



# **Technical Notes**

## **Hospital Quality-Based Program: Potentially Preventable Readmissions**

**Patient Population: Texas Medicaid and CHIP**

**Reporting Period: State Fiscal Year 2021**

**The Institute for Child Health Policy**

**University of Florida**

**The External Quality Review Organization**

**for Texas Medicaid Managed Care and CHIP**

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## Section 1. Introduction

Readmissions have potential value as an indicator of quality of care because they may reflect poor clinical care and poor coordination of services either during hospitalization or in the immediate post discharge period. A potentially preventable readmission (PPR) is a readmission (return hospitalization within the specified readmission time interval) that is clinically related to the initial hospital admission. “Clinically related” is defined as a requirement that the underlying reason for readmission be plausibly related to the care rendered during or immediately following a prior hospital admission. A readmission is defined as a return hospitalization to an acute care hospital that follows a prior acute care admission within a specified time interval, called the readmission time interval. The readmission time interval is the maximum number of days allowed between the discharge date of a prior admission and the admitting date of a subsequent admission. If a subsequent admission occurs within the readmission time interval and is clinically related to a prior admission, it is considered a PPR. The hospitalization triggering a PPR is called an Initial Admission. Subsequent PPRs relate back to the care rendered during or following the Initial Admission.

Using the 3M approach, PPRs are also measured in other quality initiatives in Texas, namely the Delivery System Reform Incentive Payment (DSRIP program, website: <https://hhs.texas.gov/laws-regulations/policies-rules/waivers/medicaid-1115-waiver>) and in the future, the Department of State Health Services (DSHS) hospital quality reporting process (website: <https://www.dshs.state.tx.us/thcic/default.shtm>).

*For this report a 15 day readmission window was applied.*

## Section 2. Data

Inpatient facility admissions for all Medicaid and CHIP population (MCO encounters and FFS claims) with an admission date for state fiscal year 2021 (September 1, 2020 through August 31, 2021) are included with three exceptions:

- **Undocumented Alien Status** — If the patient had undocumented alien status and the client was discharged and readmitted, the readmission may not have been captured in the Medicaid database.
- **Medicaid / Medicare Dual Eligibility** — Patients who are dually eligible for both Medicaid and Medicare during the measurement year were excluded.
- **Global PPR Exclusions** — Admissions with certain major or metastatic malignancy conditions; a situation where it is very likely that a readmission was either planned, unpreventable, or beyond a hospital's influence; and encounters with a discharge status of “left against medical advice”. Refer to the 3M specifications manual for the complete list of exclusions.
- **Neonatal Exclusions** — In addition to the global exclusions mentioned above, all neonatal APR-DRG between 580 and 640 are excluded from at risk admissions and the associated readmissions are no

longer considered as PPRs. This is to address the concern that most neonatal jaundice readmissions are not preventable.

### **Section 3. PPR Logic and Calculation for Facilities**

The 3M™ PPR methodology is a computerized algorithm to identify readmissions with a plausible clinical relationship to the care rendered during or immediately following a prior hospital admission. Every stay is assigned to an All Patient Refined (APR)-Diagnosis Related Group (DRG). There are more than three hundred base APR-DRGs and each base APR-DRG has four levels of severity. Severity of illness (SOI) is defined as the extent of organ system derangement or physiologic decompensation for a patient. It gives a medical classification into 1=minor, 2=moderate, 3=major, and 4=extreme.

When a patient was admitted to acute inpatient hospital more than once during the measurement period, whether a subsequent admission would be classified as a potentially preventable admission (PPR) was determined by readmission interval and clinical relationship. Only when the subsequent admission occurred within the pre-defined readmission interval (15 days) after discharge from the initial admission would the readmission be further considered for preventability. If the qualified readmission (admitted within 15 days after previous discharge) was clinically related to the initial admission as determined by their APR-DRGs, the readmission would be considered a PPR. The initial admission and the PPR formed a PPR chain. A PPR chain could contain more than one PPR. In the case when two or more readmissions followed the initial admission, and the intervals between each other were within 15 days, then the clinical relationship of each readmission would be assessed based on the relationship between the initial admission and each particular readmission, instead of the relationship between each adjacent readmission pair.

A 3M panel of clinicians determined whether each possible admission/readmission pair represented a PPR. For some pairs, additional factors were considered, including patient age or particular diagnoses and procedures within an APR-DRG. A readmission is considered clinically-related to the Initial Admission if the reason for the readmission falls into one of three categories for medical readmissions, one of two categories for surgical readmissions and one category for mental health or substance abuse conditions. Readmissions for medical reasons are much more common than readmissions for surgical procedures, regardless of the reason for the Initial Admission. The three categories of clinically-related medical readmissions are as follows:

- A continuation or recurrence of the reason for the Initial admission, or for a condition closely related to the reason for the Initial Admission (e.g. a readmission for diabetes following an Initial Admission for diabetes).
- An ambulatory care sensitive condition (as designated by the Agency for Healthcare Research and Quality, AHRQ), or a chronic problem that may be related to care either during or after the initial admission.
- An acute medical condition or complication that may be related to or have resulted from care during or after the initial admission.

