



3MSM Health Care Academy

3M™ Population-focused Preventables (PFP) Classification Methodology

Methodology overview

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3M™ Population-focused Preventables: A set of classification systems for identifying potentially preventable health care events

This manual describes the 3M™ Population Focused Preventables (PFP) classification system—a core set of population-based quality of care outcome measures for identifying potentially preventable healthcare events, based on computerized discharge abstract data. Higher than expected rates of these events may indicate opportunities to improve outcomes and increase overall healthcare efficiency. A provider’s performance on these measures provides a picture of the effectiveness of the care being provided and healthcare outcomes. The PFP classification system includes clinical categories that classify patients based on their chronic illness burden for risk adjusting the rates of these events.

PFP v2.1 uses the following subcomponents as part of its logic:

Subcomponent	Version
3M™ All Patient Refined Diagnosis Related Groups (APR DRG) Classification Methodology	34.0
3M™ Enhanced Ambulatory Patient Groups (EAPG) Classification Methodology	3.12
3M™ Clinical Risk Groups (CRG) Classification Methodology	2.1

Introduction

Process and outcomes quality measures exist for profiling performance, identifying potential quality problems such as overutilization, as well as payment adjustment. There are two types of outcomes measures: those that can be precisely translated into dollars saved or lost and those that cannot. The overall suite of five 3M Potentially Preventable Events (PPEs) identifies the vast majority of services that are potentially preventable. The PFP classification system specifies three of these PPEs.

PFP logic focuses on three outcomes of public interest that are often overused and therefore potentially preventable: inpatient admissions, emergency department visits, and outpatient services.

Background

The response to rising healthcare costs will inevitably result in reduced payments to providers. The simplest and most politically expedient means of reducing payments is to impose across the board cuts. This approach spreads the financial pain proportionally across providers either through actual reductions in payment rates or by artificially constraining the annual inflation update factor. As a result, efficient, high quality providers suffer the same financial penalty as inefficient, low quality providers. Such an unfocused approach is fundamentally unfair and ultimately inefficient.

Existing payment systems are being reconfigured to get increased value from our healthcare expenditures by simultaneously increasing efficiency and improving quality. For most quality measures, whether directed to profiling performance, identifying potential quality problems, or payment adjustment, there is no direct link between the quality measure and its associated cost or payment, especially for quality measures based on adherence to processes of care. The use of process-based quality measures requires artificial and complex rules for associating the lack of adherence to the process measure with a payment adjustment. In order to create effective and meaningful links between quality and payment, quality measures to be used for payment adjustment should have a direct and unambiguous link between the cost or payment associated with the quality measure and the care delivered. These types of quality measures form a subset of what are called outcome measures.

The healthcare marketplace is in fact undergoing a transformation from fee-for-service payment to payment that is linked to outcome measures. In addition, the unit of payment is expanding across the continuum of care through the increasing practice of bundling payments for all aspects of an episode of care. The use of quality outcome measures can expand upon currently available process measures, and can speed the transformation to an efficient and effective outcomes based care healthcare delivery system.

PFPs build on the foundation of patient classification systems, like Diagnosis Related Groups (DRGs) and 3M™ Enhanced Ambulatory Patient Grouping (EAPG) System, developed by researchers formerly at Yale and now at 3M Health Information Systems Inc. These patient classification systems encompass groups of clinically similar patients, creating a comprehensive (all clinical areas are covered) set of categories with a uniform and consistent structure that link the clinical and financial aspects of care, providing hospital administrators and physicians with a meaningful basis for evaluating both the processes of care and the associated financial impact. The categorical nature of these patient classification systems was critical to the creation of a powerful, transparent, and clinically precise set of communications and management tools.

PFPs are more comprehensive in large part because of advances in our understanding of the role coordinated care can play in avoiding admissions together with the understanding that the preventability of these events should be adjusted for the overall burden of illness of the individual patient. Further, a focus on identifying excess PFPs by comparing risk adjusted rates of PFPs across providers will allow healthcare entities to be identified and tracked, both before and after they assume responsibility for implementing a broader range of coordination and preventive services.

Definitions

This section contains the terms and definitions that are used for identifying Population Focused Preventable events.

Population-focused Preventables

A core set of population-based quality of care outcome measures for identifying potentially preventable healthcare events.

- Potentially Preventable Inpatient Admissions (PPA)
- Potentially Preventable Emergency Department Visits (PPV)
- Potentially Preventable Services (PPS)

All three of these potentially preventable events are designed to be used to evaluate healthcare organizations that have accepted responsibility for the overall care of a defined group of individuals. The designation of defined groups of potential patients allows the calculation and comparison of rates of preventable events across organizations.

Potentially Preventable Admissions (PPA)

PPAs are hospital admissions that could potentially have been dealt with in the outpatient setting. These hospital admissions may result from hospital and or ambulatory care inefficiency, lack of adequate access to outpatient care, or inadequate coordination of ambulatory care services. In many cases PPAs are for flare-ups of chronic conditions (e.g., asthma) which adequate monitoring and follow-up, such as proper medication management, could have avoided. As such, the occurrence of high rates of PPAs within a region or a healthcare system may represent a failure of the ambulatory care system.

Potentially Preventable Emergency Department Visits (PPV)

PPVs are emergency department visits for conditions that could otherwise be treated by a care provider in a non-emergency setting. PPVs may also result from a lack of adequate care or ambulatory care coordination, such as access to an urgent care facilities, availability of primary care physicians, etc. Like PPAs, PPVs include visits that adequate patient monitoring and treatment (e.g., medication management) should be able to reduce or eliminate. High rates of PPVs may therefore represent a failure of the ambulatory care provided to the patient. In addition, when a PPV occurs shortly following a hospitalization it may be the result of actions taken or omitted during the hospital stay, such as inadequate care of the underlying problem and/or poor coordination with the outpatient physician.

Potentially Preventable Services (PPS)

PPSs are high cost ancillary services that may not provide useful information for diagnosis or treatment, and therefore have no effect on clinical management. They include diagnostic tests, laboratory tests, therapy services, radiology services and pharmaceuticals that may be redundant or are not reasonably necessary for providing care or treatment. An example would be an MRI scan of the lower back when neither the surgeon nor the patient believe that surgery would be a reasonable option.

Ambulatory care sensitive conditions

PPAs and PPVs include additional criteria for chronic medical conditions among individuals who are members of an Integrated Delivery System or are residents of a residential nursing facility, for which hospital admissions could be prevented by readily available, good quality outpatient care. Examples include hospital admissions for headaches, asthma, uncontrolled diabetes, and deterioration of congestive heart failure.

PFP assignment start date

The PFP assignment start date is usually the date that the patient experienced the admission, ED visit, or service.

PFP window

The PFP window consists of a two time periods defined by the PFP assignment start date. Claims data with a visit or discharge date later than or equal to the PFP assignment start date will be used for PFP assignment. Claims data with a visit or discharge date prior to the PFP assignment start date will be used for risk adjustment and to determine the patient's chronic disease burden.

Candidate events

Candidate events are types of emergency visits, services, and inpatient admissions that could potentially have been avoided.

PPA candidates

PPA candidates are inpatient admissions that indicate the admission could potentially have been avoided.

Established Integrated Health Delivery Systems (IDS)

An Integrated Delivery System (IDS) is a network of healthcare providers and organizations which provides or arranges to provide a coordinated continuum of services to a defined population and has existed for several years at a minimum. Their goal is to increase quality, reduce waste, and contain costs.

PPV candidates

PPV candidates are emergency room visits that may have occurred due to a lack of adequate access to care or ambulatory care coordination had been provided.

PPS candidates

PPS candidates are services that may have been unnecessary because they are unlikely to affect patient management, either by establishing a diagnosis or determining treatment.

3M All Patient Refined Diagnosis Related Groups (APR DRGs)

The 3M™ APR DRG Classification System classifies patients according to their reason for admission, severity of illness and risk of mortality. APR DRGs use claims data to assign patients to a 'base APR DRG' that is determined either by the principal diagnosis, or, for surgical patients, the most important surgical procedure performed in an operating room. Each base APR DRG is then divided into four severity of illness (SOI) levels, determined primarily by secondary diagnoses that reflect both comorbid conditions and the severity of the underlying illness. The APR DRGs compute both an admission severity of illness and a discharge severity. The present on admission indicator for each secondary diagnosis is a required data field for computing the severity of illness at the time of admission.

3M Enhanced APGs (EAPGs)

The 3M™ Enhanced Ambulatory Patient Grouping (EAPG) System forms clinically meaningful sets of patient groups across all outpatient settings and are designed to explain the amount and type of resources used in an ambulatory visit. These resources include pharmaceuticals, supplies, ancillary tests, equipment, type of room, treatment time, etc. Patients in each EAPG have similar clinical characteristics, resource use, and costs.

3M Clinical Risk Groups (CRGs)

CRGs are a categorical clinical model that assigns each enrollee in a health insurance plan, managed care group, or other group of patients to a single mutually exclusive risk group based on their chronic illness burden. These groups relate the historical clinical and demographic characteristics of the enrollee to the amount and type of healthcare resources that enrollee could be expected consume in the future.

