AMERICA'S ESSENTIAL HOSPITALS

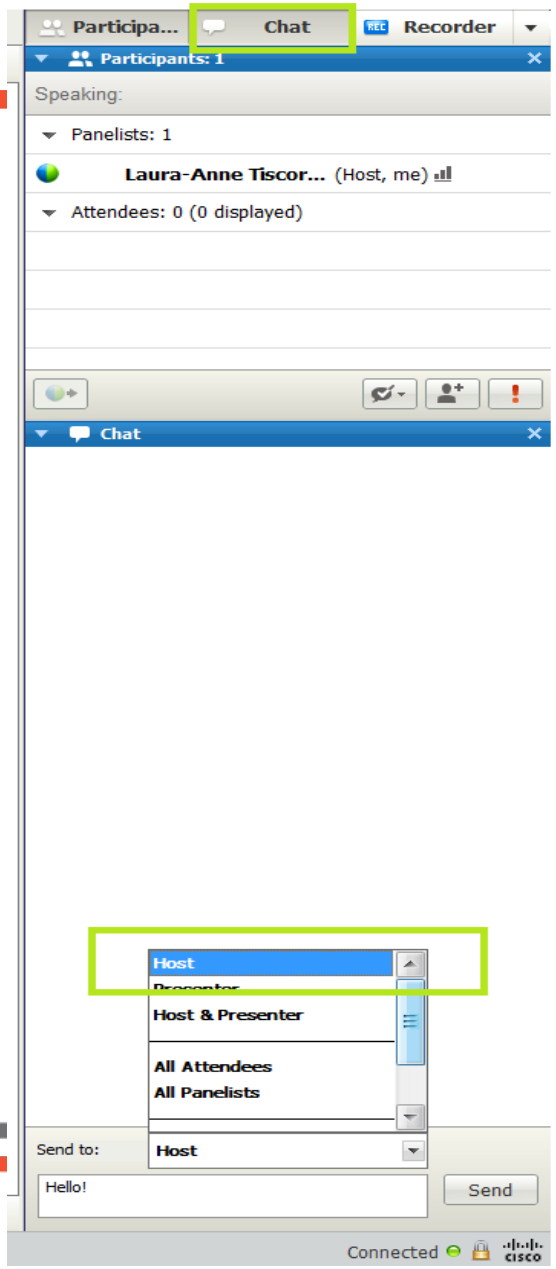
Clamping Down on Preeclampsia

Essential Hospitals Engagement Network

July 17, 2014

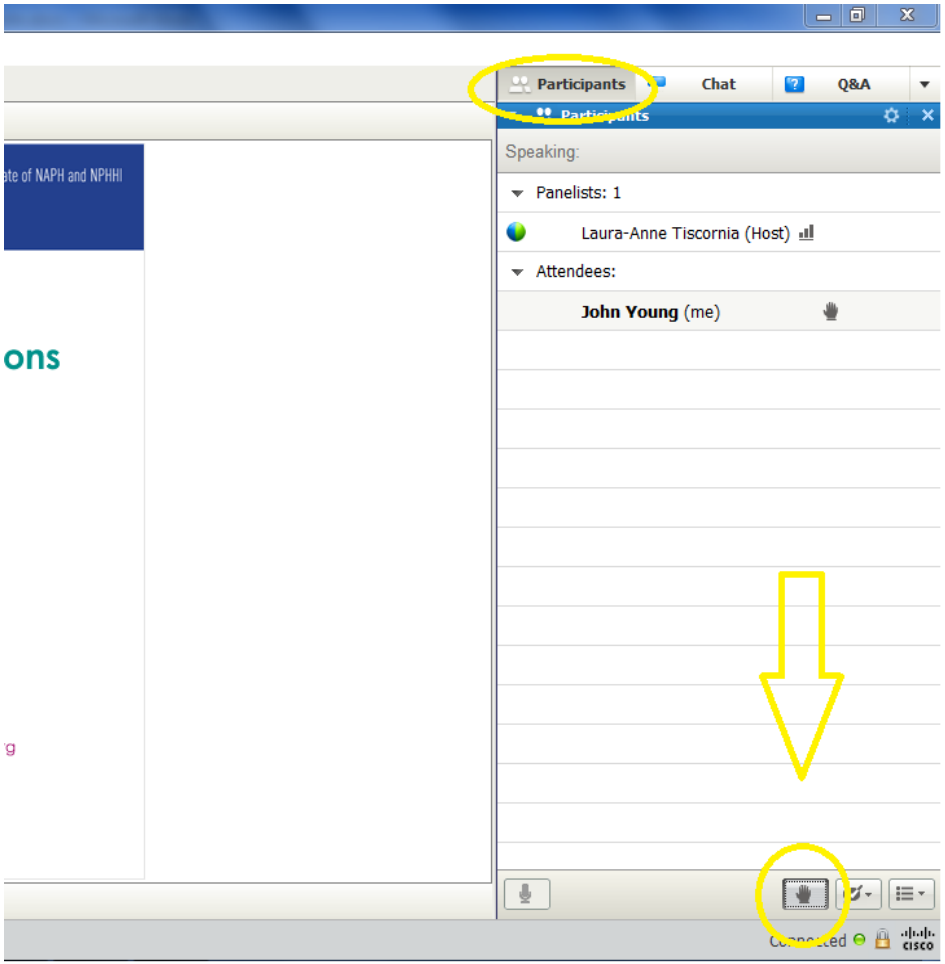
CHAT FEATURE

The chat tool is available to ask questions or comments at anytime during this event.

