Assessment of the OB Patient Presenting to the ED

Cardiac Complications in Pregnancy and Postpartum

Jill Henkle RNC-OB

July 18, 2022

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CONVENTION
2022


G5
Obstetrics in the Emergency Department (ED) – How Rural EDs Will Play a Role in Reducing Maternal Mortality and Morbidity

Bucket List

Support acknowledgement:
HRSA State Maternal Health Innovation Program

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Disclosures

- Speakers have identified no financial disclosures or conflict of interests

Note on Terminology

- Throughout this presentation, the terms “mother” or “maternal” or “she or “her” are used in reference to the birthing person. Recognition that not all birthing people identify as mothers or women. We believe all birthing people are equally deserving of patient-centered care that helps them attain their full potential and live authentic health lives.

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EMS Credits

Send Marleine EMS license #

In Chat put in full name and facility

Must attend live Zoom Meeting

Upcoming Topics

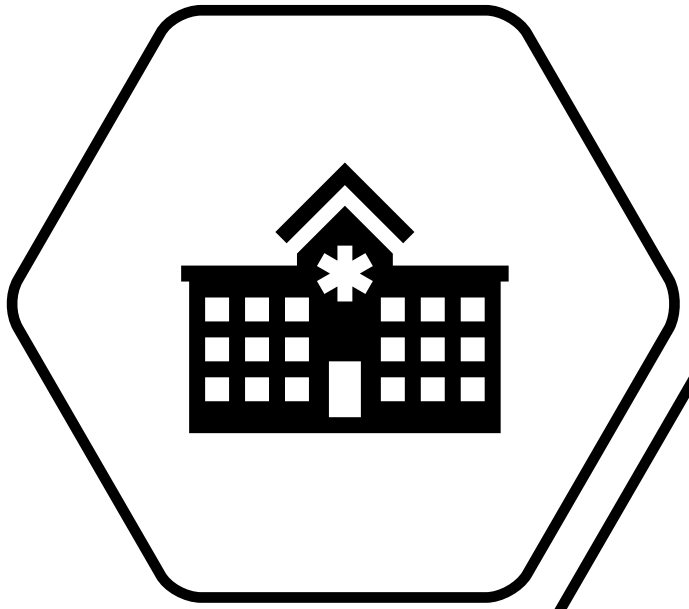
August – Maternal Venous Thrombosis/Sepsis

September - TBD - This will be our last monthly offering

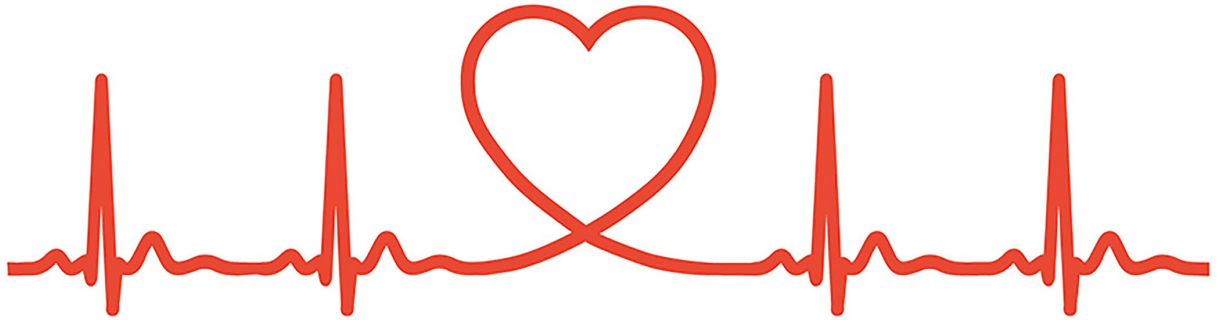
Interest in continuing if CEU's not offered – Quarterly?

