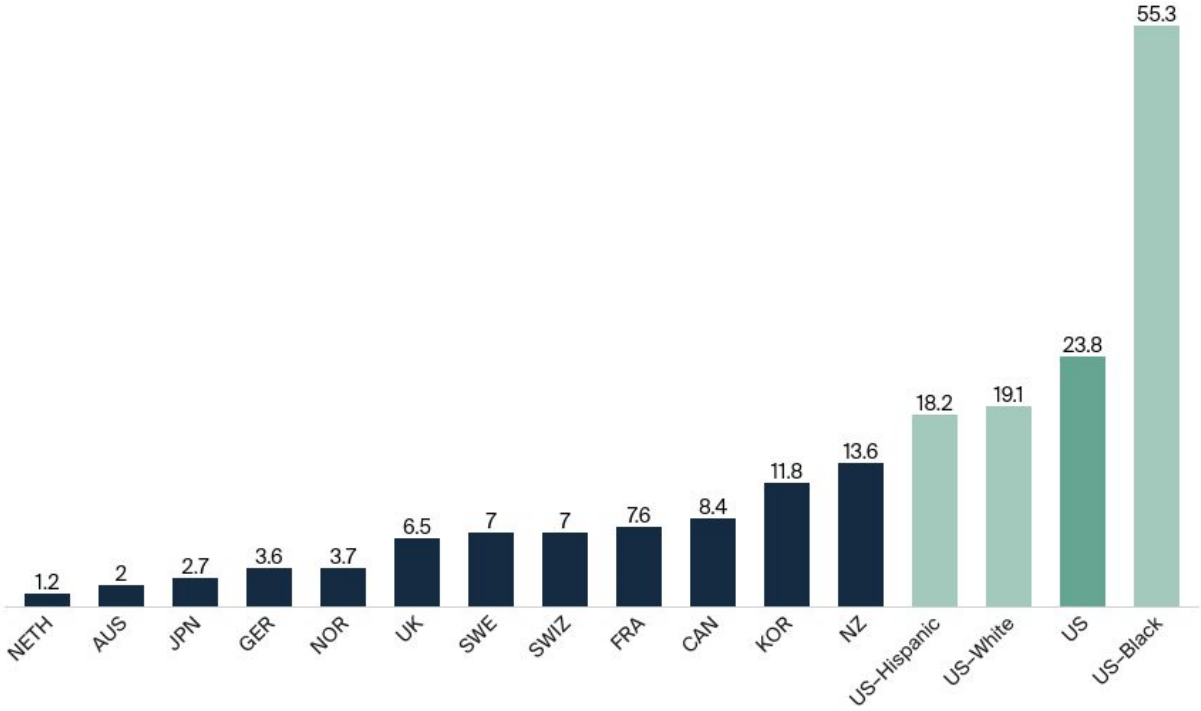
EMS and the OB Patient…….. What do you need to Know ?

- Dr. Ben Weston — Medical College of WI, Milwaukee County EMS
- Dr. C. Crawford Mechem — Philadelphia Fire Department
- **Dr. Fionna Moore** — UK- Kent Surrey Sussex Air Ambulance Charity
- Dr. David Miramontes — UT Health San Antonio San Antonio Fire Dept.

Why are Pregnant and Post-Partum Women Dying?

New Data Shows U.S. Maternal Mortality Rate Exceeds That in Other High-Income Countries