Residential nursing care facilities

One of the following designated places of service: Skilled Nursing Facility (SNF), nursing home, Intermediate Care Facility/Individuals with Intellectual Disabilities, residential substance abuse treatment facility, psychiatric residential treatment center, comprehensive inpatient rehabilitation facility.

Patient health status

Healthy/Non-Users. Healthy status individuals have no Primary Chronic Diseases (PCDs) and no significant acute Episode Diagnostic Categories (EDCs) or Episode Procedure Categories (EPCs) in the most recent six months of the analysis period. They may have minor acute EDCs present (e.g., upper respiratory infection) but otherwise have no reported problems. Status 1 CRGs may include individuals with chronic diseases who did not access the medical care system during the time period used to assign the CRGs. There are two CRGs for healthy individuals. One is for individuals with encounters with the healthcare system and the other includes individuals who have no healthcare system encounters. No severity levels are assigned for healthy patients.

History of Significant Acute Disease. These individuals have no PCDs, they had at least one significant acute EDC or significant EPC in the most recent six months of the analysis period. In some cases, the significant acute EDC (e.g., Above the Knee Amputation) creates a chronic EDC (e.g., amputation and chronic musculoskeletal disease), and the individual would therefore also be assigned to a PCD and would not be included in this status.

Single Minor Chronic Disease. This status is identified by the presence of a single Minor Chronic primary chronic disease, such as hyperlipidemia.

Minor Chronic Disease in Multiple Organ Systems. This status is identified by the presence of two or more Minor Chronic primary chronic diseases.

Single Dominant or Moderate Chronic Disease. A single dominant or moderate chronic disease is identified by the presence of a chronic condition that would be expected to require substantial amounts of medical care and resources.

Significant Chronic Disease in Multiple Organ Systems. Significant chronic diseases in multiple organ systems are identified by the presence of two or more primary chronic diseases of which at least one is a Dominant or Moderate Chronic primary chronic disease.

Dominant Chronic Disease in Three or More Organ Systems. Dominant chronic disease in three or more organ systems consists of explicit combinations of three dominant PCDs (e.g., congestive heart failure, diabetes, and chronic obstructive pulmonary disease) as well as broader combinations that include categories consisting of dominant chronic PCDs that are not explicitly identified. Some moderate chronic PCDs are included in these combinations and are explicitly identified. For example, two PCDs from the cardiovascular MDC meet the criteria for a combined group called Advanced Coronary Artery Disease (CAD):

- History of Myocardial Infarction (MI)
- Angina and Ischemic Heart Disease (a moderate chronic PCD)

Malignancy, Under Active Treatment.

- The only malignancy EDC, or
- The only malignancy EDC in the most recent year of the analysis period, or
- The only primary malignancy EDC, or
- The highest ranked malignancy EDC that shows evidence of aggressive treatment, or
- The highest ranked malignancy EDC with hospitalization in the most recent year of the analysis period, or
- The highest ranked malignancy EDC with two or more encounters at least 90 days apart in the most recent year of the analysis period, or
- The highest ranked malignancy EDC, if no other conditions apply

Catastrophic Conditions. Catastrophic Conditions are associated with long term dependence on medical technology, or life-defining chronic diseases or conditions that dominate the medical care required. All conditions considered catastrophic are ordered hierarchically (e.g., renal dialysis is higher in the catastrophic hierarchy than history of heart transplant).

Overview of PFP logic

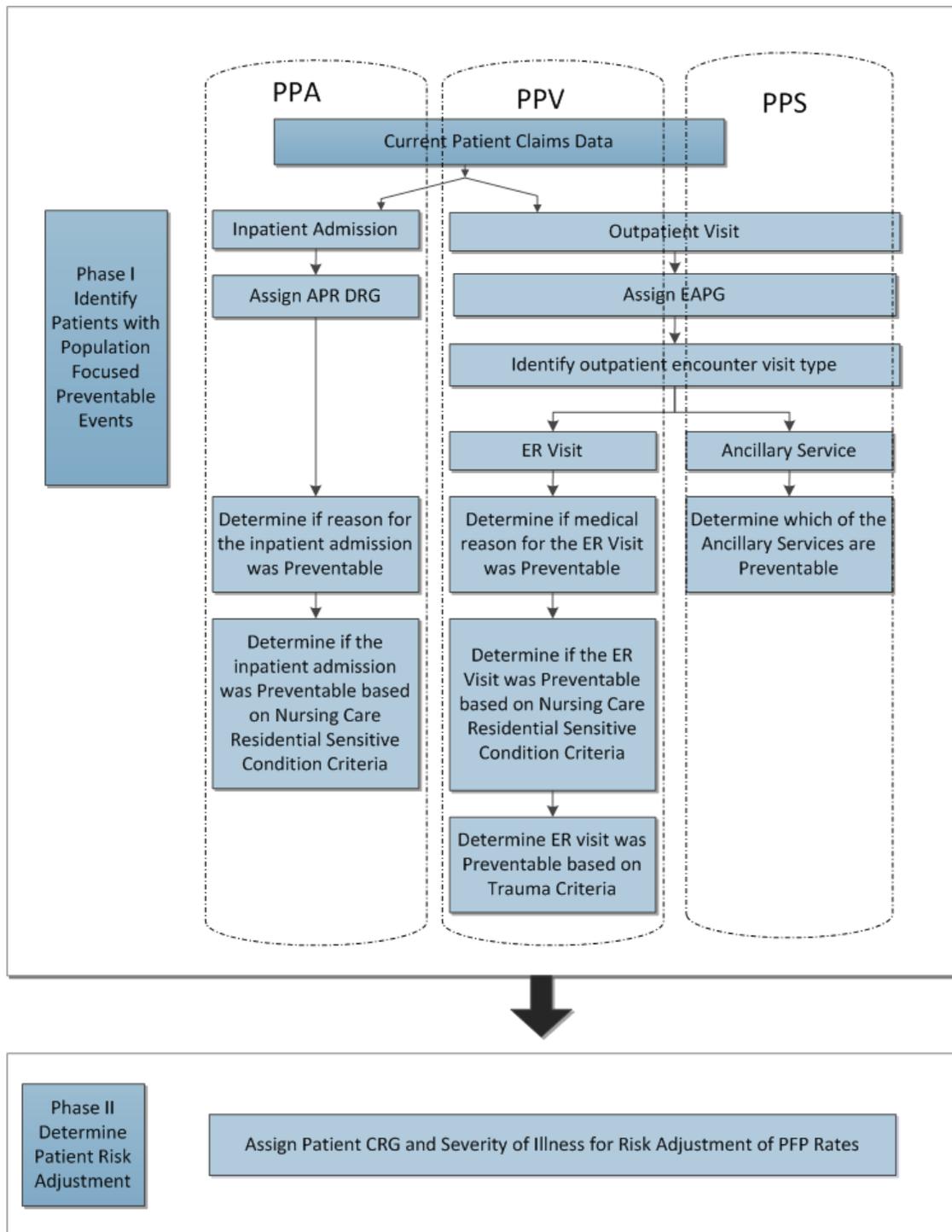
This section provides an overview of the PFP logic. The logic is divided into two phases:

1. Identify patients with population focused preventable events
2. Determine patient risk adjustment

The identification of a potentially preventable event (admission, emergency department visit, or service) does not necessarily imply problems with quality of care. It is only if the patient care entity under evaluation – the managed care plan, Accountable Care Organization, Medical Home, or group practice – is found to have a risk adjusted rate of preventable events that is statistically higher than its peer organizations that the possibility of inadequate quality would be raised. It is important to remember that any assessments created by PFPs are based on comparisons of organizations with similar operating characteristics and patient populations, not

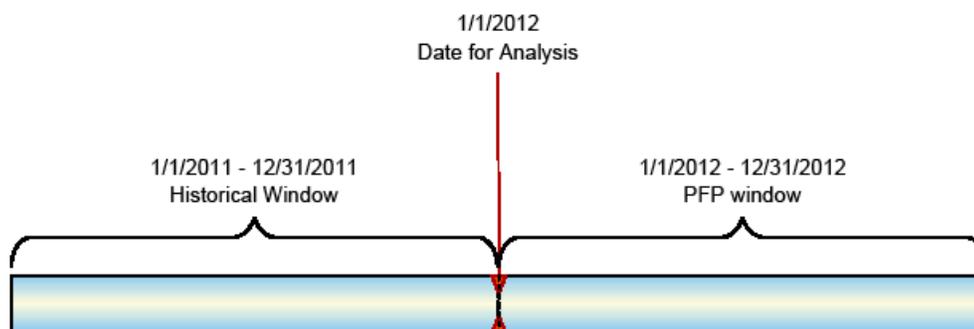
on the presence or absence of a certain number of potentially preventable events. The PFPs are based on potential preventability, not absolute preventability.

The following figure is a graphical representation of the PFP logic.



Phase I - Identify patients with candidate population-focused preventable events

Phase I of the PFP logic consists of identifying patients that had candidate events by applying the PFP assignment criteria. The assignment criteria for PFPs are based on two widely used classification methods: 3M™ APR DRG Classification System and 3M™ Enhanced Ambulatory Patient Grouping (EAPG) System. Healthcare encounters can be determined to be candidate events for PFPs based on their APR DRG and EAPG assignments. Claims data with a visit or discharge date equal to or subsequent to the PFP assignment start date will be used in Phase I for PFP assignment.