Simulations Visits

- Our Team will start reaching out to facilities to schedule visits



Cardiac Complications in Pregnancy and Postpartum



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Objectives

- Discuss why symptoms of cardiac disease may be falsely attributed to the common symptoms in a normal pregnancy
- Review CVD Assessment Algorithm for Pregnant and Postpartum Women
- Describe the clinical uses of BNP in pregnancy
- Discuss why CVD is a leading preventable cause of mortality and morbidity in the obstetrical patient
- Review Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm

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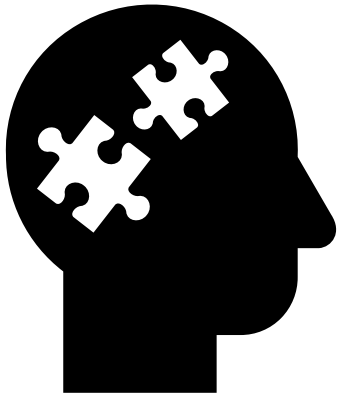
Case Study



- 24 y/o Black Female
- Mildly Obese
- Complaints:
  - Cough
  - Fatigue

Case Study

VS:

98.0

P 130

R 22

BP 140/100

O2 Sat 96%

Lung Sounds

Few scattered crackles

Heart Sound

Irregular – states she has “racing” heartbeat at times

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Case Study

While in your ED – Continues to worsen

30 min later:

Increased shortness of breath

RR 48 and shallow

HR 130's - SVT

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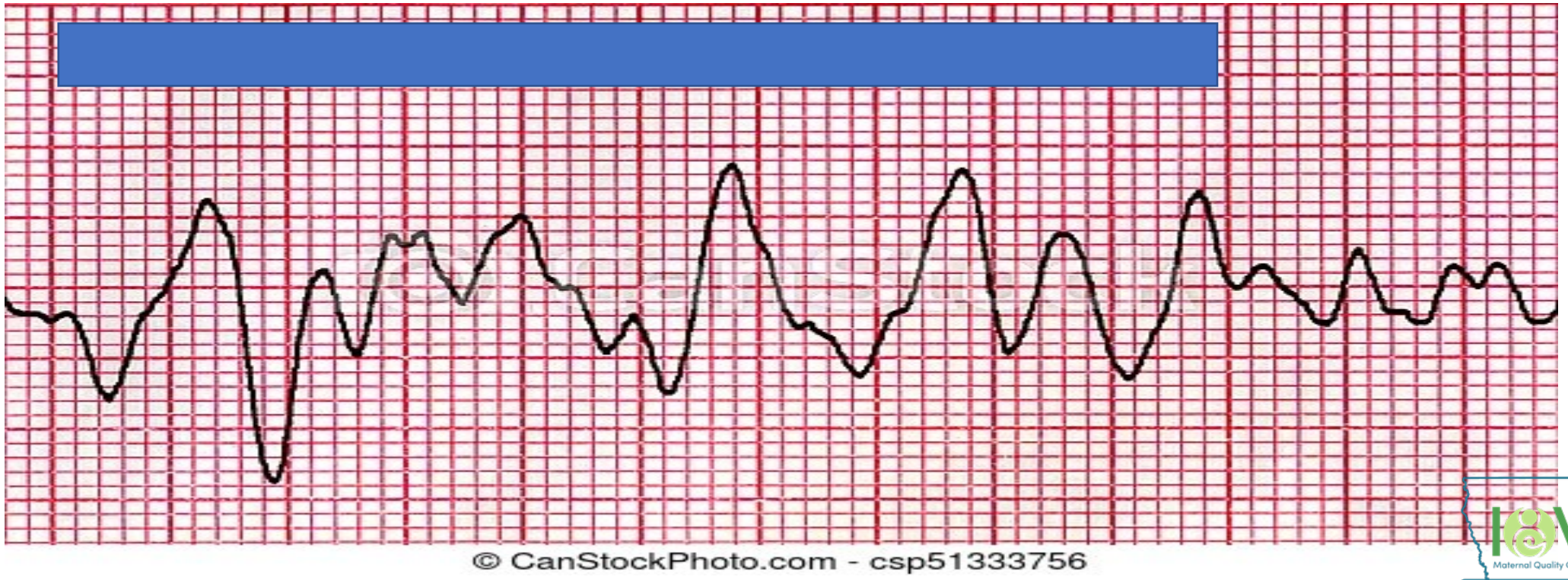
Case Study

- 45 minutes later
  - Becomes unresponsive



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Critical Questions

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Appendix G: Stop Sign for Patient Information

Improving Health Care Response to Hypertensive Disorders of Pregnancy, a CMQCC Quality Improvement Toolkit, 2021.