Deaths per 100,000 live births



Download data

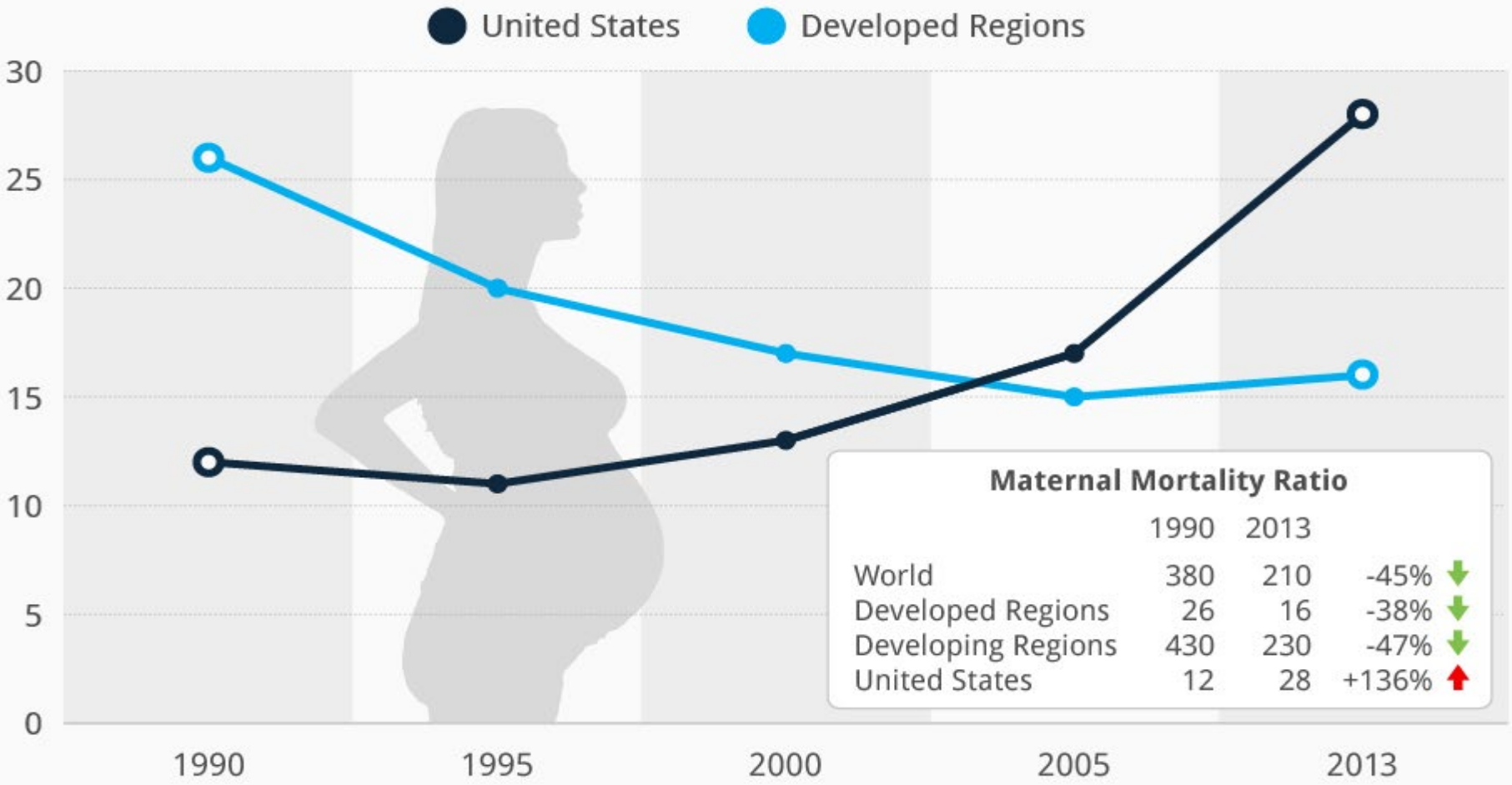
Notes: The maternal mortality ratio is defined by the World Health Organization as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. 2015 data for FRA; 2017 data for UK; 2018 data for NZ; 2019 data for SWIZ; 2020 data for AUS, CAN, GER, JAP, KOR, NETH, NOR, SWE, and US.

Data: Data for all countries except US from OECD Health Statistics 2022. Data for US from Donna L. Hoyert, *Maternal Mortality Rates in the United States, 2020* (National Center for Health Statistics, Feb. 2022).

Source: Munira Z. Gunja, Evan D. Gumas, and Reginald D. Williams II, "The U.S. Maternal Mortality Crisis Continues to Worsen: An International Comparison," To the Point (blog), Commonwealth Fund, Dec. 1, 2022. https://doi.org/10.26099/8vem-fc65

Maternal Deaths in the U.S. Are on the Rise

Maternal mortality ratio (number of maternal deaths per 100,000 live births)



Maternal Mortality Ratio

	1990	2013	
World	380	210	-45% ↓
Developed Regions	26	16	-38% ↓
Developing Regions	430	230	-47% ↓
United States	12	28	+136% ↑