PPA Assignment Criteria

This section gives a brief overview of the overuse of hospital care and describes Potentially Preventable Admissions (PPAs), a method developed by 3M Health Information Systems to describe the amount of variability in hospital admissions and to estimate the potential magnitude of avoidable hospitalizations.

Assign APR DRG

Each inpatient admission is assigned to an All Patient Refined Diagnosis Related Group (APR DRG). APR DRGs classify patients according to their reason for admission and severity of illness.¹ APR DRGs assign patients to a 'base APR DRG' that is determined either by the principal diagnosis, or, for surgical patients, the most important surgical procedure performed in an operating room. The base APR DRG represents the underlying reason for the hospital admission and is used in the PPA logic to identify patients that had candidate PPA events. Refer to the APR DRG section of this manual for a detailed description of APR DRG methodology.

Determine if reason for the inpatient admission is an ambulatory care sensitive condition

Hospital admissions make the largest contribution to rising healthcare costs. To the extent that hospital care can be shortened, shifted to the outpatient setting, or eliminated altogether, the cost of healthcare can be reduced.

We define PPAs as hospital admissions for problems that could potentially have been dealt with in the outpatient setting, having resulted from inefficiency, lack of adequate access to outpatient care, or inadequate coordination of ambulatory care services. In many cases PPAs are for flare-ups of chronic conditions (e.g., asthma) for which adequate monitoring and follow-up, such as proper medication management, could have avoided. As such, the occurrence of high rates of PPAs within a region or a healthcare system may represent a failure of the ambulatory care system.

Inadequate care leading to preventable hospitalizations can occur among individuals living at home and not participating in an integrated delivery system, or among those cared for in a longer term primary care relationship, such as a capitation-based program, accountable care organization, or medical home. Integrated delivery systems should be better able to provide adequate access and coordination over a period of several years and therefore could be expected to have an impact on the rate of hospitalizations for long-term complications, such as chronic renal failure, vision loss, and vascular disease in diabetic patients. In the absence of such long-term arrangements, only acute complications (e.g. asthma) or potentially preventable interventions (such as back procedures for disc rupture) that would not have required years of good quality care might be expected to be preventable.

Studies have documented not only that preventable hospitalizations exist, but also that they can be reduced by specific interventions. Ouslander et al showed that guidelines implemented in nursing homes decreased the rate of hospital admissions.² Lin et al documented that Patients with COPD with higher continuity of care had a significantly lower likelihood of avoidable hospitalization.³

The PPA list of 3M™ All Patient Refined Diagnosis Related Group (APR DRG) considered as ambulatory sensitive conditions is more comprehensive than the Agency for Healthcare Research and Quality (AHRQ) list of Prevention Quality Indicators (PQIs). PPAs focus on the potentially preventable aspect and are a fairer representation because they exclude those admissions that are not preventable without years of coordinated and integrated care. For example, surgery for vascular complications of diabetes (e.g., amputations) are not included because they are not preventable unless appropriate care is given for several years before the admission. These surgeries, in particular, consume significant dollars but neither newly initiated managed care nor can hospitals under any circumstances be held responsible for these procedures. The rate of PPAs are adjusted for the complexity of the patient population whereas the AHRQ Prevention Quality Indicators (PQIs)⁴ include all patients admitted with diabetes irrespective of the severity of the patient. It is clear that a diabetic who is diet controlled has a different probability of hospital admission as compared to a diabetic patient who is on dialysis.

There are two aspects of the increased comprehensiveness of the PPAs: a larger number of diagnoses that are similar to each other (the PPAs consist of similar diagnoses within a specific

APR DRG) and a longer list of conditions (e.g., spinal surgery, which is frequently avoidable with medical treatment). In addition, PPAs are more comprehensive than the PQIs in large part because of advances in our understanding of the role coordinated care can play in avoiding admissions together with an appreciation of the fact that the preventability of these admissions should be adjusted for the overall burden of illness of the individual patient. Further, as described below, a focus on identifying excess PPAs by comparing risk adjusted rates of PPAs across providers allows a wider range of conditions to be identified as a PPA. PPA-based initiatives are readily suited for scaling should healthcare entities, such as Accountable Care Organizations (ACOs), with the full responsibility for coordination and preventive services become more commonplace.

Further, 3M PPAs evaluate at the diagnosis codes within an APR DRG as preventable or not preventable. For example, cardiac catheterization is considered potentially preventable for patients with a diagnosis of coronary atherosclerosis, but not preventable for patients with an acute myocardial infarction or unstable angina.

In summary, the following PQIs have limited utilization in the PPA algorithm:

- **Long term diabetes complications.** While in the long term these conditions could be included in the PPA list, they should not be included in the initial efforts as decrease in these admissions pertain to care that has occurred for years (not just one) before this admission. These are considered to be potentially preventable in settings of integrated or accountable care.
- **Lower extremity amputation among patients with diabetes.** Same as previous indicator. These are considered to be potentially preventable in settings of integrated or accountable care.
- **Perforated appendix.** While perforated (vs. non perforated) appendix does represent an issue pertaining to access to appropriate outpatient services, there are few dollars that can be saved here as these individuals would have had, in any event, an appendectomy.
- **Low birth weight infants.** The empirical data is not as well developed for this indicator.⁵ This indicator could be added over time and is especially relevant for outcomes management for Medicaid Managed Care organizations, medical homes/accountable care organizations that provide prenatal care.

The following PPAs are not included in the Prevention Quality Indicators (PQI) list. A summary of the literature providing support for the inclusion of each PPA is appended.

- **Seizures.** Recent studies have shown that non-adherence to medication, which could be corrected for many individuals with closer follow-up and better education, appears to be associated with serious outcomes, increased utilization and costs of inpatient and Emergency Department (ED) services.⁶
- **Migraines.** This is an infrequent cause for hospitalization and can be often avoided with appropriate prophylactic and timely therapeutic interventions.
- **Cardiac catheterization.** Many researchers have documented that, “cardiac catheterization is substantially underused among higher-risk patients with acute myocardial infarction (AMI)

with appropriate indications but overused among patients with inappropriate indications.”⁷ In addition, most of the time when appropriate, these procedures can be done on an outpatient basis.

- **Chest pain and abdominal pain.** For both chest and abdominal pain there is considerable variation in practice patterns with respect to the necessity of hospitalizations. Many consensus documents have been published for the most appropriate evaluation approach for both of these conditions; particularly chest pain.⁸
- **Back procedures for discogenic pain.** There is considerable variation in practice patterns for this procedure. It is clear that many of these procedures could be avoided altogether. There is little evidence that treatment interventions work for most individuals with this very common illness.⁹
- **Sickle cell anemia crisis.** Recent literature reports on variation in readmissions and the impact of interventions. These interventions include establishment of a dedicated outpatient clinic for adults (Lanzkron et al) and educational interventions (Shahine et al). While the most recent article by Lanzkron from May 2015 was done with adult patients who had sickle cell, an article by Raphael et al from 2013 documented the positive impact of a day hospital on a pediatric sickle cell population.¹⁰
- **Mental Health and Substance Abuse (MH/SA) disorders.** There is ample evidence indicating that adequate outpatient services decrease hospital use.¹¹ We are not including MH/SA admissions for initial inclusion in the PPA list as very often these patients are only admitted once. We are including these APR DRGs for another potentially preventable event, Potentially Preventable Readmissions (PPRs). However MH/SA admissions are included in settings of integrated or accountable care.
- **Coronary angioplasty, Coronary Artery Bypass Grafts (CABG), other types of angioplasties and grafts.** For more than a quarter century, there has been extensive documentation of the variation in practice patterns in these procedures. Among many others, Saleh, Hannan and Ting documented this variation in 2005¹². Most recently, research on this variation has focused on socioeconomic disparities and the importance of risk adjustment. In addition, a recent article published in 2014 documented the impact that providing data can have on the performance on angioplasties. The same article noted that there are ongoing significant opportunities for improvement.¹³

Determine if patient was admitted from a residential nursing care facility

Additional assignment criteria specific to patients admitted directly from a residential nursing care facility for identifying patients with candidate PPA events. Fever, chest pain, heart disease (mainly heart failure), mental status changes, gastrointestinal bleeding, urinary tract infections, metabolic disturbances, pneumonia, diseases of the skin, and injuries due to falls have been identified as reasons for potentially preventable events. Researchers argue that some of these conditions, such as urinary tract infections, could be more appropriately treated in the nursing home. Other conditions, such as those related to falls or pneumonia may have been avoided by preventing the adverse health event itself. Decreasing potentially preventable events may

reduce healthcare costs, lessen trauma or complications resulting from medical treatment for nursing home residents, and improve quality of care. Refer to the APR DRG section of this manual for a list of residential nursing care facility sensitive conditions. Patients admitted directly from a residential nursing care facility and assigned to an APR DRG that is on the list of APR DRG residential nursing care facility sensitive conditions are identified as PPA candidates.