HDP_FINAL_Appendix_G_111621 (1).pdf

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Every Patient

- Obtain a focused pregnancy and cardiac history in all care settings, including emergency department, urgent care and primary care
- In all care environments assess and document if a patient presenting is pregnancy or has been pregnant within the past year
- Assess if escalating warning signs for an imminent cardiac event are present
- Utilize standardized cardiac risk assessment tools to identify and stratify risk
- Conduct a risk appropriate work-up for cardiac conditions to establish diagnosis and implement the initial management plan
- Screen each person

[Cardiac Conditions in Obstetrical Care | AIM Program (Previously Council on Patient Safety) (safehealthcareforeverywoman.org)]

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Background

- Cardiovascular Disease (CVD) complicates 1% of all pregnancies
- Severity has increased
- Postpartum hospitalizations for cardiovascular complications have tripled
- More than 25% of pregnancy-related mortality in the US (2011 to 2013 attributed to CVD or cardiomyopathy
- Approx 25% of these deaths are preventable if recognized earlier in pregnancy

Kuklina E, Callaghan W. Chronic heart disease and severe obstetric morbidity among hospitalisations for pregnancy in the USA: 1995-2006. *BJOG*. 2011;118(3):345-352; Centers for Disease Control and Prevention. Pregnancy Mortality Surveillance System. 2018. Available at https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html; Hameed AB, Lawton ES, McCain CL, et al. Pregnancy-related cardiovascular deaths in California: beyond peripartum cardiomyopathy. *Am J Obstet Gynecol*. 2015;213(3):379.e1-379.e10; Hameed AB, Morton CH, Moore A. Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum. 2017. Available at https://www.cdph.ca.gov/Programs/CFH/DMCAH/RPPC/CDPH%20Document%20Library/CMQCC_CVD_Toolkit.pdf.

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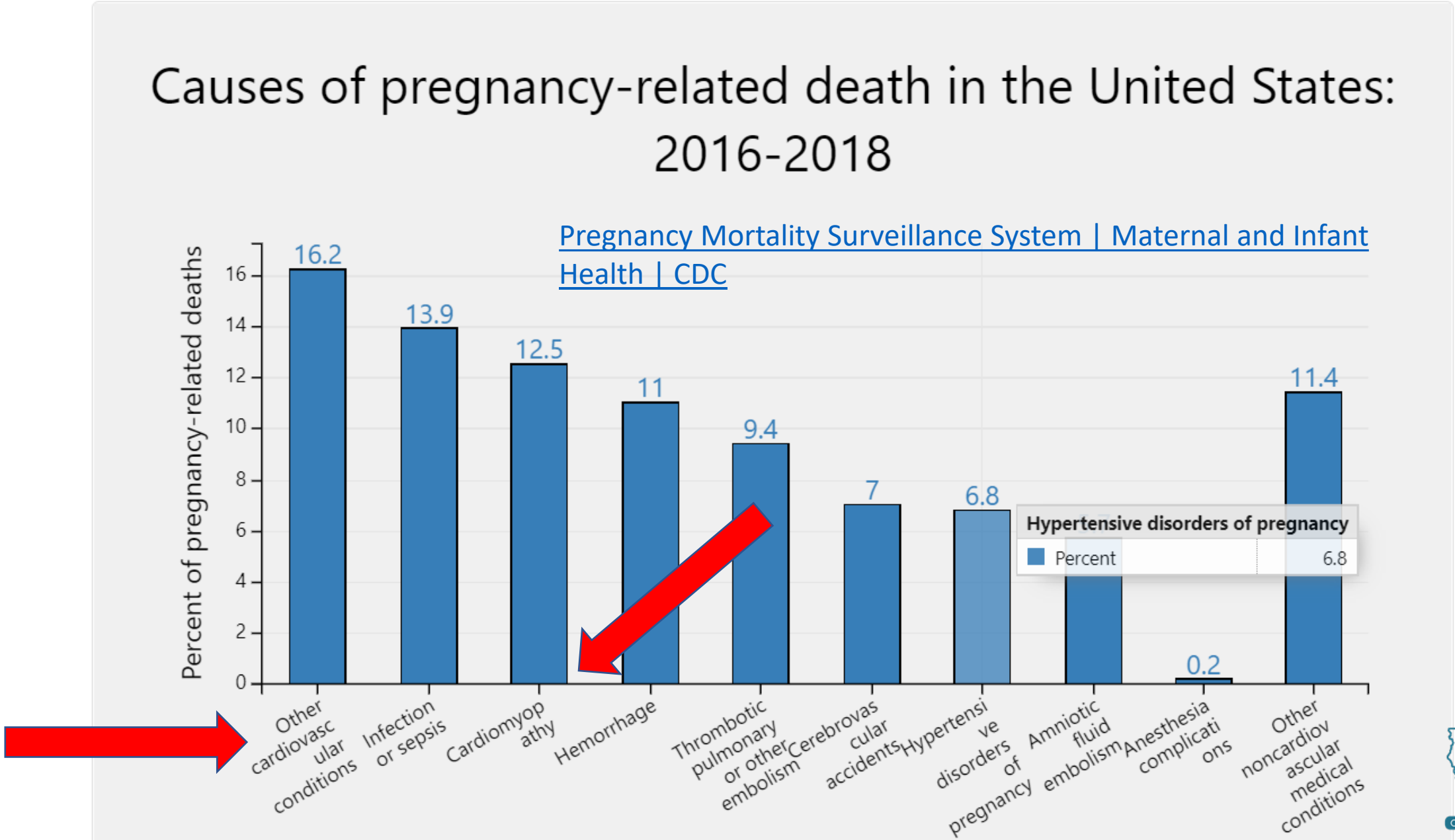
Causes of Pregnancy-Related Deaths