Source: World Health Organization

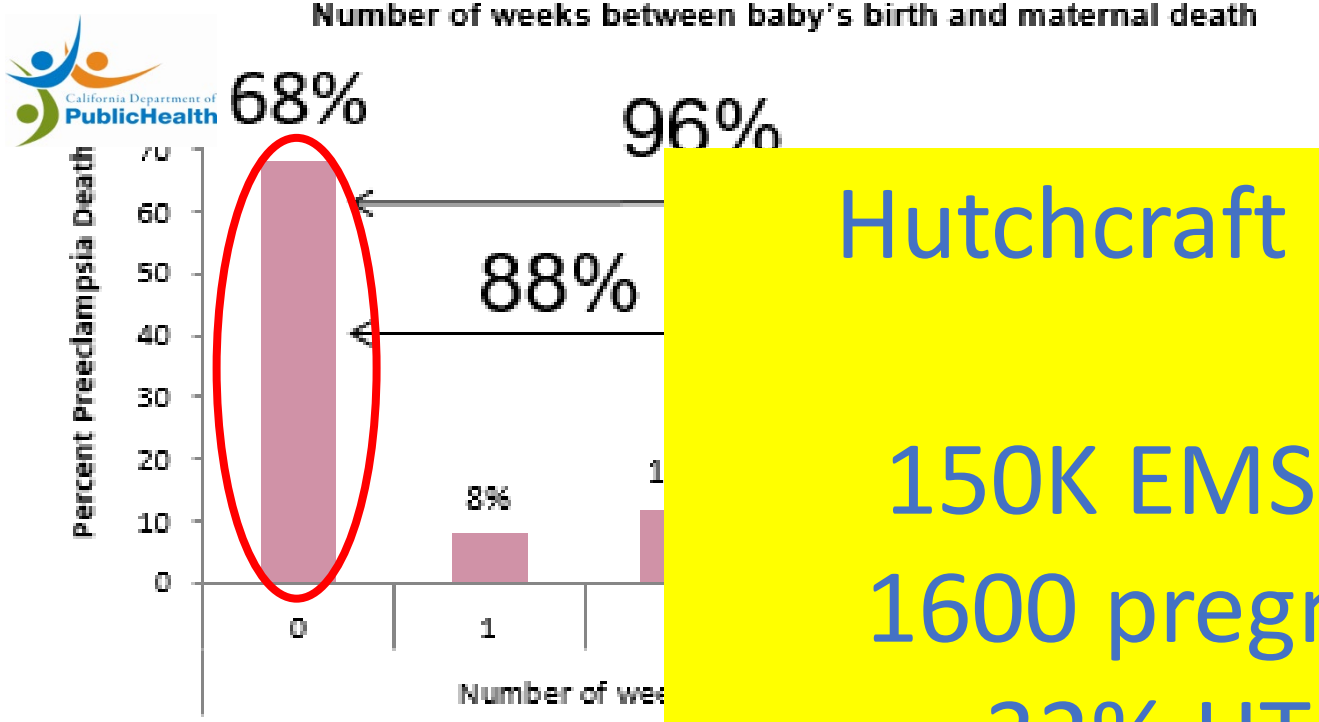
Mashable statista

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%)

140/90

160/110



Timing of Pregnar

Hutchcraft 2022

150K EMS pts
1600 pregnant
32% HTN
1 CC HTN

Eclampsia/Pre-Eclampsia Can Occur **ANYTIME** before and up to **6 weeks** after delivery

Obstetric Hemorrhage and Preeclampsia: Summary

- Most common **preventable** causes of maternal mortality
- Far and away the most common causes of Severe Maternal Morbidity
- High rates of provider "quality improvement opportunities"