Residential nursing care facilities are designated as one of the following places of service: SNF, nursing home, Intermediate Care Facility/Individuals with Intellectual Disabilities, residential substance abuse treatment facility, psychiatric residential treatment center, comprehensive inpatient rehabilitation facility. Refer to the place of service section of this manual for detailed logic for residential nursing care facility identification.

Determine if the patient was part of an Integrated Delivery System (IDS)

PPAs now include additional criteria for patients that belong to an Integrated Delivery System. Reducing potentially preventable admissions to hospitals using Integrated Delivery Systems using a bundled approach is another opportunity for better care coordination and lower spending. It is designed to encourage accountability for cost and quality across a spectrum of care. With bundled payments, fewer potentially preventable admissions will result due to improved transitions between healthcare settings. Providers will need to carefully consider the correct post acute care that their patients would benefit from without compromising patient care. This method eliminates incentive to provide more services that increase revenue and result in fragmented care.

A significantly greater number of hospitalizations are potentially preventable if the population is managed by a well-established Integrated Health Delivery System. Coronary artery bypass grafts (CABG) and other vascular interventions such as lower extremity revascularization and lower extremity amputations from peripheral vascular disease. These are considered potentially preventable for two reasons in established integrated delivery systems. First, with population healthcare management and, for example, better diabetes control, fewer vascular interventions are needed. Secondly, for many vascular interventions such as CABGs it is well documented that a percentage of these interventions are completely avoidable.¹⁴ Coronary artery bypass grafts and percutaneous cardiac interventions are therefore considered potentially preventable, although whether the patient care organization responsible is judged to be providing inadequate care will depend on how its rates compare with peer organizations. Similarly, mental health admissions are considered potentially preventable, with assessments of quality depending on the rates of those admissions.

Established vs. newly-formed Integrated Delivery System (IDS)

One cannot expect a newly-formed IDS to provide coordinated care when first established. For example, one should not expect coordinated care for the chronically mentally disabled in the early stages of a newly-formed IDS. In addition, certain complications of chronic illnesses, such as the vascular complications of diabetes, cannot be addressed without years of coordinated care. On the other hand, with expert coordinated care one should expect lower rates of

complications from many chronic illnesses. As a consequence, a newly-formed IDS should refer to the General Population PPA preventability status.

Potentially preventable admissions (PPA) output

Potentially Preventable Admissions (PPA) contain a number of outputs including risk status and reason. There are two risk (R) statuses for PPA: At Risk Potentially Preventable (RP) and At Risk Not Potentially Preventable (RN). Inpatient admissions identified as potentially preventable are assigned a single reason that best conveys the cause of the PPA assignment. Further detail on the rationale associated with each reason is provided at the end of this section.

Potentially Preventable (RP)

- 21 - Potentially Preventable

PPA Reasons

- 0 - Not Potentially Preventable
- 11 - Potential area of overuse
- 22 - Patient safety
- 33 - Primary care accessibility, coordination and management
- 44 - Substance abuse accessibility, coordination and management
- 55 - Mental health accessibility, coordination and management
- 66 - Not clinically related

For PPA, there are specific APR DRGs that require additional code level detail to determine the potential preventability of an admission. For these APR DRGs, the principal diagnosis is required to make a final determination. If the principal diagnosis for the claim is not considered potentially preventable, the claim will be returned with a status of RN. If the principal diagnosis is considered potentially preventable, the claim will be returned with a status of RP and the relevant reason assigned.

Additionally, for APR DRGs that require code level detail, a PPA may not be assigned in some cases due to diagnosis specific age criteria. If the principal diagnosis is potentially preventable but is associated with specific age criteria, the admission is not considered potentially preventable if the patient's age falls within that range. In this case, the claim will be returned with a status of RN.

Group assignment to one of the following APR DRGs is not compatible with PPA and will output an error return (RX):

- APR DRG 955 Principal diagnosis invalid as discharge diagnosis
- APR DRG 956 Ungroupable

While Potentially Preventable Admissions are assigned to categories, it should be emphasized that there is cross-over and that some PPAs can belong to more than one category. Some PPAs fit nicely into single category. For example, potentially preventable surgical procedures for back pain secondary to disc rupture clearly belong to the Potential Overuse category, while a hospital admission from a nursing home for trauma clearly belongs to the Patient Safety category. Other PPAs do not fit so clearly into a single category. For example pulmonary edema/respiratory failure is categorized as potentially preventable, but could also represent an opportunity for improvement in coordination. Several categories of preventable admissions are labeled as applying to Integrated Delivery Systems that could be expected to implement practices and procedures to optimize care for more complex illnesses. Severe mental health conditions, for example, can be difficult to manage by themselves, and can make care for other coexisting chronic illness much more difficult than usual, and can benefit from coordinated care delivered by integrated systems. (Ultimately, we would like to see all individuals become members of Integrated Delivery Systems that link behavioral and physical care together – not separately as is too often the case today.) Patients with chest pain can be difficult to deal with in a cost-effective manner, and their care can benefit from a greater degree of coordination and clear communication, so that many such patients can be appropriately treated in an outpatient setting.

- **Not Clinically Related.** Refers to a diagnosis that is not related to a procedure.
- **Outpatient Coordination Management.** Providing medical care for chronic illness is often complex, and failure to deal with complexity with a coordinated approach to care can result in a preventable admission. Patients require multiple resources, treatments, and providers that, in many healthcare settings, are not integrated into a coherent system of care. This fragmentation puts patients with serious or multiple chronic illnesses at risk of experiencing inadequate quality of care and makes their healthcare expenditures substantially higher than for those who have minor or no chronic conditions. Outpatient Coordination and Management refers to services such as case management that serve to streamline these complex services and in so doing improve outcomes and decrease potentially preventable admissions. For example, there is a great deal of literature documenting the positive impact of case management services on hospital admissions for heart failure.
- **Potential Overuse.** Potentially unnecessary healthcare (overutilization, overtreatment) is healthcare provided for conditions and in situations for which its effectiveness has not been proved, or for which evidence has shown a lack of effectiveness. Similarly, overtreatment refers to unnecessary medical interventions. These can include treatment of a self-limited condition, or extensive treatment for a condition that requires only limited treatment. Over diagnosis, when patients are given a diagnosis that will cause no symptoms or harm, can lead to overtreatment.
- **Primary Care Accessibility.** Primary care accessible services can be manifested by short waiting times for urgent needs, extended service hours, around-the-clock telephone or electronic access to a member of the care team, and alternative methods of communication such as email and telephone care. The medical home practice is responsive to patients' preferences regarding access. With accessible services, infections of the upper respiratory tract which can develop into pneumonia can be effectively treated in the outpatient setting.

- **Patient Safety.** Patient Safety refers to the reporting, analysis, and prevention of medical error that often leads to adverse healthcare events. Trauma that occurs in the nursing home clearly represents a patient safety issue.

Prevalence and potential cost savings related to preventable admissions

Treo Solutions, now part of 3M Health Information Systems, analyzed potentially preventable admissions in a commercial and Medicaid claims database using a significant portion of its 25-million covered-lives benchmark data set and identified 14% of inpatient admissions to be potentially preventable. 3M estimates that inpatient expenditures could be reduced by 4-6% by: (1) communicating actionable risk-adjusted comparative performance information to providers, and (2) by creating financial incentives focused on reducing the rates of excess potentially preventable admissions.¹⁵

Proper application of Potentially Preventable Admissions

For potentially preventable event measures to be effectively and fairly used in performance reporting and/or pay for performance programs, the measurement tools, scoring methodology, program design and program applications must meet a number of core requirements. The classification systems underlying the measurement tools must be clinically precise, comprehensive, have a uniform and consistent structure, and be transparently available to affected providers. The tools must generate information at multiple levels: individual provider, service line, major diagnostic category and at the hospital or health system level. Comparative provider performance must be risk adjusted to account for the severity of patient illness and patient chronic illness burden. Providers should not be evaluated on a case-by-case basis, but via a rate-based approach which motivates providers to achieve performance levels being achieved by their peers. The state agency must involve providers and other stakeholders in program design. Finally, patients and their families should be meaningfully engaged in care decisions.

PPV Assignment Criteria

Potentially unnecessary hospital emergency room visits are not unusual. In 2011, there were over 136 million visits to emergency departments (EDs) throughout the United States (CDC),¹⁶ many of which were for non-emergency conditions. Many of these non-emergency visits were by people who either lack access to primary care altogether or whose primary care providers provide inadequate access to care, especially after hours or on weekends. Emergency departments have increasingly served as primary care providers of last resort, and non-emergent care provided in emergency departments has come to be seen as an indicator of the inadequacy of primary care services in the U.S. Researchers have found that Emergency Department (ED) overcrowding by those with minor medical conditions such as sore throats and ear aches may also hinder an ED's ability to provide quality care. Many EDs, after all, are already overcrowded and struggling to handle an increase in patient visits. These visits originate from a home setting or nursing home/rehabilitation hospital setting.