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- Only a small fraction of these women had a known diagnosis of CVD prior to death
- Most women who died had presented with symptoms either during pregnancy or after childbirth

Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit CMQCC, 2017

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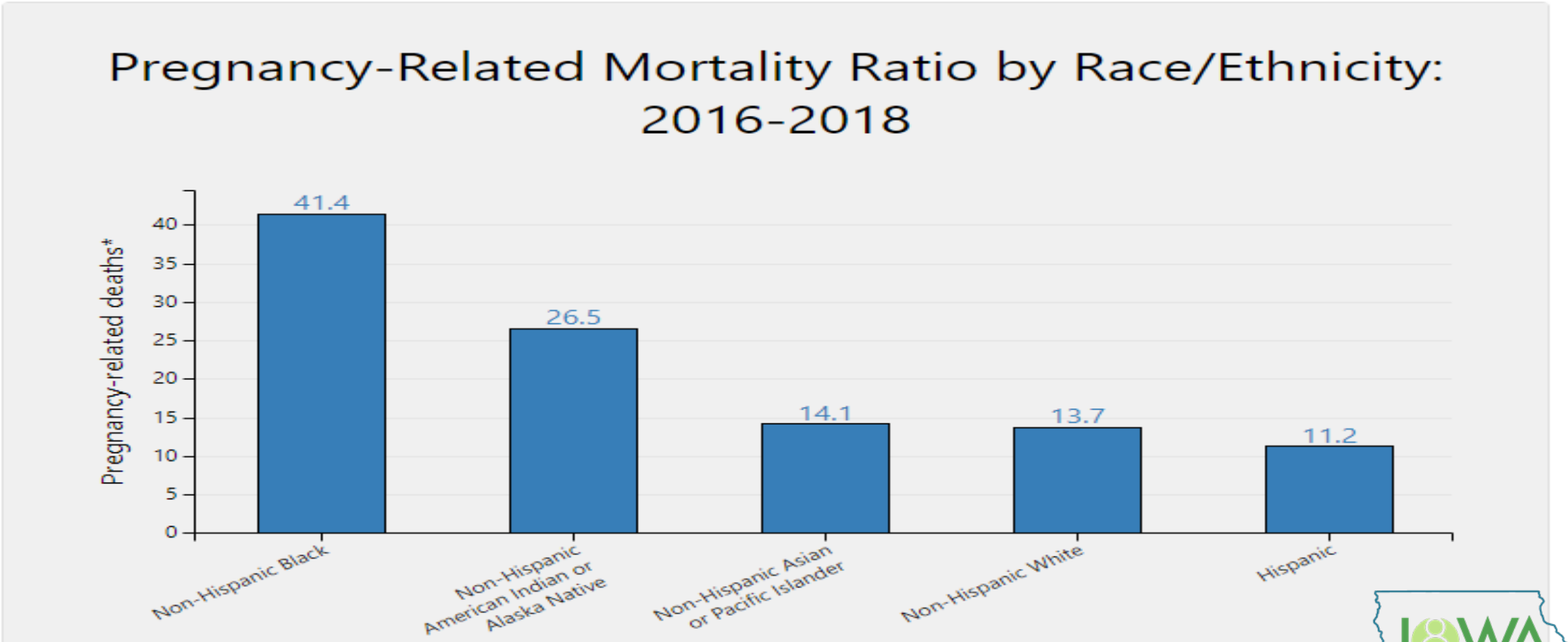
Racial Disparities

