

V.14.2 Special Report: Postpartum Hemorrhage

I. Introduction

This special report is an update of the V10.4 special report by NPIC/QAS on the topic, provided in July 2011. Obstetric complications, including hemorrhage, contribute to a significant number of maternal deaths. Postpartum hemorrhage (PPH) is the most common cause of obstetric hemorrhage and accounts for 30% of all maternal deaths (Kahn et. al., 2006¹). While most of the deaths occur in developing countries, a review of trends in postpartum hemorrhage in selected developed countries by the International Postpartum Hemorrhage Collaborative Group revealed an increase in PPH in Australia, Canada, the UK, and the USA with increasing rates of severe adverse outcomes (Knight et. al., 2009²). In a 2010 study by Callaghan, Kuklina and Berg, a 26% increase in PPH was found in the United States between 1994 and 2006³. Another recent study of PPH in a large nationwide sample of deliveries found a 27.5% increase between 1995 and 2004⁴. In January 2010, The Joint Commission put out a sentinel event alert identifying leading causes and prevention of maternal death⁵. Hemorrhage was among the leading causes.

II. Protocols/Practice Bundles to Address Obstetrical Hemorrhage

The Joint Commission suggested actions that included educating health care providers about risk identification, along with identifying triggers for responding to changes in the woman's vital signs and clinical condition. The need to develop and use protocols and drills to respond to changing conditions such as hemorrhage was clearly a part of the suggested actions. Over the past few years, several professional groups have come together to form the National Partnership for Maternal Safety. Part of the group's priority is to establish a practice bundle to address obstetrical hemorrhage⁶.

In 2009 the California Maternal Quality Care Collaborative (CMQCC) surveyed California maternity services and found several centers lacking in updated treatment measures and updated obstetrical hemorrhage protocols⁷. In response, the CMQCC and the Hemorrhage Task Force developed the toolkit "Improving Health Care Responses to Obstetric Hemorrhage"⁸. The toolkit includes a series of articles related to obstetric hemorrhage, guidelines including summaries of best practices with checklists and flow charts, and appendices with sample policies, procedures, risk assessment and QI tools. This Task Force (CMQCC) recommends four objectives for hospital level implementation of PPH best practices and guidelines⁹: readiness, recognition, response and reporting.

III. Defining Postpartum Hemorrhage

Postpartum hemorrhage has been defined in the US as vaginal bleeding in excess of 500 mL after vaginal delivery and in excess of 1000 mL after cesarean delivery (Knight, 2010¹⁰). In August 2012 the American Congress of Obstetrics and Gynecology (ACOG), with additional support from the March of Dimes, the Society for Maternal Fetal Medicine, and the United Health

Foundation, brought together over 80 national leaders in women's health care for the reVITALize Obstetric Definitions Conference¹¹. The Conference was chaired by Elliott K. Main, MD, FACOG and M. Kathryn Menard, MD, MPH, FACOG. After review and public comment, 44 definitions were confirmed and published in the July, 2014 Green Journal¹² including the definition of "early postpartum hemorrhage of cumulative blood loss of ≥ 1000 ml or blood loss accompanied by sign/symptoms of hypovolemia within 24 hours following the birth process (includes intrapartum loss)". As clinicians adopt and document this new definition, coded data will continue to lag behind and overestimate PPH, especially for women delivered vaginally.

Regardless of the definition of PPH, the accuracy in estimating blood loss continues to be discussed frequently and is often seen as underestimated by obstetricians (Maslovitz et. al.,¹³). Rath¹⁴ discussed problems with definition and diagnosis of PPH due to poor estimation of blood loss, poor correlation with Hct drop and variations in transfusion protocols. Maslovitz et. al.,¹⁵ conducted a prospective study using simulation to improve accuracy of postpartum blood loss estimates. The study suggested that during care of a hemorrhaging patient, estimating blood loss at periodic intervals may improve accuracy. (The CMQCC toolkit includes an appendix on quantitative measurement of blood loss¹⁶.)

IV. Risk Factors Associated with Obstetrical Hemorrhage

Ongoing monitoring of hemorrhage risk/incidence is essential given the cesarean section rates, increased maternal age for pregnancy, and multiple pregnancies associated with assisted reproductive technologies. The most common cause of PPH is uterine atony. Additional causes of hemorrhage in the postpartum period include abnormal placentation, birth trauma, uterine rupture, retained placental tissue and coagulation abnormalities (Burtelow et. al.,¹⁷). It is important to note that increased Body Mass Index (BMI) has been linked as a risk factor for hemorrhage (Robinson et.al.,¹⁸). Given the rising obesity rates in the US population, this risk may likely increase. Labor induction may increase overall labor time and possibly increase the potential for PPH (Knight et. al.,¹⁹).

CMQCC has developed a risk factor evaluation with medium risk factors for obstetrical hemorrhage including prior Cesarean births or uterine surgery, multiple gestation, >4 previous vaginal births, chorioamnionitis, history of PPH and large uterine fibroids. High risk factors include placenta previa, suspected placenta accreta or percreta, hematocrit < 30 , platelets $< 100,000$, active bleeding on admit and known coagulopathy²⁰).

