

Treating Maternal Hypertension

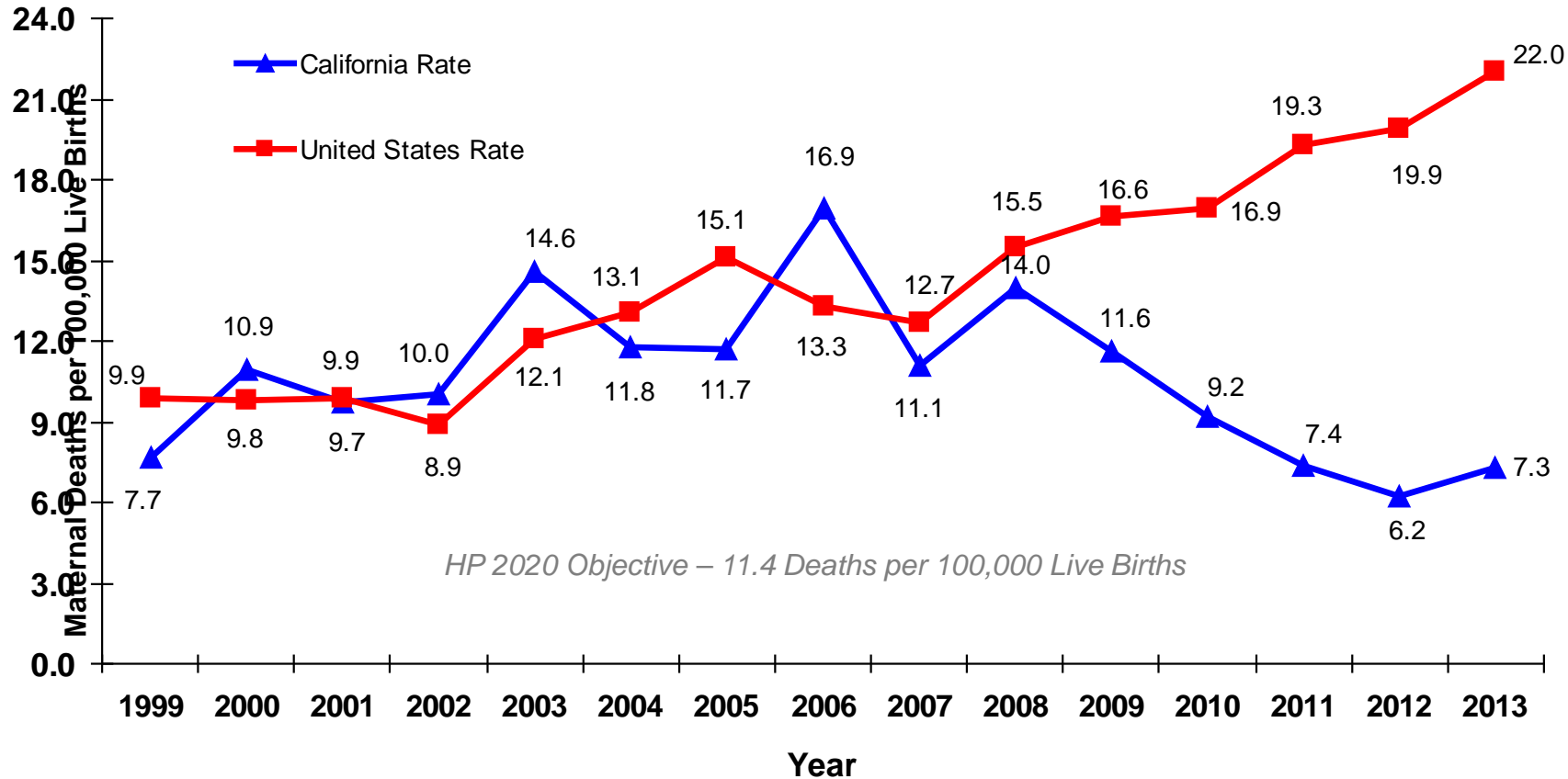
James N. Martin, Jr., MD; Laurence E. Shields, MD; Maurice L. Druzin, MD

Alliance for Innovation in Maternal Health (AIM)

February 2017



Maternal Mortality Rate California and United States 1999-2013



SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2013. Maternal mortality for California (deaths \leq 42 days postpartum) was calculated using ICD-10 cause of death classification (codes A34, O00-O95, O98-O99). United States data and HP2020 Objective use the same codes. U.S. maternal mortality data is published by the National Center for Health Statistics (NCHS) through 2007 only. U.S. maternal mortality rates from 2008 through 2013 were calculated using CDC Wonder Online Database, accessed at <http://wonder.cdc.gov> March 11, 2015. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, March 2015.