Pregnancy–Related Death by Race/Ethnicity



[Pregnancy Mortality Surveillance System | Maternal and Infant Health | CDC]

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Racial Disparities

- Black women:
  - Present at significantly younger ages, and more commonly in postpartum period
  - Receive care less often and later in pregnancy
  - Have higher rates of obesity and hypertensive disorders, often more severe
  - Some risk factor modifiable, but are not easily achieved (health care access, diet, physical activity

Goland S, Modi K, Hatamizadeh P, Elkayam U. Differences in clinical profile of African-American women with peripartum cardiomyopathy in the United States. J Card Fail. 2013 Apr;19(4):214-8. doi: 10.1016/j.cardfail.2013.03.004. PMID: 23582086.

Iowa

Pregnancy-Associated but Unable to Determine Pregnancy Relatedness	• Suicide • Cardiac Arrhythmia caused by cardiomegaly left ventricular hypertrophy • Homicide (Domestic violence)		• Cardiac Arrest

2021 Iowa Maternal Mortality Review Committee Report.pdf

- Cardiac Disorders
- Risk factors and symptoms associated with cardiomyopathy were not recognized by healthcare providers.
- Warnings of cardiac symptoms were not included on postpartum discharge instructions when risk factors were present.
- Tobacco cessation not discussed or not documented

2021 Iowa Maternal Mortality Review Committee Report.pdf

Peripartum Cardiomyopathy

- Defined as a reduced ejection fraction of less than 45% presenting near the end of pregnancy or in the few months after delivery in a woman with no history of structural heart disease
- The cause of peripartum cardiomyopathy (PPCM) remains unknown
- 37% of those diagnosed with PPCM had some type of hypertension during pregnancy (preeclampsia, gestational or chronic hypertension)
- Likely an underestimate, as hypertensive disorders often are used as exclusion criteria when diagnosing PPCM

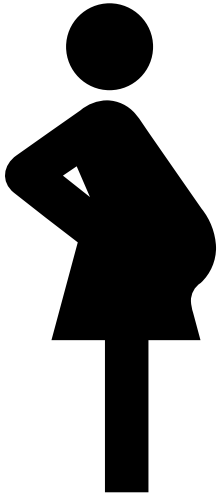
Halliday BP, de Marvao A, Thilaganathan B. Peripartum cardiomyopathy and pre-eclampsia: two tips of the same iceberg. Eur J Heart Fail. 2021 Dec;23(12):2070-2072. doi: 10.1002/ejhf.2300. Epub 2021 Aug 26. PMID: 34263509.

- Pregnancy is like a stress test for rest of your life
  - Diabetes
  - Hypertension
  - CVD

[(132) Pregnancy and Cardiovascular Disease (Valeria Duarte, MD) April 8, 2021 - YouTube]

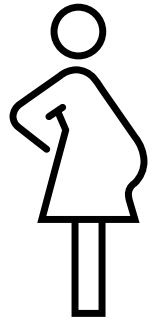
Pregnancy Pathophysiology

- Blood volume increases ~ 40% - 50 % with peak at 32 weeks
  - 45% in plasmas volume and 30% red cell mass (relative anemia)
  - 1600 ml – singleton
- ↓ albumin/oncotic pressure
- ↑ cardiac output (30 – 50%)
  - Maternal posture affects cardiac output after 20 weeks
  - Increased 6 – 7 l/min
  - Increase peaks by 30 weeks
  - Increased 2 -3 weeks post partum
- Increased stroke volume and heart rate = increased cardiac output
- Heart increases in size and is displaced upward
- Plasma volume increases mor than RBC volume creating a physiologic anemia
- Pregnancy is a hypercoagulable state



(132) Pregnancy and Cardiovascular Disease (Valeria Duarte, MD) April 8, 2021 - YouTube

Pregnancy Pathophysiology



- Placenta – low vascular resistance
- Stoke volume – climbs dramatically and peaks at 30 weeks
- 2nd trimester – often seek consultation – stress of CV system
  - Palpitation
  - Shortness of breath
- Peripartum cardiomyopathy –80 to 90 % within one month of delivery

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Acquired heart disease in pregnancy

- Rheumatic disease is now uncommon in the US but common in the developing world and among immigrant populations
- Pregnancy makes this worse
- Scarlet Fever

