DSRIP Provider Reporting

Potentially Preventable Complications

Technical Notes

Patient Population: Texas Medicaid and CHIP

Measurement Year: Calendar Year 2014

**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

Potentially Preventable Complications (PPCs) are in-hospital complications that are not present on admission, but result from treatment during the inpatient stay. As indicators of quality of care, PPCs represent harmful events or negative outcomes that might result from processes of care and treatment rather than from natural progression of the underlying disease. Increased costs resulting from complications are passed on to payers because the diagnosis codes linked to complications frequently increase Diagnosis Related Group (DRG) payment.

The 3M PPC methodology identifies PPCs based on risk at admission, using information from inpatient encounters, such as diagnosis codes, procedure codes, procedure dates, present on admission (POA) indicators, patient age, sex and discharge status. Accurate coding of the POA indicators is particularly important as it serves two primary purposes: (1) to identify potentially preventable complications from among diagnoses not present on admission, and (2) to allow only those diagnoses designated as present on admission to be used for assessing the risk of incurring complications.

# Section 2. Data Inclusion

Inpatient facility admissions for all Medicaid programs and CHIP for calendar year 2014, with three exceptions:

* ***Medicaid / Medicare Dual Eligibility*** – Admissions for enrollees who were dually eligible for both Medicaid and Medicare during the analysis year were excluded.
* ***Hospitals with Less than 30 Admissions*** – Admissions from hospitals with less than 30 total admissions were excluded because the POA quality check results are not deemed reliable when the claims volume is low.
* ***3M defined PPC Exclusions*** — A defined subset of diagnosis codes and procedure codes are eligible for consideration for PPCs. The 65 categories of PPCs are defined based on diagnoses and POA, procedures and procedure dates, and enrollee age. A PPC diagnosis may be preventable for some type of patients, but not for others and some complication groups apply to only certain types of patients, e.g. Obstetric complications occur in only females who deliver after an admission. Admissions for patients with certain severe or catastrophic illnesses that are particularly susceptible to a range of complications, including those with trauma, HIV, and major or metastatic malignancies are also excluded. The 3M manual offers a detailed list of software exclusions.

# Section 3. POA Quality Checks

POA indicators are crucial for the identification of PPCs, however, the quality and consistency of this indicator varies greatly among hospitals. Admissions from hospitals with questionable data are not considered in calculating state averages (also called norms).

POA indicator value “U” (no information in the record) is mapped to “N” (not present on admission), and value “W” (clinically undetermined) is mapped to “Y” (present on admission).

The POA quality screening criteria was developed by 3M based on statistical criteria and clinical consensus. Two levels of POA quality were defined for each criterion, the “red zone” and the “grey zone”. Hospitals failing in the “red zone” for ONE or more criterion, or in the “grey zone” for TWO or more criteria are identified as having questionable data and are considered to have failed POA quality check. Admissions for these hospitals are not included in statewide analyses.

The POA quality screening criteria applied are:

##### Quality Screen 1: High % Non POA for secondary diagnoses on the Pre-Existing List

This criterion identifies hospitals with a high percent non-POA (POA = N) for pre-existing secondary diagnosis codes.

* Red Zone: % Non POA on Pre-Exist ≥ 7.5%
* Grey Zone: 5% ≤ % Non POA on Pre-Exist < 7.5%

##### Quality Screen 2: High % POA for secondary diagnoses

This criterion identifies hospitals with an extremely high percent present on admission (POA = Y) for secondary diagnosis codes (excluding exempt, pre-existing, and OB 7600x-7799x codes).

* Red Zone: % POA ≥ 96%
* Grey Zone: 93% ≤ % POA < 96%

##### Quality Screen 3: Low % POA for secondary diagnoses

This criterion identifies hospitals with an extremely low percent present on admission for secondary diagnoses codes (excluding exempt, pre-existing, and OB 7600x-7799x codes).

* Red Zone: % POA ≤ 70%
* Grey Zone: 70% < % POA ≤ 77%

##### Quality Screen 4: High % POA for secondary diagnoses on the Elective Surgical List

This criterion identifies hospitals with a high percent non-POA (POA = N) for elective surgery secondary diagnosis codes.