Cause of U.S. Maternal Mortality

- CDC Review of 14 years of coded data: 1979-1992
- 4024 maternal deaths
- 790 (19.6%) from preeclampsia

Table 2. Specific Causes of Death Among Women Who Died of Preeclampsia or Eclampsia

Cause of death	Percent of deaths		
	Preeclampsia	Eclampsia	Total
Cerebrovascular events	17.3	21.4	38.7
Cerebrovascular hemorrhage	15.8	18.8	34.7
Cerebral edema	1.1	1.8	2.9
Cerebral embolus	0.4	0.8	1.1
Renal or hepatic failure	7.2	5.4	12.5
HELLP syndrome	4.8	2.3	7.1
Other complications of hypertension	13.9	11.8	25.7
Not specified hypertension	7.6	8.3	15.9
Preeclampsia and eclampsia	50.8	49.2	100

90%
of CVA were
from
hemorrhage

HELLP = hemolysis, elevated liver enzymes, and low platelet count syndrome.

How Do Women Die Of Preeclampsia in CA?

CA-PAMR Final Cause of Death Among Preeclampsia Cases, 2002-2004 (n=25)

Final Cause of Death	Number	%	Rate/100,000
Stroke	16	64%	1.0
<i>Hemorrhagic</i>	14	87.5%	
<i>Thrombotic</i>	2	12.5%	
Hepatic (liver) Failure	4	16.0%	.25
Cardiac Failure	2	8.0%	
Hemorrhage/DIC	1	4.0%	
Multi-organ failure	1	4.0%	
ARDS	1	4.0%	

CA-PAMR Pregnancy-Related Deaths, Chance to Alter Outcome by Grouped Cause of Death; 2002-2005 (N=207)

Clinical Cause of Death	Chance to Alter Outcome (%)			
	Strong/Good	Some	None	Total N
Obstetric hemorrhage	14	5	1	20
Deep vein thrombosis/ pulmonary embolism	10	9	1	20
Sepsis/infection	7	6	1	14
Preeclampsia/eclampsia*	21(60)	14(40)	0	35
Cardiomyopathy and other cardiovascular causes*	14	30	4	48
Cerebral vascular accident	3	4	9	16
Amniotic fluid embolism	0	15	3	18
All other causes of death	15	15	4	34
Total (%)	84	98	23	205*

* Two deaths lacked sufficient records to make determination (one from each cause of death).

Factors Contributing to Pregnancy-Related Deaths

CA-PAMR 2002-2004

Contributing Factor (at least one factor probably or definitely contributed)	Preeclampsia N (%)	TOTAL N (%)
OVERALL	25 (100%)	129 (89%)
PATIENT FACTORS	16 (64%)	104 (72%)
Underlying significant medical conditions	8 (50%)	40 (39%)
Delay or failure to seek care	10 (63%)	27 (26%)
Lack of understanding the importance of a health event	9 (56%)	16 (15%)
HEALTHCARE PROFESSIONALS	24 (96%)	115 (79%)
Delay in diagnosis	22 (92%)	62 (54%)
Misdiagnosis	13 (54%)	36 (31%)
Use of ineffective treatment	19 (79%)	48 (42%)
Failure to refer or seek consultation	6 (25%)	26 (23%)
HEALTHCARE FACILITY	12 (48%)	72 (50%)



ACOG PRACTICE BULLETIN

CLINICAL MANAGEMENT GUIDELINES FOR
OBSTETRICIAN–GYNECOLOGISTS
NUMBER 33, JANUARY 2002

This Practice Bulletin was developed by the ACOG Committee on Practice Bulletins—Obstetrics with the assistance of Larry C. Gilstrap III, MD,

Summary of Recommendations

The following recommendations are based on good and consistent scientific evidence (Level A):

- ▶ Magnesium sulfate should be used for the prevention and treatment of seizures in women with severe preeclampsia or eclampsia.

