups are excluded. The average COC for those members is compared to the expected COC for similar attributed members.

Supporting documentation for continuity of care index:

- Primary care continuity has been associated with better adherence, identification of health problems, rates of immunizations, and patient satisfaction as well as lower hospitalizations, emergency room use, and total cost of care (summarized in Reid, 2003).

- One of the oldest and most widely used measures for continuity of care is the COC index created by Bice (1977). The COC was a numerical response to Shortell's (1976) concept that "the number of different sources of care" is a key to continuity because "the fewer the number of sources of care a patient sees, the greater the likelihood that he or she will experience continuity of care" and therefore less duplication of unnecessary services, better follow-up and adherence. The COC is the most widely used metric for measuring the dispersion of care (Jee, 2005). a concept that rests within the domain of "relational" continuity of care (i.e., having a regular provider for most care). Higher COC scores have been favorably associated with desirable primary care processes and outcomes: decreased ambulatory care sensitive admissions (Tom, 2010; Cheng, 2010); well child visits, screenings, and immunizations (Flores, 2008; Christakis, 2000); reduced emergency department use (Brousseau, 2004; Christakis, 2001); costs of care (Chen, 2011); and better clinical outcomes of care (Christakis, 2001; Christakis, 2002). The COC has proven useful for evaluating health care finance reform (Glazier, 2009) and the COC is the basis for the only claims based measure for

care coordination endorsed by the Agency for Health Research and Quality in their Care Coordination Measures Atlas (McDonald, 2010) in a modified form as the Fragmentation of Care Index (FCI) (Liu, 2010) which is the COC for assessing care coordination in clinics (or FQHC's) as the unit of interest.

- 3M made some adjustments in the inputs for the COC to improve stability and better reflect the realities of care delivery. First, the 3M version of COC is only calculated on members with four or more visits. Requiring a minimum number of visits for the score is common in the literature as a means to improve stability in the score. Secondly, we treated visits in a group practice to another primary care provider in the group practice as if those visits were to the same provider. This is consistent with the idea that group practices afford common coverage, common medical records and ancillary staff and may represent common cultures of care. We treated potentially preventable visits to an emergency room that did not result in admission as if those were visits to a physician and a different physician for each visit. Finally we risk adjusted the measure to account for the known decrease in COC that accompanies panels with high numbers of chronic patients.

- Bice, TW, and Boxerman, SB (1977). A Quantitative Measure of Continuity of Care. Medical Care, 15(4), 347-349.
- Brousseau, DC, Meurer, JR, Isenberg, ML, Kuhn, EM, and Gorelick, MH (2004). Association Between Infant Continuity of Care and Pediatric Emergency Department Utilization, Pediatrics, 113(4), 738 -741.
- Chen, CC, and Chen, SH (2011). Better Continuity of Care Reduces Costs for Diabetic Patients. The American Journal of Managed Care, 17(6), 420-427.
- Cheng, SH, Chen, CC, and Hou, YF (2010). A Longitudinal Examination of Continuity of Care and Avoidable Hospitalization: Evidence From a Universal Coverage Health Care System. Archives of Internal Medicine, 170(18), 1671-1677. doi:10.1001/archinternmed.2010.340
- Christakis, DA, Mell, L, Wright, JA, Davis, R, and Connell, FA (2000). The Association Between Greater Continuity Of Care And Timely Measles-Mumps-Rubella Vaccination. American Journal of Public Health, 90(6), 962-965.
- Christakis, Dimitri A, Mell, L, Koepsell, TD, Zimmerman, FJ, and Connell, FA (2001). Association of Lower Continuity of Care with Greater Risk of Emergency Department Use and Hospitalization in Children. Pediatrics, 107(3), 524 -529. doi:10.1542/peds.107.3.524.
- Christakis, Dimitri A, Feudtner, C, Pihoker, C, and Connell, FA (2001). Continuity and Quality of Care for Children With Diabetes Who Are Covered by Medicaid. Ambulatory Pediatrics, 1(2), 99-103. doi:10.1367/1539-4409(2001)001<0099:CAQOCF>2.0.CO.

