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Regulatory applications of 3M potentially preventable event measures and 3M methods of risk adjustment

3M Health Information Systems

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With Medicaid expenditures comprising a large component of many state budgets, there is intense pressure on state Medicaid programs to find innovative ways to control health care expenditures. Many Medicaid programs have focused on payment reforms that provide financial incentives for improving the quality of care. Excess health care expenditures can be the result of quality of care problems and delivery system ineffectiveness. Quality failures and delivery system ineffectiveness often result in the need for a greater volume of services to correct the quality problem. For example, a patient discharged from a hospital too quick or too sick (poor quality) can lead to an avoidable readmission or emergency department visit, resulting in increased expenditures.

Many Medicaid programs have implemented payment reforms focused on reducing quality of care and delivery system failures as a means of controlling the volume of services and reducing expenditures. To accomplish payment reform goals, the methodologies collectively referred to as **3M™ Potentially Preventable Events (PPEs)**[1] have been widely adopted by state Medicaid agencies. These methodologies include:

- **3M™ Potentially Preventable Admissions (PPAs)**[2,3]
- **3M™ Potentially Preventable Emergency Department Visits (PPVs)**[4,5]
- **3M™ Potentially Preventable Readmissions (PPR) Grouping Software**[6,7]
- **3M™ Potentially Preventable Complications (PPC) Grouping Software**[8,9]

3M PPEs identify quality of care and delivery system failures for which there is reasonable likelihood that the potentially avoidable event could have been prevented. A systematic pattern of a higher than expected volume of 3M PPEs raises concerns regarding quality of care performance and delivery system effectiveness. Essentially, the occurrence of a 3M PPE is an end manifestation or outcome of an underlying quality or delivery system problem. Appendix A contains a description of each of the 3M PPEs.

In general, 3M PPE-based payment reforms determine the difference between the actual and the expected volume of 3M PPEs and adjust payments based on the magnitude of the difference in actual and expected 3M PPE volume. The determination of expected volume must be risk adjusted for the case mix of the patients being treated by a provider or health plan. The 3M PPAs and 3M PPVs are population measures and are risk adjusted using **3M™ Clinical Risk Groups (CRGs) Software**.[10,11] 3M PPRs and 3M PPCs are hospital performance measures and are risk adjusted using **3M™ All Patient Refined DRG Software (APR DRGs)**.[12,13]

3M CRGs and 3M APR DRGs are categorical systems that are comprised of exhaustive and mutually exclusive risk categories, under which each patient is assigned to only one risk category. This categorical structure allows the actual 3M PPE rate in each risk class for a provider or health plan to be compared to the 3M PPE rate in a reference population such as a national database. 3M CRGs and 3M APR DRGs are not only used to risk adjust PPE rates but can also be used as the unit of payment to directly set per case and per capita payments. **3M™ Enhanced Ambulatory Patient Groups (EAPGs)** are used as the unit of payment to directly set per visit payments.[14,15] Appendix B contains a description of the 3M CRGs, 3M APR DRGs and 3M EAPGs. The 3M PPEs, 3M CRGs, 3M APR DRGs and 3M EAPGs have been widely researched and reported in health care literature. Appendix C contains a bibliography of articles and reports referencing the 3M PPEs. Appendix D contains a bibliography of articles and reports with research on the 3M CRGs, 3M APR DRGs and 3M EAPGs.

In addition to state Medicaid programs, 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs are being utilized by commercial payers and other state agencies, including Departments of Corrections and entities such as all payer claims databases (APCDs) and quality improvement organizations (QIOs). In addition to Medicaid payment applications, 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs are used for internal and public reporting of provider and health plan performance. Table **1** summarizes the number of state Medicaid agencies and other entities using 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs for payment or reporting. Many state Medicaid agencies use multiple PPEs in their state payment and reporting programs. Table 2 lists state Medicaid programs using 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs for either payment or reporting. Table 3 contains a sample of links to state applications of 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs. (Information and website links contained in Tables 1, 2 and 3 are current as of this report's March 2023 publication date.)

