# UCSF Obstetric and Neonatal Simulation Training

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UCSF Benioff Children's Hospitals

# Your UCSF Perinatal Outreach team!


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# 17 of 22 Perinatal Outreach Hospitals


Community Hospital of Monterey Peninsula
Dameron Hospital - Stockton
Mad River Community Hospital – Arcata
Marin General Hospital
Mendocino Coast District Hospital
Natividad Medical Center – Salinas
Petaluma Valley Hospital
Queen of the Valley Medical Center -Napa
Redwood Memorial Hospital – Fortuna
San Francisco General Hospital
San Joaquin General Hospital
Santa Rosa Memorial
Sonoma Valley Health Care District Hospital
St. Joseph Hospital of Eureka
St. Helena, Clearlake Hospital
Ukiah Valley Medical Center
ValleyCare Health System – Pleasanton
Washington Hospital - Fremont

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# Simulation Scenarios

- Customized scenarios that have been developed based on your learning needs
- Each simulation class has had measurable objectives tailored to your needs

## MATERNAL

- Shoulder Dystocia
- Postpartum Hemorrhage
- Antepartum Hemorrhage
- Emergency Cesarean Section
  - Uterine Rupture
  - Prolapse Umbilical Cord
  - Fetal Bradycardia
- Precipitous Preterm Birth
- Eclampsia /$MgSO_4$ Toxicity
- Maternal Code Blue

## NEONATAL

- Neonatal Depression
- Meconium Aspiration
- Hypovolemic Shock
- Tension Pneumothorax
- Preterm Infant Stabilization
- Ductal Dependent CHD

# Collaborative Scenario Development

- Determine the metrics
  - What is going to be measured?
  - How will the metrics be incorporated into the drill?
  - short in duration (~8 minutes)
- Current policy and procedure of your department
- Current process – unit, department, hospital
- Review of literature
  - Evidence based, ACOG/AAP/AWHONN
- Write the scenario – realistic / suspend disbelief
  - List props, equipment, actors needed
- Keep all participant in their skill set

# The Crown Jewel: The Debrief

- Confidential – safe forum for disclosure
- Provides a clear representation of the scenario
- Encouraged the participants to take the situation seriously
- Allowed the staff the rare opportunity to see how they practice with each other
- Reveals team performance behaviors
- Has uncovered system issues – findings/notes
- Promotes an improved work environment

# So Why Simulation?

## Common Obstetric High Risk Situations

- Abnormal fetal heart rate tracings
- Oxytocin, misoprostol, MgSO4 use
- Operative Vaginal Delivery
- VBAC
- Shoulder Dystocia

## Common Neonatal High Risk Situations

- Perinatal Depression
- Preterm Delivery
- Congenital Anomalies

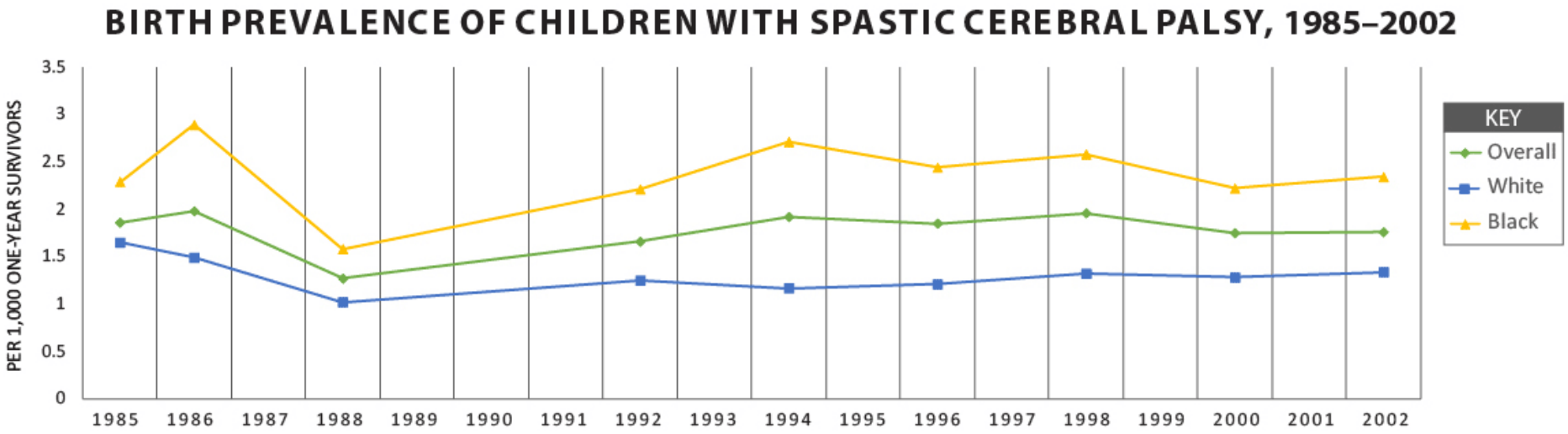
# How have we done in Obstetrics over the last 2 decades?

- Erb's palsy rate – No change
- Postpartum Hemorrhage rate – Increased *
- Peripartum Hysterectomy – Increased *
- Preeclampsia rate – Increased *
- Maternal Death – Increased

Many poor outcomes are not preventable, but some are…. notably, death from bleeding and preeclampsia

* Results were reported as mixed

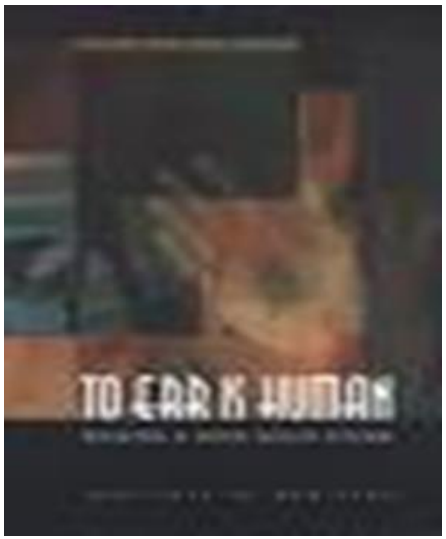
# What about neonatal outcomes?