* Red Zone: % POA ≥ 40%
* Grey Zone: 30% ≤ % POA < 40%

# Section 4. PPC Logic and Calculations for Facilities

The PPC classification system first assigns each inpatient encounter to one of the 1,256 All Patient-Refined Diagnosis-Related Groups (APR-DRGs). Next, the exclusions for patients with severe or catastrophic conditions are identified. Finally, the remaining encounters are considered PPC candidate admissions and evaluated for PPCs. Multiple PPCs can be assigned to an admission if they are not clinically overlapping.

Because not all DRG categories require the same treatment resources, Healthcare Cost and Utilization Project (HCUP) Relative PPC weights (version 32) are assigned to each PPC category. These weights were determined based on resource utilization from national medical data. High resource PPCs are weighted more heavily than PPCs requiring less resources.

The PPCs are grouped into 65 categories. Admissions may be at risk for some PPC categories but not others. A state norm PPC rate for each admission APR-DRG/ Severity of Illness (SOI) level is calculated for each PPC category. Using PPC data from all hospitals passing the POA quality checks, the average PPC rate (total number of PPCs in each category divided by the total number of admissions at risk for that PPC category) in each admission APR-DRG and SOI is calculated to establish the Texas PPC norms for each PPC category. For each hospital, the expected PPC number is the sum of expected PPC numbers in the hospital for all levels of APR-DRG and SOI (Texas PPC norm for each APR-DRG/SOI times the admissions in the hospital at risk for that PPC category). The total expected PPC weights for each hospital is the sum of expected PPC weights for all the PPC categories (expected number of PPCs in each category times the PPC weight for that category).

The actual to expected ratio is the total actual PPC weights divided by the total expected PPC weights.

Regular facility bills do not have itemized expenditure for hospital-acquired complications, thus the PPC expenditures have to be estimated using the method suggested by 3M:

*Hospital Expenditure = Total Actual HCUP PPC Weights X Scaling Factor X Hospital Base Rate*

Total actual PPC weight was calculated as described above. The scaling factor was calculated by dividing the total Texas APR DRG weights (Texas specific weights for Grouper 32 APR-DRG, effective 09/01/2015, calculated by the Texas claims administrator (TMHP) using Texas inpatient data) associated with all the admissions by total National APR DRG weights (for Grouper 32 APR-DRG, calculated by 3M using national data) associated with the same admissions. The scaling factor accounts for the relative difference between Texas and National relative resource utilization on inpatient cares. The hospital base rate is the total inpatient expenditure of a hospital divided by the total (Texas) APR DRG weights associating with the admissions of this hospital. Hospital base rate reflects the average expenditure per unit of relative weight of a given hospital. For the calendar year 2014 reporting period, the Texas scaling factor is 1.384621.

# Section 5. Guide to the PPC Hospital Report

Using the 3M™ Core Grouping software and methodology (Core Grouping Software Version 2016.0.2; PPC Version 32.0), encounter and eligibility data for Texas Medicaid and CHIP for the 2014 service year was used to calculate facility rates for PPCs.

Low volume hospitals can affect the reliability and interpretability of hospital based summary statistics. Hospitals meeting the following criteria below were considered low volume. These hospitals will receive a report, yet a low volume hospital flag will appear on the report, and the hospitals are excluded from statewide percentile evaluation.

* Less than 40 total admissions at risk for PPC (at risk for any PPC category) or
* Less than 5 admissions that had any PPC.

#### 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 provider results.

#### TPI

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

### Hospital Present on Admission (POA) Quality Check

See section 3 for full descriptions of each criterion and determination of overall POA Quality Check.

* % columns show the percent of secondary diagnosis for eligible encounters fitting the criteria. Quality Screen 2 and 3 are combined to show very high or very low prevalence of the POA marker which is indicative of questionable data.
* POA Quality Check show overall PASS/FAIL based on rules described in section 3.

### PPC Resource Utilization (Provider Results)

#### Total Number of Admissions

All institutional inpatient encounters with Type of Bill code = ‘11x’, ’12x’, ‘41x’, which represent hospital inpatient encounters. The report is not generated for hospitals with less than 30 total admissions, and these hospitals are also excluded from the calculation of state norm.

#### Admissions at Risk for PPC

Admissions that are at risk for at least one PPC category, as defined by 3M PPC methodology.

#### Number of PPC Admissions

The number of institutional inpatient admissions that had at least one PPC.