## *PPR Hospital Reporting Technical Notes*

Surgical readmissions were generally considered not preventable unless they met one of the two criteria for a clinical relationship to the Initial Admission:

- A readmission for a surgical procedure that addressed a continuation or a recurrence of the problem causing the Initial Admission (a patient readmitted for an appendectomy following an Initial Admission for abdominal pain and fever).
- A readmission for a surgical procedure that addressed a complication resulting from care during the Initial Admission (a readmission for drainage of a post-operative wound abscess following an Initial Admission for a bowel resection).

Readmissions for mental health or substance abuse reasons will be considered clinically related regardless of the diagnoses for the initial admission.

- Readmission for mental health reasons following an initial admission for a non-mental health, non-substance abuse reason.
- Readmission for a substance abuse diagnosis reason following an initial admission for a non-mental health, non-substance abuse reason.
- Mental health or substance abuse readmission following an initial admission for a substance abuse or mental health diagnosis.

A readmission that did not fit one of these categories (e.g., a readmission for trauma) is classified as a clinically-unrelated readmission and, therefore, not potentially preventable (i.e. not a PPR). A readmission that is not clinically-related to the Initial Admission in a readmission chain terminates the readmission chain. A readmission that has a discharge status of transferred to an acute care hospital, left against medical advice or died terminates a readmission chain.

Relative weights are assigned to each admission by APR-DRG. These weights (Texas relative weights for APR-DRG Grouper 38, effective 10/01/2020) were determined based on resource utilization from Texas Medicaid data, and can be downloaded from [http://www.tmhp.com/Pages/Medicaid/Medicaid\\_hosp\\_reimb.aspx](http://www.tmhp.com/Pages/Medicaid/Medicaid_hosp_reimb.aspx). Weighting the PPRs is important because not all PPRs have the same resource costs. High resource PPR should weigh more when comparing the impact of PPRs.

In the PPR reports prior to SFY2014, all PPR chains were event-based. No relative weights were assigned to the PPR chains. While event based PPR rates reflect the basic prevalence of PPRs, there are potential drawbacks with the un-weighted approach, because 1) not all PPRs have the same resource costs, 2) more than one PPRs can happen in a single PPR chain. Starting SFY2014, PPR chains and the Actual to Expected (A/E) ratio have been reported on both counts and weights to provide hospitals with a better view of their performance. In SFY2021, the hospital level reimbursement reduction is based on the un-weighted A/E ratio.

Using all the qualifying encounters data from the state, state norm PPR weight is calculated for each APR-DRG and SOI (severity of illness) level of the initial admissions. The initial admissions are first grouped by their APR-DRGs and SOI level, then APR-DRG weights of the PPR chains following the initial

admissions were summed up respectively for different APR-DRG and SOI level of the initial admission. For each APR-DRG and SOI level within each hospital, the expected PPR weight was calculated by multiplying the state norm PPR weight for each APR-DRG and SOI level by the number of candidate admissions in the hospital in the corresponding APR-DRG and SOI level. The overall expected PPR weights for the hospital is the sum of the expected PPR weight for all APR-DRGs and SOI levels. The un-weighted expected PPR chain calculation follows the similar logic but counting the numbers of PPR chains instead of PPR weights.

## **Section 4. How Hospitals Should Use This Hospital Level Report**

The “Hospital PPR Results by APR-DRG” table in the report lists the top 40 APR-DRGs of the initial admissions, ranked by the total counts of the PPR events following the initial admission. Associated PPR weights following the same initial admission will also be provided in the same table. Hospitals may focus on the top APR-DRGs to target opportunities for improvement. The underlying detail data will be provided to hospitals upon request. The underlying data is a good resource for hospitals to identify which claims/encounters are potentially preventable. Based on the information provided, hospitals can design their own intervention strategies.

The underlying data used to generate the hospital level report can be requested via an email to [MCD\\_PPR\\_PPC@hsc.state.tx.us](mailto:MCD_PPR_PPC@hsc.state.tx.us) (please provide full name, email, phone number, NPI, TPI and hospital name).

## **Section 5. Guide to the PPR Hospital Level Report**

Using the 3M™ PPR Grouping software and methodology (3M Core Grouping Software Version 2021.3.0, PPR Version 38.0), encounter and eligibility data for Texas Medicaid and CHIP for SFY2022 was used to calculate facility rates for PPRs.