Table 1: *State Medicaid Programs and other entities using 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs for Payment and Reporting*

Methodology	Medicaid Programs		Other Entities		Application
	Payment	Reporting	Payment	Reporting	
Inpatient 3M PPEs					
3M Potentially Preventable Readmissions (PPRs)	5	7	2	1	Identification of Readmissions following Hospital Discharge
3M Potentially Preventable Complications (PPCs)	3	3	0	0	Identification of Complications for Inpatients
Population 3M PPEs					
3M Preventable Admissions (PPAs)	4	2	2	1	Per Capita Admissions in a Population
3M Potentially Preventable Emergency Department Visits (PPVs)	4	2	2	1	Per Capita Emergency Department Visits in a Population
Risk Adjustment for 3M PPEs					
3M All Patient Refined DRGs (APR DRGs)	8	10	2	1	Inpatient 3M PPE Risk Adjustment
3M Clinical Risk Groups (CRGs)	4	2	2	2	Population 3M PPE Risk Adjustment
Unit of Payment					
3M Enhanced Ambulatory Patient Groups (EAPGs)	12	2	10	1	Per Visit Payment
3M All Patient Refined DRGs (APR DRGs)	29	3	9	1	Per Case Payment
3M Clinical Risk Groups (CRGs)	2	1	0	0	Per Capita Payment

Table 2: *Medicaid programs using 3M PPEs, 3M APR DRGs and 3M CRGs for payment or reporting*

State	3M PPR	3M PPC	3M PPA	3M PPV	3M EAPG	3M APR	3M CRG
AZ AHCCCS						X	
CA Medi-Cal						X	
CO HCPF					X	X	
CT Medicaid			X	X		X	X
DC Medicaid					X	X	
FL AHCA	X		X	X	X	X	X
HI Med-quest						X	
ID Medicaid						X	
IL DHFS					X	X	
IN Medicaid						X	
MA Medicaid					X	X	
MD HSCRC		X			X	X	
MI Medicaid						X	
MN DoH						X	
MS Medicaid	X	X				X	
MT Medicaid						X	
ND Medicaid						X	
NE Medicaid					X	X	
NJ Medicaid						X	
NY Medicaid	X	X	X	X	X	X	X
OH Medicaid	X				X	X	X
OK OHCA	X					X	
PA Medicaid						X	
RI Medicaid						X	X
SC Medicaid						X	
TX Medicaid	X	X	X	X		X	X
VA Medicaid					X	X	
WA Medicaid					X	X	
WI Medicaid	X				X	X	
WY Medicaid						X	

Table 3: *Links to a sample of state applications of 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs*

Agency	Link
AZ Medicaid (AHCCCS)	https://www.azahcccs.gov/PlansProviders/RatesAndBilling/ManagedCare/DRGbasedpayments.html
CA Medicaid (Medi-Cal)	http://www.dhcs.ca.gov/provgovpart/pages/DRG.aspx
CO Medicaid (HCPF)	https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/COProposal.pdf
CT Medicaid	https://portal.ct.gov/DSS/Health-And-Home-Care/Medicaid-Hospital-Reimbursement/Medicaid-Hospital-Reimbursement/Related-Resources
DC Medicaid	https://dhcf.dc.gov/sites/default/files/u23/DC%20APR-DRG%20FAQ%20Eff%2010-1-2017%20DCI17006.pdf
FL (AHCA)	http://ahca.myflorida.com/medicaid/cost_reim/drg.shtml https://ahca.myflorida.com/medicaid/Finance/data_analytics/BI/docs/Winter_2019_PPE_Report.pdf
Idaho Medicaid	https://publicdocuments.dhw.idaho.gov/WebLink/DocView.aspx?id=23419&dbid=0&repo=PUBLIC-DOCUMENTS
IL Medicaid (DHFS)	https://www.illinois.gov/hfs/MedicalProviders/notices/Pages/prn160106a.aspx https://www.illinois.gov/hfs/medicalproviders/hospitals/pprreports/Pages/default.aspx
MD Medicaid (through HSCRC)	http://www.hscrc.state.md.us/Documents/Quality_Documents/RateYear2018-Quality-Program-Update-07-29-16.pdf
MN Medicaid (DoH)	https://www.health.state.mn.us/data/apcd/docs/potentially_preventable_events_072115.pdf
OH Medicaid	https://medicaid.ohio.gov/resources-for-providers/enrollment-and-support/provider-types/hospital-provider-information/hospital-payment-policy
RI Medicaid	http://www.health.ri.gov/data/chronicconditions/ https://eohhs.ri.gov/sites/g/files/xkgbur226/files/2021-03/rimap_inp_faq.pdf
SC Medicaid	https://www.scdhhs.gov/resource/apr-drg
TX Medicaid	https://thlcportal.com/home
WA Medicaid	https://www.hca.wa.gov/assets/billers-and-providers/Inpatient-hospital-bi-20180701.pdf
WI Medicaid	https://www.forwardhealth.wi.gov/WIPortal/content/Provider/APRDRG/Home.htm.spage https://www.forwardhealth.wi.gov/WIPortal/Subsystem/SW/StaticContent/Provider/medicaid/hospital/MAHG_Meetings/06072018/WI_DHS_MAHG_Meeting_Presentation.pdf.spage