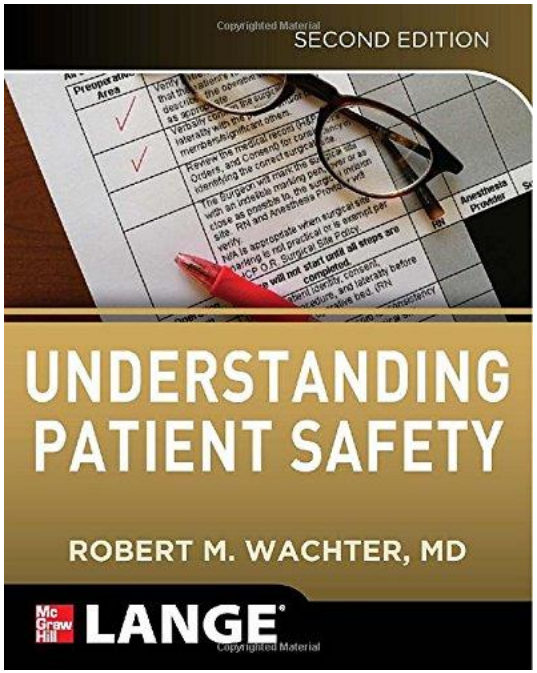

Key Findings: Birth Prevalence of Cerebral Palsy. (2015). Centers for Disease Control and Prevention. Retrieved 15 September 2016, from http://www.cdc.gov/ncbddd/cp/features/birth-prevalence.html

# What's the Problem

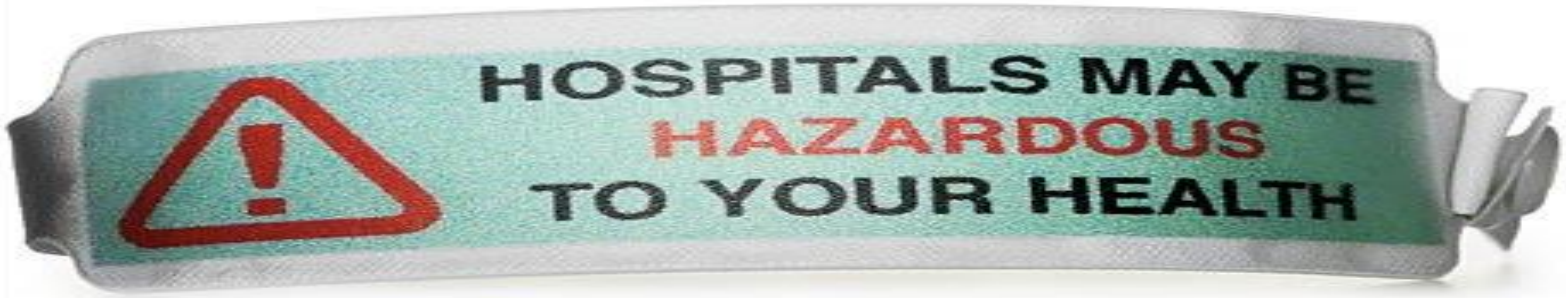
# Do we provide safe care?



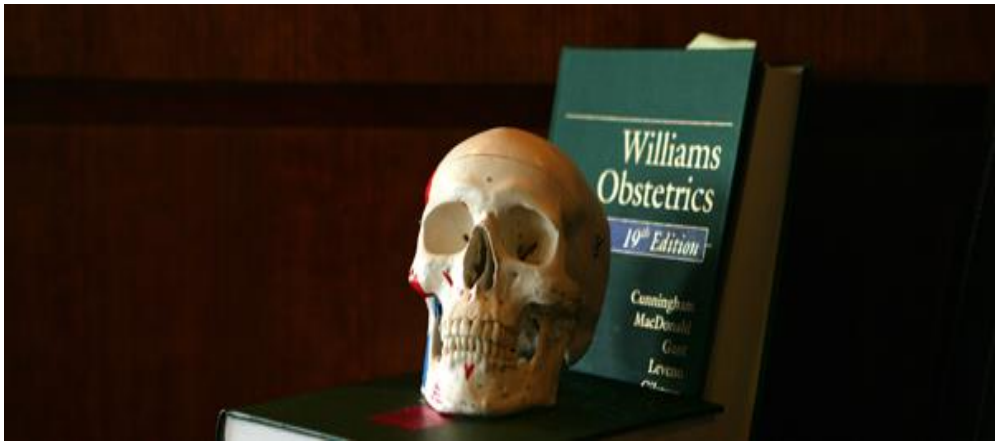

10+ years later




- 98,000 deaths/year
- Historical focus individual blame
- Hospitals seen as large complex systems
- Focus shifted to systems and prevention

