

Potentially Preventable Conditions

Presentation to the HSCRC Quality Evaluation Work Group

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17 October 2008

Agenda

- Potentially Preventable Complications
 - Methodology for Selecting PPCs
 - Patient Examples
 - MD Statewide APR DRG PPC Rates
 - Actual vs Expected PPC Rate Example
- Potentially Preventable Readmissions
 - Review PPR Assignment
 - Patient Examples
 - MD Statewide APR DRG PPC Rates

POTENTIALLY PREVENTABLE COMPLICATIONS (PPCs)

Development of PPCs

- Requires availability of present on admission indicator
 - MD established statewide POA collection/reporting on 7/1/07
- Identify post admission events that represent a complication
 - Clinical panels
- Identify chance circumstances under which the complication is potentially preventable
 - Clinical panels
- Develop a method of risk adjusting complication rates

3M's Approach to Preventable Conditions

Potentially Preventable Complications

- Potentially Preventable Complications (PPCs): 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
- All broad categories of the AHRQ PSI's, NQF, and CMS list are built into the PPCs.
- PPCs are a much larger list than others: because there are numerous exclusions and extensive risk adjustment built into the PPC list. (Example: exclusions are built into the decubitus ulcer PPC that are not present for either the AHRQ PSI or the CMS HAC category)

PPC Diagnoses and PPC Groups

- Of 13,367 ICD-9 CM diagnosis codes, we identified 1,450 as PPC diagnoses
- Each of the 1,450 codes designated as PPC diagnoses were assigned to one of 64 mutually exclusive PPC Groups (PPCs for short), based on similarities in clinical presentation and clinical impact

PPC Uses and Evaluations

- New York Department of Health for private reporting of select major PPCs since 2005 on five years of data
- IPRO study in New York.
- HANYS and GNYHA clinical quality committees and other committees of these two hospital associations.
- Numerous presentations all around New York state on the detail logic of PPCs.
- Direct input was provided at many of these presentations which resulted in changes in the PPC logic.
- NY DOH provided patient level data back to individual hospitals that included the PPC assignment so that hospitals could review individual medical records.

PPC 5 Pneumonia & Other Lung Infections

ICD-9-CM Diagnosis and Procedures Codes

Diagnosis codes:

If LOS > 2 days: 003.22, 481, 482.0-482.2, 482.30-482.39, 482.4, 482.4x, 482.8x, 482.9, 483.8, 484.8, 485, 486, 510.0, 510.9, 511.1, 513.x, 519.2

If LOS > 6 days: 466.11, 466.19, 480.1, 487.0

If LOS > 21 days:

Diagnosis codes: 033.x

Exclusions:

PPC is not assigned if any diagnosis from one of the following exclusion groups is present on admission

- 16 Cystic fibrosis - pulmonary disease
- 17 BPD & major respiratory anomalies
- 18 Pulmonary edema & respiratory failure
- 20 Major respiratory infections & inflammations
- 21 Bronchiolitis & rsv pneumonia
- 22 Other pneumonia
- 23* Chronic Obstructive Pulmonary Disease
- 24* Asthma
- 71 Hematologic immunocompromise
- 72 Hemolytic & aplastic anemia
- 74 Sickle cell anemia crisis
- 76 Septicemia & disseminated infections
- 84 Drowning and asphyxiation exclusion
- 85 Neuro-muscular disorders
- 92 Sickle cell disease and thalassemia

* Exclusion groups 23 and 24: if LOS is less than 4 days

PPC 10 Congestive Heart Failure

ICD-9-CM Diagnosis and Procedures Codes

Diagnosis codes: 415.0, 428.0, 428.1, 428.21, 428.31, 428.33, 428.41, 428.43, 428.9

Exclusions:

PPC is not assigned if any diagnosis from one of the following exclusion groups is present on admission

- 33 Acute & subacute CHF
 - 39 Cardiomyopathy
 - 41 Cardiac injury, inflammation, & infection
-

PPC 35 Septicemia and Severe Infections

ICD-9-CM Diagnosis and Procedures Codes

If LOS > 2 days:

Diagnosis codes: 003.1, 003.21, 036.0, 036.1, 036.2, 038.0, 038.10-038.19, 038.2, 038.3, 038.40-038.49, 038.8, 038.9, 112.5, 112.81, 112.83, 320.0-321.2, 323.8-325, 421.x, 422.92, 567.0-567.2, 567.21-567.29, 590.2, 728.86, 995.91, 995.92

Exclusions:

PPC is not assigned if any diagnosis from one of the following exclusion groups is present on admission

- 6 Bacterial & tuberculous infections of nervous system
 - 30 Acute & subacute endocarditis
 - 48 Peritonitis & enterocolitis
 - 71 Hematologic immunocompromise
 - 76 Septicemia & disseminated infections
 - 99 Central Venous Catheter Infection
-

PPC Examples

- Patient 7_00033422 assigned PPC 5, 35
- Patient 8_00064716 assigned PPC 35
- Patient 7_00122303 and 7_00125990 assigned PPC 10
- Patient 8_00161869 excluded PPC 35

PPC 5 Pneumonia & Other Lung Infections – PPC Rates by APR DRG and SOI

Severity of Illness Level	Number of Admissions At Risk for PPC	Number of Admissions Assigned PPC	Maryland Statewide PPC Rate
APR DRG 058 OTHER DISORDERS OF NERVOUS SYSTEM			
1	1,045	4	0.38%
2	1,123	21	1.87%
3	599	20	3.34%
4	60	2	3.33%
APR DRG 163 CARDIAC VALVE PROCEDURES W/O CARDIAC CATHETERIZATION			
1	90	4	4.44%
2	193	11	5.70%
3	307	22	7.17%
4	19	6	31.58%
APR DRG 194 HEART FAILURE			
1	538	8	1.49%
2	4,328	99	2.29%
3	4,776	138	2.89%
4	241	11	4.56%
APR DRG 221 MAJOR SMALL & LARGE BOWEL PROCEDURES			
1	946	12	1.27%
2	1,556	39	2.51%
3	1,120	88	7.86%
4	110	25	22.73%
APR DRG 308 HIP & FEMUR PROCEDURES FOR TRAUMA EXCEPT JOINT REPLACEMENT			
1	267	2	0.75%
2	962	22	2.29%
3	712	34	4.78%
4	49	2	4.08%

PPC 10 Congestive Heart Failure – PPC Rates by APR DRG and SOI

Severity of Illness Level	Number of Admissions At Risk for PPC	Number of Admissions Assigned PPC	Maryland Statewide PPC Rate
APR DRG 137 MAJOR RESPIRATORY INFECTIONS & INFLAMMATIONS			
1	51	0	0.00%
2	519	8	1.54%
3	1,028	24	2.33%
4	250	15	6.00%
APR DRG 139 OTHER PNEUMONIA			
1	615	0	0.00%
2	3,078	26	0.84%
3	2,716	40	1.47%
4	226	6	2.65%
APR DRG 140 CHRONIC OBSTRUCTIVE PULMONARY DISEASE			
1	1,186	1	0.08%
2	4,209	18	0.43%
3	2,177	29	1.33%
4	245	5	2.04%
APR DRG 165 CORONARY BYPASS W CARDIAC CATH OR PERCUTANEOUS CARDIAC PROCEDURE			
1	97	3	3.09%
2	673	48	7.13%
3	335	29	8.66%
4	13	3	23.08%
APR DRG 174 PERCUTANEOUS CARDIOVASCULAR PROCEDURES W AMI			
1	593	4	0.67%
2	853	18	2.11%
3	203	9	4.43%
4	35	2	5.71%

PPC 35 Septicemia and Severe Infections – PPC Rates by APR DRG and SOI

Severity of Illness Level	Number of Admissions At Risk for PPC	Number of Admissions Assigned PPC	Maryland Statewide PPC Rate
APR DRG 137 MAJOR RESPIRATORY INFECTIONS & INFLAMMATIONS			
1	51	1	1.96%
2	537	16	2.98%
3	1,471	58	3.94%
4	473	34	7.19%
APR DRG 139 OTHER PNEUMONIA			
1	615	6	0.98%
2	3,207	21	0.65%
3	4,452	53	1.19%
4	581	12	2.07%
APR DRG 140 CHRONIC OBSTRUCTIVE PULMONARY DISEASE			
1	1,186	0	0.00%
2	4,663	7	0.15%
3	4,317	27	0.63%
4	709	11	1.55%
APR DRG 165 CORONARY BYPASS W CARDIAC CATH OR PERCUTANEOUS CARDIAC PROCEDURE			
1	97	0	0.00%
2	705	4	0.57%
3	608	13	2.14%
4	52	4	7.69%
APR DRG 174 PERCUTANEOUS CARDIOVASCULAR PROCEDURES W AMI			
1	595	0	0.00%
2	952	5	0.53%
3	466	7	1.50%
4	78	1	1.28%