Complete definitions manuals with the details of the clinical logic are available for the 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs. Each system is reviewed on a regular basis and updated for changes in the ICD-10-CM and ICD-10-PCS code sets, as well as medical advances. Because of their extensive use by regulatory agencies, 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs have undergone the intense scrutiny associated with any regulatory implementation. These regulatory applications have spanned decades of ongoing use and have been widely evaluated in the health service research literature. The 3M PPEs, 3M APR DRGs, 3M CRGs and 3M EAPGs have a proven track record of providing clinically credible and actionable information to payers and provides that result in real and sustainable performance improvements.

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Appendix A: Description of 3M PPEs

3M Potentially Preventable Complications

3M PPCs are harmful events (accidental laceration during a procedure) or negative outcomes (hospital acquired pneumonia) that may result from the process of care and treatment rather than from a natural progression of underlying disease. There are 57 3M PPCs that encompass the full range of complications. For each 3M PPC, the patients considered at risk for the 3M PPCs and the clinical circumstances under which the 3M PPC could be consider potentially preventable are specified. Any patient who had one or more 3M PPCs during their hospital stay is consider having a PPC. For more detail go to:

For more detail go to: https://www.3m.com/3M/en_US/health-information-systems-us/drive- value-based-care/patient-classification-methodologies/ppcs/

3M Potentially Preventable Readmissions

3M PPRs are return hospitalizations within 30 days following a prior hospitalization. 3M PPRs may result from deficiencies in the process of care (readmission for a surgical wound infection), or inadequate post-discharge follow up (prescription not filled) rather than unrelated events that occur post discharge (broken leg due to trauma). Readmissions may result from actions taken or omitted during the initial hospital stay, such as incomplete treatment or poor care of the underlying problem, or from poor coordination of services at the time of discharge and afterwards, such as incomplete discharge planning or inadequate access to care. The admissions considered at risk for a 3M PPRs and the clinical circumstances under which a subsequent readmission is considered potentially preventable are specified in the 3M PPR logic. A 3M PPRs is assigned to any admission that was followed by one or more potentially preventable readmissions during the 30 days following a hospital discharge.

For more detail go to: https://www.3m.com/3M/en_US/health-information-systems-us/drive-value-based- care/patient-classification-methodologies/pprs/

3M Potentially Preventable Admissions

3M PPAs are hospital admissions that can often be avoided. There are six broad categories of 3M PPAs:

- Admissions for chronic disease management that could potentially have been managed in the outpatient setting (e.g., asthma)
- Admissions for acute diseases that could potentially have been managed in the outpatient setting (e.g., viral pneumonia)
- Admissions for a procedure that can be done in an outpatient setting (e.g., cardiac catheterization for non-acute disease such as atherosclerosis)
- Admissions for a procedure for which there is a less invasive alternative procedure (e.g., percutaneous coronary angioplasty with a stent instead of coronary bypass surgery)
- Admissions for a procedure that research has shown to be prone to overuse (e.g., spinal procedures for back pain)
- Admissions that could potentially have been avoided for residents of a residential care facility such as a skilled nursing facility (e.g., trauma due to a fall)

The most prevalent 3M PPAs are for medical management of chronic and acute diseases. These hospital admissions may result from hospital or ambulatory care inefficiency, lack of adequate access to outpatient care, or inadequate coordination of ambulatory care services. In many cases 3M PPAs are

for flare-ups of chronic conditions (e.g., heart failure) for which adequate monitoring and follow up, such as proper medication management, could have avoided the need for hospitalization.