Risk assessment and effective, efficient management of PPH can help to improve cost containment for health care organizations. James et. al.,²¹ found a diagnosis of anemia in hospitalized women with obstetrical bleeding was associated with a 9-fold increase in blood transfusions, longer length of stay and a 50% higher average total cost per hospital day. The need to monitor postpartum hemorrhage is essential in order to identify trends in occurrence and risk factors and determine effectiveness of treatment. Adequate management of hemorrhage during childbearing will improve outcomes in maternal mortality and morbidity.

V. Description of Tables and Graphs

The tables and graphs in this special report provide clinical data for postpartum hemorrhage. Data for your hospital is provided as well as data for your NPIC/QAS subgroup and the NPIC/QAS database average. *The report includes data for discharge date range 7/1/13 – 6/30/14.*

The details concerning the codes used for each variable are provided in the glossary at the end of this report. Medical record numbers for the cases contributing to your hospital's rates are available by emailing mervices@npic.org. We are also happy to answer any questions you may have regarding this report.

Table 1: Postpartum Hemorrhage Risk Profile

Section A: Overview displays total deliveries; the case mix index for your hospital (for total deliveries); and the count of numerator/denominator postpartum hemorrhage cases and rates with upper and lower confidence intervals for total deliveries with hemorrhage codes on the NPIC/QAS data submission. Data are provided for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database.

Section B: Risk Profile – All Deliveries divides cases into the CMQCC high risk and medium risk factors (noted in the text); other risk factors are also provided for all deliveries. *Risk factors are not mutually exclusive.* The count of numerator/denominator cases in each risk category is provided and rates with upper and lower confidence intervals, for total deliveries. Data are provided for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database.

Section C: Risk Profile – Cases Coded with Postpartum Hemorrhage divides cases into the CMQCC high risk and medium risk factors (noted in the text); other risk factors are also provided for the subset of deliveries coded with a postpartum hemorrhage. *Risk factors are not mutually exclusive.* The count of numerator/denominator cases in each risk category is provided and rates with upper and lower confidence intervals, for total deliveries. Data are provided for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database.

Table 2: Deliveries Coded with Postpartum Hemorrhage by Type of Hemorrhage

Section A: Overview displays total deliveries with coded postpartum hemorrhage and the count of numerator/denominator postpartum hemorrhage cases and rates with upper and lower confidence intervals for total deliveries with hemorrhage codes on the NPIC/QAS data submission. The case mix index for your hospital (for deliveries with postpartum hemorrhage) is also displayed. Data are provided for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database.

Section B: Postpartum Hemorrhage displays by type of hemorrhage code the count of numerator/denominator cases and rates with upper and lower confidence intervals for total deliveries with hemorrhage codes on the NPIC/QAS data submission. Total postpartum

hemorrhage codes is provided at the bottom of the table. Data are provided for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database.

Table 3: Coded Postpartum Hemorrhage Transfusion Analysis

This Table displays blood transfusions for deliveries with postpartum hemorrhage by type of transfusion. *Please note, NPIC/QAS identifies patients with blood transfusions by the presence of procedure code (99.0x), transfusion of blood and blood components, on the data submission file. It is our understanding that use of the transfusion codes is considered “optional” and therefore not all hospitals use the transfusion codes. For hospitals that choose not to code blood transfusions, the NPIC/QAS data submission format contains a “Blood Transfusion Indicator” field that can be used to flag patients with transfusions; transfusion data can also be submitted on a supplemental file.*

In each hemorrhage category the table displays the count of numerator/denominator cases and rates with upper and lower confidence intervals for the following types of coded transfusion: (99.03) other transfusion of whole blood, (99.04) transfusion of packed cells, (99.05) transfusion of platelets, (99.07) transfusion of other serum, and “**all other transfusion codes**” (see codes provided below the Table). A separate row displays cases *only* identified by the transfusion indicator flag. Data are provided for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database.

The table also displays total transfusion codes and total cases transfused - the count of numerator/denominator cases and rates with upper and lower confidence intervals for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database.

Table 4: Maternal Outcomes/Complications for Deliveries with Postpartum Hemorrhage and Blood Transfusion

Section A: Overview displays for cases with postpartum hemorrhage and blood transfusion the count of numerator/denominator cases and rates with upper and lower confidence intervals. The case mix index for your hospital (for deliveries with coded postpartum hemorrhage and transfusion) is also displayed. Data are provided for your hospital, your NPIC/QAS subgroup, and for the NPIC/QAS database. Total vaginal deliveries and total C-section deliveries data is also provided.

Section B: Selected Complications provides delivery complications data including the count of numerator/denominator cases and rates with upper and lower confidence intervals for your hospital compared to your subgroup average and the database average. The outcomes/complications are ranked by database average in descending order. Total selected complications and total cases with selected complications data is provided at the bottom of the table, *which includes all complications except anemia.*

Graph 1: Postpartum Hemorrhage Rate

This Graph displays the rate of postpartum hemorrhage as a percent of total deliveries for your hospital and the hospitals in your subgroup. The graphs also display the upper and lower confidence intervals for each hospital, the subgroup average, database average and the database top decile average.