Example Actual vs Expected PPC Rate

PPC 5 Pneumonia & Other Lung Infections

MD Statewide PPC Rate : 0.71%

Provider	Number of Discharges at risk for PPC 5	Number of Discharges with PPC 5 Assigned	Actual PPC Rate	Expected PPC Rate
XYZ	14,427	74	0.51%	0.47%
ABC	17,348	149	0.86%	0.91%



POTENTIALLY PREVENTABLE READMISSIONS (PPRs)

Methodology for Selecting Potentially Preventable Readmissions (PPRs)

M - Medical
 MS - Major Surgical
 OS - Other Surgical
 EM - Elective Medical
 ES - Elective Major Surgical
 EO - Elective Other Surgical
 XMA - Malignancy Exclusion
 XTB - Trauma Exclusion
 XNN - Neonatal Exclusion
 XOB - Obstetrical Exclusion
 XOG - Other Exclusion

Liver trans &/or intest trans
 Heart &/or lung transplant
 Bone marrow transplant
 ECMO or trach w MV w extn proc
 Trach w MV wo exten proc
 Pancreas transplant
 Craniotomy for trauma
 Craniotomy exc for trauma
 Ventricular shunt proc
 Spinal procedures
 Extracranial vascular proc
 Oth nervous syst & relat proc
 Spinal disorders & injuries
 Nervous system malignancy
 Degeneratv nerv sys dis exc MS
 Mult sclerosis/oth demyelin dx
 Intracranial hemorrhage
 CVA w infarct
 Nonspec CVA & precereb occl
 Transient ischemia
 Periph, cranial, auton nerv dx
 Bact & tuberculous nerv infect
 Non-bact nerv infect exc VM

MDC	Type	PPR Type	IA APR Desc	RA APR→ IA APR↓	MS	MS	MS	MS	MS	MS	XTB	MS	MS	MS	MS	M	XMA	M	M	M	M	M	M	M	M	M
					1	2	3	4	5	6	20	21	22	23	24	26	40	41	42	43	44	45	46	47	48	49
00	S	MS	Liver trans &/or intest trans	1	Y	X	X	Y	Y	X	G	X	X	X	X	X	G	X	X	X	X	X	X	X	X	X
00	S	MS	Heart &/or lung transplant	2	X	Y	X	Y	Y	X	G	X	X	X	X	X	G	X	X	X	X	X	X	X	X	X
00	S	MS	Bone marrow transplant	3	X	X	Y	Y	Y	X	G	X	X	X	X	X	G	X	X	X	X	X	X	X	X	X
00	S	MS	ECMO or trach w MV w extn proc	4	X	X	X	X	X	X	G	X	X	X	X	X	G	X	X	X	X	X	X	X	X	X
00	S	MS	Trach w MV wo exten proc	5	X	X	X	X	X	X	G	X	X	X	X	X	G	X	X	X	X	X	X	X	X	X
00	S	MS	Pancreas transplant	6	X	X	X	Y	Y	Y	G	X	X	X	X	X	G	X	X	X	X	X	X	X	X	X
01	S	XTB	Craniotomy for trauma	20	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
01	S	MS	Craniotomy exc for trauma	21	X	X	X	Y	Y	X	G	Y	Y	Y	Y	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	S	MS	Ventricular shunt proc	22	X	X	X	Y	Y	X	G	Y	Y	Y	Y	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	S	MS	Spinal procedures	23	X	X	X	Y	Y	X	G	Y	Y	Y	Y	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	S	MS	Extracranial vascular proc	24	X	X	X	Y	Y	X	G	Y	Y	Y	Y	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	S	MS	Oth nervous syst & relat proc	26	X	X	X	Y	Y	X	G	Y	Y	Y	Y	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Spinal disorders & injuries	40	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	XMA	Nervous system malignancy	41	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
01	M	M	Degeneratv nerv sys dis exc MS	42	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Mult sclerosis/oth demyelin dx	43	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Intracranial hemorrhage	44	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	CVA w infarct	45	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Nonspec CVA & precereb occl	46	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Transient ischemia	47	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Periph, cranial, auton nerv dx	48	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Bact & tuberculous nerv infect	49	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y
01	M	M	Non-bact nerv infect exc VM	50	X	X	X	X	X	X	G	X	X	X	X	Y	G	Y	Y	Y	Y	Y	Y	Y	Y	Y