Background on Emergency Department use and overuse

Increasing use of the Emergency Department (ED) as a source of first-contact care for non-emergent conditions has contributed to overcrowding, which in turn causes a number of complications, as pointed out by the American College of Emergency Physicians, the Institute of Medicine, and the Government Accounting Office.¹⁷ These complications include:

- Delays in the treatment of serious problems, including heart attacks
- Increased waiting times for people with minor illnesses
- Reduced promptness and quality of pain management
- Hallway boarding of admitted patients
- Ambulance diversions
- Decreased physician productivity

Evidence for ED utilization for non-emergent care comes from the National Hospital Ambulatory Medical Care Survey: 2011 Emergency Department Summary (U.S. Department of Health and Human Services)¹⁸ and includes the following:

- 28% of ED patients had no diagnostic or screening services performed.
- 49% of ED patients had no procedures performed (the most frequent procedure performed was infusion of intravenous fluids).
- 43% of patients were designated as either semi-urgent (able to wait an hour to be seen) or non-urgent at the time of arrival by the triage nurse.
- The great majority of patients (83%) were discharged to home: 11.9% were admitted to hospital, another 2.1% to an observation unit, and 2.1% were transferred to another hospital.

Analysts have pointed out that much of this inappropriate utilization could be eliminated if our primary care system functioned as it should. Many analysts have attempted to estimate the magnitude of this burden, with varying success.

Relevant information from the Emergency Department survey cited above includes:

- About 3.6 percent of ED visits were made by patients who had been seen in the same ED within the last 72 hours.
- About 2.1 percent of ED visits were made by patients who had been discharged from the hospital within the last 7 days.
- Though overall ED visits increased, the number of visits considered emergent or urgent (15.9 million) did not change significantly from 2005, nor did the number of patients arriving by ambulance (18.4 million).

With respect to nursing homes, older adults, particularly nursing home residents, comprise a large and growing percentage of those visiting the ED. Prior research has identified conditions

that may lead to potentially preventable visits to an ED among nursing home residents. Researchers argue that some of these conditions, such as urinary tract infections, could be more appropriately treated in the nursing home. Other conditions prompting ED visits, such as those related to falls or pneumonia, may have been avoided by preventing the adverse health event itself. Decreasing potentially preventable visits to EDs may reduce healthcare costs, lessen trauma or complications resulting from medical treatment for nursing home residents, and improve quality of care.

According to a recently published survey on ED visits and Medicaid, with respect to children, a handful of conditions account for more than half of all ED visits by both privately insured and Medicaid-covered children aged 0 to 12 years: acute respiratory and other common infections and injuries. Together, these conditions accounted for 53 percent of ED visits by children with Medicaid and almost 60 percent of all visits by privately insured children. Very few other condition groups account for a large enough share of visits that, if redirected to other care settings, could have a real impact on patient volume in emergency departments. This is strong evidence supporting the idea that settings other than emergency departments could manage a large share of visits by children, but these settings would require capacity to treat 1) urgent and common childhood infections; and 2) minor or uncomplicated injuries.”¹⁹

Classification systems addressing preventable emergency visits

There have been several methods developed to identify potentially preventable emergency visits with the goal of reducing their frequency. Of greatest relevance:

- New York University Emergency Department Visit (NYU ED) severity algorithm
- The Emergency Severity Index (ESI)
- The 3M Potentially Preventable Emergency Department Visits (PPV) methodology, based on the 3M™ Enhanced Ambulatory Patient Grouping (EAPG) classification system

The NYU ED classification description divides patients into four categories of need based on a three-step process: first on the severity of findings at the time of admission to the ED, then based on the types of services provided in the ED, and then finally the diagnosis assigned to the patient at the end of the visit. First a determination of “emergent” versus “non-emergent” need is made based on demographics, vital signs, primary symptoms and comorbid conditions. Then the emergent cases are separated into “emergent, primary care treatable” and “emergent, ED care needed” based on whether the patient received any services that would have only been available in an ED setting and unavailable in a primary care setting. A “preventability percentage” is assigned based on the initial research sample. Thus (and this is from their web site) “for abdominal pain, the algorithm assigns a specific percentage of the visit into the categories of ‘non-emergent,’ ‘emergent/primary care treatable,’ and ‘emergent/ED care needed-not preventable/avoidable’ based on what we observed in our sample for cases with an ultimate discharge diagnosis of abdominal pain.” Finally, the group of “emergent, ED care needed” patients are further separated into groups considered to be “preventable/avoidable” with adequate primary care services, or “not preventable/avoidable.” This last distinction is based on the whether an ambulatory care sensitive condition diagnosis code was assigned to the

patient at the time of discharge from the ED, and the probability of that diagnosis being preventable or avoidable derived from previous analyses.²⁰

A number of studies have evaluated the NYU ED classification system, some favorable and some not.²¹ A comprehensive study of the details of the system by the Washington State Hospital Association (WHSA) found several defects:²²

- The model has not been updated since 2001, so that the additions and changes in diagnostic coding and clinical practice have not been incorporated.
- The classification system includes the category of “unclassifiable” and in their study 42% of cases fell into this category.
- The model does not evaluate each visit claim as necessary or unnecessary, appropriate or not appropriate.

A recent article highlighted some of the many factors pertaining to avoidable ED visits, “Previous studies have found a lower rate of resource utilization for non-urgent patients; however, our analysis shows a high rate of interventions for even the lowest acuity visits. This suggests that healthcare services are needed even for the lowest acuity visit and calls into question the designation of a non-urgent ED visits as being unnecessary.” Categorizing an ED visit as unnecessary depends not only on patient acuity but also the appropriateness of the site of service and availability of alternate sources of acute, unscheduled care. The ED may in fact be an appropriate site of service for a non-urgent presentation or complaint if there are no other available sites to provide timely care to the patient.²³

This article highlights the need to look at avoidable ED visits as part of a coordinated care or integrated delivery system approach. That is, the challenge for the integrated delivery systems that are being implemented is to exactly address the challenge in the last sentence of this excerpt.

A second methodology examining appropriateness and severity of ED visits, The Emergency Severity Index (ESI), provides an example of a purely clinically-based approach to severity classification, and relies on signs of acuity such as hypotension, fever, tachycardia, and selected high-risk symptoms, and was designed to classify severity at the bedside for individual patients. It can be also used to stratify severity for performance evaluations for groups of ED patients, but requires either prospective data gathering or retrospective chart review. For research purposes, therefore, the ESI has much higher costs than a system based on routinely available computerized clinical data.²⁴

Assign EAPG

A patient’s individual outpatient services are assigned to EAPGs. EAPGs are a comprehensive method of determining a patient’s reason for an ambulatory visit and are used in the PPV logic to identify patients that had candidate PPV events. The standard EAPG logic partitions outpatient services into separate days and assigns the individual outpatient services to an EAPG. Each EAPG is assigned to one of five categories comprised of per-diem visits, significant procedure, ancillary service, incidental services and medical visit indicator. The medical visit

EAPG is used to identify candidate potentially preventable Emergency Department (ED) visits. PPV evaluation for the majority of EAPGs is based on the medical reason for why the patient was seen in the ED, not the specific services performed during the encounter. For instance, if a patient is seen in the ED for a headache and a CT scan is performed, the PPV logic will evaluate if the visit for the headache may have been prevented. Refer to the EAPG section of this manual for a detailed description of EAPG methodology. There is a small subset of significant procedure EAPGs that are potentially preventable. For example, bunion procedures, circumcisions, fitting of contact lenses, etc.

Outpatient encounters for per-diem visits and significant procedures determine the categorization for the reason for the visit and are not assigned a medical EAPG. Only those outpatient encounters with a medical visit indicator that do not also have a per-diem or significant procedure performed are classified with a medical visit EAPG. However, there are a select set of ancillary procedures that dominate the cost of the visit and are categorized as significant procedure EAPGs. For example, performing an MRI for mild low back pain may not be useful to establish a diagnosis. Outpatient encounters that are found on the list of significant procedure ancillary EAPGs are reassigned to a medical visit EAPG based on the reason for the ambulatory visit.

Determine if the outpatient visit occurred in a hospital emergency room

Treatment for outpatient services can occur in many healthcare settings. PPVs are only assigned to visits that occurred in a hospital's emergency department. Outpatient visits with charges for the following revenue codes or Evaluation and Management HCPCS/CPT codes (CPT codes, descriptions and materials only © 2018 American Medical Association. All Rights Reserved):

Revenue center codes

- 0450 Emergency department general
- 0451 EMTALA emergency medical screening
- 0452 ER beyond EMTALA screening
- 0456 Urgent Care
- 0459 Other emergency room
- 0981 Emergency room

E&M HCPCS/CPT codes

- 99281 Emergency Department visit (straight forward decision making)
- 99282 Emergency Department visit (low complexity)
- 99283 Emergency Department visit (expanded problem focus exam/moderate complexity)
- 99284 Emergency Department visit (detail exam/mod complexity)
- 99285 Emergency Department visit (high complexity) are identified as ED visits for a patient

- G0380 Lev 1 hosp type B ED visit
- G0381 Lev 2 hosp type B ED visit
- G0382 Lev 3 hosp type B ED visit
- G0383 Lev 4 hosp type B ED visit
- G0384 Lev 5 hosp type B ED visit
- G0390 Trauma Respons w/hosp Criti

Determine if reason for the visit is an ambulatory care sensitive condition

PPVs are emergency room visits that may result from a lack of adequate access to care or ambulatory care coordination. Similar to PPAs, PPVs are ambulatory sensitive conditions (e.g., asthma) which adequate patient monitoring and follow-up (e.g., medication management) should be able to reduce or eliminate. PPVs are inefficient and expensive either because the care could have been provided in a less expensive setting that was not available, or because inadequate care of a chronic or sub-acute problem in the outpatient setting resulted in an acute deterioration, or a combination of both. In addition, when a PPV occurs shortly following a hospitalization, the PPV may be the result of actions taken or omitted during the hospital stay, such as incomplete treatment or poor care of the underlying problem and/or poor coordination with the primary care or specialist physicians.