Graph 2: Postpartum Hemorrhage Trend: 2009-2013 and Q1&2, 2014

Graph 2 displays your hospital's postpartum hemorrhage rates for **2009-2013 and Q1&2, 2014** compared to the NPIC/QAS Trend Database, a subgroup of 59 member hospitals that have participated in the NPIC/QAS database for the same 5 year period. Below each graph is a table that includes: all the data displayed for the trend analysis period; the trend database average; the hospital rate with upper and lower confidence intervals and the hospital's count of the numerator and denominator cases for each year. The graphs also display the percent change in the rate for your hospital and the trend database average rate for the trend period. The trendlines indicate whether there is a significant upward or downward trend in the rate, or if it is stable over time.

Questions regarding this analysis should be directed to Sandra Boyle, Director of Membership Services (sboyle@npic.org) or Janet Muri, President (jmuri@npic.org) at 401-274-0650.

REFERENCES

1. Khan, K.S., Wojdyla, D Say, L., Gulmezoglu, A.M. & Van Look, PFA. (2006) WHO analysis of causes of maternal death: a systematic review. *The Lancet*, 367, 1066-1074.
2. Knight, M., Callaghan, W., Berg, C., Alexander, S., Bouvier-Colle, M., Ford, J., Walker, J. (2009). Trends in postpartum hemorrhage in high resource countries: a review and recommendations from the International Postpartum Hemorrhage Collaborative Group. *BMC Pregnancy and Childbirth*, 9:55. Retrieved from <http://www.biomedcentral.com/1471-2393/9/55>
3. Callaghan, W.M., Kuklina, E.V., & Berg, C.J. (2010, April) Trends in postpartum hemorrhage: United States, 1994-2006. *American Journal of Obstetrics and Gynecology*, 202(4), 353 e1-6.
4. Bateman, B.T., Mitchell, F.B., Riley, L.E., & Leffert, L.R. (2010). The epidemiology of postpartum hemorrhage in a large, nationwide sample of deliveries. *Society for Obstetric Anesthesia and perinatology*, 110, 1368-1373.
5. The Joint Commission. (2010, January 26). Preventing Maternal Deaths. *Sentinel Event Alert*, 44. Retrieved from http://www.jointcommission.org/sentinel_event_alert_issue_44_preventing_maternal_death/
6. D'Alton, M., Main, E. Maynard, K& Levy, B. (2014, May). The National Partnership for Maternal Safety. *Obstetrics & Gynecology*, 123(5), 973-977.
7. Lyndon, A., Lagrew, D. Shields, L., Melsop, K., Bingham, B., & Main, E. (Eds). (2010, July). Improving Health Care Response to Obstetric Hemorrhage. *Maternal Quality Care*

Collaborative Toolkit to Transform Maternity Care. *California Department of Public Health; Maternal Child and Adolescent Health Division*. California: California Maternal Quality Care Collaborative (https://cmqcc.org/ob_hemorrhage)

8. Op cit, Lyndon et al.
9. Op cit, Lyndon et al.
10. Ibid, Knight.
11. <http://www.acog.org/reVitalize>
12. *Obstetrics & Gynecology*, July 2014, Volume 124, Issue 1, pages 150-153).
13. Maslovitz, S., Barkai, G. Lessing< J., Ziv, A. & Many, A. (2008). Improved accuracy of postpartum blood loss estimation as assessed by simulation. *Acta Obstetricia et Gynecologica*, 87, 929-934.
14. Rath, W. (2011). Postpartum hemorrhage-update on problems of definitions and diagnosis. *Acta Obstetricia et Gynecologica Scandinavica*, 90,421-428.
15. Op cit, Rath
16. Ibid, Lyndon et al.
17. Burtelow, M., Riley, E., Druzin, M. Fontaine, M., Viele, M. & Goodnough, L. (2007, September). How we treat: Management of life-threatening primary postpartum hemorrhage with a standardized massive transfusion protocol. *Transfusion*, 47, 1564-1572.
18. Robinson, H.E., O'Connell, C.M. Joseph, K.S. & McLeod, N.L. (2005). Maternal outcomes in pregnancies complicated by obesity. *Obstetrics & Gynecology*, 106 (6), 1357-1364.
19. Ibid, Knight et al.
20. Ibid, Lyndon et al
21. James, A, Patel, S., Watson, W., Zaidi, Q., Mangione, A. & Goss, T. (2008). An assessment of medical resource utilization and hospitalization cost associated with a diagnosis of anemia in women with obstetrical bleeding in the United States. *Journal of Women's Health*, 17(8), 1279-1284.

