

STATE OF MARYLAND
DEPARTMENT OF HEALTH AND MENTAL HYGIENE

Frederick W. Puddester
Chairman

Kevin J. Sexton
Vice Chairman

Joseph R. Antos, Ph.D.

George H. Bone, M.D.

C. James Lowthers

Herbert S. Wong, Ph.D.



Robert Murray
Executive Director

Stephen Ports
Principal Deputy Director
Policy & Operations

Gerard J. Schmith
Deputy Director
Hospital Rate Setting

HEALTH SERVICES COST REVIEW COMMISSION

4160 PATTERSON AVENUE, BALTIMORE, MARYLAND 21215

Phone: 410-764-2605 · Fax: 410-358-6217

Toll Free: 1-888-287-3229

www.hscrc.state.md.us

To: HSCRC Commissioners

From: Şule Çalikoğlu, Ph.D.

Re: Maryland Hospital Acquired Conditions (MHAC) Trends and Data Analysis for FY2010 and FY2009

Date: January 26, 2011

This memo summarizes the findings from Maryland Hospital Acquired Conditions (MHAC) initiative using potentially preventable complications (PPCs) rates in FY 2010.

- Complications that are included in our initiative cost \$521.3 million in FY 2010 (Table 1). PPC24 Renal Failure without Dialysis has the highest additional cost with \$42.1 million in FY 2010, followed by PPC4 Acute Pulmonary Edema and Respiratory Failure with Ventilation (\$39.0 million) and PPC35 Septicemia & Severe Infections (\$37.6 million).
- In the second year of the commission's complication based pay-for-performance initiative, the State witnessed about an 11.9% drop in the frequency of hospital acquired complications (after adjusting for difference in patient mix from year to year). The staff estimates this improvement means that hospitals responded to the Commission's system of quality incentives and removed approximately \$62.5 million of cost associated with preventable complications (Table 2).
- Infection related complication rates declined by 19.06% resulting in \$34.3 million savings. All infection related complications (a total of 11 PPCs) improved with declines ranging from 27.7% to 5.8% (Table 3).