[(133) Cardiac Disease in Pregnancy - CRASH! Medical Review Series - YouTube]

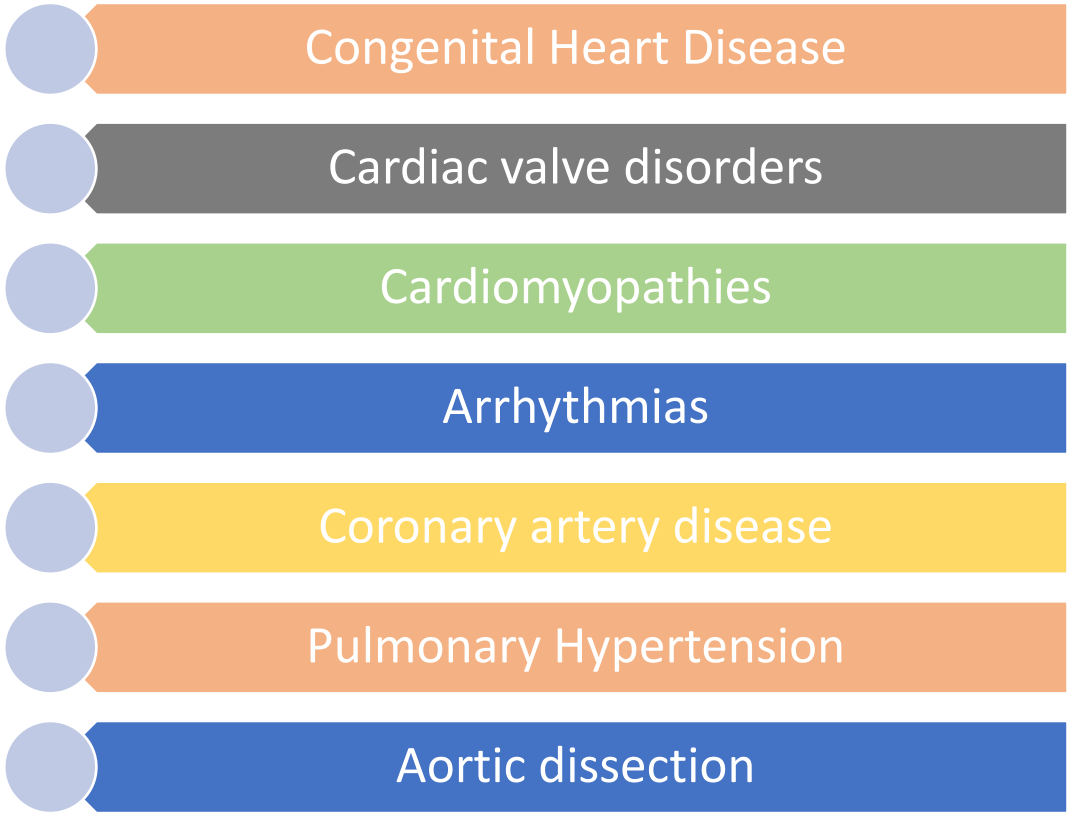
Recognition

- Complicates 1% of all pregnancies
- Severity of disease has increased
- Postpartum hospitalizations for cardiovascular complications have tripled

Kuklina E, Callaghan W. Chronic heart disease and severe obstetric morbidity among hospitalisations for pregnancy in the USA: 1995-2006. BJOG. 2011;118(3):345-352; Centers for Disease Control and Prevention. Pregnancy Mortality Surveillance System. 2018. Available at https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html; Hameed AB, Lawton ES, McCain CL, et al. Pregnancy-related cardiovascular deaths in California: beyond peripartum cardiomyopathy. Am J Obstet Gynecol. 2015;213(3):379.e1-379.e10; Hameed AB, Morton CH, Moore A. Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum. 2017. Available at https://www.cdph.ca.gov/Programs/CFH/DMCAH/RPPC/CDPH%20Document%20Library/CMQCC_CVD_Toolkit.pdf ALSO AAFP

Cardiac Conditions

- Disorders of the cardiovascular system which may impact maternal health



CCOC Implementation Webinar Recording.mp4 (dropbox.com)

Risk Factors

- Age ≥ 40 years
- African American
- Pre-pregnancy obesity (BMI ≥ 35)
- Pre-existing diabetes
- Hypertension
- Substance use
  - Nicotine, cocaine, alcohol, methamphetamines
- History of chemotherapy