V14.2 Special Report: Postpartum Hemorrhage Analysis
Table 1: Postpartum Hemorrhage Risk Profile

NPIC ID: SAMPLE	Numerator	Denominator	Hospital	LCI	UCI	Subgroup Average	Database Average
A: Overview							
Total Deliveries			2,225			3,962	3,962
Case Mix Index (CMI) - Total Deliveries			0.4541			0.4437	0.4378
Total Deliveries with Coded Postpartum Hemorrhage	60	2,225	2.7%	2.1%	3.5%	4.5%	3.4%
B. Risk Profile - All Deliveries (not mutually exclusive)							
High Risk							
Placenta Previa (641.0x; 641.1x)	16	2,225	0.7%	0.4%	1.2%	0.9%	0.7%
Suspected placenta accreta or percreta; retained placenta (667.0x; 667.1x)	13	2,225	0.6%	0.3%	1.0%	0.9%	0.6%
Coagulation abnormalities (641.3x; 649.3x; 666.3x)	38	2,225	1.7%	1.2%	2.3%	2.9%	2.4%
<i>Subtotal High Risk</i>	67	2,225	3.0%			4.6%	3.7%
Medium Risk							
Prior Uterine Scar (654.2x)	417	2,225	18.7%	17.1%	20.4%	17.0%	18.0%
Multiple Gestation (651.xx; V27.2 - V27.7)	83	2,225	3.7%	3.0%	4.6%	2.9%	2.3%
Chorioamnionitis (658.4x)	25	2,225	1.1%	0.7%	1.7%	3.6%	2.6%
Uterine Fibroids (654.1x)	18	2,225	0.8%	0.5%	1.3%	1.7%	1.7%
<i>Subtotal Medium Risk</i>	543	2,225	24.4%			25.2%	24.6%
Other Risk Factors							
Induction - excludes Augmentation (73.01; 73.1; 73.4)	532	2,225	23.9%	22.2%	25.7%	24.3%	21.5%
Atony of Uterus (661.2x; 666.1x)	84	2,225	3.8%	3.0%	4.7%	5.6%	5.0%
Maternal age > 35	289	2,225	13.0%	11.6%	14.5%	15.4%	15.7%
Morbid Obesity (278.01)	56	2,225	2.5%	1.9%	3.3%	1.8%	2.1%
Inversion/tear of uterus (665.2)	0	2,225	0.0%	0.0%	0.1%	0.0%	0.0%
Premature separation of placenta - Abruptio Placenta (641.2x)	26	2,225	1.2%	0.8%	1.7%	1.6%	1.2%
<i>Subtotal Other Risk Factors</i>	987	2,225	44.4%			48.8%	45.5%
Total Risk Factors	1,597						
Total Cases with Risk Factors	1,219	2,225	54.8%	52.7%	56.9%	56.8%	54.8%

V14.2 Special Report: Postpartum Hemorrhage Analysis
Table 1: Postpartum Hemorrhage Risk Profile (continued)

NPIC ID: SAMPLE	Numerator	Denominator	Hospital	LCI	UCI	Subgroup Average	Database Average
A: Overview							
Total Deliveries			2,225			3,962	3,962
Case Mix Index (CMI) - Total Deliveries			0.4541			0.4437	0.4378
Total Deliveries with Coded Postpartum Hemorrhage	60	2,225	2.7%	2.1%	3.5%	4.5%	3.4%
C. Risk Profile - Cases coded with Postpartum Hemorrhage (not mutually exclusive)							
High Risk							
Placenta Previa (641.0x; 641.1x)	0	60	0.0%	0.0%	4.9%	2.5%	2.2%
Suspected placenta accreta or percreta; retained placenta (667.0x; 667.1x)	0	60	0.0%	0.0%	4.9%	0.4%	0.3%
Coagulation abnormalities (641.3x; 649.3x; 666.3x)	1	60	1.7%	0.0%	8.9%	5.0%	5.2%
<i>Subtotal High Risk</i>	<i>1</i>	<i>60</i>	<i>1.7%</i>			<i>7.8%</i>	<i>7.7%</i>
Medium Risk							
Prior Uterine Scar (654.2x)	4	60	6.7%	1.8%	16.2%	15.0%	14.1%
Multiple Gestation (651.xx; V27.2 - V27.7)	8	60	13.3%	5.9%	24.6%	6.8%	4.9%
Chorioamnionitis (658.4x)	0	60	0.0%	0.0%	4.9%	6.1%	5.2%
Uterine Fibroids (654.1x)	0	60	0.0%	0.0%	4.9%	1.8%	2.3%
<i>Subtotal Medium Risk</i>	<i>12</i>	<i>60</i>	<i>20.0%</i>			<i>29.7%</i>	<i>26.4%</i>
Other Risk Factors							
Induction - excludes Augmentation (73.01; 73.1; 73.4)	24	60	40.0%	27.6%	53.5%	30.8%	27.1%
Atony of Uterus (661.2x; 666.1x)	52	60	86.7%	75.4%	94.1%	84.3%	83.0%
Maternal age > 35	8	60	13.3%	5.9%	24.6%	16.4%	16.8%
Morbid Obesity (278.01)	1	60	1.7%	0.0%	8.9%	2.3%	2.1%
Inversion/tear of uterus (665.2)	0	60	0.0%	0.0%	4.9%	0.4%	0.3%
Premature separation of placenta - Abruption Placenta (641.2x)	0	60	0.0%	0.0%	4.9%	2.7%	2.0%
<i>Subtotal Other Risk Factors</i>	<i>85</i>	<i>60</i>	<i>141.7%</i>			<i>137.0%</i>	<i>131.2%</i>
Total Risk Factors	98						
Total Cases with Risk Factors	57	60	95.0%	86.1%	99.0%	97.0%	96.0%