Potential preventability is assessed relative to the care given in the immediate period preceding a hospital admission (months). Conditions that require an extended period of coordinated and integrated care are not considered potentially preventable. For example, an admission for renal failure is not considered a 3M PPA because it is not preventable unless appropriate care has been given for several years before the admission, making it difficult to judge potential preventability based solely on the care given in the immediate period preceding the admission.

Preventability is also assessed based on the relative acuteness of the reason for the admission. For example, an admission for a 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.

Medicare beneficiaries living in residential care facilities such as a skilled nursing facility (SNF) or nursing home generally are expected to receive a higher level of coordinated care than beneficiaries living at home. Many conditions such as fever, urinary tract infections, metabolic disturbances and pneumonia can often be managed in a residential care facility, thereby avoiding the need for hospitalization. Other conditions such as diseases of the skin and injuries due to falls should be more readily avoided in a residential care facility setting. In determining whether an admission is potentially preventable, 3M PPAs apply a broader list of conditions that are considered potentially preventable when a beneficiary is living in a residential care facility.

For more detail go to: https://www.3m.com/3M/en_US/health-information-systems-us/drive-value-based- care/patient-classification-methodologies/ppa/

3M Potentially Preventable Emergency Department Visits

3M PPVs are emergency department visits that can often be avoided. There are five broad categories of PPVs:

- Emergency department visits for chronic disease management that could potentially have been managed in the outpatient setting (e.g., asthma)
- Emergency department visits for minor acute conditions that could potentially have been managed in the outpatient setting (e.g., constipation)
- Emergency department visits for signs and symptoms that do not require urgent care (e.g., lumbago)
- Emergency department visits for minor trauma (e.g., contusions)
- Emergency department visits that could potentially have been avoided for residents of a residential care facility such as a SNF (e.g., trauma due to a fall)

The most prevalent 3M PPVs will be for minor trauma and pain. These hospital emergency department visits may result from lack of access to adequate primary care or inadequate coordination of ambulatory care services. 3MPPVs also include chronic conditions (e.g., hypertension) for which adequate monitoring and follow up, such as proper medication management, could have avoided the need for an ED visit. A comprehensive evaluation of potentially preventable ED visits can provide a more complete assessment of the continuity of care and of the functioning of the health care delivery. For more detail go to:

For more detail go to: https://www.3m.com/3M/en_US/health-information-systems-us/drive-value-based- care/patient-classification-methodologies/ppv/

Appendix B: 3M risk adjustment methods

3M All Patient Refined DRGs

3M APR DRGs are a categorical clinical model that is composed of base DRGs that are subdivided into four severity of illness levels based on the extent of physiologic decompensation or organ system loss of function and four risk of mortality subclasses. The underlying clinical principles of 3M APR DRGs are that the severity of illness and risk of morality are highly dependent on the patient's underlying clinical problems, and that patients with high severity of illness (SOI) and risk of mortality (ROM) are usually characterized by multiple serious illnesses. In the 3M APR DRGs, the assessment of the severity of illness and risk of mortality of a patient is specific to the base 3M APR DRG to which a patient is assigned. In other words, the determination of the SOI and ROM is disease specific. In 3M APR DRGs, high severity of illness and risk of mortality are primarily determined by the interaction of multiple diseases. Patients with multiple comorbid conditions involving multiple organ systems represent difficult to treat patients who tend to have poor outcomes. The 3M APR DRG is computed at the time of admission and at the time of discharge.

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For more detail go to: https://www.3m.com/3M/en_US/health-information-systems-us/drive-value-based- care/patient-classification-methodologies/apr-drgs/

3M Clinical Risk Groups

3M CRGs are a categorical clinical model that assigns each individual in a population to a single, mutually exclusive, risk group that relates the clinical and demographic characteristics of an individual to their outcomes and health care resource use. 3M CRGs describe the health status and burden of chronic illness of individuals and are subdivided into up to six severity of illness levels. Each 3M CRGs and severity subgroup is used to describe the health status of groups of individuals with a similar burden of chronic illness. Individuals with severe chronic disease in multiple organ systems are the patients who are most difficult to treat, experience poorer outcomes, and consume a disproportionate share of health care resources.