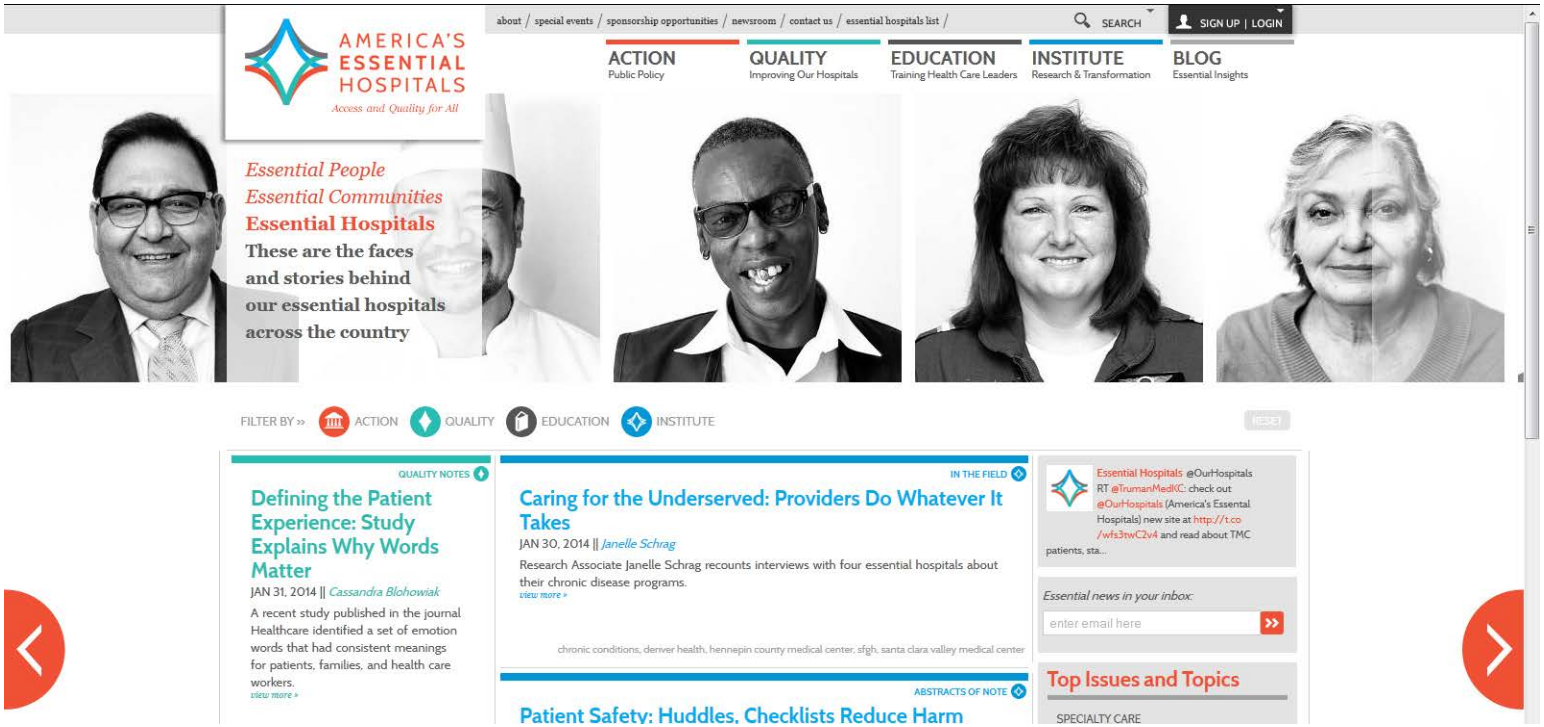


RAISE YOUR HAND

- If you wish to speak telephonically, please "raise your hand". We will call your name, when your phone line is unmuted



ENGAGE AT OUR NEW WEBSITE!



Network with peers, learn how essential hospitals are changing lives
Now live at essentialhospitals.org

AGENDA

- Partnership for Patients and 2014
- CMQCC Preeclampsia Collaborative
  - » Maricopa Medical Center
- Questions and Answers
- Upcoming events

PARTNERSHIP FOR PATIENTS

Reduce harm by 40 % for 9 hospital conditions and 20% for readmissions

HAIs	• CLABSI, CAUTI, SSI, VAP/VAE
HACs	• Falls, HAPU, ADE, VTE
OB	• EED • NEW 2014: preeclampsia & maternal hemorrhage
Readmissions	

SPEAKERS

Megan Schendel-Dittmann, MD
Attending general OB/GYN Physician
Maricopa Integrated Health Network

Zaqueena Coleman, BSN, RN
Labor and Delivery Nurse
Maricopa Medical Center

Carolina Macaraeg, BSN, RN
Postpartum Nurse
Maricopa Medical Center

Mary Bachhuber, BSN, RN
Quality Analyst
Maricopa Medical Center

CMQCC Preeclampsia Collaborative

Maricopa Medical Center

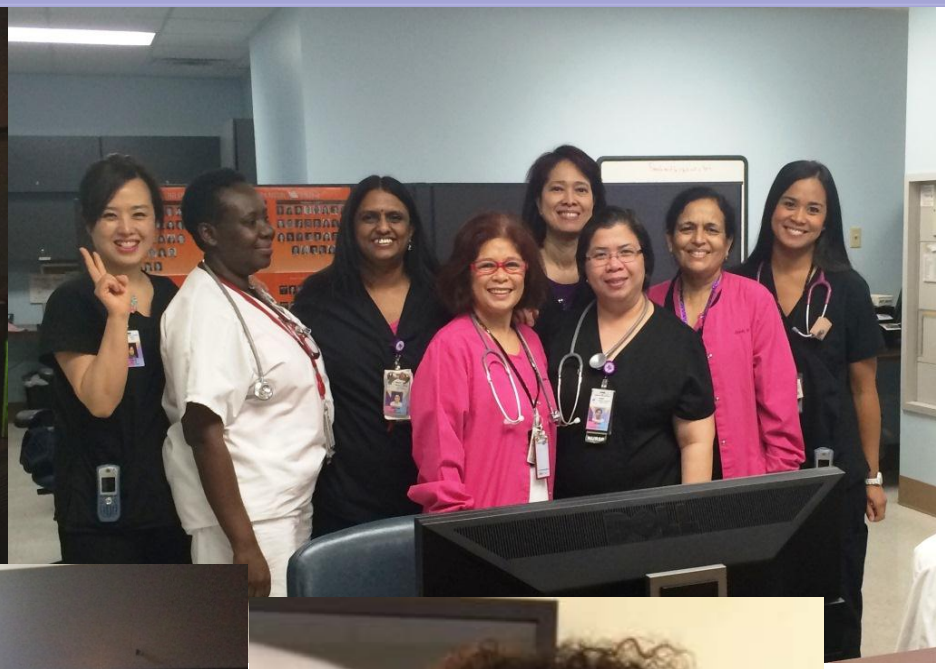
Megan Schendel-Dittmann, MD
Mary Bachhuber, RN
Zaqueena Coleman, RN
Carolina Macaraeg, RN

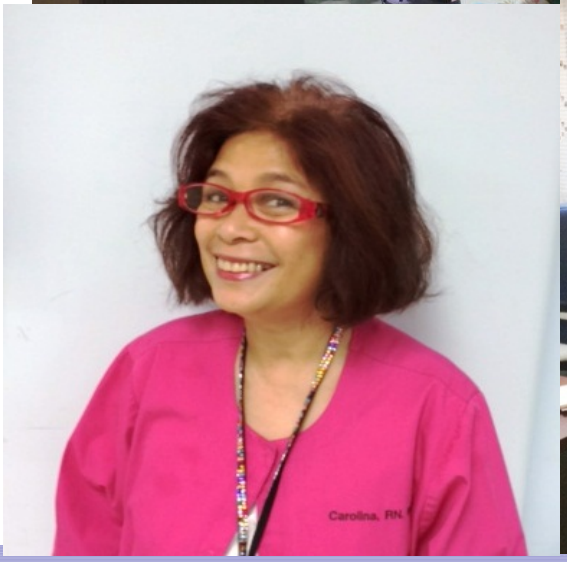
MARICOPA INTEGRATED HEALTH SYSTEM
Count on us to care.