V14.2 Special Report: Postpartum Hemorrhage Analysis
Table 2: Deliveries coded with Postpartum Hemorrhage by Type of Hemorrhage

NPIC ID: SAMPLE	Numerator	Denominator	Hospital	LCI	UCI	Subgroup Average	Database Average
A: Overview							
Total Deliveries with Coded Postpartum Hemorrhage	60	2,225	2.7%	2.1%	3.5%	4.5%	3.4%
Case Mix Index (CMI) - Deliveries with coded Postpartum Hemorrhage			0.6621			0.5405	0.5320
B: Postpartum Hemorrhage (diagnosis codes 666.0x - 666.2x or procedure code 39.98)							
666.0x - Third-stage hemorrhage (associated with retained, trapped or adherent placenta)	3	60	5.0%	1.0%	13.9%	9.8%	9.9%
666.1x - Other immediate postpartum hemorrhage (atony of uterus with hemorrhage; hemorrhage within 24 hours following delivery of placenta; postpartum atony with hemorrhage)	52	60	86.7%	75.4%	94.1%	84.1%	82.7%
666.2x - Delayed and secondary postpartum hemorrhage (after 24 hours following delivery; associated with retained portions of the placenta or membranes; postpartum hemorrhage specified as delayed or secondary; retained products of conception).	4	60	6.7%	1.8%	16.2%	7.5%	9.7%
39.98 - Control of hemorrhage NOS (angioplasty; control of post-op hemorrhage; venoplasty)	2	60	3.3%	0.4%	11.5%	0.9%	1.0%
Total Postpartum Hemorrhage Codes	61	60	101.7%			102.3%	103.3%

V14.2 Special Report: Postpartum Hemorrhage Analysis
Table 3: Coded Postpartum Hemorrhage Transfusion Analysis

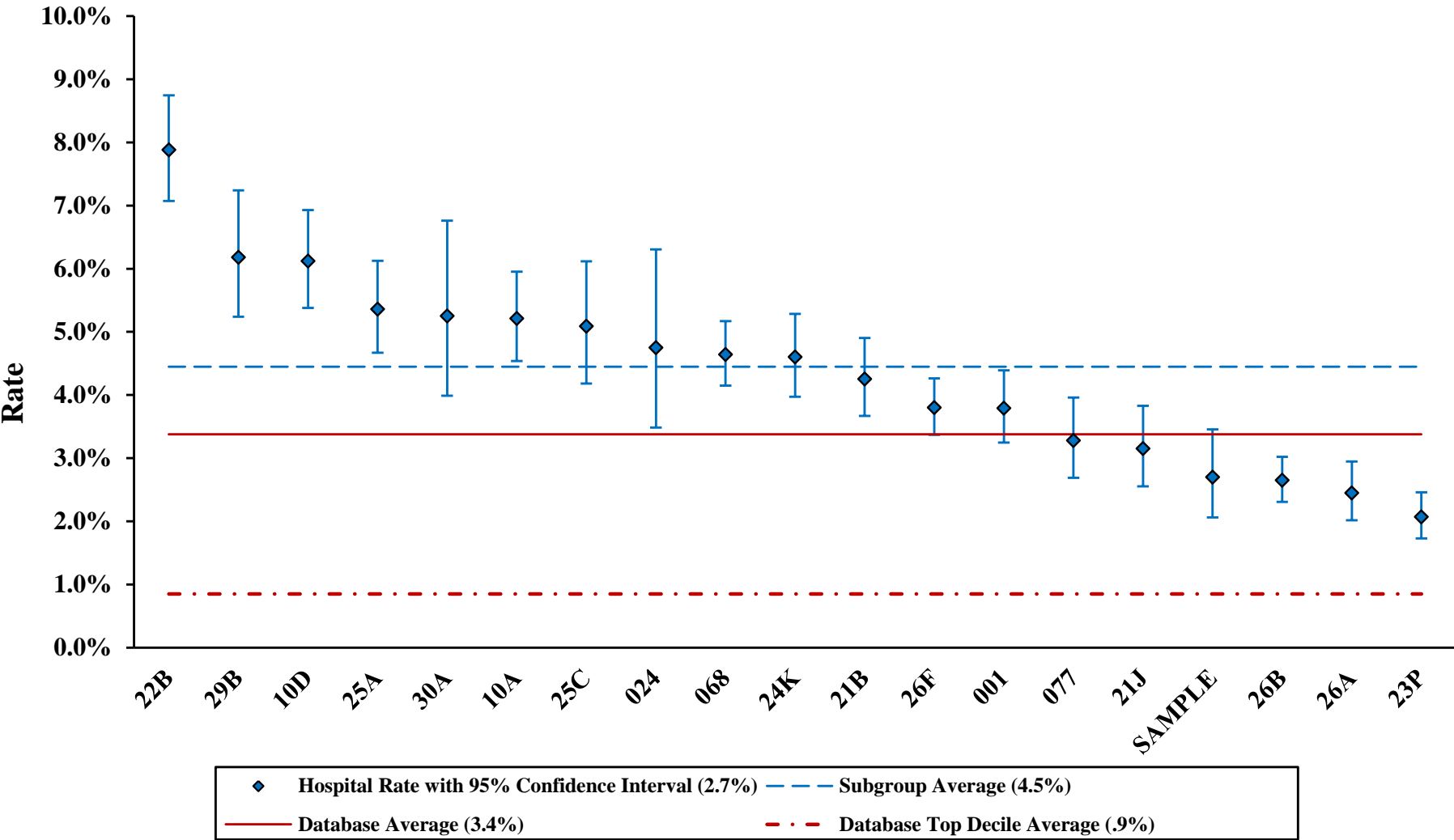
NPIC ID: SAMPLE	Numerator	Denominator	Hospital	LCI	UCI	Subgroup Average	Database Average
Postpartum Hemorrhage (666.0x-666.2x or procedure code 39.98)	60	2,225	2.7%	2.1%	3.5%	4.5%	3.4%
Transfusion analysis (percent of total postpartum hemorrhage cases)							
99.03 Other transfusion of whole blood	0	60	0.0%	0.0%	4.9%	0.2%	0.1%
99.04 Transfusion of packed cells	2	60	3.3%	0.4%	11.5%	17.5%	19.5%
99.05 Transfusion of platelets	0	60	0.0%	0.0%	4.9%	1.1%	1.5%
99.07 Transfusion of other serum	0	60	0.0%	0.0%	4.9%	1.9%	3.0%
All other Transfusion codes *	0	60	0.0%	0.0%	4.9%	0.1%	0.4%
Blood transfusion indicator only (excludes cases with blood transfusion codes)	11	60	18.3%	9.5%	30.4%	12.5%	2.1%
Total Transfusion Codes	2	60	3.3%	0.4%	11.5%	20.7%	24.6%
Total Cases Transfused (postpartum hemorrhage cases with transfusion codes or blood transfusion indicators on the data submission)	13	60	21.7%	12.1%	34.2%	18.6%	20.4%