- Christakis, Dimitri A, Wright, JA, Zimmerman, FJ, Bassett, AL, and Connell, FA. (2002). Continuity of Care Is Associated With Well-Coordinated Care. Ambulatory Pediatrics, 3(2), 82-86. doi:10.1367/15394409(2003)003<0082:COCIAW>2.0.CO;2.
- Flores, AI, Bilker, WB, and Alessandrini, EA (2008). Effects of Continuity of Care in Infancy on Receipt of Lead, Anemia, and Tuberculosis Screening. Pediatrics, 121(3), e399 -e406. doi:10.1542/peds.2007-1497.
- Glazier, RH, Klein-Geltink, J, Kopp, A, and Sibley, LM, (2009). Capitation and Enhanced Fee-For-Service Models for Primary Care Reform: A Population-Based Evaluation. Canadian Medical Association Journal, 180(11), E72 -E81. doi:10.1503/cmaj.081316.
- Jee, SH and Cabana, MD (2006). Indices for Continuity of Care: A Systematic Review of the Literature. Medical Care Research and Review, 63(2), 158 -188. doi:10.1177/1077558705285294.
- Liu CW, Einstadter D, Cebul RD (2010). Care Fragmentation and Emergency Department Use Among Complex Patients with Diabetes. American Journal of Managed Care;16(6):413-20.
- McDonald KM, Schultz E, Albin L, Pineda N, Lonhart J, Sundaram V, Smith-Spangler C, Brustrom J, and Malcolm E (2010). Care Coordination Atlas Version 3 (Prepared by Stanford University under subcontract to Battelle on Contract No. 290-04-0020), AHRQ Publication No. 11-0023-EF, Rockville, MD: Agency for Healthcare Research and Quality. November 2010.
- Shortell, SM (1976). Continuity of Medical Care: Conceptualization and Measurement. Medical Care, 14(5), 377-391.
- Tom, JO, Tseng, CW, Davis, J, Solomon, C, Zhou, C, and Mangione-Smith, R (2010). Missed WellChild Care Visits, Low Continuity of Care, and Risk of Ambulatory Care-Sensitive Hospitalizations in Young Children. Archives of Pediatrics and Adolescent Medicine, 164(11), 1052-1058. doi:10.1001/ archpediatrics.2010.201.

Efficiency Domain

The Efficiency Domain represents judicious stewardship of two key health care resources, pharmaceuticals and ancillary services. One measure captures the risk-adjusted use of generic prescriptions and the other measure represents the cost of services that are potentially preventable. The metrics for both measures are percent difference between actual and expected.

Generic Prescribing (Risk adjusted)	The numerator for generic prescribing rate is the number of generic prescriptions. The denominator is the total panel members' prescriptions. This is compared to the expected rate based upon the health status of the panel.

Supporting documentation for risk-adjusted generic prescribing measure:

- This metric draws on the common practice as described by AHRQ, http://www.ahrq.gov/research/ findings/final-reports/efficiency/hcemch2.html), of health plans who seek "To minimize the amount spent on prescription drugs… (by) … measuring generic prescribing rates at the health plan or physician level… The bases of the measure are the dual assumptions that (1) the output is identical regardless of whether generic or brand name drugs are prescribed; (2) generics are always less expensive, implying that a higher ratio of generic to brand name drugs is preferable; and (3) availability of generic substitutes is consistent across conditions." 3M does not accept the last assumption and instead, calculates the risk adjusted expected rate of generics for a physician's panel and compares that to the observed rate.

- Robinson, J. C., Williams, T., & Yanagihara, D. (2009). Measurement of and Reward for Efficiency in California's Pay-For-Performance Program. Health Affairs, 28(5), 1438–1447. doi:10.1377/ hlthaff.28.5.1438

  An example of a program that began without this metric and quickly came to realize the importance of including this metric as part of a value based purchasing program.

- Haas, J. S., Phillips, K. A., Gerstenberger, E. P., & Seger, A. C. (2005). Potential Savings from Substituting Generic Drugs for Brand-Name Drugs: Medical Expenditure Panel Survey, 1997-2000. Annals of Internal Medicine, 142(11), 891–897.

  "If a generic had been substituted for all corresponding brand name outpatient drugs in 2000, the median annual savings in drug expenditures per person would have been 45.89 dollars (interquartile range, 10.35 dollars to 158.06) for adults younger than 65 years of age and 78.05 dollars (interquartile range, 19.94 dollars to 241.72 dollars) for adults at least 65 years of age. In these age groups, the national savings would have been 5.9 billion dollars (95% CI, 5.5 billion dollars to 6.2 billion dollars) and 2.9

billion dollars (CI, 2.6 billion dollars to 3.1 billion dollars), respectively, representing approximately 11% of drug expenditures."