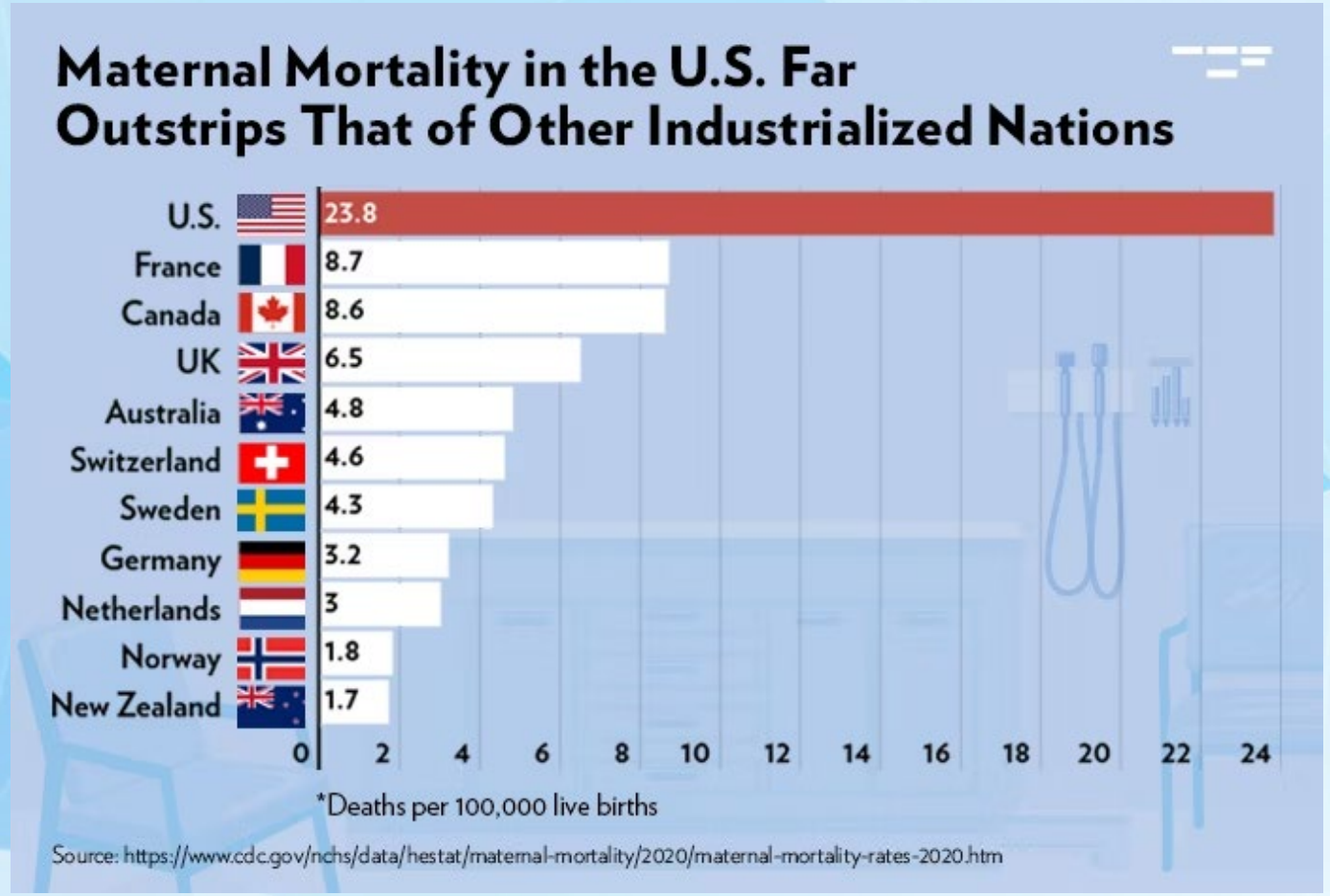
What's a Philly AR-4 For?

The Rationale and Value of Alternative Responses for Obstetrical Cases in Philadelphia

C. Crawford Mechem, MD
Department of Emergency Medicine
University of Pennsylvania School of Medicine

EMS Medical Director
Philadelphia Fire Department

Maternal Health Crisis



Tori Bowie, 1990-2023

Maternal Health Crisis

- In Philadelphia, from 2013 - 2018 there were 110 pregnancy-associated deaths
- Reviewed by City Maternal Mortality Review Cmte
- 26 pregnancy-related (contributed to death)
- Rest not related or undetermined

Causes of Maternal Death in Philadelphia

26

Pregnancy-Related

1. Cardiomyopathy, other CV
2. Embolism
3. Infection
4. Other causes
5. Hemorrhage

Not Pregnancy-Related

1. Accidental
   i. Drug overdose
   ii. MVCs
   iii. Fire
   iv. Other accidents
2. Medical conditions

Suicide, homicide, undetermined

Maternal Health Crisis

- Can these deaths be prevented?
- Per MMRC, ~54% related to pregnancy may be preventable
- How could they be prevented?
- What role can EMS play?