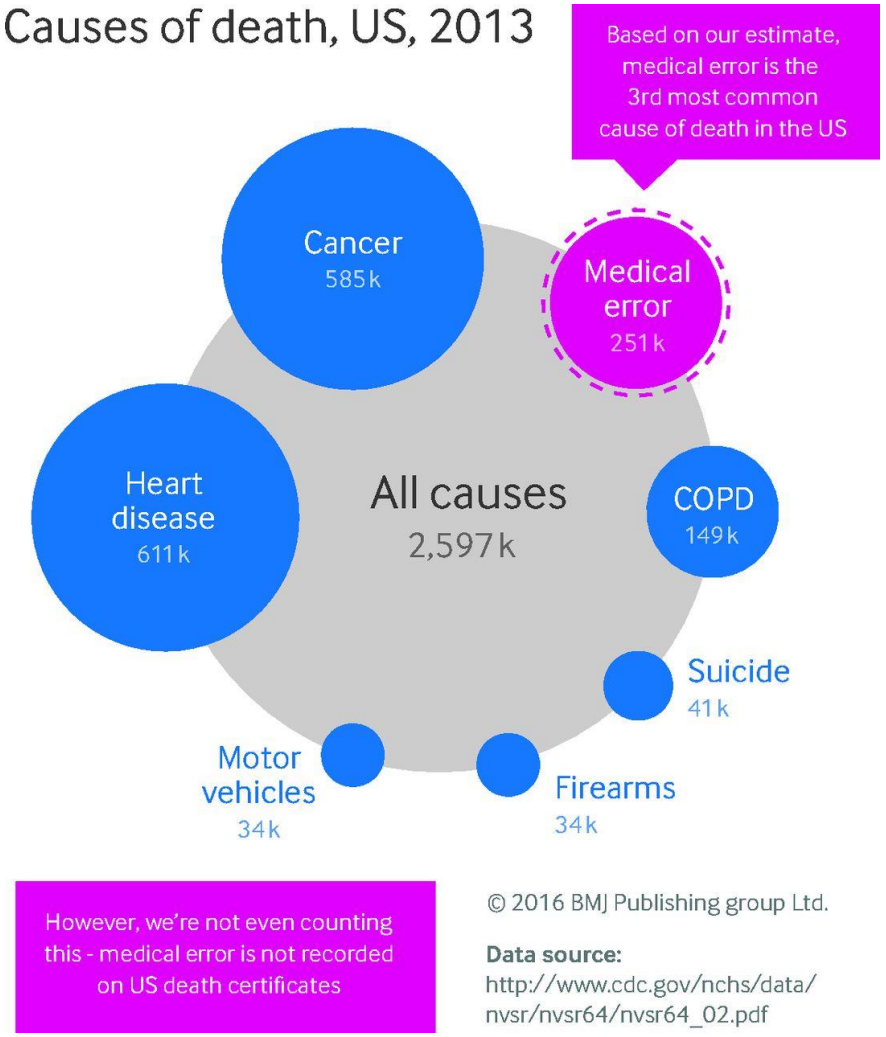



| Leading Cause of Death in United States | | |
|---|---|---|
| 1 | Heart Disease | 652,091 |
| 2 | Cancer | 559,312 |
| 3 | Stroke | 143,579 |
| 4 | Chronic Lower Respiratory Disease | 130,933 |
| 5 | Accidents (unintentional injuries) | 117,809 |
| | **Preventable Medical Errors** | **98,000** |
| 6 | Diabetes | 75,119 |
| 7 | Alzheimer's Disease | 71,599 |
| 8 | Influenza/Pneumonia | 63,001 |
| 9 | Nephritis/Nephrosis | 43,901 |
| 10 | Septicemia | 34,136 |




**Preventable Medical Errors ranked above Diabetes, Alzheimer's, and Influenza**

**Fig 1 Most common causes of death in the United States, 2013.**




**Martin A Makary, and Michael Daniel BMJ2016;353:bmj.i2139**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# Even the best….
# Can make a mistake

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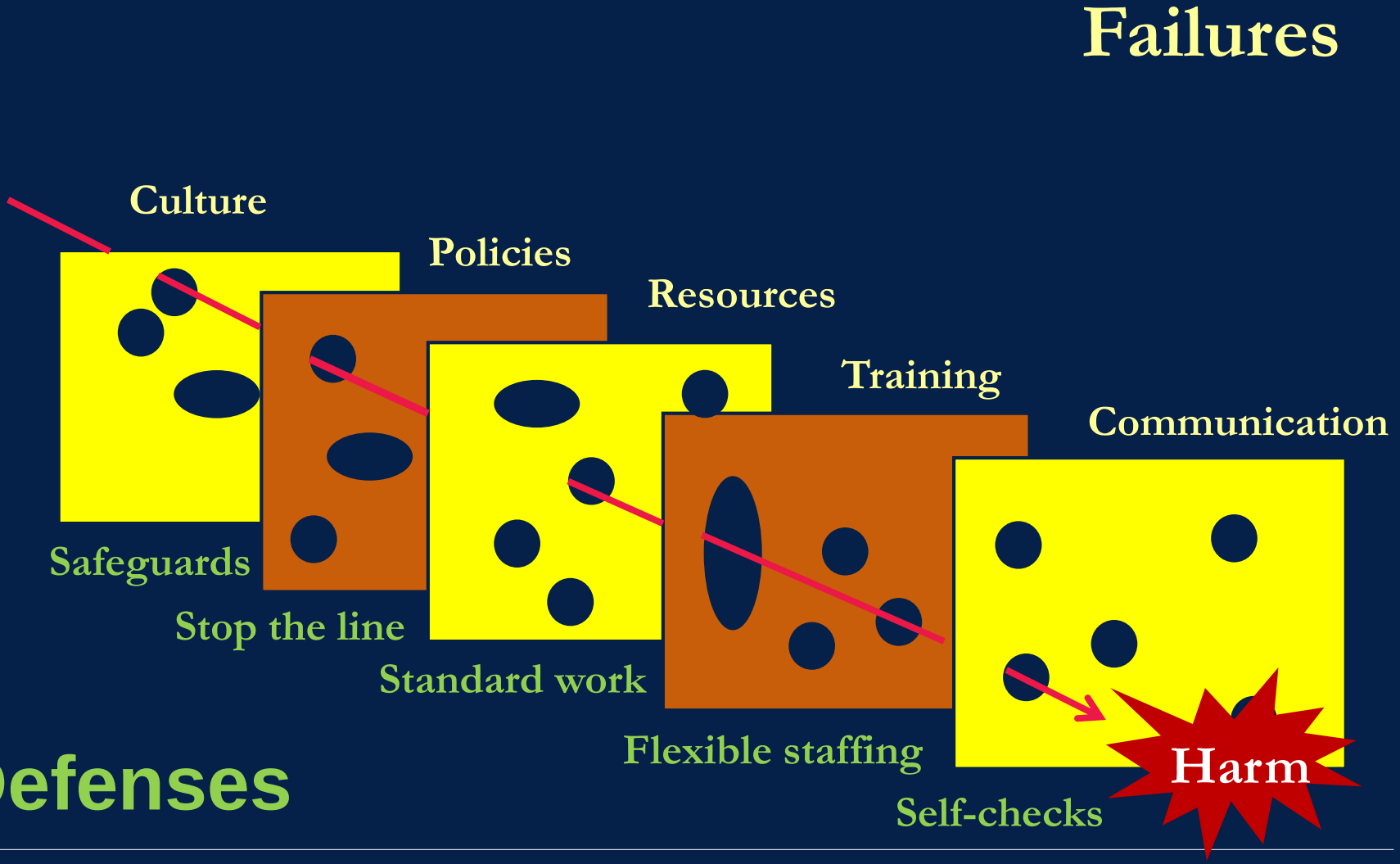
# YOUR PRACTICE DOMAIN