#### Actual PPC Weights

The sum of HCUP PPC weights for all PPCs. Weights reflects the standardized resource utilization values estimated for the PPCs.

#### Expected PPC Weights

The sum of expected PPC weights for the hospital, explained in Section 4.

#### Actual to Expected Ratio for PPC Weights

The ratio of the actual PPC weights to the expected PPC weights.

### Hospital PPC Expenditures

#### Members with PPCs

The number of clients with at least one PPC.

#### Actual PPC Counts

The total number of PPCs. A single admission can have more than one PPC, therefore, this number is equal to or greater than the actual number of admissions that had a PPC.

#### Estimated PPC Expenditures

The sum of marginal PPC costs estimated using the regression model, explained in Section 4.

### State-Wide Provider PPC Resource Utilization

#### Percentiles

Calculated from ‘Actual PPC Weights’ for all hospitals excluding low volume hospitals and hospitals failing the POA Quality Check. Weights of a PPC are constructed such that combinations of individual PPC weights are additive. Low values indicate better performance.

### State-Wide Provider Distributions

#### Percentiles

Calculated from ‘Total Number of Admissions’, ‘Admissions at Risk for PPC’, ‘Actual Number of Admissions with PPC’, ‘Members with PPCs’, and ‘Actual PPC Counts’ for all hospitals excluding low volume hospitals and hospitals failing the POA Quality Check.

### PPC Results by PPC Group

PPC are assigned in 65 categories which are classified into 8 mutually exclusive PPC groups based on clinical characteristics. See appendix for the detailed list of groups.

#### PPC Weights

Actual PPC weights for the PPCs belonging to the group.

#### Fraction of Total PPC Weights

The actual PPC weights for this group divided by the hospital’s total actual PPC weights.

#### PPC Counts

The number of PPCs belong to the group.

#### Fraction of Total PPCs

The PPC counts for this group divided by the hospital’s total PPC counts.

### PPC Results by PPC Category

Based on the clinical reason, 3M PPC methodology generates 65 PPC categories. See appendix for the detailed list of categories.

# Reference

3MTM Health Information Systems. Potentially Preventable Complications (Version 32.0): Definitions Manual. GRP-093, 2014.

# Appendix

## List of PPC groups

|  |  |
| --- | --- |
| PPC Group | Group Description |
| 1 | Extreme Complications |
| 2 | Cardiovascular-Respiratory Complications |
| 3 | Gastrointestinal Complications |
| 4 | Perioperative Complications |
| 5 | Infectious Complications |
| 6 | Malfunctions, Reactions, etc. |
| 7 | Obstetrical Complications |
| 8 | Other Medical and Surgical Complications |