Low volume hospitals can affect the reliability and interpretability of hospital-based summary statistics such as statewide percentile rankings. Hospitals meeting any of the following criteria below were considered low volume. These hospitals will receive a report, but will be excluded from reimbursement reductions.

- Less than 40 total admissions at risk for PPR or,
- Less than 5 actual PPR chains or,
- Less than 5 expected PPR chains

### **Hospital**

The hospital name associated with the NPI.

### **National Provider Identifier (NPI)**

The NPI associated with the hospital, and identified as the billing hospital in the encounters attributed to the hospital and included in the hospital results.

## **Texas Provider Identifier (TPI)**

The TPIs corresponding to the hospital NPI based on the crosswalk provided by Texas Medicaid Healthcare Partnership (TMHP).

## **Table 1: Hospital PPR Rates**

### **Total Admissions at Risk for PPR**

All encounters with bill type = '11x', '12x', '41x' (hospital inpatient encounters) minus the global exclusions and non-events per the software. For the fiscal year 2021 reporting period, admissions between September 1, 2020 and August 16, 2021 were evaluated. The last 15 days of the reporting period are excluded to allow for the 15 days readmission window. The total admissions at risk for PPR can be found in the underlying data by filtering the 'Candidate Admissions' column to only show = 1 (yes).

### **Actual Number of PPR Chains**

A readmission chain is a sequence of PPRs that are all clinically related to the Initial Admission. A readmission chain may contain an Initial Admission and only one PPR, which is the most common situation, or may contain multiple PPRs following the Initial Admission. The actual number of PPR chains can be found in the underlying data by filtering the 'Initial Admissions' column to only show = 1 (yes).

### **Actual PPR Weights**

The sum of APR-DRG weights (Texas relative weights for APR-DRG Grouper 38, effective 10/01/2020) for all PPRs. To calculate the actual PPR weights you will need the underlying data that lists all APR-DRGs. For calculations, see the section on "Hospital PPR Results by APR-DRG." APR-DRG weights can be found on TMHP website.

### **Expected PPR Weights**

Expected PPR weights reflects the sum of APR-DRG weights that would be expected based on your hospital's case mix, calculated based on APR-DRG (including severity of illness), the presence or absence of a major mental health or substance abuse comorbidity, and patient age.

### **Actual PPR Rate**

Actual number of PPR chains divided by total admissions at risk for PPR.

### **Expected PPR Rate**

Expected PPR rate is obtained by dividing the expected number of PPR chains by the total admissions at risk of PPR.



### **Actual to Expected Ratio for PPR Chains**

The ratio of the actual to expected PPR chains indicates the performance of the hospital relative to the overall performance for all hospitals in Texas. This is calculated by dividing the Actual PPR Rate by the Expected PPR Rate.

### **Total Reimbursement Reduction**

The total reduction percentage of fee-for-service claims that HHSC will reduce based on the performance of PPRs, consistent with state legislation.

Hospitals will be penalized up to 1% for an actual to expected ratio (un-weighted) of 1.10 or greater (10% above the statewide risk adjusted average) or 2% for an actual to expected ratio (un-weighted) of greater than 1.25 (25% above the statewide, risk adjusted average).

### **Table 2: Hospital PPR Expenditures**

#### **Unique Members with PPRs**

Number of unique clients with PPRs. The unique members with PPRs can be found in the underlying data by filtering for the 'Initial Admission' column = 1 (yes). Then de-duplicate the 'Medicaid Client ID' to find the unique members with PPRs.

#### **Number of PPR Events**

Count of all Readmissions. The number of PPR events can be found in the underlying data by filtering 'Potentially Preventable Readmission (PPR)' column to only show = 1 (yes).

#### **Actual PPR Expenditures**

Sum of payment amounts associated with all PPRs.

### **Table 3: State-Wide Hospital PPR Rate (information can be found in the State Norm file on the HHSC PPE webpage, see References)**

#### **Percentiles**

Calculated from 'Actual PPR Weights' for all hospitals, excluding those identified as low volume hospitals.

**Table 4: State-Wide Hospital Distributions (information can be found in the State Norm file on the HHSC PPE webpage, see References)**

**Percentiles**

Calculated from 'Total Admissions at Risk for PPR', 'Actual Number of PPR Chains', 'Unique Members with PPRs', and 'Number of PPR Events' for all hospitals, excluding those identified as low volume hospitals.

**Table 5: Hospital PPR Results by PPR Reason**

This table provides a distribution of Number of PPR Events, PPR weights and expenditures for each PPR Reason for the hospital based on the clinical-related reasons defined by 3M. PPR Reasons are identified by APR-DRG.