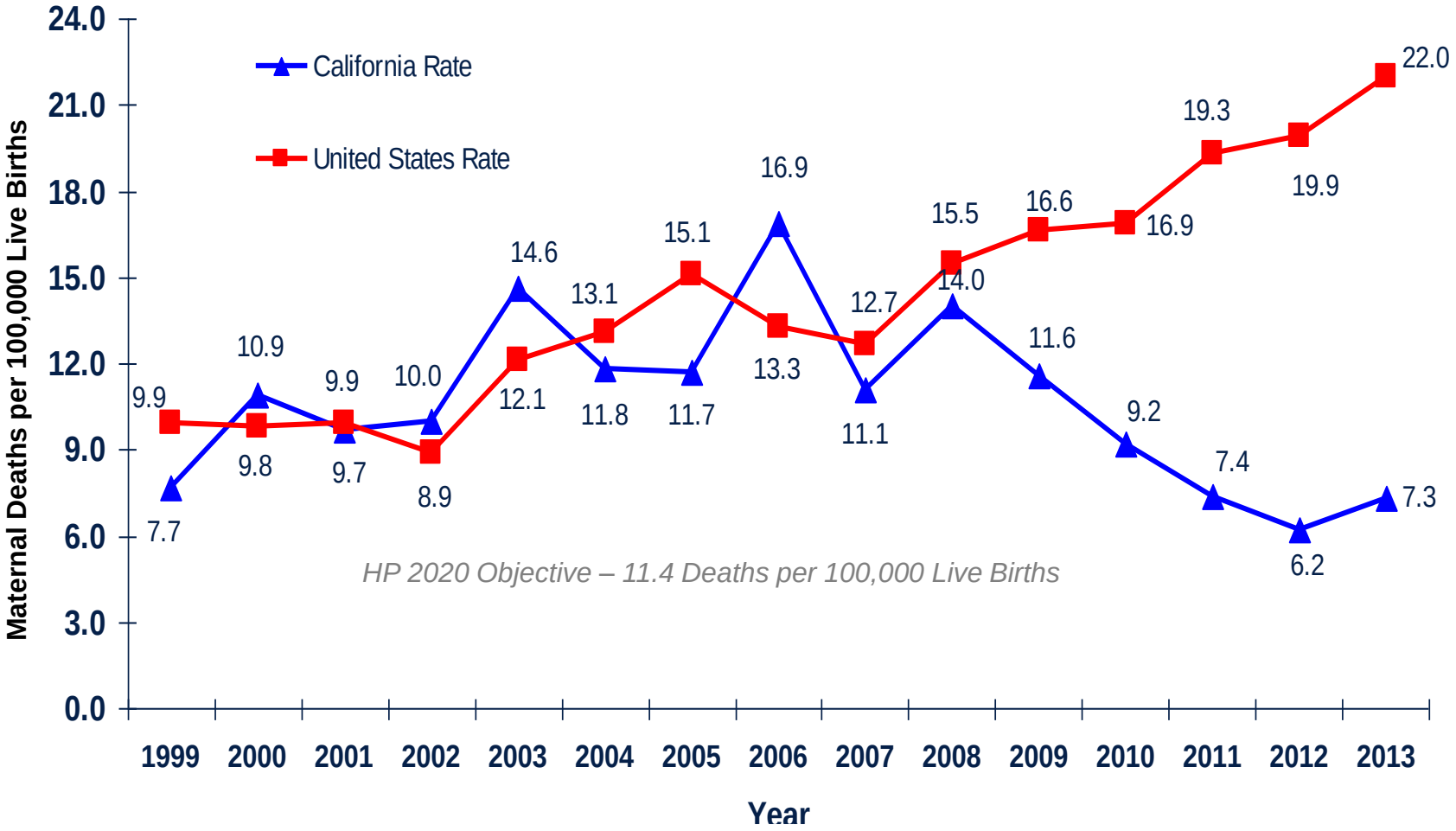
- Stress
- Fatigue
- High stakes
- Time pressure
- Task saturation
- Auditory overload
- Two patients
- Language barrier
- High expectations
- Limited resources
- Multiple care teams
- Frantic spouse/family

# How Errors Occur



# Just a routine operation….


# 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 ≤ 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.govon March 11, 2015. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, March, 2015.

# CA-PAMR: Chance to Alter Outcome

| 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** |

# Labor & Delivery: A Unique Domain

**ED + OR + ICU + NICU = L&D**

- **High stakes**

- **High payouts**

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# Sentinel Event Analysis

## Root Causes

- Communication (72%)
- Staff competency (47%)
- Orientation and training (40%)
- Inadequate fetal monitoring (34%)
- Unavailable monitoring equipment/drugs (30%)
- Credentialing/Privileging/Supervising MD CNM (30%)
- Staffing issues (25%)
- Physician unavailable or delayed (19%)
- Unavailable prenatal information (11%)

# 2004 Joint Commission Recommendations
# Sentinel Event Alert # 30

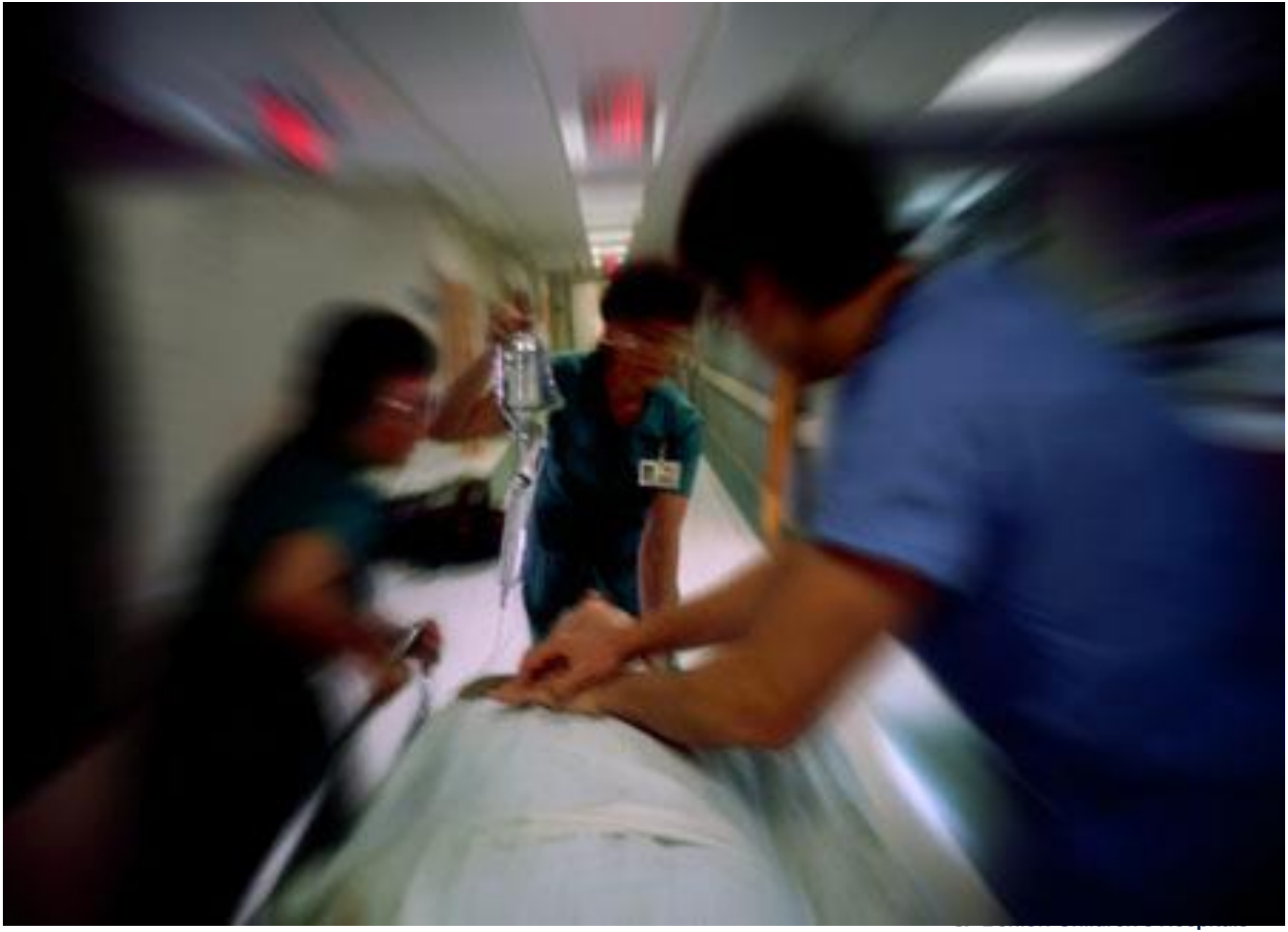
1. Conduct team training in perinatal areas to **teach staff** to **work together** and **communicate** more effectively.