## List of PPC categories

| PPC Category | PPC Description | PPC Group | HCUP PPC Weight (V32) |
| --- | --- | --- | --- |
| 1 | Stroke & Intracranial Hemorrhage | 2 | 1.1453 |
| 2 | Extreme CNS Complications | 1 | 1.5464 |
| 3 | Acute Pulmonary Edema and Respiratory Failure without Ventilation | 2 | 0.7958 |
| 4 | Acute Pulmonary Edema and Respiratory Failure with Ventilation | 1 | 2.7409 |
| 5 | Pneumonia & Other Lung Infections | 2 | 1.3451 |
| 6 | Aspiration Pneumonia | 2 | 1.2553 |
| 7 | Pulmonary Embolism | 2 | 1.3671 |
| 8 | Other Pulmonary Complications | 2 | 0.9017 |
| 9 | Shock | 1 | 1.5133 |
| 10 | Congestive Heart Failure | 2 | 0.4572 |
| 11 | Acute Myocardial Infarction | 2 | 0.7034 |
| 12 | Cardiac Arrythmias & Conduction Disturbances | 2 | 0.3138 |
| 13 | Other Cardiac Complications | 2 | 0.4655 |
| 14 | Ventricular Fibrillation/Cardiac Arrest | 1 | 1.2542 |
| 15 | Peripheral Vascular Complications except Venous Thrombosis | 2 | 1.2836 |
| 16 | Venous Thrombosis | 2 | 1.4346 |
| 17 | Major Gastrointestinal Complications without Transfusion or Significant Bleeding | 3 | 0.9346 |
| 18 | Major Gastrointestinal Complications with Transfusion or Significant Bleeding | 3 | 1.8077 |
| 19 | Major Liver Complications | 3 | 1.0202 |
| 20 | Other Gastrointestinal Complications without Transfusion or Significant Bleeding | 3 | 1.4927 |
| 21 | Clostridium Difficile Colitis | 5 | 1.7172 |
| 22 | *This category intentionally excluded. Category 22 was retired and Categories 65 and 66 added.* | x | x |
| 23 | GU Complications except UTI | 8 | 0.6246 |
| 24 | Renal Failure without Dialysis | 8 | 0.6028 |
| 25 | Renal Failure with Dialysis | 1 | 3.0876 |
| 26 | Diabetic Ketoacidosis & Coma | 8 | 0.8608 |
| 27 | Post-Hemorrhagic & Other Acute Anemia with Transfusion | 8 | 0.8812 |
| 28 | In-Hospital Trauma and Fractures | 8 | 0.3353 |
| 29 | Poisonings except from Anesthesia | 6 | 0.1812 |
| 30 | Poisonings due to Anesthesia | 6 | 0.0737 |
| 31 | Decubitus Ulcer | 8 | 2.3048 |
| 32 | Transfusion Incompatibility Reaction | 6 | 1.2115 |
| 33 | Cellulitis | 5 | 0.8276 |
| 34 | Moderate Infections | 5 | 1.5978 |
| 35 | Septicemia & Severe Infections | 5 | 1.3722 |
| 36 | Acute Mental Health Changes | 8 | 0.3581 |
| 37 | Post-Operative Infection & Deep Wound Disruption without Procedure | 4 | 1.2701 |
| 38 | Post-Operative Wound Infection & Deep Wound Disruption with Procedure | 4 | 2.4575 |
| 39 | Reopening Surgical Site | 4 | 1.4422 |
| 40 | Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure or I&D Procedure | 4 | 0.5881 |
| 41 | Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Procedure | 4 | 1.0951 |
| 42 | Accidental Puncture/Laceration during Invasive Procedure | 4 | 0.4466 |
| 43 | Accidental Cut or Hemorrhage during Other Medical Care | 8 | 0.1929 |
| 44 | Other Surgical Complication - Moderate | 8 | 1.2153 |
| 45 | Post-procedure Foreign Bodies | 4 | 0.4933 |
| 46 | Post-Operative Substance Reaction & Non-O.R. Procedure for Foreign Body | 4 | 0.6336 |
| 47 | Encephalopathy | 8 | 0.9697 |
| 48 | Other Complications of Medical Care | 8 | 1.6033 |
| 49 | Iatrogenic Pneumothrax | 6 | 0.6090 |
| 50 | Mechanical Complication of Device, Implant & Graft | 6 | 1.3081 |
| 51 | Gastrointestinal Ostomy Complications | 6 | 1.7224 |
| 52 | Inflammation & Other Complications of Devices, Implants or Grafts except Vascular Infection | 6 | 1.0618 |
| 53 | Infection, Inflammation and Clotting Complications of Peripheral Vascular Catheters and Infusions | 6 | 1.0573 |
| 54 | Infections due to Central Venous Catheters | 6 | 2.5288 |
| 55 | Obstetrical Hemorrhage without Transfusion | 7 | 0.0541 |
| 56 | Obstetrical Hemorrhage with Transfusion | 7 | 0.2960 |
| 57 | Obstetric Lacerations & Other Trauma Without Instrumentation | 7 | 0.0341 |
| 58 | Obstetric Lacerations & Other Trauma With Instrumentation | 7 | 0.0546 |
| 59 | Medical & Anesthesia Obstetric Complications | 7 | 0.1105 |
| 60 | Major Puerperal Infection and Other Major Obstetric Complications | 7 | 0.1729 |
| 61 | Other Complications of Obstetrical Surgical & Perineal Wounds | 7 | 0.1172 |
| 62 | Delivery with Placental Complications | 7 | 0.0371 |
| 63 | Post-Operative Respiratory Failure with Tracheostomy | 1 | 8.9614 |
| 64 | Other In-Hospital Adverse Events | 8 | 0.4031 |
| 65 | Urinary Tract Infection | 5 | 0.8008 |
| 66 | Catheter-Related Urinary Tract Infection | 5 | 0.9409 |