PPR Matrix

- 98,596 cells in 314 Initial Admission (IA) APR DRG x 314 Readmission (RA) APR DRG Matrix
- 33% clinically related IA by RA APR DRG combination
- 42% globally excluded IA by RA APR DRG combination
- 25% DRG specific clinical exclusion IA by RA APR DRG combination

PPR Uses and Evaluations

- Florida Public Report Card using PPRs
- Florida Collaborative (FHA sponsored): over 100 hospitals; members include medical group and SNFs; preliminary discussions regarding tie in with payment.
- Massachusetts Department of Health Care Finance and Payment: Committee evaluating PPRs and hospital collaborative to look at data and comment on logic.

PPR Examples

Medical Initial Admission for APR DRG 140 CHRONIC OBSTRUCTIVE PULMONARY DISEASE										
Patient ID	Hospital	LOS	Charges	Patient Discharge Status	Days Post Adm	PPR Type	IA APR DRG	RA APR DRG	APR DRG Desc	Reason
Pat 1	A	10	\$19,371	62	0	OA	207		OTH CIRCULATORY SYSTEM DIAG	
Pat 1	A	7	\$13,559	1	42	IA	140		COPD	Outside 30 day readmission window
Pat 1	A	1	\$2,719	1	15	RA	140	140	COPD	A medical readmission for a continuation or recurrence of the reason for the initial admission

Medical Initial Admission for APR DRG 194 HEART FAILURE										
Patient ID	Hospital	LOS	Charges	Patient Discharge Status	Days Post Adm	PPR Type	IA APR DRG	RA APR DRG	APR DRG Desc	Reason
Pat 2	A	3	\$6,130	1	0	OA	194		HEART FAILURE	
Pat 2	B	2	\$6,221	1	58	IA	194		HEART FAILURE	Outside 30 day readmission window
Pat 2	B	7	\$21,531	1	20	RA	194	194	HEART FAILURE	A medical readmission for a continuation or recurrence of the reason for the initial admission
Pat 2	A	2	\$4,497	1	25	RA	194	425	ELECTROLYTE DIS EXC HYPOVOL	A medical readmission for an acute medical complication plausibly related to care during the initial admission.
Pat 2	A	2	\$4,748	1	6	RA	194	207	OTH CIRCULATORY SYSTEM DIAG	A medical readmission for an acute medical complication plausibly related to care during the initial admission.
Pat 2	A	3	\$4,995	1	11	RA	194	201	CARD ARRHYTHMIA & CONDUCTION	A medical readmission for an acute medical complication plausibly related to care during the initial admission.

Patient ID	Hospital	LOS	Charges	Patient Discharge Status	Days Post Adm	PPR Type	IA APR DRG	RA APR DRG	APR DRG Desc	Reason
Pat 3	B	3	\$16,989	1	0	OA	190		ACUTE MYOCARDIAL INFARCT	
Pat 3	C	5	\$43,469	1	39	OA	161		CARDIAC DEFIB & HEART ASSIST	Outside 30 day readmission window
Pat 3	A	3	\$5,299	1	139	IA	194		HEART FAILURE	Outside 30 day readmission window
Pat 3	A	5	\$11,374	1	4	RA	194	144	RESP SIGNS & SYMPTONS	A medical readmission for an acute medical complication plausibly related to care during the initial admission.
Pat 3	A	0	\$2,116	1	8	OA	861		SIGNS/SYMPTONS/OTH FACTORS	RA for APR DRG 861 not clinically related to previous admission for APR DRG 194
Pat 3	A	1	\$2,125	1	8	OA	194		HEART FAILURE	RA for APR DRG 194 not clinically related to previous admission for APR DRG 861