#26

Figure 2.9 Preventability of Pregnancy-Related Deaths, 2013-2018 (n=26)

Plus deaths not pregnancy-related

Alternative Response Unit 4
(Proposed)

- Collaboration between PFD, PDPH, local health system
- Some potential functions:
  - Facilitate referral for prenatal & postpartum care
  - Address risk factors for pregnancy-related deaths
    - HTN, dm, obesity
  - Help patients navigate insurance, social services
  - Locate patients who have disengaged from care
  - Public education
  - Link to AR-2 & AR-3

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KENT SURREY SUSSEX

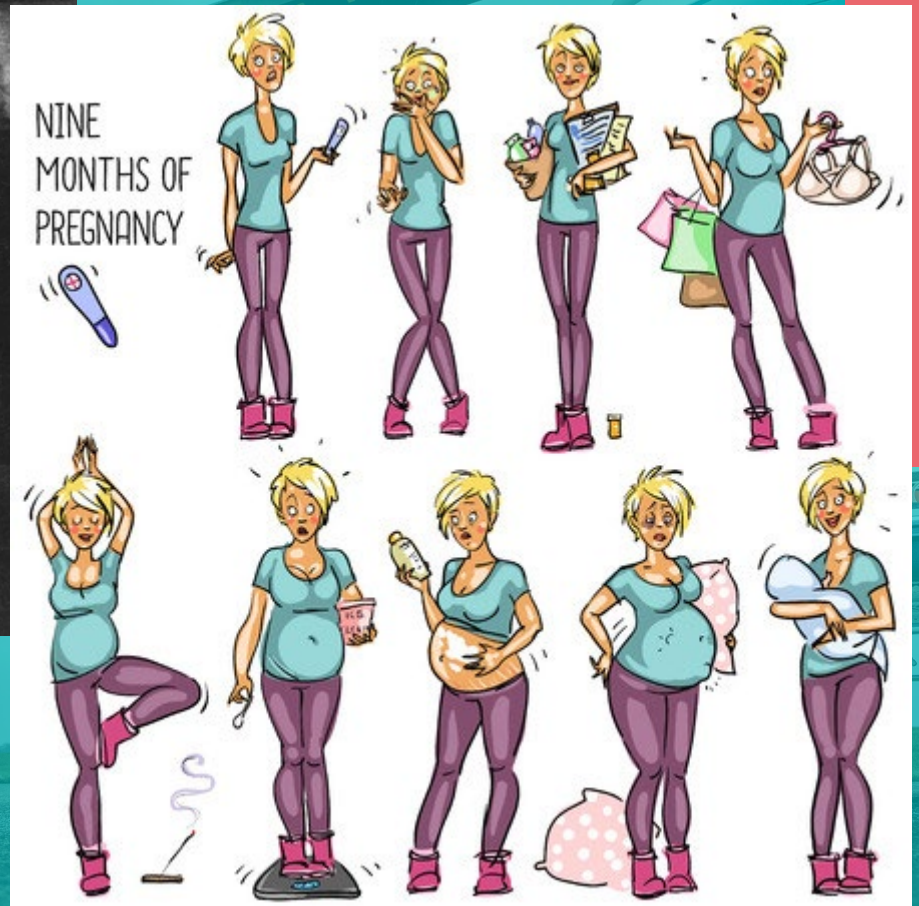
What are the benefits of employing a Consultant Midwife in your EMS?

Dr Fionna Moore MBE QAM
Senior Medical Adviser
AAKSS

South East Coast Ambulance Service

Population
4.46
million
3.6 K sq
miles

What’s the scariest job your crews attend?



Maternity care in the UK

- Largely based in multi-specialist units, Obstetrician led
- Some stand alone Midwife led units
- Each patient has an allocated Midwife throughout pregnancy & delivery
- Home births 2-4% but up to 15% in some areas
- ‘Free birthing’ increased during & after the Pandemic
- Frequent use of Doulas

Maternity care in the UK

Currently a political ‘hot potato’ 

Highly critical reports on three major hospital Trusts

- Telford and Shrewsbury (Ockenden)
- East Kent (Kirkup)
- Nottingham

Poor care, poor communication, tribalism, failure to learn from incidents, lack of leadership, poor outcomes – especially in ethnic minority patients

Numbers of 999 emergency maternity calls 2020 -2022

YEAR	Calls received	C1 emergency	HCP transfers	
2020	2602	32%	24%	
2021	2454	55%	26%	
2022	2169	52%	7%	

- **Almost 3,00 babies delivered per year**
- **Neonatal resus or maternal emergency bi weekly**

EMS background in England

All hospital based maternity units employ senior or Consultant Midwives

2009: London Ambulance Service employed a Consultant Midwife

2018 SECAmb employed a full time Consultant Midwife

Benefits

Training for front line crews in managing:

Normal delivery

Neonatal resuscitation

Benefits

Training for front line crews in recognising:

Abnormal presentations

Pre eclampsia and Eclampsia

And training a cadre of Critical Care Paramedics in providing remote and on scene support

Assessment of Preterm births

Provide guidance on gestation

Do not attempt resus under 22 weeks gestation

Provide sensitive management of an extreme pre term foetus

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Full term
28 weeks
22 weeks

Lily pockets

Management of Preterm births

Examples of benefit:

Remote support

- **Shoulder dystocia** at home. No progress with McRobert's manoeuvre.