2. For high risk events, such as emergency cesarean delivery, **conduct clinical drills** and **debriefings** to **evaluate team performance** and **identify areas** for improvement.

# 2010 Joint Commission Recommendations
# Sentinel Event Alert # 44

1. Develop written criteria describing MEWS
2. Identify specific **triggers** for responding to subtle vital sign changes and maternal condition….
3. Requirement to promptly seek assistance be in place
4. Use **drills** to train staff

# Traditional Learning



Practice crisis skills not often used

Suspend disbelief: simulation artifact

# No potential harm; not random

# Errors can be allowed to occur

# Ability to Debrief

- Rarely a record of events & actions
- Rarely any systematic debriefing afterwards
- So…how does the team learn for next time?

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# Why Do We Videotape the Scenarios?

- Excellent debriefing tool
- Shows exactly what went on in the scenario
- Most learners agree that it is a valuable tool
- Allows learners to comment and discuss key events/actions during the scenario

***"Finding good players is easy.***
***Getting them to play as a team is another story"***

**Casey Stengel**

# Promote High Reliability

- **Lucky verses Good**
- By conducting a drill you can actually test your department's capability to handle a rare obstetrical or neonatal emergency
- Measure outcomes in minutes
  - PRBC's transfusing after requested
  - Time of birth after prolapse cord
  - Magnesium Sulfate bolus infusing

"Circumstance determined that it was this experienced crew that was scheduled to fly that particular flight on that particular day , but I know I can speak for the entire crew when I tell you **we were simply doing the job we were trained to do."**

*Chesley Sullenberger III*

# The Principles of Crew Resource Management


- Know your environment
- Anticipate and plan
- Assume the leadership role
- Communicate effectively
- Distribute work load optimally

- **Allocate attention Wisely**
- **Utilize all available information**
- **Utilize all available resources**
- **Call for help early enough**
- **Maintain professional behavior**

# Know Your Environment

- Sounds simple but it's not !
- Emergency equipment rarely used
  - OR – arm boards, stirrups, rapid infuser
- Often there was a small widget needed
  - Suction failure, pentothal pin, stopcock
- Equipment and supplies move
- Staff vacations, relief/ float staff