- * 99.00 - Perioperative autologous transfusion of whole blood or blood components
99.01 - Exchange transfusion
99.02 - Transfusion of previous collected autologous blood
99.06 - Transfusion of coagulation factors
99.08 - Transfusion of blood expander
99.09 - Transfusion of other substance.

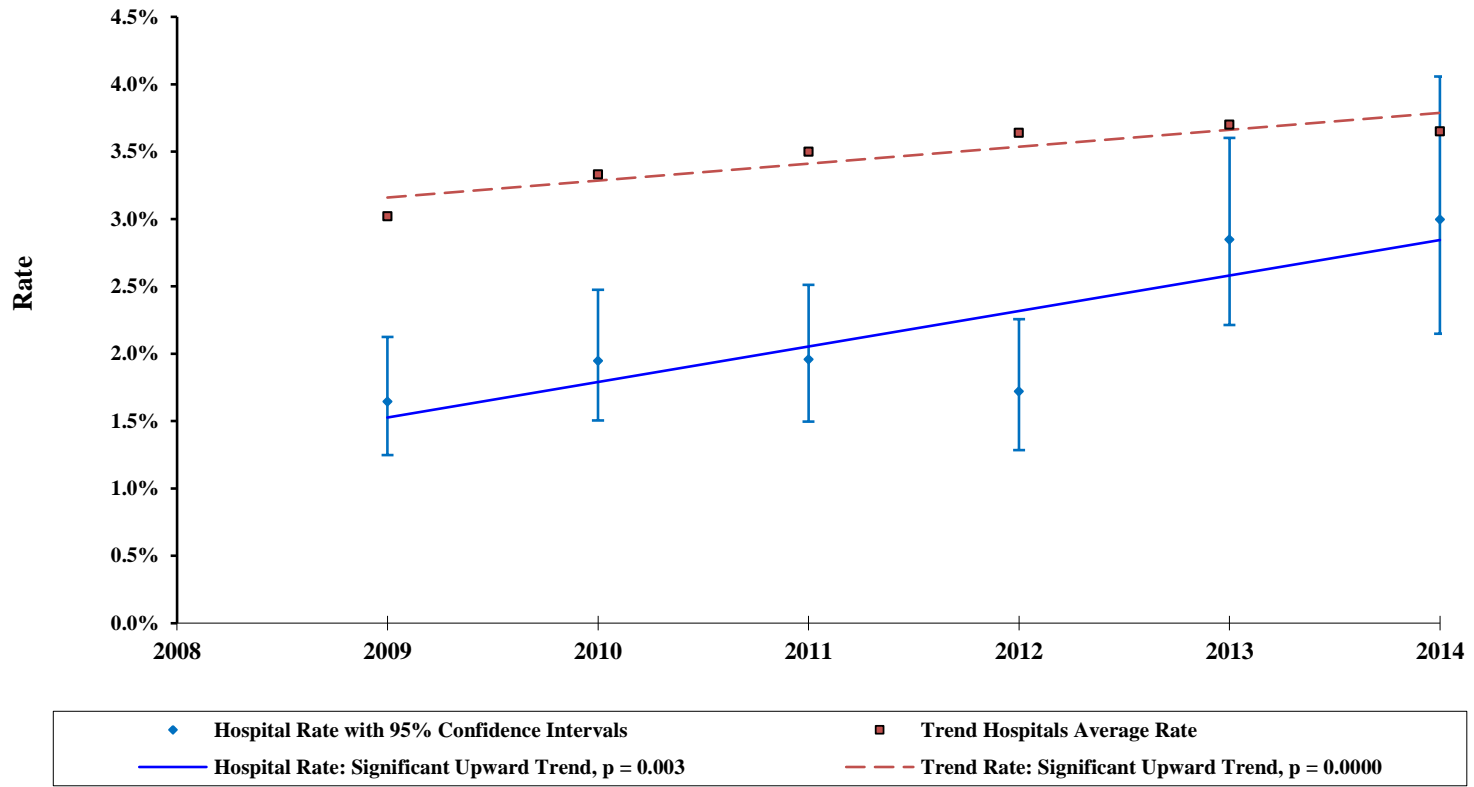
V14.2 Special Report: Postpartum Hemorrhage Analysis
Table 4: Maternal Outcomes/Complications in
Deliveries with Postpartum Hemorrhage and Blood Transfusion