CCP talked through bringing down posterior shoulder via radio contact

Baby delivered successfully

- 36yo multip; planned home delivery

Massive post partum haemorrhage unresponsive to uterine massage & oxytocics

Talked through bimanual compression

Mother and baby transported safely

Impact on complaints, untoward incidents and litigation

Complaints and incidents:

Knowledgeable clinician to undertake investigation and liaise with complainants, parents and hospitals;

- ✓ Ability to defuse situations
- ✓ Provide an educated ear for mothers and relatives
- ✓ Debriefing and support for staff after distressing calls
- ✓ Provide training for hospital staff in unfamiliar situations

Litigation

No successful claims since appointment in 2018

Take home messages

- Maternity emergencies are the most stressful your crews attend
- They may go really well, or really, really badly
- There are two patients; always dispatch two resources
- Regular training delivered by an expert can assist in managing emergencies
- Upskill a cohort of advanced clinicians who can provide on scene or remote support

Thank you

Severe Hypertension in Pregnancy and Postpartum; Identification and Management

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Thinking beyond

Presented by:

Lolly Perry MSN, RNC-OB

ADAPTED FOR UT HEALTH EMS CE

David Miramontes MD FACEP EMT-P

Risk factors for Pre-Eclamsia

- 1st Pregnancy
- Pre-Eclampsia before (8xrisk)
- Age >40 or teenager
- Family Hx Pre-Eclampsia
- Diabetes
- Obesity
- Twins-Triplets
- Minority Ethnic Group
- Chronic HTN or Renal Disease
- Auto Immune disorders
- Vascular disorders
- New Male Partner
  (less immune sys exposure)
- In Vitro fertilization
- Sleep Apnea
- PTSD

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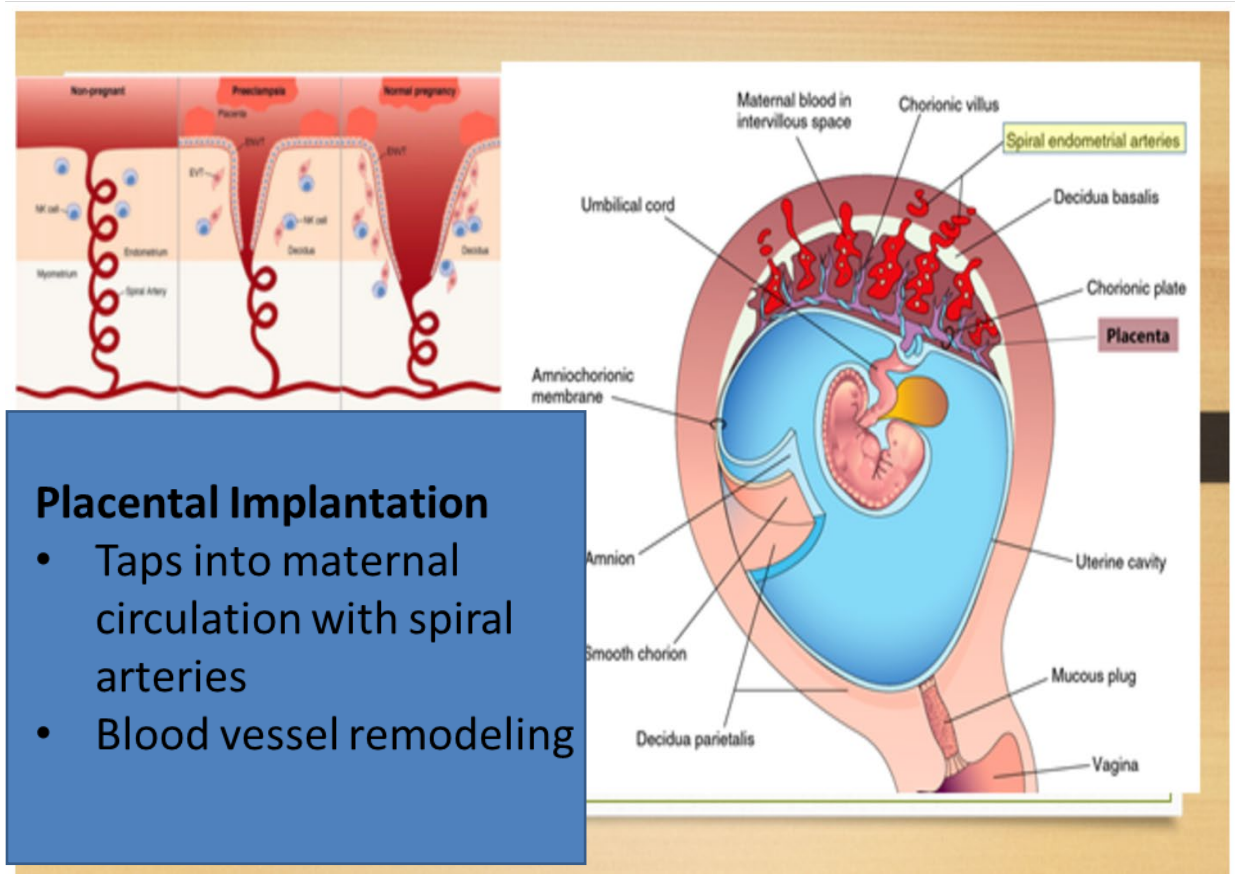
Pathophysiology of Preeclampsia