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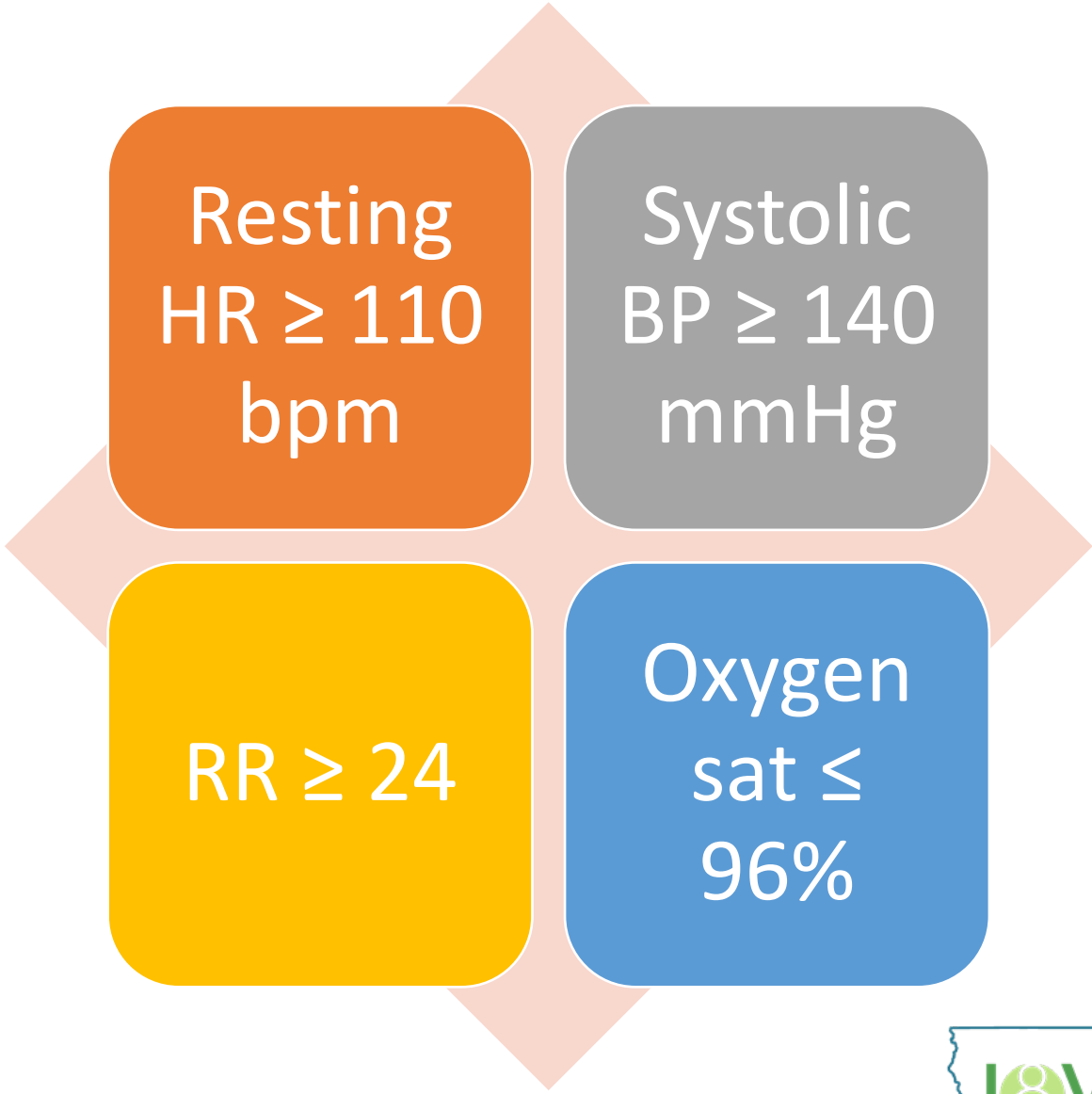
Maternal Early Warning Criteria

The Maternal Early Warning Criteria	
Measure	Value
Systolic Blood Pressure (mm Hg)	<90 or >160
Diastolic Blood Pressure (mm Hg)	>100
Heart rate (beats per minute)	<50 or >120
Respiratory rate (breaths per min)	<10 or >30
Oxygen saturation on room air, at sea level %	<95
Oliguria, mL/hr for ≥2 hrs	<35
Maternal agitation, confusion, or unresponsiveness	
Woman with preeclampsia reporting a non-remitting headache or shortness of breath	