TABLE 1: TOTAL NUMBER OF COMPLICATIONS, COMPLICATION RATE PER 1,000 AT RISK AND TOTAL COST, MARYLAND FY2010

	PPC NAME	NUMBER OF COMPLICATIONS	COMPLICATION RATE	TOTAL COST
PPC1	Stroke & Intracranial Hemorrhage	884	1.54	\$10,729,669.38
PPC2	Extreme CNS Complications	298	0.57	\$4,085,683.97
PPC3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	3,882	7.36	\$20,722,618.81
PPC4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1,587	3.01	\$39,037,852.60
PPC5	Pneumonia & Other Lung Infections	2,523	5.57	\$38,266,395.41
PPC6	Aspiration Pneumonia	1,522	2.75	\$16,967,923.43
PPC7	Pulmonary Embolism	554	0.96	\$7,038,010.12
PPC8	Other Pulmonary Complications	1,451	4.14	\$12,874,691.76
PPC9	Shock	2,020	3.57	\$36,953,874.36
PPC10	Congestive Heart Failure	1,618	3.25	\$5,180,304.66
PPC11	Acute Myocardial Infarction	1,471	2.6	\$7,219,979.07
PPC12	Cardiac Arrhythmias & Conduction Disturbances	809	285.87	\$1,693,426.99
PPC13	Other Cardiac Complications	232	0.45	\$446,433.45
PPC14	Ventricular Fibrillation/Cardiac Arrest	1,633	2.78	\$26,938,526.11
PPC15	Peripheral Vascular Complications Except Venous Thrombosis	233	0.4	\$2,411,763.47
PPC16	Venous Thrombosis	1,166	2.02	\$14,988,107.53
PPC17	Major Gastrointestinal Complications without Transfusion or Significant Bleeding	651	1.17	\$8,168,648.47
PPC18	Major Gastrointestinal Complications with Transfusion or Significant Bleeding	277	0.5	\$2,156,056.66
PPC19	Major Liver Complications	323	0.56	\$3,787,739.88
PPC20	Other Gastrointestinal Complications without Transfusion or Significant Bleeding	300	0.54	\$4,590,166.77
PPC22	Urinary Tract Infection	4,381	7.97	\$36,767,520.73
PPC23	GU Complications Except UTI	369	0.64	\$1,419,071.81
PPC24	Renal Failure without Dialysis	5,601	11.02	\$42,151,613.92
PPC25	Renal Failure with Dialysis	114	0.22	\$3,649,654.15
PPC26	Diabetic Ketoacidosis & Coma	53	0.09	\$556,527.47
PPC27	Post-Hemorrhagic & Other Acute Anemia with Transfusion	1,208	2.64	\$5,832,236.94
PPC28	In-Hospital Trauma and Fractures	139	0.24	\$1,531,415.74
PPC31	Decubitus Ulcer	849	1.38	\$15,303,944.47
PPC33	Cellulitis	757	1.5	\$3,485,093.57
PPC34	Moderate Infectious	431	0.92	\$6,534,889.10
PPC35	Septicemia & Severe Infections	2,198	3.93	\$37,681,317.77
PPC36	Acute Mental Health Changes	44	0.12	\$212,043.32
PPC37	Post-Operative Infection & Deep Wound Disruption Without Procedure	709	4.44	\$11,195,883.69
PPC38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure	80	0.48	\$1,690,357.91
PPC39	Reopening Surgical Site	186	1.17	\$4,437,511.37
PPC40	Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure	2,680	12.87	\$16,783,814.59
PPC41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or	208	1.23	\$2,441,072.63
PPC42	Accidental Puncture/Laceration During Invasive Procedure	1,269	6.24	\$5,521,553.03
PPC43	Accidental Cut or Hemorrhage During Other Medical Care	98	0.17	\$839,395.00
PPC44	Other Surgical Complication - Moderate	310	1.92	\$3,469,679.34
PPC47	Encephalopathy	544	1.21	\$5,583,484.92
PPC48	Other Complications of Medical Care	583	0.99	\$11,177,133.77
PPC49	Iatrogenic Pneumothrax	306	0.55	\$1,911,214.79
PPC50	Mechanical Complication of Device, Implant & Graft	442	0.77	\$6,701,482.57
PPC51	Gastrointestinal Ostomy Complications	228	0.39	\$5,919,170.19
PPC52	Inflammation & Other Complications of Devices, Implants or Grafts Except Vascular	948	1.65	\$8,697,176.50
PPC53	Infection, Inflammation & Clotting Complications of Peripheral Vascular Catheters &	314	0.54	\$4,455,522.06
PPC54	Infections due to Central Venous Catheters	343	0.55	\$10,140,545.17
PPC56	Obstetrical Hemorrhage with Transfusion	455	6.8	\$977,952.88
PPC21	Clostridium Difficile Colitis	1,101	1.88	\$18,229,213.72
PPC29	Poisonings Except from Anesthesia	144	0.25	\$163,143.28
PPC30	Poisonings due to Anesthesia	1	0	\$1,534.92
PPC32	Transfusion Incompatibility Reaction	2	0	\$3,457.83
PPC45	Post-procedure Foreign Bodies	34	0.04	\$68,323.67
PPC46	Post-Operative Substance Reaction & Non-O.R. Procedure for Foreign Body	2	0	\$4,694.73
PPC55	Obstetrical Hemorrhage without Transfusion	5,457	81.58	\$1,646,230.13
PPC57	Obstetric Lacerations & Other Trauma Without Instrumentation	1,204	19.19	\$503,003.77
PPC58	Obstetric Lacerations & Other Trauma With Instrumentation	480	113.39	\$286,903.55
PPC59	Medical & Anesthesia Obstetric Complications	869	12.78	\$547,589.60
PPC60	Major Puerperal Infection and Other Major Obstetric Complications	285	4.19	\$42,040.88
PPC61	Other Complications of Obstetrical Surgical & Perineal Wounds	179	2.63	\$-36,248.41
PPC62	Delivery with Placental Complications	244	3.59	\$149,739.33
PPC63	Post-Operative Respiratory Failure with Tracheostomy	97	0.67	\$12,158,873.50
PPC64	Other In-Hospital Adverse Events	601	1.02	\$1,517,055.62

Shaded PPCs are excluded from MHAC initiative.