Maricopa Integrated Health System (MIHS)

- Arizona's only Public Health Care System
- Maricopa Medical Center
  - 522 Licensed beds
  - 2013 Deliveries = 2,600
  - Level 3 Nursery
  - Serves 11 Family Health Centers
- Maricopa Health Plan
  - >60,000 members
- Most Affordable Comprehensive Maternity Plan in the Valley (Maternity Package Plan Agreement)

CMQCC Preeclampsia Collaborative
Maricopa Medical Center





MARICOPA INTEGRATED HEALTH SYSTEM
Count on us to care.

CMQCC and CPQCC

Mission: Improving care for moms and newborns

California Maternal Quality Care Collaborative (CMQCC)

- Expertise in maternal data analysis
- Developer of QI toolkits
- Host of collaborative learning sessions

California Perinatal Quality Care Collaborative (CPQCC)

- Expertise in data capture from hospitals
- Established secure data center
- Data use agreements in place with 130 hospitals with NICUs
- Model of working with state agencies to provide data of value

Preeclampsia Collaborative Participants

Northern CA

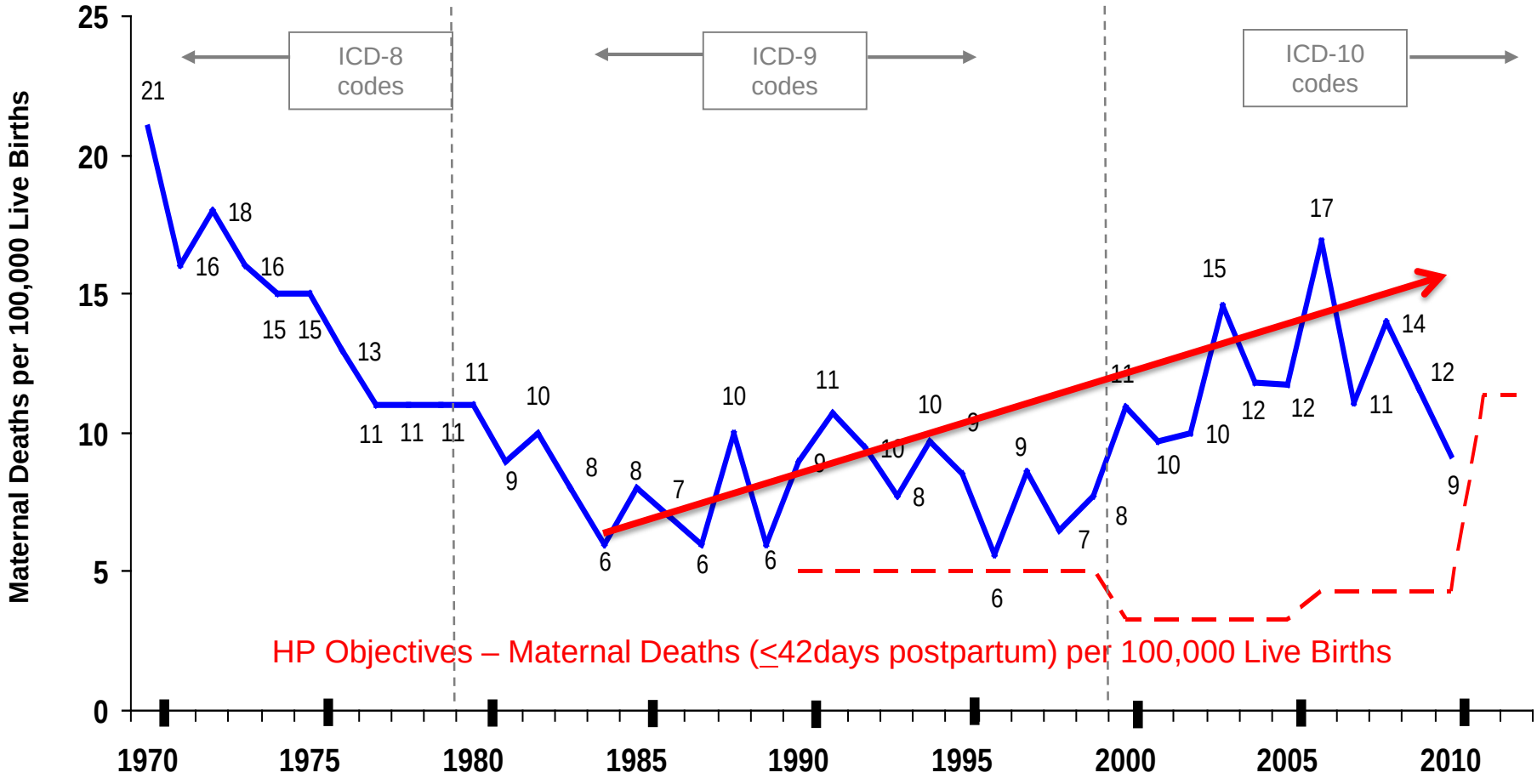
- Alta Bates Summit
- Contra Costa Regional Med Ctr
- Doctor's Hospital of Modesto
- John Muir Medical Center
- Kaiser Hayward
- Kaiser Oakland
- Kaiser Roseville
- Kaiser Santa Clara
- Mercy San Juan Med Center
- NorthBay Medical Center
- Salinas Valley Memorial
- Sonora Regional Med Center
- Sutter Medical Center

Southern CA

- Arrowhead Regional Med Ctr
- Cedars Sinai Med Center
- Citrus Valley Med Center
- Henry Mayo Newhall Memorial
- Kaiser San Diego
- Kaiser West LA
- Long Beach Miller
- Riverside County Regional Med Ctr
- St. Jude Medical Center
- Saddleback Memorial
- UCLA
- St Bernardine Medical Center
- Maricopa (Phoenix, AZ)