The PPV system utilizes the 3M™ Enhanced Ambulatory Patient Grouping (EAPG) System as its foundation, in order to identify those emergency department services that are potentially preventable. The 3M EAPGs are a classification system that categorizes all ambulatory patient services, regardless of setting, in the same way that diagnosis related groups (DRGs) comprehensively categorize inpatient hospital services. EAPGs have the following characteristics that are necessary for any ambulatory patient classification system:

- Comprehensiveness – all ambulatory services are included
- Administrative simplicity – uses claims data, and chart review is not needed
- Homogeneous resource use within each patient class
- Clinical meaningfulness
- Minimal Upcoding and Code Fragmentation – minimal opportunities for providers to assign patients to higher paying classes through upcoding (e.g. codes for "simple" and "complex" procedures are placed in separate classes)
- Flexibility - The patient classification system is flexible enough to accommodate a full range of options for incorporating ancillary services into the visit payment.

The EAPG based potentially preventable ED visits/services classification system consists of Diagnostic and Procedural axes of classification. The first step in developing a patient classification system is to choose the initial classification variable. In DRGs, the principal diagnosis is used to classify patients into a set of mutually exclusive major diagnostic categories

(MDCs). For EAPGs, the initial classification variables are procedures rather than diagnoses. The procedures that could be performed on an ambulatory basis were assigned to one of two classes:

Significant Procedures. These are ordinarily scheduled in advance, constitute the reason for the visit, and dominate the time and resources expended during the visit. Significant procedures range in scope from debridement of nails and excision of a skin lesions to pacemaker replacements and stress tests. Significant procedures need to be scheduled and consume the vast majority of the resources for that visit (all the above examples fall into that category) and these are their defining characteristics.

Ancillary Services. These include tests and procedures that can assist in diagnosis or treatment at the time of a medical encounter. Examples of ancillary procedures range from simple injections and immunizations to a cardiogram.

ED patients who do not undergo a significant or ancillary procedure are assigned to a PPV diagnostic group based on the diagnostic code that is the reason for the visit.

In addition to this Diagnostic and Procedural classification, all EAPGs are divided into those that are and are not potentially preventable when they occur in the ED. Finally, all PPVs are divided into the following categories:

- Potential areas of overuse
- Acute infections that could be treated in a primary care setting
- Chronic illnesses related to malignancy
- Mental health and substance abuse encounters
- Other chronic illnesses except mental health, substance abuse and malignancy

Understanding that the rate of preventable ED visits will never be zero, the PPV classification system examines all ED visits for opportunities for improvement.

Determine if patient was admitted from a residential nursing care facility

Research suggests increased Emergency Department (ED) visits from nursing home residents could be prevented with better quality of care was taken at the nursing care facility. For example, if a patient had a UTI the facility should have been able to treat it, therefore the event would have been avoided. These visits start in the nursing home/rehabilitation hospital setting. Like PPA, PPV also uses Nursing Care Residential Sensitive Condition Criteria.

In addition to the ambulatory sensitive conditions described above, additional diagnoses are considered PPVs specifically for patients admitted from a residential nursing care facility. Patients treated in the ED for acute major eye infections as well as patients treated for osteomyelitis, septic arthritis and other musculoskeletal infections are considered candidate PPVs. The full list of EAPGs that represents both the ambulatory sensitive conditions and the residential nursing care facility sensitive conditions are detailed in the PPV section of this manual. Thus, patients are identified as PPV candidates if they are treated in the emergency

room directly coming from a residential nursing care facility and assigned a residential nursing care facility sensitive condition.

The same logic used with the PPA assignment for residential nursing care facility identification is used with PPV assignment. Residential nursing care facilities are designated as one of the following places of service: SNF, nursing home, inpatient psychiatric facility, Intermediate Care Facility/Individuals with Intellectual Disabilities, residential substance abuse treatment facility, psychiatric residential treatment center, comprehensive inpatient rehabilitation facility. Refer to the place of service section of this manual for detailed logic for residential nursing care facility identification.

Determine if reason for the visit is a trauma-related condition

Additional trauma criteria is applied to determine if a PPV is potentially preventable for those patients treated in the ED coming from a residential nursing care facility. If a visit has a significant procedure EAPG assigned, and the reason for the visit is trauma-related, and the patient came from a residential nursing care facility, the ED visit would be considered preventable. This is based upon the premise that a nursing home facility should have measures to avoid trauma. For example, if a patient fell and sustained a hip fracture the fracture may have been avoided all together by preventing the adverse event, in this case a fall. A list of trauma diagnoses, when coded as the principal diagnosis, determines if the reason for the ED visit was trauma-related.

Potentially preventable visits (PPV) output

Potentially preventable visits (PPV) contain a number of outputs including risk status, exclusion status, and reason.

There are two risk (R) statuses for PPV: At Risk Potentially Preventable (RP) and At Risk Not Potentially Preventable (RN).

There are two exclusion (E) statuses for PPV: Excluded Potentially Preventable (EP) and Excluded Not Potentially Preventable (EN). Within PPV, there are a few scenarios where exclusion logic is applied:

1. Exclusion logic is applied if the outpatient visit date falls on or within the admit and discharge dates of an inpatient admission. Any PPV claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 92 - Inpatient admission overlap.
2. If enabled, exclusion logic is applied if a line item is performed in an ER environment (place of service value of 23). Any PPV claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 97 - Line item performed in an ER setting.
3. If enabled, exclusion logic is applied to exclude claims that are not coded with a bill type of '13' indicating a claim not performed in an outpatient setting. Any PPV claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 98 - Non-outpatient facility claim.

For PPV, there are specific medical EAPGs that require additional code level detail to determine the potential preventability of a visit. For these EAPGs, the principal diagnosis is required to make a final determination. If the principal diagnosis for the claim is not considered potentially preventable, the claim will be returned with a status of RN. If the principal diagnosis is considered potentially preventable, the claim will be returned with a status of RP and the relevant reason assigned.

Additionally, for EAPGs that require code level detail, a PPV may not be assigned in some cases due to diagnosis specific age criteria. If the principal diagnosis is potentially preventable but is associated with specific age criteria, the admission is not considered potentially preventable if the patient's age falls within that range. In this case, the claim will be returned with a status of RN.

Potentially Preventable (RP)

- 21 - Potentially Preventable

PPV Reasons

- 0 - Not Potentially Preventable
- 1 - Acute illness not related to infection
- 2 - Acute infections that could be treated in a primary care setting
- 3 - Chronic illnesses related to malignancy
- 4 - Other chronic illnesses except mental health, substance abuse and malignancy
- 5 - Mental health and substance abuse encounters
- 6 - Trauma
- 7 - Not appropriate for ED
- 92 - Inpatient admission overlap
- 97 - Line item performed in an ER setting (exclusion logic)
- 98 - Non outpatient facility claim (exclusion logic)

Groupers assignment to one of the following EAPGs is not compatible with PPV and will output an error return (RX):

- EAPG 993 Inpatient only procedures
- EAPG 994 User customizable inpatient procedures
- EAPG 999 Other unassigned

Interventions to help reduce preventable emergency visits

PPVs can identify patterns of potentially avoidable emergency department visits, and may suggest areas where primary care services should be improved. If inappropriate ED utilization is

to be minimized, however, structural changes in the organization and delivery of first contact care will be essential.

The following are recommendations from the medical literature on community initiatives that can help reduce unnecessary ER visits:

- Establish medical homes where primary care physicians coordinate patients' care.
- Start a telephone line where nurses direct callers to the best places for care.
- Enroll children in telemedicine programs.
- Improve the availability of after-hours care.
- Increase enrollment in safety net programs.
- Simplify health information so patients can learn to care for themselves and avoid the ER.
- Educate the community on appropriate ER visits.
- Create case management programs to help people manage chronic diseases.
- Start workplace wellness programs to bolster workers' health.
- Establish urgent care centers to take on patients who are not necessarily seen in an ED but who were not able to obtain a timely primary care physician appointment or in fact who do not have a primary care physician.

Prevalence and potential cost savings related to preventable Emergency Department visits

The Minnesota Department of Health published a study on the volume and payments for potentially preventable events within the state. They identified 1.2 million potentially preventable Emergency Department (ED) visits with an associated cost of \$1.3 billion in 2012 alone.²⁵ The distribution of the PPVs were observed to fall predominately upon Medicaid where Medicaid enrollees accounted for 14 percent of the population but 41 percent of PPVs. The New York State Department of Health has been publicly reporting PPVs for the Medicaid program since 2011.²⁶ In 2011 there were 2,568,757 PPVs, a rate of 45.44 per 100 people. In 2013 the rate had barely changed at 45.31 per 100 people with 2,741,677 PPVs. Education, information and incentives are required to lower these rates with the potential to unlock billions of dollars for state budgets and the knock-on effects of reducing ED crowding and the need to maintain excess high cost ED capacity.