TABLE 2: STATE-WIDE CHANGES BETWEEN FY2010 AND FY2009

	PPC NUMBER/NAME	OBSERVED NUMBER OF PPCs	PPC CHANGES COMPARED TO FY 2009	COST CHANGES COMPARED TO FY 2009	PERCENT SAVINGS/ EXCESS COST	PERCENT PPC RATE CHANGE
TOTAL		49281	-6691	-\$62,563,191	-10.71%	-11.95% ***
PPC53	Infection, Inflammation & Clotting Complications of Peripheral Vascular Catheters & Infusions	314	-121	-\$1,650,759	-27.03%	-27.74% ***
PPC13	Other Cardiac Complications	232	-84	-\$162,159	-26.64%	-26.61% **
PPC31	Decubitus Ulcer	849	-284	-\$5,166,710	-25.24%	-25.06% ***
PPC22	Urinary Tract Infection	4381	-1653	-\$12,295,803	-25.06%	-27.40% ***
PPC17	Major Gastrointestinal Complications without Transfusion or Significant Bleeding	651	-203	-\$2,535,683	-23.69%	-23.79% ***
PPC36	Acute Mental Health Changes	44	-14	-\$63,159	-22.95%	-23.57% NA
PPC35	Septicemia & Severe Infections	2198	-583	-\$9,273,119	-19.75%	-20.97% ***
PPC15	Peripheral Vascular Complications Except Venous Thrombosis	233	-61	-\$545,674	-18.45%	-20.79%
PPC44	Other Surgical Complication - Moderate	310	-70	-\$760,709	-17.98%	-18.44% ***
PPC10	Congestive Heart Failure	1618	-294	-\$1,093,374	-17.43%	-15.40% ***
PPC16	Venous Thrombosis	1166	-285	-\$3,151,315	-17.37%	-19.63% ***
PPC33	Cellulitis	757	-175	-\$729,917	-17.32%	-18.82% ***
PPC54	Infections due to Central Venous Catheters	343	-91	-\$1,985,669	-16.38%	-20.97% ***
PPC47	Encephalopathy	544	-73	-\$1,051,906	-15.85%	-11.78% **
PPC11	Acute Myocardial Infarction	1471	-253	-\$1,318,983	-15.45%	-14.67% ***
PPC42	Accidental Puncture/Laceration During Invasive Procedure	1269	-246	-\$1,006,848	-15.42%	-16.22% ***
PPC14	Ventricular Fibrillation/Cardiac Arrest	1633	-265	-\$4,392,102	-14.02%	-13.96% ***
PPC48	Other Complications of Medical Care	583	-87	-\$1,747,664	-13.52%	-12.98%
PPC5	Pneumonia & Other Lung Infections	2523	-364	-\$5,379,818	-12.33%	-12.62% ***
PPC52	Inflammation & Other Complications of Devices, Implants or Grafts Except Vascular Infection	948	-129	-\$1,153,046	-11.71%	-12.00% ***
PPC2	Extreme CNS Complications	298	-35	-\$529,091	-11.47%	-10.53%
PPC7	Pulmonary Embolism	554	-92	-\$823,321	-10.47%	-14.20% ***
PPC40	Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure or I&D Proc	2680	-341	-\$1,798,910	-9.68%	-11.30% ***
PPC28	In-Hospital Trauma and Fractures	139	-13	-\$158,064	-9.36%	-8.67%
PPC23	GU Complications Except UTI	369	-45	-\$129,425	-8.36%	-10.96% *
PPC3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	3882	-215	-\$1,866,704	-8.26%	-5.25% **
PPC34	Moderate Infectious	431	-69	-\$546,921	-7.72%	-13.73% **
PPC8	Other Pulmonary Complications	1451	-160	-\$1,049,302	-7.54%	-9.93%
PPC6	Aspiration Pneumonia	1522	-110	-\$1,229,773	-6.76%	-6.74% ***
PPC50	Mechanical Complication of Device, Implant & Graft	442	-19	-\$234,328	-3.38%	-4.03%
PPC12	Cardiac Arrhythmias & Conduction Disturbances	809	-33	-\$58,262	-3.33%	-3.97%
PPC19	Major Liver Complications	323	-18	-\$126,074	-3.22%	-5.37%
PPC24	Renal Failure without Dialysis	5601	-214	-\$1,258,499	-2.90%	-3.68% **
PPC51	Gastrointestinal Ostomy Complications	228	-13	-\$114,367	-1.90%	-5.40% *
PPC27	Post-Hemorrhagic & Other Acute Anemia with Transfusion	1208	-26	-\$106,506	-1.79%	-2.12%
PPC1	Stroke & Intracranial Hemorrhage	884	-13	-\$124,993	-1.15%	-1.47% *