25 California hospitals representing ~ 82,000 births in 2011 (1:6)

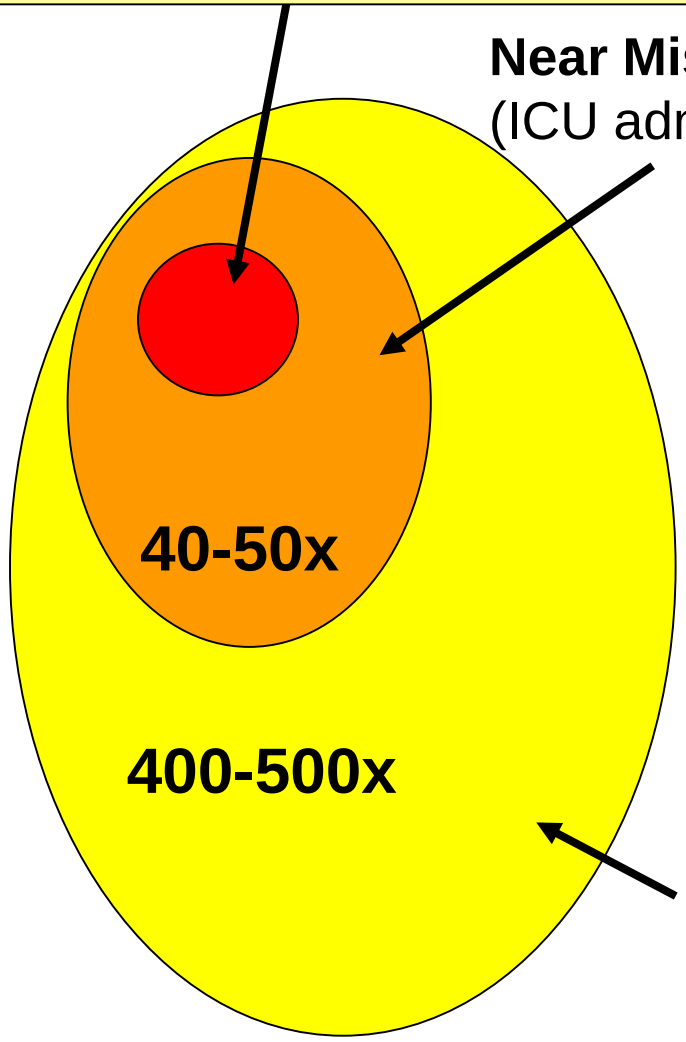
Maternal Mortality Rate, California Residents; 1970-2010



SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1970-2010. Maternal mortality for California (deaths ≤ 42 days postpartum) was calculated using the ICD-8 cause of death classification for 1970-1978, ICD-9 classification for 1979-1998 and ICD-10 classification for 1999-2010. Healthy People Objectives: HP2000: 5.0 deaths per 100,000 live births; HP2010: 3.3 deaths, later revised to 4.3 deaths per 100,000 live births, and; HP2020: 11.4 deaths per 100,000 live births. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, December, 2012.

Maternal Morbidity and Mortality: Preeclampsia

About 8 Preeclampsia Related Mortalities/2007 in CA



Source: 2007 All-California Rapid Cycle Maternal/Infant Database for CA Births: CMQCC

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

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

90% of CVA were from hemorrhage

MacKay AP, Berg CJ, Atrash HK. Obstetrics and Gynecology 2001;97:533-538

Key Clinical Pearl

In patients with
severe **preterm** preeclampsia,
the disease can rapidly progress to
significant maternal morbidity and/or
mortality.

CA-PAMR: Chance to Alter Outcome
Grouped Cause of Death; 2002-2004 (N=145)

Grouped Cause of Death	Chance to Alter Outcome			
	Strong / Good (%)	Some (%)	None (%)	**Total** N (%)
Obstetric hemorrhage	69	25	6	16 (11)
Deep vein thrombosis/ pulmonary embolism	53	40	7	15 (10)
Sepsis/infection	50	40	10	10 (7)
Preeclampsia/eclampsia	**50**	**50**	**0**	**25 (17)**
Cardiomyopathy and other cardiovascular causes	25	61	14	28 (19)
Cerebral vascular accident	22	0	78	9 (6)
Amniotic fluid embolism	0	87	13	15 (10)
All other causes of death	46	46	8	26 (18)
Total (%)	**40**	**48**	**12**	**145**

Key Clinical Pearl

Controlling blood pressure
is the optimal intervention
to prevent deaths due to stroke
in women with preeclampsia.

Over the last decade, the UK has focused QI efforts on aggressive treatment of both systolic and diastolic blood pressure and has demonstrated a reduction in deaths.

CMQCC Preeclampsia Collaborative
Maricopa Medical Center

The California Maternal Quality Care Collaborative (CMQCC) presented results from a California pregnancy-associated mortality review from 1970-2010.

- There were 8 maternal deaths/year associated with preeclampsia
- Approximately 380 ICU admissions
- 3400 patients with serious morbidity each year involving prolonged inpatient length of stay
- The major cause of death was hemorrhagic stroke
  - **Pre-stroke analysis found that 95.8% of these women had systolic blood pressure > or = 160**
  - 20.8% had a diastolic blood pressure > or = 105
  - The review identified that the chance to alter outcomes for these women was 100% (50% strongly and 50% in at least some aspect) by early recognition and treatment

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%)**
Use of ineffective treatment	**19 (79%)**	**48 (42%)**
Misdiagnosis	13 (54%)	36 (31%)
Failure to refer or seek consultation	6 (25%)	26 (23%)
HEALTHCARE FACILITY	12 (48%)	72 (50%)

Measures

- Outcome Measures:

  To Discuss Recommended Revisions

  - Severe Morbidities
  - Prolonged postpartum length of stay (vaginal and cesarean)
- Process Measures:
  - Medical Management
  - Debrief
- Balance Measure:
  - Monitoring change in BP (formerly “hypotension”)

Rationale for Outcome Measure Revision

- Overall Goal of Preeclampsia Collaborative:
  to improve processes of care and outcomes for women with preeclampsia and effectively measure impact of changes
- Initial outcome measure denominator (all hypertensive disease) found to be too broad
- After “field testing” metrics, with feedback from Collaborators and Expert Panel, we recommend revision of Outcome Measure denominator, and make other minor “tweaks” to better capture impact of intervention, improve quality of data

Outcome Measures Revision:

- Current denominator captures ALL women with Hypertension
- Revise so that we can show outcomes for all **severe cases of preeclampsia and eclampsia**
- Align more closely with Process Measure (denominator is severe HTN)
- Maintain ability to compare the Collaborative outcomes against all other hospitals in the state (via ICD9 diagnosis codes available thru the California Maternal Data Center)

- Need for revisions in this process not surprising
  - First group to test a Preeclampsia toolkit
  - Measuring improvement in Preeclampsia care more difficult than PPH

Outcome Measures: Initial Denominator

ICD-9 Diagnosis Codes for Hypertension Categories: Denominator Inclusion

Mild Preeclampsia	642.4x
Chronic Hypertension	[illegible], 642.1x, 642.2x, 642.9x, 401x - [illegible]
Gestational Hypertension	642.3x
Severe Preeclampsia or Eclampsia	642.5x and 642.6x, 642.7x

PRO: Denominator will now focus ONLY on those women who have:

- Severe preeclampsia (642.5x), or
- Eclampsia (642.6x), or
- Preeclampsia superimposed on pre-existing HTN (642.7x)

CON: Denominator will now be considerably smaller:

- Morbidity rate will be higher
- More variation month-to-month

Outcome Measures: Revised Denominator

Measure #1: Severe Morbidities

Num / Denom

Women with Morbidities / Women with Severe Preeclampsia/Eclampsia/Superimposed

Measure #2: Prolonged PPLOS

Num / Denom

Women with Prolonged PPLOS (Vag/CS) / Women with Severe Preeclampsia/Eclampsia/Superimposed

Data Collection Implications:

- Active Track: No impact, already collected with admin data submission
- QI Track: Need to resubmit (small N), 2012 can be done with admin data (CMDC)

Do we have consensus?