**Table 6: Hospital PPR Results by APR-DRG**

This table lists the top 40 APR-DRGs of the initial admission, not the PPR admission. The table is shown this way because the initial admission is crucial in the PPR analysis. The table is ranked by total number of PPR events following these initial admissions. The table provides hospitals an entry point to explore the possibility to maximize the inpatient care quality by studying the subset of diagnosis groups that had cause the most utilization due to PPR. PPRs often result from defective care in initial admissions. Hospitals are recommended to consult clinicians in order to improve the performance.

This table consists of seven columns:

- 1) Initial Admission APR DRG – The APR DRG in this table is listed as the overall APR DRG. APR DRGs are further broken down by severity of illness. This is indicated as 1 through 4 (from low to high severity of illness) after the overall APR DRG. For example, APR DRG 254 | Other Digestive System Diagnosis has four levels of severity indicated as 254-1, 254-2, 254-3, and 254-4 (this is indicated in the underlying data in the 'APR DRG' column). It is important to note that the higher the severity of illness, the higher the PPR weight.
- 2) Number of PPR Events – This is a multi-step process in calculating the PPR Count of each overall APR DRG by using the underlying data. Begin by creating a new table in a separate spreadsheet or paper with three columns that you will need to fill out for Unique PPR Chain, APR DRG for PPRs, and APR DRG Weights for PPRs. Follow steps a. through d.
  - a. In the underlying data, filter the records which are not considered initial admission or a PPR by filtering 'Unique Chain ID' column to show all chains except F0.
  - b. Then filter the 'Initial Admission' column to only show = 1 (yes) and filter the 'APR DRG' column to only show the corresponding APR DRG (include all severities of illness). Write down the 'Unique Chain IDs' in the new table mentioned in 2) under Unique PPR Chain.

- c. Un-filter all columns and identify chains by filtering the 'Unique Chain ID' column to show only the unique chain IDs that you wrote down in the new table for b. Then identify the PPRs by filtering the 'Potentially Preventable Readmission (PPR)' column to only show = 1 (yes). Write down the PPR weight for each unique chain in the new table mentioned in 2) under the corresponding APR DRG for all PPRs.
  - d. Sum up all PPRs to arrive as the PPR count for that particular APR DRG.
- 3) Fraction of Total PPR Events -- This is calculated by dividing the 'Number of PPR Events' for each overall APR DRG by the 'Number of PPR Events' Column in the second table of the hospital report, and multiplying by 100.
  - 4) PPR Weights – Use the table generated in Step c above, and sum up all PPR weights for all PPRs to arrive as the PPR weights for that particular APR DRG.
  - 5) Fraction of Total PPR Weights – This is calculated by dividing the 'PPR Weights' for each overall APR DRG by the 'Actual PPR Weights' (found in the first table of the hospital report), and multiplying by 100.
  - 6) PPR Expenditures – Medicaid payment amount associated with each encounter is considered confidential, and is not shown in the underlying data. This number can be found by matching the 'Medicaid Claim ID' column in the underlying data to the hospital's claims data.
  - 7) Fraction of PPR Expenditures – This is calculated by dividing the 'PPR Expenditures' for each overall APR DRG by the 'Actual PPR Expenditures' (found in the second table of the hospital report), and multiplying by 100.

## **Section 6. Underlying Admissions Data**

The underlying inpatient admissions data are supplemented with the report cards for the providers to reproduce the PPR results. The data sets contain patients' Medicaid client IDs, claim IDs, initial admission and readmission hospital identifiers, discharge APR-DRG and SOI, discharge status, mental health comorbidity flag, unique PPR chain ID, clinical relationship reason code, primary and secondary diagnosis codes, and indicators for candidate admission, initial admission, and potentially preventable readmission.

The Medicaid client ID and claim ID allow providers to match the admission data with their own database to obtain additional information. The indicators for candidate admission, initial admission, and potentially preventable readmission allow the providers to reproduce the PPR results. A total PPR count is the sum of the "1"s in the column "Potential Preventable Readmission". PPR counts were multiplied by the corresponding APR-DRG weights to calculate the total PPR weights.

## **References**

3M™ Health Information Systems. Potentially Preventable Readmissions Classification System: Methodology Overview. GRP-139, revised on October 2020.

3M™ Potentially Preventable Readmissions (PPRs) v38.0: Definitions Manual.

3M™ Definitions Manuals via [www.aprdrgassign.com](http://www.aprdrgassign.com) (Username: TXHosp; Password: aprdrg004)

HHS PPE Webpage: <http://hhs.texas.gov/about-hhs/process-improvement/medicaid-chip-quality-efficiency-improvement/potentially-preventable-events>

Contact email for questions: MCD\_PPR\_PPC@hhsc.state.tx.us