- “A disorder of widespread endothelial malfunction and vasospasm”



Placental Implantation

- Taps into maternal circulation with spiral arteries
- Blood vessel remodeling

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Criteria for the diagnosis of preeclampsia

Systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg on at least 2 occasions at least 4 hours apart after 20 weeks of gestation in a previously normotensive patient AND the new onset of 1 or more of the following*:
•Proteinuria ≥0.3 g in a 24-hour urine specimen or protein/creatinine ratio ≥0.3 (mg/mg) (30 mg/mmol) in a random urine specimen or dipstick ≥2+ if a quantitative measurement is unavailable Serum creatinine >1.1 mg/dL (97.2 micromol/L) or doubling of the creatinine concentration in the absence of other renal disease
•Platelet count <100,000/microL
•Liver transaminases at least twice the upper limit of the normal concentrations for the local laboratory
•Pulmonary edema
•New-onset and persistent headache not accounted for by alternative diagnoses and not responding to usual doses of analgesics¶
•Visual symptoms (eg, blurred vision, flashing lights or sparks, scotomata)

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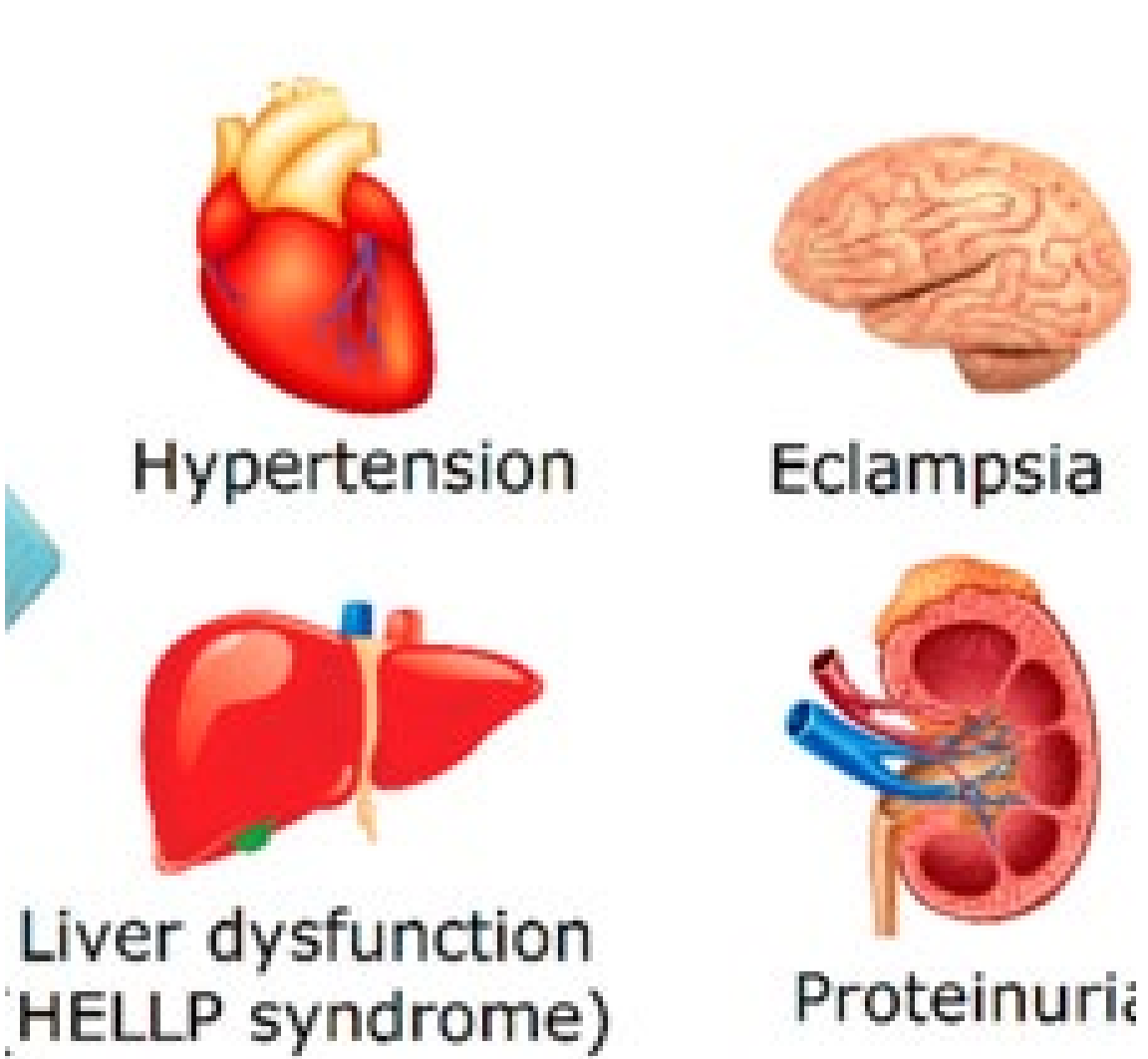
PREECLAMPSIA WITH SEVERE FEATURES