Severe Morbidity Numerator: (Callaghan 2012, Kuklina 2008)

Acute Renal Failure	669.3, 584
Pulmonary Edema	518.4, 428.1
Adult Respiratory Distress Syndrome	518.5, 518.81, 518.82, 518.84, 799.1
Puerperal Cerebrovascular Disorder	674.0, 671.5, 430, 431, 436, 432.x, 433.x, 434.x, 437.x, 997.2, 999.2
Disseminated Intravascular Coagulation Syndrome	286.6, 286.9, 666.3
Ventilation	93.90, 96.01-96.05, 96.7x
Postpartum Hemorrhage*	666.00-666.34
Abruptio Placentae*	641.20, 641.21, 641.23

- Those in blue were ICD9 codes for SMM that Callaghan used
- Those in green (PPH, abruption) were added by Expert Panel
  BUT these now appear to complicate the analysis….
  - PPH is quite common and overwhelms other codes
  - Is PPH really a complication of the preeclampsia?
  - Do we really expect to see decrease in PPH with appropriate antihypertensive treatment?

Severe Morbidity Numerator

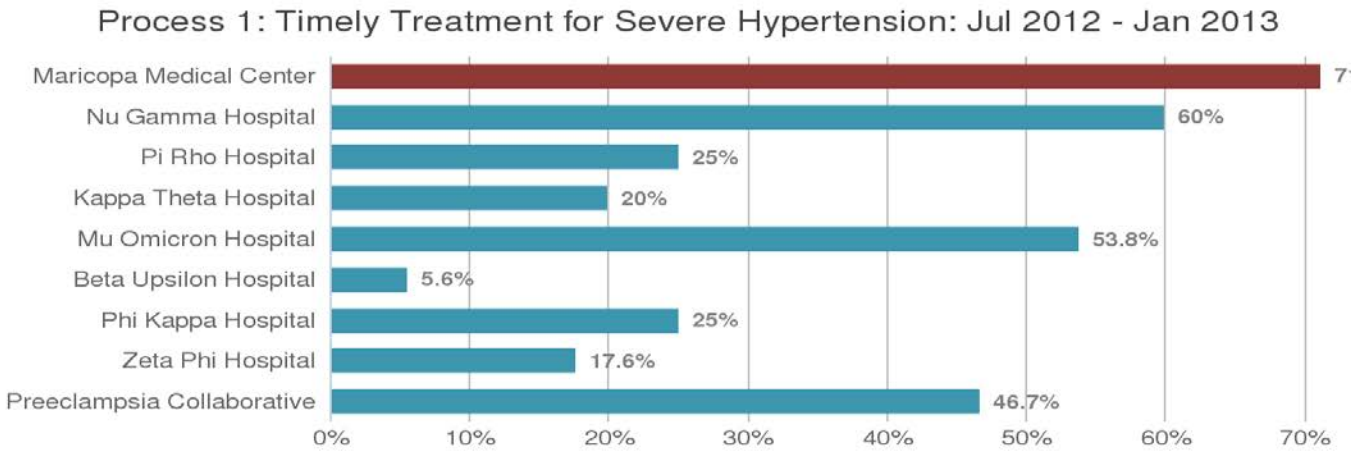
- Transfusion codes (99.03, 99.04) likely more specific
- But recommend keeping bleeding codes separate from rest of SMM so they can be analyzed separately (e.g. abruption may be useful)

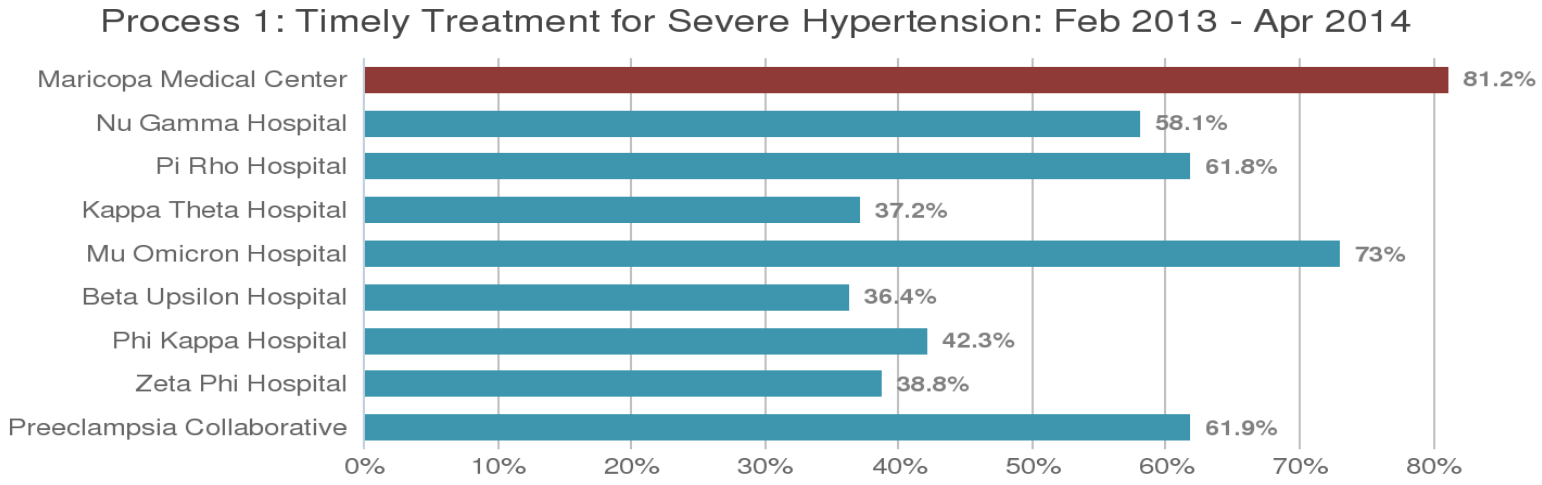
Data Collection Implications:

- Active Track: No impact, already collected with admin data submission
- QI Track: Need to resubmit; small N—but patient level data with the ICD9 codes; 2012 can be done with admin data (CMDC); could be less if “ditched” bleeding codes

CMQCC Preeclampsia Collaborative
Maricopa Medical Center

The critical initial step is to administer antihypertensive medication within 60 minutes or less:



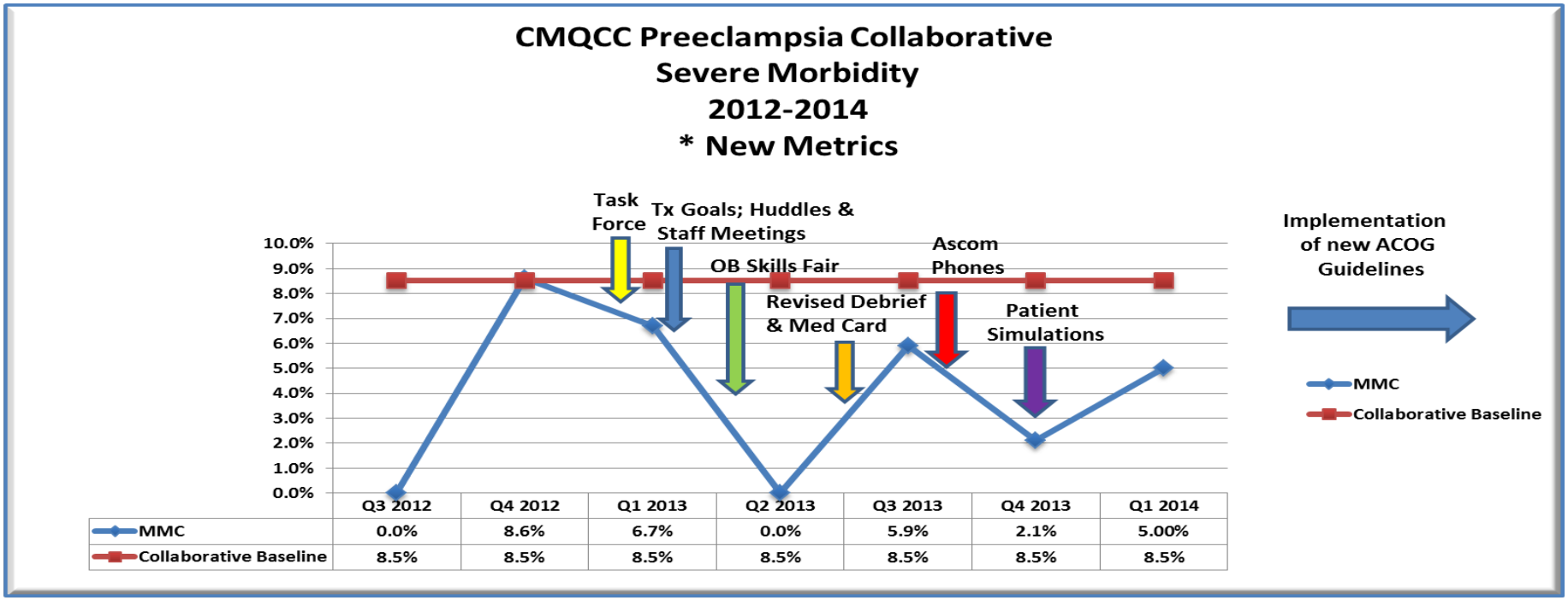


Key Clinical Pearls

- Use of preeclampsia-specific checklists, team training and communication strategies, and continuous process improvement strategies will likely reduce hypertensive related morbidity.

- Use of patient education strategies, targeted to the educational level of the patients, is essential for increasing patient awareness of signs and symptoms of preeclampsia.

CMQCC Preeclampsia Collaborative
Maricopa Medical Center



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MMC	0.0%	8.6%	6.7%	0.0%	5.9%	2.1%	5.00%
Collaborative Baseline	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%

- The California Maternal Quality Care Collaborative (CMQCC) had a baseline rate of 8.5% for severe morbidity (complications) with hypertension:
  Acute Renal Failure, Pulmonary Edema, Adult Respiratory Distress Syndrome, Puerperal & Cerebral Vascular Disorder, Disseminated Intravascular Coagulation Syndrome, Ventilation, Placental Abruption, Blood Transfusion
- The Collaborative reached the goal to reduce the rate of severe morbidity by 50% as of May, 2014.
- The Collaborative plans to continue their efforts until August, 2014.

CMQCC
CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE

Patient Sticker

PREECLAMPSIA: DEBRIEF and CHART REVIEW TOOL

Topic: Maternity service teams review and document sequence of events, successes with and barriers to swift and coordinated response to preeclampsia.
Goal: De-brief 100% of cases of new onset severe hypertension with preeclampsia or eclampsia (≥160 OR ≥105) or chronic/gestational hypertension with superimposed preeclampsia (see inclusion table) (Include patients from L&D, PP, ED) (Process Measure, P3)
Minimum Participants: Primary RN and MD participate in the de-briefing session; ideally any and all providers participate.
Instructions: Complete within 24 hours after event.

Patient Location *(Check all that apply)*
☐ L&D
☐ Postpartum
☐ ED

Debrief Participants: Primary MD: **Name:**_____
Primary RN: **Name:**_____

PROCESS MEASURE (P1): Medical Management

BP reached ≥160 or ≥105: BP=_____**Date and Time:**_____
BP confirmed ≥160 or ≥105: BP=_____**Date and Time:**_____
First IV BP med given _____**Date and Time:**_____
Time diastolic BP <105 _____ ☐ **N/A (never > 105)**

Medications (check all given)
☐ Labetalol
☐ Hydralyzine
☐ Nifedipine
☐ Other _____

Magnesium Sulfate **Loading Dose:**
☐ 4gm ☐ 6gm ☐ Other_____
Maintenance Dose:
☐ 1gm/hr ☐ 2gm/hr ☐ 3gm/hr
☐ Other _____

BALANCING MEASURE (B1,B2): Monitor Medical Management

B1. Did diastolic pressure fall to <80 within one hour after meds given?
☐ YES ☐ NO

B2. If yes, was there a corresponding deterioration of fetal heart rate?
☐ YES ☐ NO ☐ NA

Medical Management: What went well? (*Check all that apply*)
☐ Communication went well
☐ Teamwork went well
☐ Leadership went well
☐ Decision-making went well
☐ Assessing the situation went well
☐ Other _____