Top 15 Initial Admissions followed by one or more PPR - 2007

APR DRG		Initial Admissions Followed by PPRs	Percent of Initial Admissions	PPR Rate	Initial Admissions Followed by PPRs	Percent of Initial Admissions	PPR Rate
		15 Day Window			30 Day Window		
		194	HEART FAILURE	1,838	5.77%	12.03%	2,567
140	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	1,178	3.70%	10.02%	1,693	3.81%	15.67%
720	SEPTICEMIA & DISSEMINATED INFECTIONS	1,024	3.21%	10.14%	1,321	2.97%	14.31%
139	OTHER PNEUMONIA	765	2.40%	6.55%	1,078	2.43%	9.61%
175	PERCUTANEOUS CARDIOVASCULAR PROCEDURES W/O AMI	737	2.31%	8.02%	1,063	2.39%	11.81%
753	BIPOLAR DISORDERS	634	1.99%	7.53%	918	2.07%	11.56%
460	RENAL FAILURE	683	2.14%	9.85%	896	2.02%	14.01%
463	KIDNEY & URINARY TRACT INFECTIONS	606	1.90%	7.60%	836	1.88%	11.11%
201	CARDIAC ARRHYTHMIA & CONDUCTION DISORDERS	604	1.90%	6.93%	830	1.87%	9.95%
173	OTHER VASCULAR PROCEDURES	489	1.53%	10.38%	752	1.69%	16.61%
198	ANGINA PECTORIS & CORONARY ATHEROSCLEROSIS	542	1.70%	5.93%	752	1.69%	8.68%
751	MAJOR DEPRESSIVE DISORDERS & OTHER/UNSPECIFIED PSYCHOSES	512	1.61%	6.87%	732	1.65%	10.29%
383	CELLULITIS & OTHER BACTERIAL SKIN INFECTIONS	505	1.58%	4.73%	724	1.63%	7.01%
221	MAJOR SMALL & LARGE BOWEL PROCEDURES	529	1.66%	10.36%	718	1.62%	14.14%
750	SCHIZOPHRENIA	506	1.59%	9.16%	709	1.60%	13.85%

Top 15 represents 35% of all initial admissions followed by PPRs

PPR Rates by APR DRG and SOI

APR DRG		APR DRG	APR DRG	APR DRG	APR DRG
		SOI 1	SOI 2	SOI 3	SOI 4
		15 Day Window PPR Rate			
194	HEART FAILURE	6.02%	10.32%	13.45%	13.58%
140	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	5.40%	8.52%	11.78%	15.30%
720	SEPTICEMIA & DISSEMINATED INFECTIONS	3.17%	5.74%	8.92%	13.37%
139	OTHER PNEUMONIA	2.30%	4.05%	8.70%	12.75%
175	PERCUTANEOUS CARDIOVASCULAR PROCEDURES W/O AMI	6.03%	7.72%	11.72%	19.48%
753	BIPOlar DISORDERS	5.17%	7.26%	9.15%	6.19%
460	RENAL FAILURE	3.33%	7.97%	9.30%	14.41%
463	KIDNEY & URINARY TRACT INFECTIONS	2.65%	5.98%	9.21%	12.98%
201	CARDIAC ARRHYTHMIA & CONDUCTION DISORDERS	2.97%	6.01%	9.51%	13.94%
173	OTHER VASCULAR PROCEDURES	6.42%	9.66%	12.20%	16.19%
198	ANGINA PECTORIS & CORONARY ATHEROSCLEROSIS	3.12%	5.71%	9.13%	14.62%
751	MAJOR DEPRESSIVE DISORDERS & OTHER/UNSPECIFIED PSYCHOSES	4.38%	6.37%	8.87%	7.55%
383	CELLULITIS & OTHER BACTERIAL SKIN INFECTIONS	2.10%	4.33%	7.86%	14.73%
221	MAJOR SMALL & LARGE BOWEL PROCEDURES	7.10%	9.47%	10.33%	17.06%
750	SCHIZOPHRENIA	7.36%	8.76%	10.99%	15.63%