NPIC ID: SAMPLE	Numerator	Denominator	Hospital	LCI	UCI	Subgroup Average	Database Average
A: Overview							
Postpartum Hemorrhage and Blood Transfusion	13	60	21.7%	12.1%	34.2%	18.6%	20.4%
Case Mix Index (CMI) - Deliveries with coded Hemorrhage and Transfusion			1.2315			0.7275	0.7245
Total Vaginal Deliveries			6			16	12
Total C-section Deliveries			7			14	12
B: Selected Complications (ranked by Database Average in descending order)							
Anemia (648.2x; 285.1x)	12	13	92.3%	64.0%	99.8%	68.4%	64.6%
Vaginal Deliveries with LOS > 3 days	2	13	15.4%	1.9%	45.4%	15.0%	18.2%
D & C (69.02)	0	13	0.0%	0.0%	20.6%	11.4%	15.0%
Admission to ICU	2	13	15.4%	1.9%	45.4%	14.1%	14.9%
Hysterectomy (68.3-7; 68.9)	1	13	7.7%	0.2%	36.0%	10.3%	10.1%
C-section Deliveries with LOS > 5 days	1	13	7.7%	0.2%	36.0%	12.2%	9.3%
Cervical wall laceration (665.3-665.4)	2	13	15.4%	1.9%	45.4%	5.0%	6.5%
Coagulopathy (666.3)	1	13	7.7%	0.2%	36.0%	5.3%	5.4%
3rd or 4th degree laceration (664.2-664.3)	0	13	0.0%	0.0%	20.6%	4.4%	3.5%
Discharged to home and readmitted within 42 days	0	13	0.0%	0.0%	20.6%	2.5%	2.9%
Respiratory failure (518.5; 518.82; 799.1)	1	13	7.7%	0.2%	36.0%	3.1%	2.9%
Discharge disposition other than home/home under home health/died	0	13	0.0%	0.0%	20.6%	2.1%	2.1%
Renal failure (669.3x)	1	13	7.7%	0.2%	36.0%	0.6%	1.4%
Uterine Rupture	0	13	0.0%	0.0%	20.6%	0.2%	0.8%
Sepsis (670.2x, 995.91, 995.92)	0	13	0.0%	0.0%	20.6%	0.5%	0.8%
Maternal mortality (during delivery admission)	0	13	0.0%	0.0%	20.6%	0.0%	0.1%
Mechanical ventilation > 4 days (96.72)	0	13	0.0%	0.0%	20.6%	0.0%	0.1%
Total selected complications (excluding Anemia)	11						
Total cases with selected complications (excluding Anemia)	5	13	38.5%	13.9%	68.4%	47.1%	52.9%

Graph 1: Postpartum Hemorrhage Rate
NPIC ID: SAMPLE



Graph 2: Postpartum Hemorrhage Trend: 2009-2014 (Q1-Q2)
NPIC ID: SAMPLE



	2009	2010	2011	2012	2013	2014 (Q1-Q2)
Trend Rate	3.0%	3.3%	3.5%	3.6%	3.7%	3.7%
Hospital Rate	1.6%	1.9%	2.0%	1.7%	2.8%	3.0%
Hospital Numerator	57	65	60	51	67	40
Hospital Denominator	3467	3339	3066	2964	2353	1335
Lower CI	1.2%	1.5%	1.5%	1.3%	2.2%	2.1%
Upper CI	2.1%	2.5%	2.5%	2.3%	3.6%	4.1%

GLOSSARY

A. Risk Profile

Placenta Previa

641.0x Placenta previa without hemorrhage: placenta implanted in lower segment of uterus; commonly causes hemorrhage in the last trimester of pregnancy.