Diagnosis and Management of Preeclampsia and Eclampsia

Reaffirmed 2012

growth restriction.

- ▶ Expectant management should be considered for women remote from term who have mild preeclampsia.
- ▶ Antihypertensive therapy (with either hydralazine or labetalol) should be used for treatment of diastolic blood pressure levels of 105–110 mm Hg or higher.



BP Treatment Recommendations

Systolic ≥ 160	Diastolic ≥ 110	Repeat BP and treat within <u>60 minutes</u> (<u>ideally ASAP</u>)
≥155	≥105-110	Alternative triggers*

These recommendations apply to all forms of hypertension in pregnancy and postpartum:

Chronic HTN - Gestational HTN - Preeclampsia - Severe Preeclampsia

* Based on Martin 2005: Martin J, Thigpen B, Moore R, et al.. Obstet Gynecol 2005; 105(2):246-254.



TABLE 2

Severe maternal morbidity in women with and without severe hypertension

	Severe HTN (n = 2252)		No severe HTN (n = 93,650)		P value
	n	%	n	%	
Severe maternal morbidities					
Total SMM (from Callaghan criteria)	197	8.8	2178	2.3	<.001
Pulmonary edema	9	0.4	15	0.02	<.001
Acute respiratory distress syndrome	19	0.84	51	0.05	<.001
Stroke	2	0.09	17	0.02	.07
Transfusion	116	5.2	1096	1.2	<.001
Ventilation	14	0.6	47	0.05	<.001
Non—Callaghan criteria morbidities					
Postpartum hemorrhage ^a	228	10.1	4268	4.6	<.001
Placental abruption ^a	66	2.9	1015	1.1	<.001
Mean length of stay (SD)	5.32 (4.45)		2.76 (2.45)		<.001
Mean gestational age at delivery ^b (SD)	35.6 (3.5)		38.7 (2.1)		<.001