- Congressional Budget Office (2010) Effects of Using Generic Drugs on Medicare's Prescription Drug Spending, http://www.cbo.gov/publication/21800

  "Using the Part D data, CBO estimates that dispensing generic drugs rather than their brand-name counterparts reduced total prescription drug costs in 2007 by about $33 billion. The estimates of actual savings from generic substitution in 2007 and potential savings that could have been realized from greater generic and therapeutic substitution during that year illustrate that using generic drugs in the future can reduce spending under Part D. However, the potential for such savings will vary from year to year depending on many factors, including the extent to which generic drugs and new brand-name drugs enter the market. Over the next several years, entities that pay for prescription drugs will benefit from a wave of brand-name drugs in high-priced therapeutic classes losing patent protection or other periods of exclusivity, which will allow generic drugs to enter those markets for the first time. Also, relatively few new brand-name drug products are expected to reach the market in the near term. If the current rate of generic substitution is maintained, first-time generic entry occurring through 2012 will generate about $14 billion in additional savings from generic substitution, in addition to the $33 billion in savings calculated above (where both figures apply to 2007 spending patterns)."

- Government Accounting Office, (2012). Research on Savings from Generic Drug Use, http://www. gao.gov/products/GAO-12-371R.

  A thorough review of articles estimating savings from generic drug use. Generally positive. "Our review identified articles that used varying approaches to estimate the savings associated with generic drug use in the United States. One group of studies estimated the savings in reduced drug costs that have accrued from the use of generics. For example, a series of studies estimated the total savings that have accrued to the U.S. health care system from substituting generic drugs for their brand-name counterparts, and found that from 1999 through 2010 doing so saved more than $1 trillion. A second group of studies estimated the potential to save more on drugs through greater use of generics. For example, one study assessed the potential for additional savings within the Medicare Part D program—which provides outpatient prescription drug coverage for Medicare—and found that if generic drugs had always been substituted for the brand-name drugs studied, about $900 million would have been saved in 2007. A third group of studies estimated the effect on health care costs of using generic versions of certain types of drugs where questions had generally been raised about whether substituting generic drugs for brand-name drugs was medically appropriate. Unlike the other two groups which focused on savings on drugs only, these studies compared savings from the lower cost of generic drugs to other health care costs that could accrue from their use, such as increased hospitalizations. The

studies had mixed results regarding the effect of using these generics in that some found they raised health care costs, while others found they led to cost savings."

- Soumerai, S. B., McLaughlin, T. J., & Avorn, J. (1989). Improving Drug Prescribing in Primary Care: A Critical Analysis of the Experimental Literature. The Milbank Quarterly, 67(2), 268–317.

  An early review of techniques and outcomes for improving drug prescribing in primary care, including generic prescribing rates.

3M™ Potentially Preventable Services (Risk adjusted)	Based on the total allowed of all qualifying potentially preventable services (PPS), compared with the risk-adjusted expected allowed amount of PPSs for the attributed population.

Supporting documentation for risk-adjusted potentially preventable services measure:

- This metric is similar in concept to some of the ideas expressed in the Choosing Wisely campaign. "An initiative of the ABIM Foundation, Choosing Wisely is focused on encouraging physicians, patients and other health care stakeholders to think and talk about medical tests and procedures that may be unnecessary, and in some instances can cause harm. To spark these conversations, leading specialty societies have created lists of "Things Physicians and Patients Should Question" — evidence-based recommendations that should be discussed to help make wise decisions about the most appropriate care based on a patients' individual situation." http://www.choosingwisely.org/
- 3M VIS implementation uses the 3M list of Potentially Preventable Services.
- Goldfield, N., Kelly, W. P., & Patel, K. (2012). Potentially Preventable Events: An Actionable Set of Measures For Linking Quality Improvement And Cost Savings. Quality Management in Healthcare, 21(4), 213-219.
- http://solutions.3m.com/wps/portal/3M/en_US/Health-Information-Systems/HIS/Products-and-Services/Products-List-A-Z/PPR-and-PPC-Grouping-Software/

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