641.1x Hemorrhage from placenta previa

Suspected placenta accreta or percreta, retained placenta

667.0x Retained placenta without hemorrhage

667.1x Retained portions of placenta or membranes, without hemorrhage: retained products of conception following delivery, without hemorrhage.

Coagulation Abnormalities

641.3x Antepartum hemorrhage associated with coagulation defects: uterine hemorrhage prior to delivery.

649.3x Coagulation defects complicating pregnancy, childbirth, or the puerperium.

Includes codes 286 Coagulation defects 287 Purpura and other hemorrhagic conditions 289 other diseases of blood and blood forming organs

666.3x Postpartum coagulation defects

Prior Uterine Scar

654.2x Previous cesarean delivery

Multiple Gestation

651. (0-9)x Multiple gestation

V27.2-V27.7 Outcome of delivery

Chorioamnionitis

658.4x Infection of amniotic cavity

Uterine Fibroids

654.1x Tumors of body of uterus: uterine fibroids

Induction (excludes augmentation)

73.01 Induction of labor by artificial rupture of membranes: surgical induction

73.1 Other surgical induction of labor: induction by cervical dilation

73.4 Medical induction of labor

Atony of Uterus

661.2x Other and unspecified uterine inertia: lack of efficient contractions during labor causing prolonged labor.

666.1x Other immediate postpartum hemorrhage: atony of uterus with hemorrhage.

Morbid obesity

278.01 Morbid obesity: severe obesity. BMI >40

Inversion/tear of uterus

665.2 Inversion of uterus

Premature separation of placenta (Abruptio placentae)

641.2x Premature separation of placenta: premature detachment of the placenta, characterized by shock, oliguria and decreased fibrinogen.

B. Selected Complications**Anemia**

648.2x Anemia: conditions classifiable to 285

285.1x Sideroblastic anemia: characterized by a disruption of final heme synthesis; results in iron overload of reticuloendothelial tissues.

D & C

69.02 Dilation and curettage following delivery or abortion.

Admission to the ICU

DX code 5th digit = 2 (delivered with mention of postpartum condition) on any DX code 640-677 and with an ICU day or charge.

OR DX code 5th digit = 2 (delivered with mention of postpartum condition) on any DX code 640-677 and discharged to another hospital (UB92/UB04 disp=02).

OR DX code 5th digit = 2 (delivered with mention of postpartum condition) on any DX code 640-677 and one of the following procedure codes: 96.04 (Insertion of endotracheal tube), 96.05 (Other intubation of respiratory tract), 96.06 (Insertion of Sengstaken tube), 96.7 (Other continuous invasive mechanical ventilation), 93.90 (Non-invasive mechanical ventilation), 93.91 (Intermittent positive pressure breathing, IPPB), or 93.93 (Nonmechanical methods of resuscitation).

Hysterectomy

68.3-7 Subtotal abdominal hysterectomy: a hysterectomy that spares the cervix and maintains the integrity of the pelvic floor; SEMM version of the supracervical hysterectomy, also called the classic infra fascial SEMM hysterectomy; the cardinal ligaments, or lateral cervical ligaments that merge with the pelvic diaphragm remain intact.

68.9 Other and unspecified hysterectomy

Cervical wall laceration

665.3x Laceration of cervix

665.4x High vaginal laceration: laceration of vaginal wall or sulcus without mention of perineal laceration.

Coagulopathy

666.3x Postpartum coagulation defects

3rd or 4th degree laceration

664.2x Third-degree perineal laceration: perineal laceration, rupture or tear (following episiotomy) involving anal sphincter, rectovaginal septum and sphincter

664.3x Fourth-degree perineal laceration: perineal laceration, rupture, or tear as classifiable to 664.2 and involving also anal mucosa or rectal mucosa.

Respiratory failure

518.5 Pulmonary insufficiency following trauma and surgery

518.81 Acute respiratory failure

518.82 Other pulmonary insufficiency, not elsewhere classified

799.1 Respiratory arrest

Renal Failure

669.3x Acute kidney failure following labor and delivery

Uterine Rupture

665.1 (rupture of uterus during labor) in the primary, first or second diagnosis code positions only.

Sepsis

670.2x Puerperal sepsis: use additional codes 995.92

995.91 Sepsis: systematic inflammatory response syndrome due to infectious process without acute organ dysfunction

995.92 Severe sepsis: sepsis with acute organ dysfunction, sepsis with multiple organ dysfunction, systemic inflammatory response syndrome due to infectious process with acute organ dysfunction

Mechanical Ventilation > 4 days

96.72 Continuous invasive mechanical ventilation for 96 consecutive hours or more