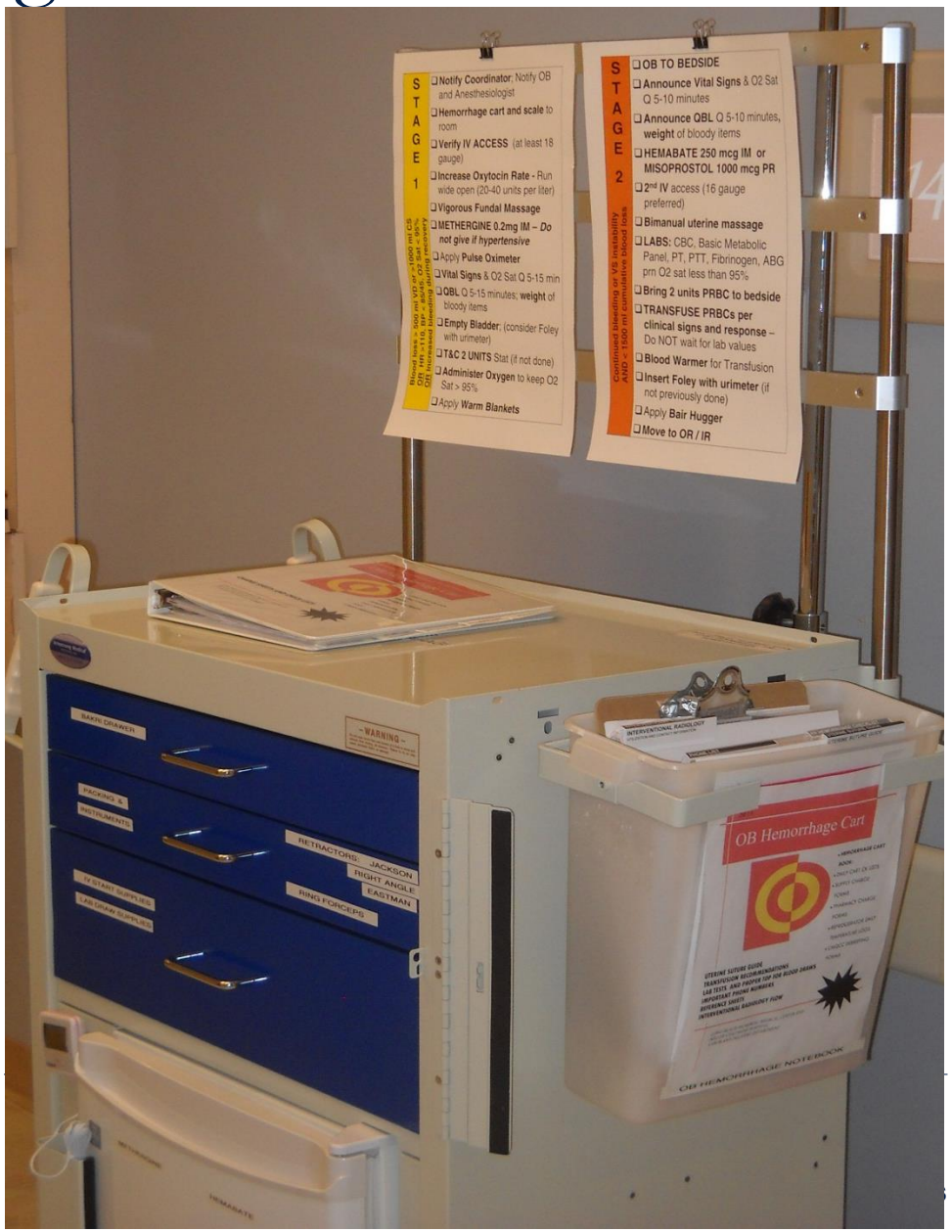
# Instrument & Supply Room

## Access to Emergency Supplies

- Rearranged supplies and labeled bins
- Stocked emergency supplies in red bins & moved to upper shelves
- Re-labeled frequent use bins with known names
- Grouped related items

# OB Hemorrhage Cart: 2014

- Quick access to emergency supplies
- Refrigerator for meds
- Establish necessary items and par levels
- Label drawers/compartments
- Include checklists
- Develop process for checking and restocking
- Educate nursing and physician staff




McNulty, 2014

# Anticipate and Plan for Crisis

- Situational Awareness
- Don’t sleep on the job  - Risk assess
- Know the department standards and guidelines
- Have a back up plan for your back up plan

Preparing for Clinical Emergencies in Obstetrics and Gynecology

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

# COMMITTEE OPINION

- Number 590 • March 2014 *(Replaces Committee Opinion Number 487, April 2011)*
- Committee on Patient Safety and Quality Improvement

- *This document reflects emerging concepts on patient safety and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.*

The American College of Obstetricians and Gynecologists

- WOMEN'S HEALTH CARE PHYSICIANS

*Current Commentary*

Obstetrics & Gynecology
VOL. 123, NO. 5, MAY 2014

# The National Partnership for Maternal Safety

Mary E. D'Alton, MD, Elliott K. Main, MD, M. Kathryn Menard, MD, and Barbara S. Levy, MD

*Current Commentary*

Obstetrics & Gynecology
VOL. 124, NO. 4, Oct 2014

# The Maternal Early Warning Criteria

## *A Proposal From the National Partnership for Maternal Safety*

Mhyre, J., D' Oria, R., Hameed, A., et al

# Examples of Tools for Managing Clinical Emergencies


- Availability of appropriate emergency supplies in a resuscitation cart (crash cart) or kit
- Development of a rapid response team
- Development of protocols that include clinical triggers
- Use of standardized communication tools for huddles and briefs (eg, SBAR)
- Implementation of emergency drills and simulations
- Abbreviation: SBAR, Situation–Background–Assessment–Recommendation.

CMQCC
CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE

# California Partnership for Maternal Safety

PATIENT SAFETY BUNDLE

OBSTETRIC HEMORRHAGE

## READINESS

***Every unit***

- ✓ Hemorrhage cart with supplies, checklist, instruction cards and posters
- ✓ Immediate access to hemorrhage medications (kit or equivalent)
- ✓ Establish a response team – who to call when help is needed
- ✓ Establish massive and emergency release transfusion protocols/policies (type O negative/uncrossmatched)
- ✓ Unit education on processes, unit-based drills (with post-drill debriefs)

## RECOGNITION & PREVENTION

***Every patient***

- ✓ Assessment of hemorrhage risk (prenatal, on admission, prior to delivery and post birth)
- ✓ Measurement of cumulative blood loss (formal, as quantitative as possible)
- ✓ Active management of 3rd stage of labor

## RESPONSE

***Every hemorrhage***

- ✓ Unit-standard, stage-based on QBL, obstetric hemorrhage emergency management plan with checklists
- ✓ Support program for patients, families, and staff for all significant hemorrhages

## REPORTING/SYSTEMS LEARNING

***Every unit***

- ✓ Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- ✓ Multidisciplinary review of significant hemorrhages for systems issues
- ✓ Monitor outcomes and process metrics in perinatal quality improvement committee

This bundle was developed by the Council On Patient Safety in Women's Health Care, National Partnership for Maternal Safety 2014

COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE
safe health care for every woman

Draft 1.2

# STAGE 1: OB Hemorrhage

**Cumulative Blood Loss >500ml vaginal birth or >1000ml C/S -OR-**
**Vital signs >15% change or HR ≥110, BP ≤85/45, O2 sat <95% -OR-**
**Increased bleeding during recovery or postpartum**

## MOBILIZE

**Primary nurse, Physician or Midwife** to:
- ☐ Activate OB Hemorrhage Protocol and Checklist

**Primary nurse** to:
- ☐ Notify obstetrician (in-house and attending)
- ☐ Notify charge nurse
- ☐ Notify anesthesiologist

## ACT

**Primary nurse**:
- ☐ Establish IV access if not present, at least 18 gauge
  Increase IV Oxytocin rate, 500 mL/hour of 10-40 units/1000mL solution); Titrate infusion rate to uterine tone
- ☐ Continue vigorous fundal massage
- ☐ Administer Methergine 0.2 mg IM per protocol (if not hypertensive); give once, if no response, move to alternate agent; if good response, may give additional doses q 2 hr
- ☐ Vital Signs, including O2 sat & level of consciousness (LOC) q 5 minutes
- ☐ Weigh materials, calculate and **record** cumulative blood loss q 5-15 minutes
- ☐ Administer oxygen to maintain O2 sats at >95%
- ☐ Empty bladder: straight cath or place Foley with urimeter
- ☐ Type and Crossmatch for 2 units Red Blood Cells STAT (if not already done)
- ☐ Keep patient warm

**Physician or midwife:**
- ☐ Rule out retained Products of Conception, laceration, hematoma

**Surgeon (if cesarean birth and still open)**
- ☐ Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior uterus, and retained placenta

## THINK

Consider potential etiology:
- Uterine atony
- Trauma/Laceration
- Retained placenta
- Amniotic Fluid Embolism
- Uterine Inversion
- Coagulopathy
- Placenta Accreta