PPC37	Post-Operative Infection & Deep Wound Disruption Without Procedure	709	-44	-\$90,186	-0.80%	-5.88%
PPC38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure	80	-6	\$2,111	0.13%	-6.46%
PPC4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1587	-54	\$80,446	0.21%	-3.27%
PPC9	Shock	2020	24	\$444,162	1.22%	1.21%
PPC41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	208	1	\$87,894	3.74%	0.71%
PPC20	Other Gastrointestinal Complications without Transfusion or Significant Bleeding	300	6	\$205,311	4.68%	2.00%
PPC25	Renal Failure with Dialysis	114	-4	\$210,896	6.13%	-3.16% *
PPC18	Major Gastrointestinal Complications with Transfusion or Significant Bleeding	277	18	\$150,385	7.50%	6.88%
PPC26	Diabetic Ketoacidosis & Coma	53	2	\$40,115	7.77%	3.69% NA
PPC56	Obstetrical Hemorrhage with Transfusion	455	20	\$71,263	7.86%	4.68%
PPC43	Accidental Cut or Hemorrhage During Other Medical Care	98	6	\$62,167	8.00%	6.03% ***
PPC49	Iatrogenic Pneumothrax	306	32	\$239,423	14.32%	11.69%
PPC39	Reopening Surgical Site	186	59	\$1,551,777	53.77%	46.51%

* p<.05

** p<.005

***p<.001

NA statistical test could not be performed.

TABLE 3 : STATE-WIDE CHANGES BETWEEN FY2010 AND FY2009 FOR INFECTION PPCs

PPC NUMBER/NAME		OBSERVED NUMBER OF PPCs	PPC CHANGES COMPARED TO FY 2009	SAVINGS/ EXCESS COST	PERCENT SAVINGS/ EXCESS COST	PERCENT PPC RATE CHANGE
TOTAL		14206	-3346	-\$34,332,900	-16.33%	-19.06% ***
PPC53	Infection, Inflammation & Clotting Complications of Peripheral Vascular Catheters & Infusions	314	-121	-\$1,650,759	-27.03%	-27.74% ***
PPC22	Urinary Tract Infection	4381	-1653	-\$12,295,803	-25.06%	-27.40% ***
PPC35	Septicemia & Severe Infections	2198	-583	-\$9,273,119	-19.75%	-20.97% ***
PPC33	Cellulitis	757	-175	-\$729,917	-17.32%	-18.82% ***
PPC54	Infections due to Central Venous Catheters	343	-91	-\$1,985,669	-16.38%	-20.97% ***
PPC5	Pneumonia & Other Lung Infections	2523	-364	-\$5,379,818	-12.33%	-12.62% ***
PPC52	Inflammation & Other Complications of Devices, Implants or Grafts Except Vascular Infection	948	-129	-\$1,153,046	-11.71%	-12.00% ***
PPC34	Moderate Infectious	431	-69	-\$546,921	-7.72%	-13.73% **
PPC6	Aspiration Pneumonia	1522	-110	-\$1,229,773	-6.76%	-6.74% ***
PPC37	Post-Operative Infection & Deep Wound Disruption Without Procedure	709	-44	-\$90,186	-0.80%	-5.88%
PPC38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure	80	-6	\$2,111	0.13%	-6.46%

* p<.05

** p<.005

***p<.001