Proper application of potentially preventable visits

For potentially preventable event measures to be effectively and fairly used in performance reporting and/or pay for performance programs, the measurement tools, scoring methodology, program design and program applications must meet a number of core requirements.

1. The classification systems underlying the measurement tools must be clinically precise, comprehensive, have a uniform and consistent structure, and be transparently available to affected providers.
2. The tools must generate information on individual service, service line, major diagnostic category, and aggregate levels.
3. Comparative provider performance must be risk adjusted to account for the severity of patient illness and patient chronic illness burden.
4. Providers should not be evaluated on a case-by-case basis, but via a rate based approach which motivates providers to achieve performance levels being achieved by other in-state providers.
5. The state agency must involve providers and other stakeholders in program design.
6. Finally, patients and their families should be meaningfully engaged in care decisions.

PPS Assignment Criteria

PPSs are services provided or ordered by primary care physicians or specialists to supplement or support the evaluation or treatment of patient. They include diagnostic tests, laboratory tests, therapy services, and radiology services that are unlikely provide useful information for diagnosis and treatment (MRI early in an episode of back pain, for example) and therefore will not influence the management of the patient regardless of the result, and are therefore redundant or unnecessary for providing care. There recently have been numerous articles published in the peer reviewed literature highlight opportunities for avoidable of ancillary tests and outpatient procedures.

The PPS logic is much more detailed and comprehensive and covers all potentially preventable outpatient procedures and tests. As with the other PFPs, risk adjustment is absolutely critical for a fair comparison of rates between institutions.

The research literature shows significant variation in the use of ancillary services. As the Medicare Payment Advisory Commission recently pointed out in a January 2011 report on regional variation:

“Areas that are high use in one sector (such as inpatient, ambulatory, and post-acute) tend to be high use overall, and all three sectors contribute to overall variation. We also find that areas with high service use among Medicare decedents (those who died during the year) tend to have high service use for non-decedents as well. In short, the pattern of high use often extends across different services and different groups of beneficiaries.”²⁷

Outpatient ancillary services (e.g. radiology, pharmaceutical, laboratory tests) ordered and prescribed on an outpatient basis represent a significant portion of the variation in the use of services. The 3M Potentially Preventable Services (PPS) logic has been designed to provide a transparent, adjustable listing of virtually all ordered/prescribed ancillaries that are potentially preventable. In measuring PPS performance of various providers, it is important to adjust for the

burden of illness of the patient population using a clinically detailed tool such as 3M™ Clinical Risk Grouping (CRG) Classification System (for example, to account for fact that a diabetic patient on dialysis has significantly higher rate of appropriate ancillaries as compared to a diabetic who is diet controlled).

Research identifying the significant number and volume of specific potentially preventable services, along with their associated costs, is summarized next.

Imaging

- CT/MRI/MRA: There is extensive literature documenting the overuse of both CT and MRI Scans.²⁸ These represent “poster children” for expensive imaging tests for which there is extensive documentation on overuse.
- Plain Films.²⁹
- Ultrasound, Nuclear Medicine and other Radiologic Procedures: A recent randomized, controlled trial found that “incorporation of a goal-directed ultrasound protocol in the evaluation of non-traumatic, symptomatic, undifferentiated hypotension in adult patients results in fewer viable diagnostic etiologies and a more accurate physician impression of final diagnosis.”³⁰ Recent scientific review and government sponsored articles have demonstrated significant opportunities for improvement in the overuse of ultrasounds.³¹

Laboratory tests

As referenced below, there is significant literature documenting the overuse of laboratory tests. According to a recently published study:

“Inappropriate testing is not just unnecessary repeat blood draws. Our work reveals a landscape of inappropriate testing where rates vary systematically according to setting, test volume, and criteria in ways that can inform clinical practice and future research. For example, focusing on ordering the right test during initial evaluation, as opposed to reducing repeat testing, may have the greater impact on reducing errors and improving care.

What about reducing cost? Laboratory testing itself accounts for only a tiny fraction (~3–5%) of healthcare spending. The true costs associated with testing include the costs or savings of the downstream activities that testing leads to or prevents. The costs of these downstream activities – prescriptions, imaging, surgeries, hospital stays – dwarf the cost of laboratory testing.

Economic models of how testing influences these activities would be useful. Meanwhile, insofar as testing is considered appropriate only if it supports the standard of care, which in turn is defined according to patient outcomes, improving laboratory utilization should lead to more cost-effective care, regardless of whether more appropriate utilization leads to fractionally lower, or even fractionally higher, testing costs. We suggest further study of over- and underutilization in tandem, and in the context of downstream costs and outcomes, to learn how best to improve the efficiency and effectiveness of care.”³²

In addition there is good scientific literature documenting that clinicians can change their test ordering patterns.

- Simple/commonly ordered.³³
- Simple/commonly ordered for general physicals.
- Simple/commonly ordered for pre-op physicals. According to a recent review, despite guideline recommendations to limit testing before low-risk surgical procedures, preoperative ECG and chest radiography were performed frequently. Significant variation across institutions remained after adjustment for patient- and institution-level factors.³⁴
- Expensive for common diseases.
- Expensive for rare diseases.

Pharmaceuticals

- Expensive for rare diseases
- Expensive for late stage disease
- Expensive for which there are other therapeutic alternatives that are generic
- Inexpensive commonly ordered

Non-imaging diagnostic testing

- Cardiac tests (e.g., echocardiograms, stress tests, atrial/ventricular recording, anti-arrhythmic)
- Diagnostic Arthroscopies³⁵
- Diagnostic upper GI evaluation

Non-imaging therapeutic interventions

- Physical/Occupational Therapy/ Chiropractic/Acupuncture: Therapeutic interventions for chronic back pain represent the most important area of focus.³⁶
- AICD implants³⁷
- Pacemaker

Choosing Wisely Campaign

Since 3M Potentially Preventable Services (PPS) was introduced, medical societies have discouraged unnecessary testing and procedures (largely outpatient) under the banner of the Choosing Wisely Campaign. Much of the inspiration for the Choosing Wisely campaign came from a *New England Journal of Medicine (NEJM)* article by Howard Brody in which he encouraged medical societies to be actively involved in cutting healthcare costs.³⁸ With this as an impetus, and now quoting from a recent NEJM article that provides a historical perspective on this effort:

"Beginning in 2009, the National Physicians Alliance, funded by the ABIM Foundation, guided volunteers from three primary care specialties through the development of "Top Five" lists—specialty-specific enumerations of five achievable practice changes to improve patient health through better treatment choices, reduced risks and, where possible, reduced costs. In April 2012, the effort was expanded and launched as the Choosing Wisely campaign, with lists from nine specialty societies and a patient-education component led by Consumer Reports."³⁹

This article also documented numerous challenges in the Choosing Wisely Campaign. Participating societies generally named other specialties' services as low-value. Most proceduralists, like the orthopedists, include few of their own operative services. The American Academy of Otolaryngology—Head and Neck Surgery, for example, lists three imaging tests and two uses of antibiotics but no procedures, despite decades of literature on wide variation and overuse of tonsillectomy and tympanostomy tube placement.⁴⁰

Put differently, Howard Brody argued, "Publishing the lists is not enough—there needs to be accountability."⁴¹ As the article stated on the Choosing Wisely Campaign:

- Participating societies generally named other specialties' services as low-value.
- More numerous and more courageous lists should be developed, published, and heeded.

The Potentially Preventable Services methodology was developed with the intention of directly responding to the need for, to use Professor Brody's term - accountability. The PPS methodology is

- Comprehensive and identifies all possible potentially preventable outpatient services
- Population Risk adjusted
- Further categorized into the following reasons for preventability: almost always (except for the initial visit) seen on an inpatient basis, test for prevention,

All outpatient encounters with health professionals are considered as non-preventable. The PPS methodology focuses on outpatient tests and procedures.

Prevalence/potential cost savings

Treo Solutions, now part of 3M Health Information Systems, analyzed potentially preventable services in a commercial and Medicaid claims database using a significant portion of its 25-million covered-lives benchmark data set. 3M estimates that total inpatient and outpatient expenditures could be reduced by 2-3 % by: (1) communicating actionable risk-adjusted comparative performance information to providers, and (2) by creating financial incentives focused on reducing the rates of excess potentially preventable services.⁴²

Underutilization of services is also important to emphasize. This is likely particularly a challenge for the underserved, underinsured, and those suffering from socioeconomic disparities.