Opportunities for improvement: "human factors" (*Check all that apply*)
☐ Communication needed improvement
☐ Teamwork needed improvement
☐ Leadership needed improvement
☐ Decision-making needed improvement
☐ Assessing needed improvement
☐ Delay in recognition
☐ Other_____

Maternal Complications (*Check all that apply*)
☐ Pulmonary Edema
☐ Intracranial Hemorrhage
☐ Oliguria
☐ Acute tubular necrosis
☐ ICU admission
☐ HELLP Syndrome
☐ Eclampsia
☐ Liver failure
☐ OB Hemorrhage
☐ DIC
☐ Other _____

Comments

Opportunities for improvement: "non-human factors" (*Check all that apply*)
☐ Delay in HTN medications
☐ Other Medications issues
☐ Delays in transport (intra-, inter-hospital transport)
☐ Inadequate support (in-unit/other areas)
☐ Equipment issues

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PROCESS MEASURE (P2) Discharge Management

A. Discharge Education: education materials about preeclampsia given?
☐ YES ☐ NO

B. Discharge Management: Follow-up Appt Scheduled within 3-10 days (for all women with any hypertension)
☐ YES ☐ NO

Was Patient discharged on meds?
☐ YES ☐ NO

If YES: Was Followup appointment scheduled in <72 hours?
☐ YES ☐ NO

COMMENTS about Medical Management, Monitoring, Discharge

☐ Other _____

Briefly describe:

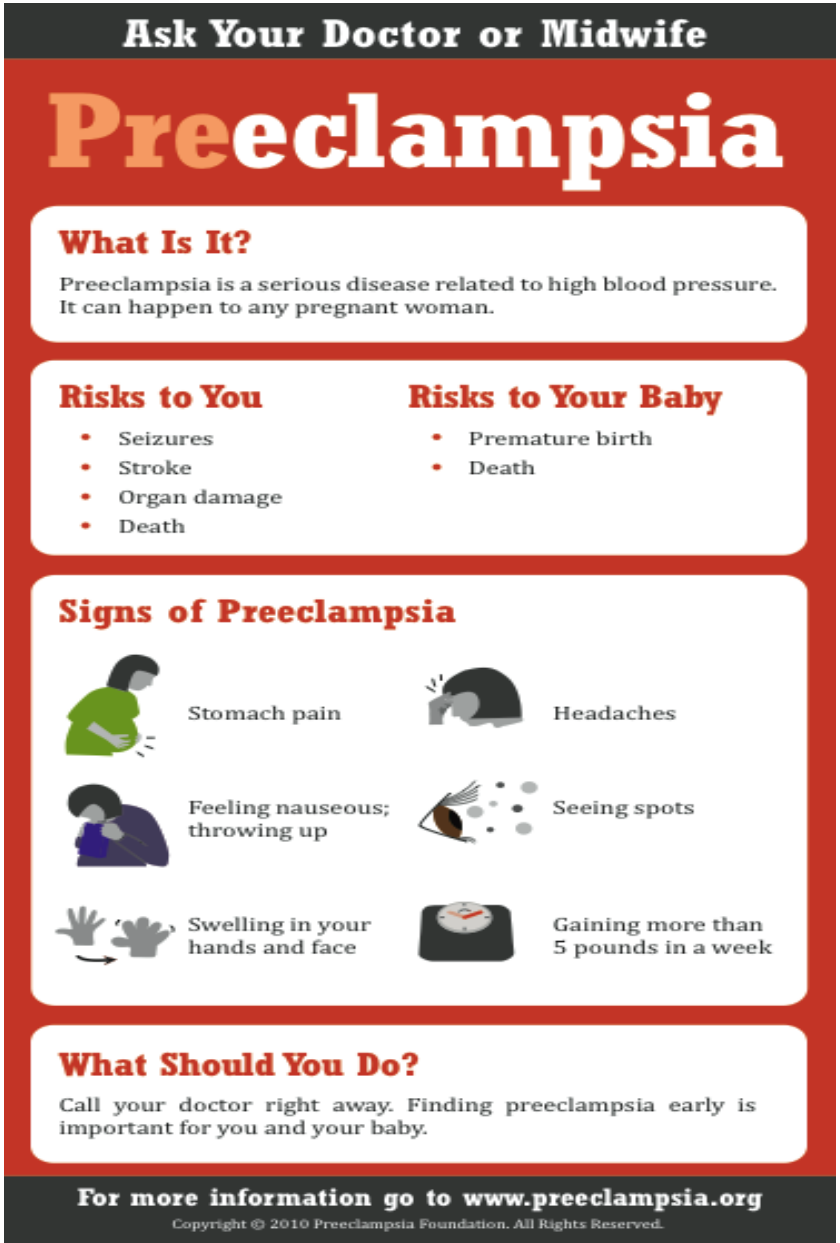
DID FINAL ICD9 CODES AGREE WITH CHART REVIEW FINDINGS?
☐ YES ☐ NO

Key Clinical Pearls

- Use of preeclampsia-specific checklists, team training and communication strategies, and continuous process improvement strategies will likely reduce hypertensive related morbidity.

- Use of patient education strategies, targeted to the educational level of the patients, is essential for increasing patient awareness of signs and symptoms of preeclampsia.

Patient Education Materials



This and many other patient education materials can be ordered from www.preeclampsia.org/market-place

Postpartum Case Study

- 24 year-old G2, P0-0-1-0 @ 39 wks
- Prenatal course unremarkable, GBS (+)
- Blood pressure normal throughout prenatal period
- Presented to the office with complaint of regular uterine contractions
- Cervical exam: 3 cm dilated
- BP: 142/95
- Urinalysis negative for protein

Postpartum Case Study (continued) Status on Admission

- The patient was admitted for spontaneous labor and gestational hypertension
- On admission to Labor and Delivery
  - BP 133/74
  - Urinalysis negative
  - Platelet count: 187,000/unit
  - AST 14
  - ALT 18
  - Uric Acid 5.5

Postpartum Case Study (continued) Course in Labor

- BP remained modestly elevated throughout labor and the postpartum stay
- Fetal heart rate consistently Category 1 (normal) tracing
- Patient had primary late term c/section for failure to progress on day 2
- Postpartum course was unremarkable. No documented complaints of headache, blurred vision or epigastric pain

Postpartum Case Study (continued) Post-op Day # 3

- Patient complained of “acute, crushing headache”, pain rated 8/10. D/C orders already written
- Received hydrocodone 15 mg/acetaminophen 650 mg
- Discharged 30 minutes later; no follow-up of headache documented