3M CRGs (version 2.1) are composed of 332 base 3M CRGs that describe the beneficiary's most significant chronic conditions and explicit severity levels that distinguish differences in disease burden due to severity of illness resulting in 1,414 individual 3M CRGs. The individual 3M CRGs are aggregated into nine health statuses ranging from catastrophic to healthy.

Status 1 – Healthy
Status 2 – History of acute disease e.g., chest pain
Status 3 – Single minor chronic disease e.g., migraine
Status 4 – Minor chronic disease in multiple organ systems e.g., migraine and BPH
Status 5 – Single dominant or moderate chronic disease e.g., CHF
Status 6 - Dominant or moderate chronic disease in multiple organ systems, e.g., CHF, COPD
Status 7 - Dominant chronic disease in three or more organ systems, e.g., CHF, COPD, DM
Status 8 - Malignancy, under active treatment, e.g., lung cancer
Status 9 - Catastrophic conditions, e.g., major organ transplant

Based on the severity levels of the chronic conditions that comprise each status, beneficiaries in the nine statuses are assigned a severity level between one and six, resulting in 53 aggregated 3M CRGs risk categories. 3M CRGs are a transparent system with a definition manual available for inspection.

For more detail go to: https://www.3m.com/3M/en_US/health-information-systems-us/drive-value-based- care/patient-classification-methodologies/crgs/

3M Enhanced Ambulatory Patient Groups

3M EAPGs 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 3M EAPG have similar clinical characteristics, resource use, and costs. Similar clinical characteristics mean that the definition of the 3M EAPG have a common organ system or etiology and that a specific medical specialty will typically provide care to the patients in the 3M EAPG. 3M EAPGs were developed to encompass the full range of ambulatory settings including same day surgery units, hospital emergency rooms, and outpatient clinics. In addition, 3M EAPGs can address phone contacts, home visits and physician visits but do not address nursing home care, inpatient care, self-administered pharmaceuticals, or other miscellaneous services.

Procedures performed during an ambulatory visit are categorized as a significant procedure or an ancillary procedure. A significant procedure is normally scheduled, typically surgical or invasive, constitutes the reason for the visit and dominates the time and resources expended during the visit. Patients who undergo a significant procedure are assigned to a significant procedure 3M EAPG. All medical services provided to the patient are assumed to be an integral part of the procedure. Patients who received medical treatment but who have no significant procedures performed are assigned to Medical 3M EAPGs. Ancillary procedures include tests to assist in patient diagnosis or treatment such as laboratory of radiological tests and minor procedures that increases but do not dominate the time and resources expended during a visit such as an immunization. A patient who neither received medical treatment nor underwent a significant procedure, but had an ancillary service performed would be assigned to only an ancillary service 3M EAPG.

3M EAPGs address the diversity within the outpatient setting by assigning patients to multiple 3M EAPGs. Patients are described by a list of 3M EAPGs that correspond to each service provided to the patient. The categorization of each service provided during an ambulatory visit can be configured to achieve specific policy objectives and provides great flexibility for using 3M EAPGs in payment and performance evaluation systems. The 3M EAPGs form a manageable, clinically meaningful set of patient groups that relate the attributes of patients to the resource demands and associated costs experienced during an ambulatory visit.

For more detail go to: https://www.3m.com/3M/en_US/health-information-systems-us/drive-value-based-care/patient-classification-methodologies/enhanced-apgs/

Appendix C: Bibliography of publicly available articles and reports – PPAs, PPVs, PPCs, and PPRs

All articles and reports are publicly available and are listed in chronological order. The opinions and conclusions in these articles and reports are solely those of the authors.

3M Potentially Preventable Admissions

Articles, reports, and book chapters

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Appendix D: Bibliography of publicly available articles and reports: 3M APR DRGs, 3M CRGs and 3M EAPGs

All articles and reports are publicly available and are listed in chronological order. The opinions and conclusions in these articles and reports are solely those of the authors.

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