- Two severe BP values (SBP ≥ 160 **or** DBP ≥ 110) obtained15-60 minutes apart
- Persistent oliguria <500 ml/24hours
- Progressive renal insufficiency
- Unremitting headache/visual disturbances
- Pulmonary edema
- Epigastric/RUQ pain
- LFTs > 2x normal
- Platelets < 100K
- HELLP syndrome
- ***5 gr of proteinuria no longer criteria for severe preeclampsia***



Characterization of Symptoms Immediately Preceding Eclampsia

- 3,267 deliveries and 46 cases of eclampsia (1.4%)
- Most common prodromal neurological symptoms (regardless of the degree of hypertension OR whether the seizure occurred antepartum or postpartum):
  - Headaches (80%)
  - Visual disturbance (45%),

  BUT Hold ON …….

- **20% of women** with eclampsia reported **no neurologic symptoms before the seizure**

Cooray SD, Edmonds SM, Tong S, et al. Characterization of Symptoms Immediately Preceding Eclampsia. Obstetrics & Gynecology, Vol 118(5):1000-1004, November 2011.

Emergent Therapy for Acute-Onset, Severe Hypertension

Notify Physician if: Systolic ≥ to 160 mmHg OR if Diastolic is greater than or equal to 110 mmhg administer first line therapy using one of the following:

LABETALOL Monitor BP q 10m	HYDRALAZINE Monitor BP q 20m	ORAL NIFEDIPINE* Monitor BP q 20m
20 mg IV	5-10 mg IV	10 mg orally
40 mg IV	10 mg IV	20 mg orally
80 mg IV	Switch to Labetalol 20mg	20 mg orally
Switch to: Hydralazine 10 mg IV	Labetalol 40 mg	Switch to: 20 mg Labetalol IV

Prevention of Seizures

Magnesium sulfate

- Reduces the rate of recurrent seizures by one-half to two-thirds
- Reduces the rate of maternal death by one-third

Altman D, Carroli G, Duley L, et al. The Magpie Trial: a randomized placebo-controlled trial; *Lancet* 2002;359:1877–90.

Magnesium Sulfate

- Loading dose 4-6 grams IV over 20 minutes per IV pump
- 2 grams/hour maintenance dosing
- May repeat dosing during eclamptic siezure

Final words

- **Be aware High Risk groups for Pregnancy Induced Hypertension and pre-eclampsis**
- **<u>A BP >140 IS NOT normal in pregnancy</u>**
- **Be aggressive:**
  - **Magnesium SZ Prophylaxis**
  - **BP Management**

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Questions?

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