Postpartum Case Study (continued) Post Discharge

- Post-op day #4: Patient reported worsening headache to family
- Post-op day #5: Progressively worsening headache and new-onset visual changes
- 911 call placed by family
- Initial seizure occurred shortly thereafter
- Multiple seizures witnessed by family
- Intubated in the field and transported to hospital
  - Started on $MgSO_4$, ativan, keppra, labetalol
- Helicopter transport to tertiary center, neurology ICU

Postpartum Case Study (continued)
Post-op Day 6 to 9

- Extubated shortly after admission
- BP's remained elevated; BP max 148/98; SBP mostly 130's; DBP mostly 80's
- Platelet count 370,000, AST 30, ALT 33, Creatinine 0.9 mg/dl
- Urinalysis: Negative for protein
- Persistent, mild headache with some postural component
  - Anesthesia consult obtained; Conservative treatment
- MRI: "no evidence of ischemic injury"; no parieto-occipital edema suggestive of PRES*

*PRES: Posterior Reversible Encephalopathy Syndrome

Late Postpartum Eclampsia

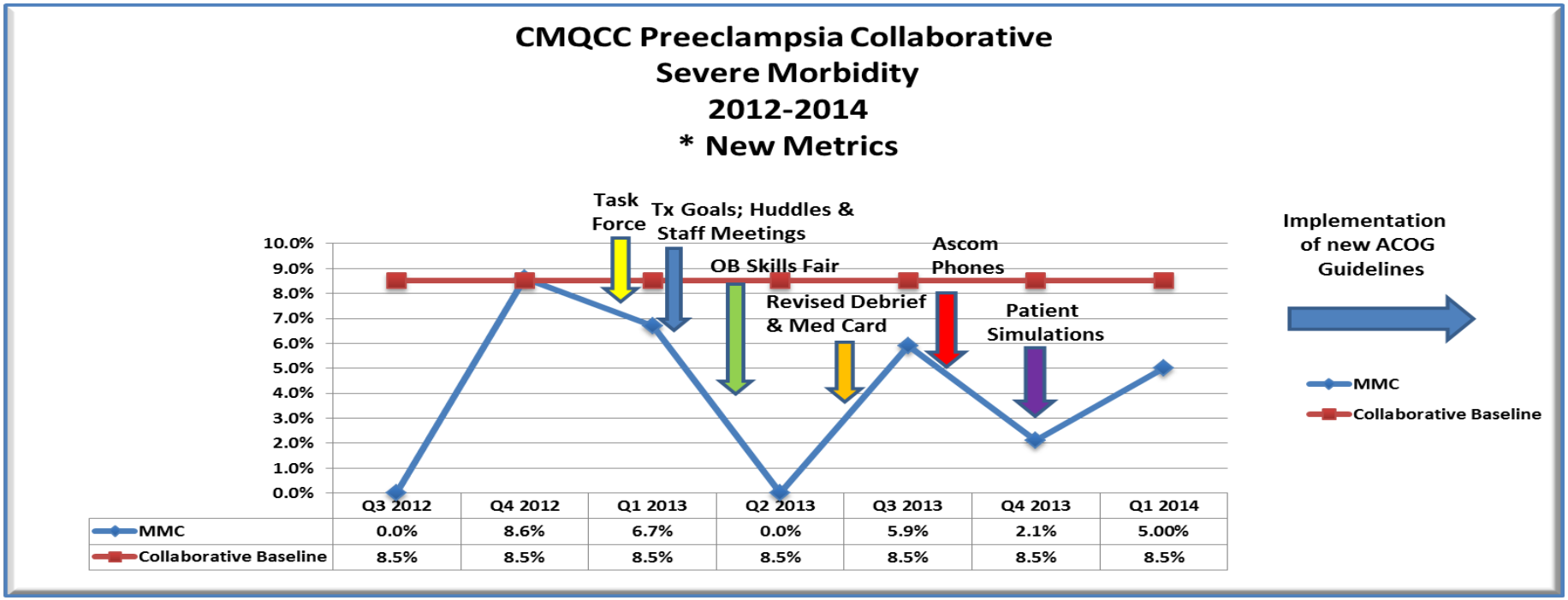
- >48 hours following delivery, up to 4 weeks PP
- Accounts for approximately 15% of cases of eclampsia
- 63% had no antepartum hypertensive diagnosis
- The magnitude of blood pressure elevation does ***not*** appear to be predictive of eclampsia
- The most common presenting symptom was headache, which occurred in about 70% of patients; other prodromal symptoms included shortness of breath, blurry vision, nausea or vomiting, edema, neurological deficit, and epigastric pain

Al-Safi Z, Imudia A, Filetti L, et al. Delayed Postpartum Preeclampsia and Eclampsia. Obstet Gynecol. 2011;118(5):1102-1107.

Key Clinical Pearls

- Early post-discharge follow-up recommended for **all patients** diagnosed with preeclampsia/eclampsia
- Preeclampsia Toolkit recommends post-discharge follow-up:
  - within 3-7 days if medication was used during labor and delivery OR postpartum
  - within 7-14 days if no medication was used
- **Postpartum** patients presenting to the ED with hypertension, preeclampsia or eclampsia should either be assessed by **or admitted to an obstetrical service**

CMQCC Preeclampsia Collaborative
Maricopa Medical Center



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A California Toolkit to Transform Maternity Care

Improving Health Care Response to Preeclampsia: A California Quality Improvement Toolkit

THIS COLLABORATIE PROJECT WAS DEVELOPED BY:

THE PREECLAMPSIA TASK FORCE
CALIFORNIA MATERNAL QUALITY CARE COLLABORATIE
MATERNAL, CHILD AND ADOLESCENT HEALTH DIVISION; CENTER FOR FAMILY HEALTH
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

For More Information and to Download the Toolkit

- Visit our website: www.cmqcc.org
- Or contact us: info@cmqcc.org

Available online at www.cmqcc.org

Q&A

Megan Schendel-Dittmann, MD
Attending general OB/GYN Physician
Maricopa Integrated Health Network

Zaqueena Coleman, BSN, RN
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Carolina Macaraeg, BSN, RN
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Mary Bachhuber, BSN, RN
Quality Analyst
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UPCOMING EVENTS

- **Webinars:**
  Preparing IT Systems for Race, Ethnicity and Language Data Collection
  July 22 | 1-2pm EST

  The Texas Regional Approach to DSRIP Waivers: Success, Challenges, Sustainability
  July 23 | 2-3pm EST

  Training Staff to ask REAL Questions
  August 19 | 1-2pm EST

  Leadership for Safety: Setting Safety Goals
  Sept 25 | 12- 1 pm EST

- **In Person Event:**
  Summit on Harm Reduction - Sustaining Progress, Building on Success
  Nov 10 | Chicago

THANK YOU FOR ATTENDING

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