**Once stabilized:** Modified Postpartum management with increased surveillance

**If: Continued bleeding or Continued Vital Sign instability, and <1500 mL cumulative blood loss proceed to STAGE 2**

## UTEROTONIC AGENTS for POSTPARTUM HEMORRHAGE

| Drug | Dose | Route | Frequency | Side Effects | Contraindications | Storage |
|---|---|---|---|---|---|---|
| Pitocin® (Oxytocin) 10 units/ml | 10-40 units per 1000 ml, rate titrated to uterine tone | IV infusion | Continuous | Usually none<br>Nausea, vomiting, hyponatremia ("water intoxication") with prolonged IV admin.<br>↓ BP and ↑ HR with high doses, esp IV push | Hypersensitivity to drug | Room temp |
| Methergine® (Methylergonivine) 0.2mg/ml | 0.2 mg | IM (**not** given IV) | -Q 2-4 hours<br>-If no response after first dose, it is unlikely that additional doses will be of benefit | Nausea, vomiting<br>Severe hypertension, esp. with rapid administration or in patients with HTN or PIH | Hypertension, PIH, Heart disease<br>Hypersensitivity to drug<br>**Caution** if multiple doses of ephedrine have been used, may exaggerate hypertensive response w/possible cerebral hemorrhage | Refrigerate<br>Protect from light |
| Hemabate® (15-methyl PG F2a) 250mcg/ml | 250 mcg | IM or intra-myometrial (**not** given IV) | -Q 15-90 min<br>-Not to exceed 8 doses/24 hrs<br>-If no response after several doses, it is unlikely that additional doses will be of benefit. | Nausea, vomiting, Diarrhea<br>Fever (transient), Headache<br>Chills, shivering<br>Hypertension<br>Bronchospasm | Caution in women with hepatic disease, asthma, hypertension, active cardiac or pulmonary disease<br>Hypersensitivity to drug | Refrigerate |
| Cytotec® (Misoprostol) 100 or 200mcg tablets | 800-1000mcg | Per rectum (PR) | One time | Nausea, vomiting, diarrhea<br>Shivering, Fever (transient)<br>Headache | Rare<br>Known allergy to prostaglandin<br>Hypersensitivity to drug | Room temp |

# Comprehensive maternal hemorrhage protocols reduce the use of blood products and improve patient safety

Shields, L., et. al., (2014) *AJOG*

- Checklist for protocol and data compliance
  - ❑Risk assess
  - ❑Correct blood bank request
  - ❑Quantified blood loss
  - ❑Correct lab results were obtained
  - ❑> 2 Uterotonics give w/o MD present
  - ❑Blood given per protocol

*Safehealthcareforeverywoman.org*

# Assume the Leadership Role

- The Primary Nurse

- What happens when the MD enters the scenario?

# Communicate Effectively

- Again this sounds so simple
- How exactly does one learn to communicate effectively?
- Are there tools/ strategies to promote effective communication?
- Communication is revealed on the video
  - Masks
  - Alarms
  - Incoming staff

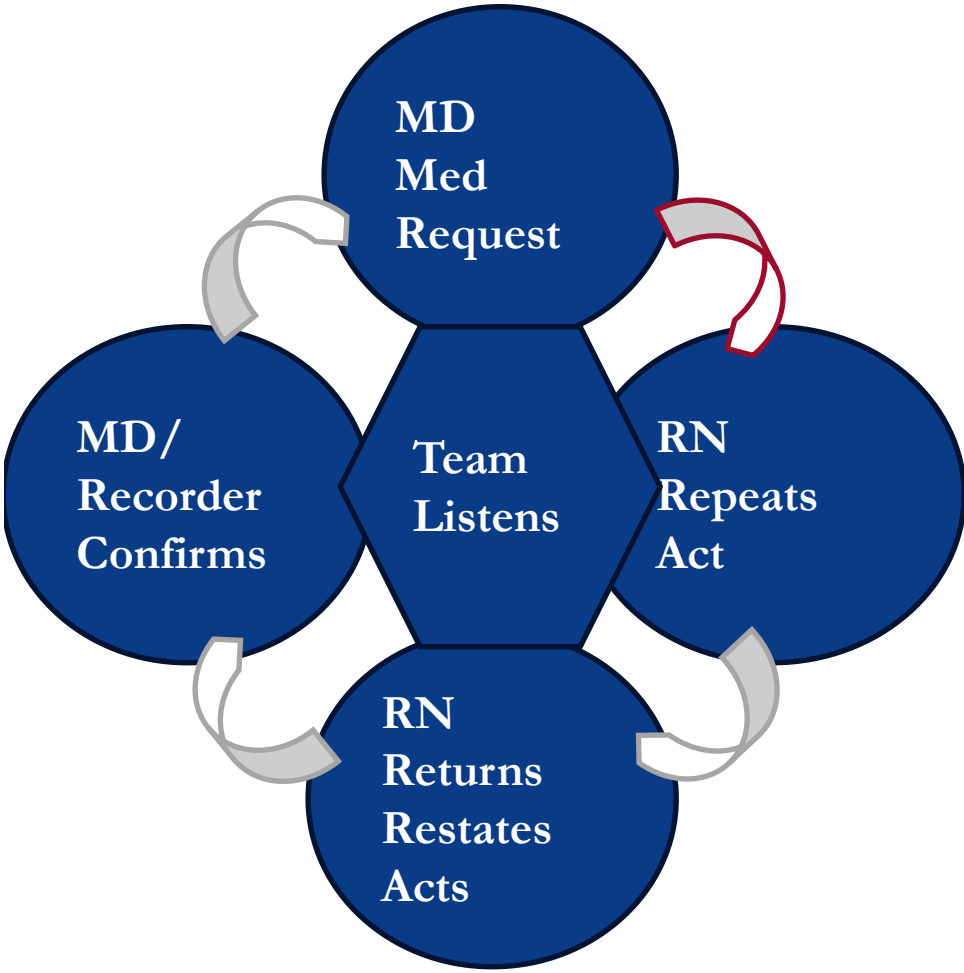
# Communicate Clearly!

- With all members of the team
- If you are asking for help, tell them why and what they can do to help.