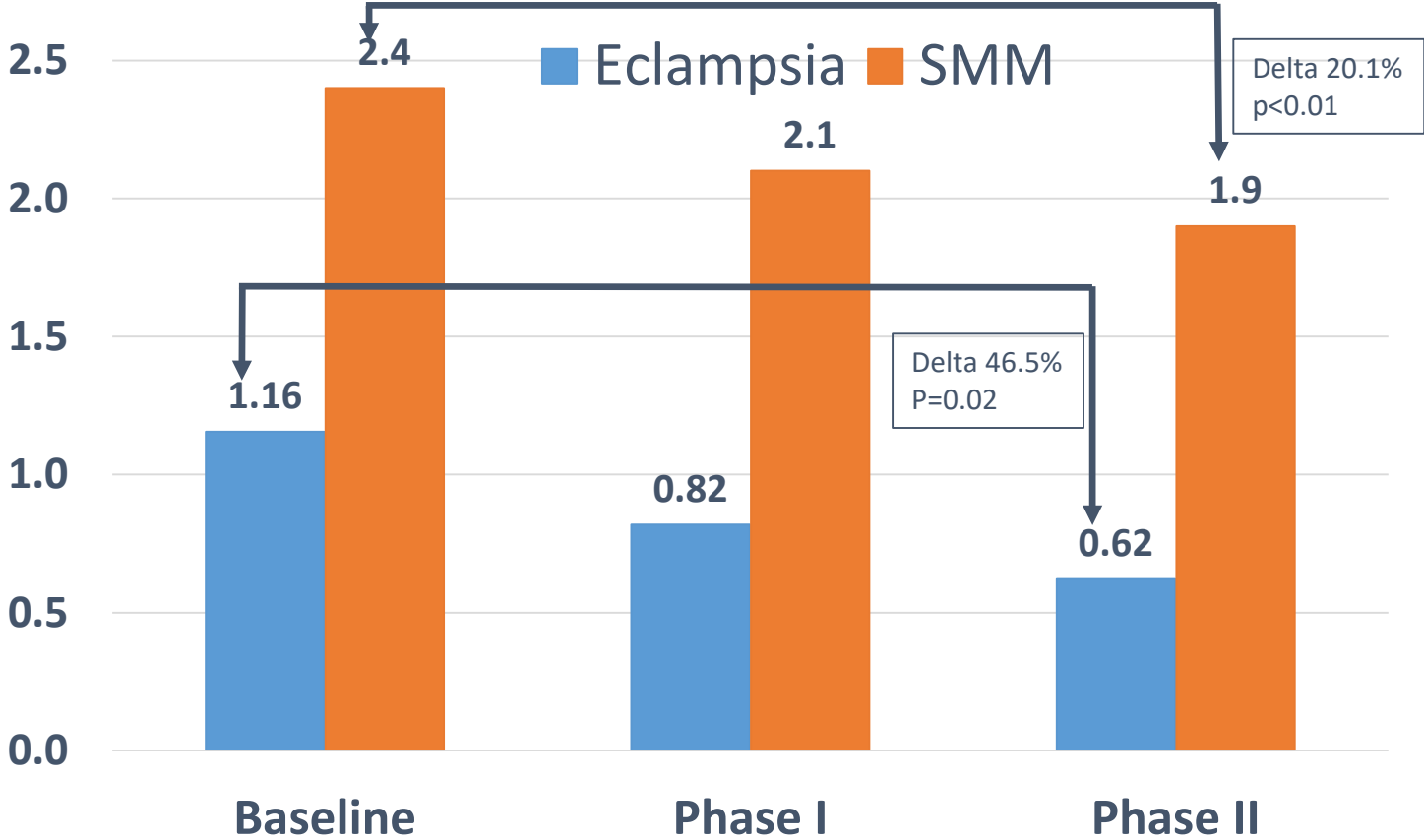
HTN, hypertension; SMM, severe maternal morbidity; SD, standard deviation.

^a Placental abruption and postpartum hemorrhage calculated independently of Callaghan’s metric; ^b Missing in 8%.

Kilpatrick et al. Severe maternal morbidity and intrapartum severe hypertension. *Am J Obstet Gynecol* 2016.



Rate of Eclampsia/1000 Births and SMM/100 Births



Treatment of elevated blood pressure, give magnesium sulfate, early postpartum follow-up





The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

COMMITTEE OPINION

Number 623 • February 2015

(Replaces Committee Opinion Number 514, December 2011)

Committee on Obstetric Practice

This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

Emergent Therapy for Acute-Onset, Severe Hypertension During Pregnancy and the Postpartum Period

- Acute-onset, severe hypertension, **160 systolic, OR 110 diastolic**, that is accurately measured using standard techniques and is persistent for **15 minutes** or more is considered a **hypertensive emergency. (repeat and treat)**
- First-Line Therapy – **Recommendations**
 - **IV labetalol** or/and **hydralazine**
 - Evidence available suggests that **oral Nifedipine, 10 mg**, also may be considered as a first-line therapy.
 - **Treatment within 30-60 minutes. (repeat and treat)**



Magnesium Sulfate

- Primary effect is via CNS depression
- Improves blood flow to CNS via small vessel vasodilation
- Blood pressure after magnesium infusion:
 - 6 gm loading then 2 gm/hr.

	sBP mm Hg	sBP 30 min	sBP 120 min	dBP mm Hg	dBP 30 min	dBP 120 min
Mild Group	145 ±10	143 ±13	141 ±14	87 ±10	79 ±9	82 ±9

- Magnesium sulfate should **not** be considered a **antihypertensive** medication

Belfort M, Allred J, Dildy G. Magnesium sulfate decreases cerebral perfusion pressure in preeclampsia. Hypertens Pregnancy. 2008;27(4):315-27.



For Additional resources go to:

<http://safehealthcareforeverywoman.org>

Or contact AIM@acog.org

Thank you.



ALLIANCE FOR INNOVATION
ON MATERNAL HEALTH **A** **I** **M**