Proper application of potentially preventable services measures

For potentially preventable event measures to be effectively and fairly used in performance reporting and/or pay for performance programs, the measurement tools, scoring methodology, program design and program applications must meet a number of core requirements. The classification systems underlying the measurement tools must be clinically precise, comprehensive, have a uniform and consistent structure, and be transparently available to affected providers. The tools must generate information on individual service, service line, major diagnostic category and aggregate levels. Comparative provider performance must be risk adjusted to account for the severity of patient illness and patient chronic illness burden. Providers should not be evaluated on a case-by-case basis, but via a rate based approach which motivates providers to achieve performance levels being achieved by other in-state providers. The state agency must involve providers and other stakeholders in program design. Finally, patients and their families should be meaningfully engaged in care decisions.⁴³

Assign EAPG

A patient's individual outpatient services are assigned to EAPGs. EAPGs are used for not only determining a patient's reason for an ambulatory visit, but also for categorizing the individual services performed during the visit. EAPGs are used in the PPS logic to identify patients that had candidate PPS events. Refer to the EAPG section of this manual for a detailed description of the 3M™ Enhanced Ambulatory Patient Grouping (EAPG) methodology.

Determine if the outpatient visit occurred outside of a hospital emergency room

Potentially Preventable Services (PPSs) are assigned to visits that occurred outside of a hospital's emergency department. Claims without the following ED revenue codes or HCPCS/CPT codes will be evaluated for a PPS (CPT codes, descriptions and materials only © 2018 American Medical Association. All Rights Reserved):

Revenue center codes

- 0450 Emergency department general
- 0451 EMTALA emergency medical screening
- 0452 ER beyond EMTALA screening
- 0456 Urgent Care
- 0459 Other emergency room
- 0981 Emergency room

E&M HCPCS/CPT codes

- 99281 Emergency Department visit (straight forward decision making)

- 99282 Emergency Department visit (low complexity)
- 99283 Emergency Department visit (expanded problem focus exam/moderate complexity)
- 99284 Emergency Department visit (detail exam/mod complexity)
- 99285 Emergency Department visit (high complexity) are identified as ED visits for a patient
- G0380 Lev 1 hosp type B ED visit
- G0381 Lev 2 hosp type B ED visit
- G0382 Lev 3 hosp type B ED visit
- G0383 Lev 4 hosp type B ED visit
- G0384 Lev 5 hosp type B ED visit
- G0390 Trauma Respons w/hosp Criti

Potentially preventable services (PPS) output

PPS logic was reviewed based on the current Diagnostic Subgroups (DSGs) and Enhanced Ambulatory Patient Groups (EAPGS).

There are two risk (R) statuses for PPS: At Risk Potentially Preventable (RP) and At Risk Not Potentially Preventable (RN). There are two exclusion (E) statuses for PPS: Excluded Potentially Preventable (EP) and Excluded Not Potentially Preventable (EN). Within PPS, there are a few scenarios where exclusion logic applied:

1. Exclusion logic is applied if an outpatient visit date falls on or within the admit and discharge dates of an inpatient admission. Any PPS claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 92 - Inpatient admission overlap.
2. Exclusion logic is applied if the outpatient claim has Modifier 26, which is used when billing only the professional component of a procedure code that combines both professional and technical services. Any PPS claim with a Modifier 26 will be returned with a status of EP or EN and assigned a reason of 96 - Professional component.
3. If enabled, exclusion logic is applied if a line item is performed in an ER environment (place of service value of 23). Any PPS claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 97 - Line item performed in an ER setting

Additional PPS output has been provided below to give more information on why services may be indicated and, therefore, not potentially preventable.

Not Potentially Preventable (RN) Indications

- 11 - *Indicated EAPG Preventative Services*: The outpatient service provided is a preventative service, for example all CPT/HCPCs codes from EAPG 149 Screening Colorectal Services

- 12 - *Indicated, Outpatient services not potentially preventable*: The outpatient service provided for the indicated diagnosis is not potentially preventable, for example Psoriasis with Photochemotherapy.
- 13 - *Indicated, Profiling*: The outpatient service provided for the indicated diagnosis is not potentially preventable but should be monitored, for example, EAPG 319 Activity therapy
- 90 - *Indicated*: The diagnosis with the outpatient service provided is not potentially preventable, for example all diagnoses in DSG 915601 Respiratory Failure and Lung Edema are not potentially preventable.

Potentially Preventable (RP)

- 21 - Potentially Preventable

PPS Reasons

- 0 - Not Potentially Preventable
- 1 - Pharmacy utilization
- 2 - Procedure utilization
- 3 - Back procedures
- 4 - Ancillary utilization
- 6 - GI Test utilization
- 7 - DME
- 8 - Cardiac utilization
- 9 - Endoscopy utilization
- 10 - Laboratory utilization
- 11 - Surgical utilization
- 13 - Neuro injections
- 14 - Cardiac rehab utilization
- 15 - Therapy utilization
- 22 - Psych therapy utilization
- 24 - Radiology
- 92 - Inpatient admission overlap
- 96 - Professional component
- 97 - Line item performed in an ER setting (exclusion logic)

Group assignment to one of the following EAPGs is not compatible with PPS and will output an error return (RX):

- EAPG 993 Inpatient only procedures
- EAPG 994 User customizable inpatient procedures
- EAPG 999 Other unassigned

Phase II - Determine patient risk adjustment

Phase II of the PFP logic determines the patient category used for risk adjustment. Risk adjustment for PPAs, PPVs, and PPSs is accomplished using 3M™ Clinical Risk Grouping (CRG) Classification System.

In any rate-based comparison of outcomes, risk adjustment is essential to ensure a fair comparison of rates. Admissions, emergency room visits, and services examine enrollees over time and are population-based. Thus, one of the most essential elements of the PFP methodology is the critical role of population-based risk adjustment. Although PFPs are generally preventable, they will never be totally eliminated even with optimal care. As a result, there will be a residual rate of PFPs for even the best performing providers. More importantly, the rate at which PFPs occur depends on the burden of illness of the population. A diabetic who is on dialysis is more likely to have a PFP as compared to a diabetic who is controlled on diet. However, there is still considerable variation in occurrence of PFPs after controlling for the burden of illness of the population. Risk adjustment also negates the "my patients are sicker" argument by accounting for differences in patient severity of illness and burden of illness.

CRGs are a comprehensive method of determining the chronic illness burden of a patient. The chronic illness burden of an individual consists of an identification of different chronic illnesses, the severity of each chronic illness (e.g., diabetes severity levels 1-4), and specification of the impact of acute illnesses, such as pneumonia on chronic illnesses. CRGs provide the most detailed accounting of each of these three important facets of an individual's disease burden.

CRGs are used for risk adjustment for comparing actual and expected outcome rates for population-based outcomes. CRGs are a clinical model in which each enrollee is assigned to a single mutually-exclusive risk group that relates the historical clinical and demographic characteristics of the enrollee to the amount and type of healthcare resources that enrollee will consume in the future. Since the CRGs are clinically-based, they create a language similar to DRGs that links the clinical and financial aspects of care.

Each enrollee is assigned to one of nine CRG statuses ranging from 'Healthy' to 'Catastrophic'. The CRG status is assigned hierarchically starting with catastrophic conditions. The highest hierarchical status for which criteria are met is assigned as the CRG status. Enrollees in each status are divided into base CRGs which are then further subdivided into severity levels. CRGs are aggregated into one of three successive tiers of consolidation. The aggregated CRGs sacrifice some clinical precision but with only a slight loss of predictive performance. Normative expected

rates of PPAs, PPVs, and PPSs should be calculated using the third tier of CRG aggregation (ACRG3).

Rate-based Determination of Excess Negative Outcomes

To determine an institution's payment adjustment for an outcome measure, the following steps would be followed:

- Compute the institution's actual historical number of negative outcomes
- Compute an outcome norm
- Compute the institution's risk adjusted expected number of negative outcomes based on the norm
- Compare the institution's actual and expected number of negative outcomes to determine excess negative outcomes
- Quantify the financial impact of the excess negative outcomes
- Convert the financial impact of excess negative outcomes into an institution payment adjustment factor
- Prospectively apply payment adjustment factor to all of an institution's patients

Since CRGs are a categorical clinical model that assigns enrollees to a discrete risk category, an outcome norm can be calculated as the average outcome rate in each risk category in a national or state level database. An alternative would be to set the norm to reflect the best empirically-derived outcomes that are consistently being achieved (i.e., best practice). Such a demanding standard will create a stronger financial incentive to improve outcomes. Using the selected norm and applying indirect rate standardization, the expected number of negative outcomes for an institution can be calculated by multiplying the norm rate in each risk category by the actual number of patients/enrollees in the risk category and summing overall risk categories in the institution. The difference between an institution's actual numbers of negative outcomes compared to its risk adjusted expected number of negative outcomes defines the excess number of negative outcomes at the institution.

Summary

Collectively, PPAs, PPVs and PPSs are referred to as Population-focused Preventables (PFPs). Although PFPs are generally preventable, they will never be totally eliminated even with optimal care. As a result, there will be a residual rate of PFPs for even the best performing providers. Therefore, in order to use PFPs in provider profiling and payment systems, the subset of patients "at risk" for having a preventable healthcare event must be identified and a provider's risk adjusted expected rate of PFPs must be computed in order to identify the rate of "excess" PFPs

for an individual provider. Risk adjustment is essential since a patient's susceptibility to PFPs is dependent upon the patients underlying clinical condition.

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