- This is what is happening…
- This is what I need…
- This is what you can do…

# Closed Loop Communication

- When possible assign a specific task to a specific person
- When assigned a task or to accept an unassigned task
  – **close the loop**
- If possible make eye contact & use the person's name



# Distribute Work Load Optimally

- Avoid the “one woman band”
  - Compressions
  - Ventilations
  - Delegate tasks

- Utilize staff in the area of expertise
  - Respiratory Therapists - airway
  - Nursing Supervisor - recorder

# Allocate Attention Wisely

- Neonatal intubation
  - Time sensitive
  - Avoid fixation errors
- Avoid flitting
- Finish assigned tasks

# Utilize all Available Information

- Lost in Translation
  - Prenatal record
  - Patient hand-offs
  - Nurse to Nurse report
  - Patient transfer

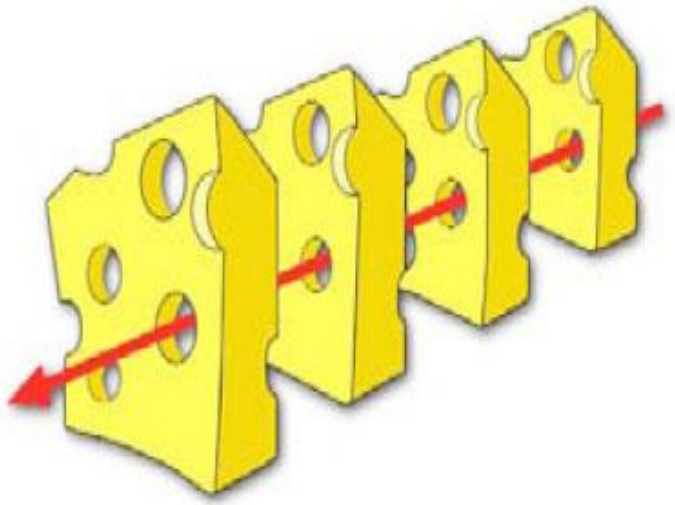


*Figure 2. Reason's 'Swiss cheese' model*

- Utilization Strategies
  - Sharing a mental model
  - Thinking out loud

# Call for Help Early

- What is the culture - is it safe?
- Every hospital system is unique
  - How exactly does the staff call for help?
  - Variations on shifts and weekends
- What language is used to convey urgency
  - Code OB, Code Red, Code H, OB Stat….
  - Ensure the staff knows what/how when to call

# Call for Help Early

- Who responds?
  - Rapid Response Team?
    - What is the SBAR?
    - What is their role?
    - Who is leader?

# Maintain professional behavior

- Laughing
- Offensive language


# The Schedule

- Brief
- Familiarization
- Scenarios
- ‘5 Minute’ Debrief
- Facilitated Debrief
- Confidentiality

# Set-up / Reset

# What You Can Expect From Us

- Professionalism
- Clear direction
- Orientation to equipment and how you will get information on the patient(s)
- Challenging scenarios
- No tricks
- A positive learning environment

# What We Expect From You

- Professionalism
- Suspending disbelief
- Act as you would in a real situation
- Think out loud
- Ask questions if something is unclear
- All information about scenarios and participants strictly confidential
- Teamwork and communication

# Ever wish for a second chance? We've all been there.

- Avoid negativity & perfectionism
- Performances & scenarios STAY HERE

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# Enhance Realism


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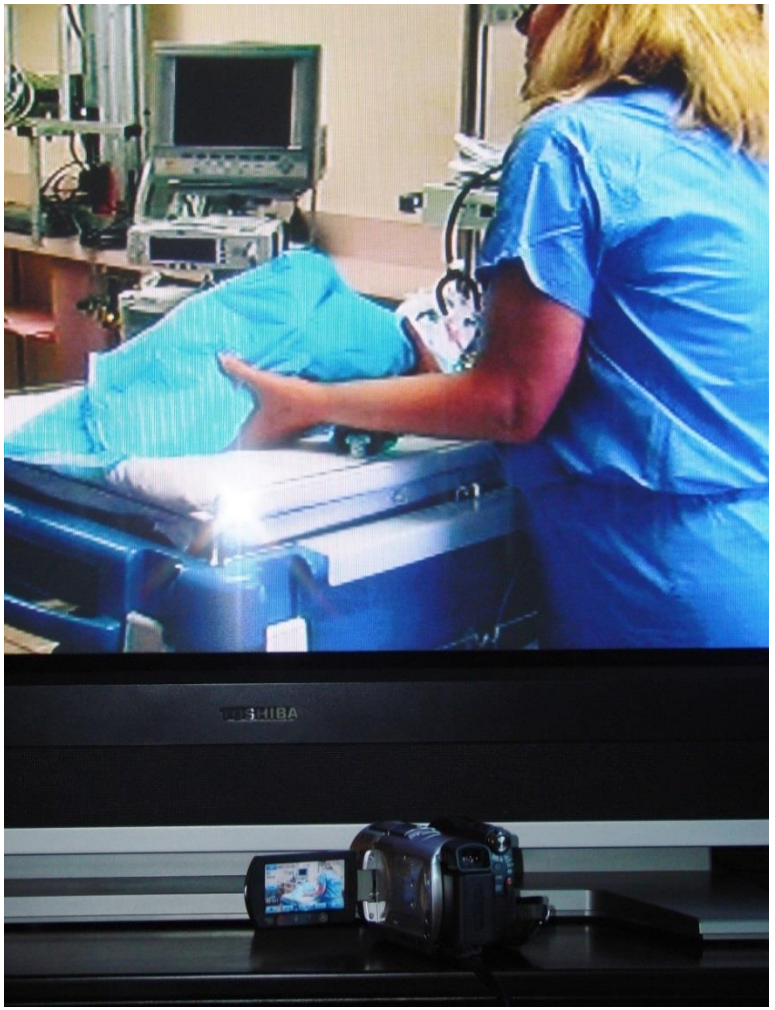
# The Wardrobe

# Lights, Camera, Action!

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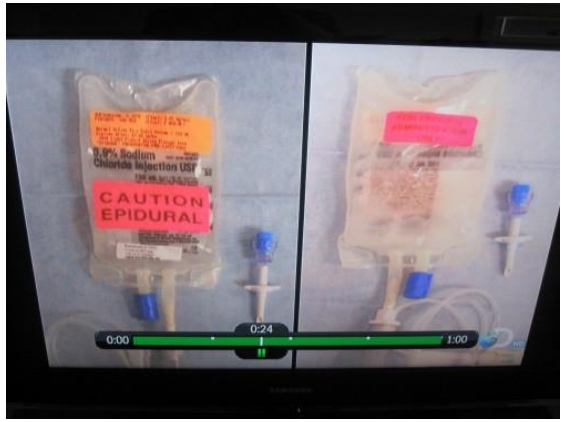
# Drill Outcomes

- Staff empowered to improve work environment
  - Suggestion box in staff lounge
- Data for Patient Safety and Risk Mgmt
- Posters placed on unit
  - Promotes staff awareness of system improvements derived from drills

# Second Victim

- Julie Thao Story

- Medical errors should not be criminalized




- Fear is a major barrier to action

# Promote a Culture of Safety

# Thank You!

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