Vital Signs



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Symptoms

Suggestive of Heart Failure

- Dyspnea
- Mild orthopnea
- Tachypnea
- Asthma unresponsive to therapy

Suggestive of arrythmia

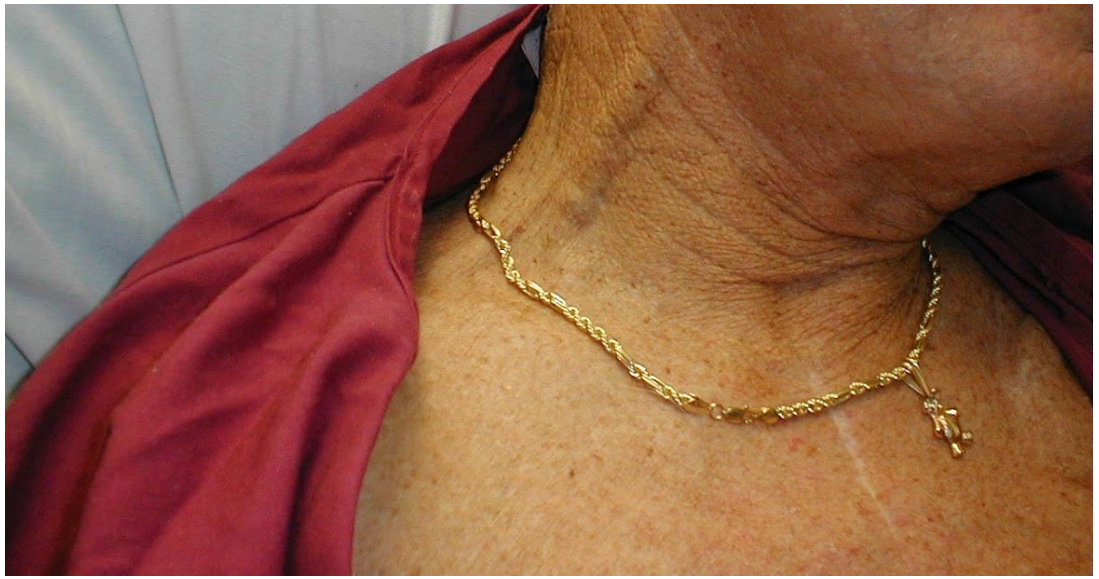
- Palpitations
- Dizziness/syncope

Physical Exam

- Rapid or irregular heart rate may be abnormal (a minor degree of tachycardia is common in normal pregnancy)
- Rales are not a normal finding
- A soft crescendo-decresendo systolic murmur over the aortic or pulmonic valve indicative in increased flow is normal
- A diastolic or loud systolic murmur, or holosystolic murmur is not normal
- Dependent edema is to be expected late in pregnancy, but is not a prominent symptom in early in pregnancy

Nihoyannopoulos P. Cardiovascular examination in pregnancy and the approach to diagnosis of cardiac disorder. In: Oakley C, Warnes CA, eds. *Heart Disease in Pregnancy*, 2nd edition. Malden MA: Blackwell Publishing; 2007.

JVD



- Noninvasive
- Key symptom of heart failure, and other hear and circulatory problems
- Not an assessment that is common when assessing a pregnant person

[Jugular Vein Distention: Symptoms and Causes (clevelandclinic.org)]

BNP

- B Type Natriuretic Peptide
- Neurohormone secreted by the cardiac ventricles in response to ventricular volume expansion and pressure overload
- Routinely used in ED's to differentiate cardiac vs pulmonary etiology of dyspnea
- BNP – when released – meant to get rid of water
- Relaxes vascular smooth muscle
- Inhibits renin-angiotensin-aldosterone system
- Increases natriuresis and diuresis

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[Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit Teaching Slideset for Professionals | California Maternal Quality Care Collaborative (cmqcc.org)]

Clinical Uses of BNP in Pregnancy

Diagnosis of heart failure

- In women with dilated CMP, higher BNP predicts adverse cardiovascular outcomes
- Higher predictive value than X-ray

Asymptomatic left ventricular function

- Useful to evaluate shortness of breath

Predictor of cardiovascular outcome

- In pregnant women with congenital heart disease, higher BNP levels are associated with poor outcomes

[Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum | California Maternal Quality Care Collaborative (cmqcc.org)]

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BNP

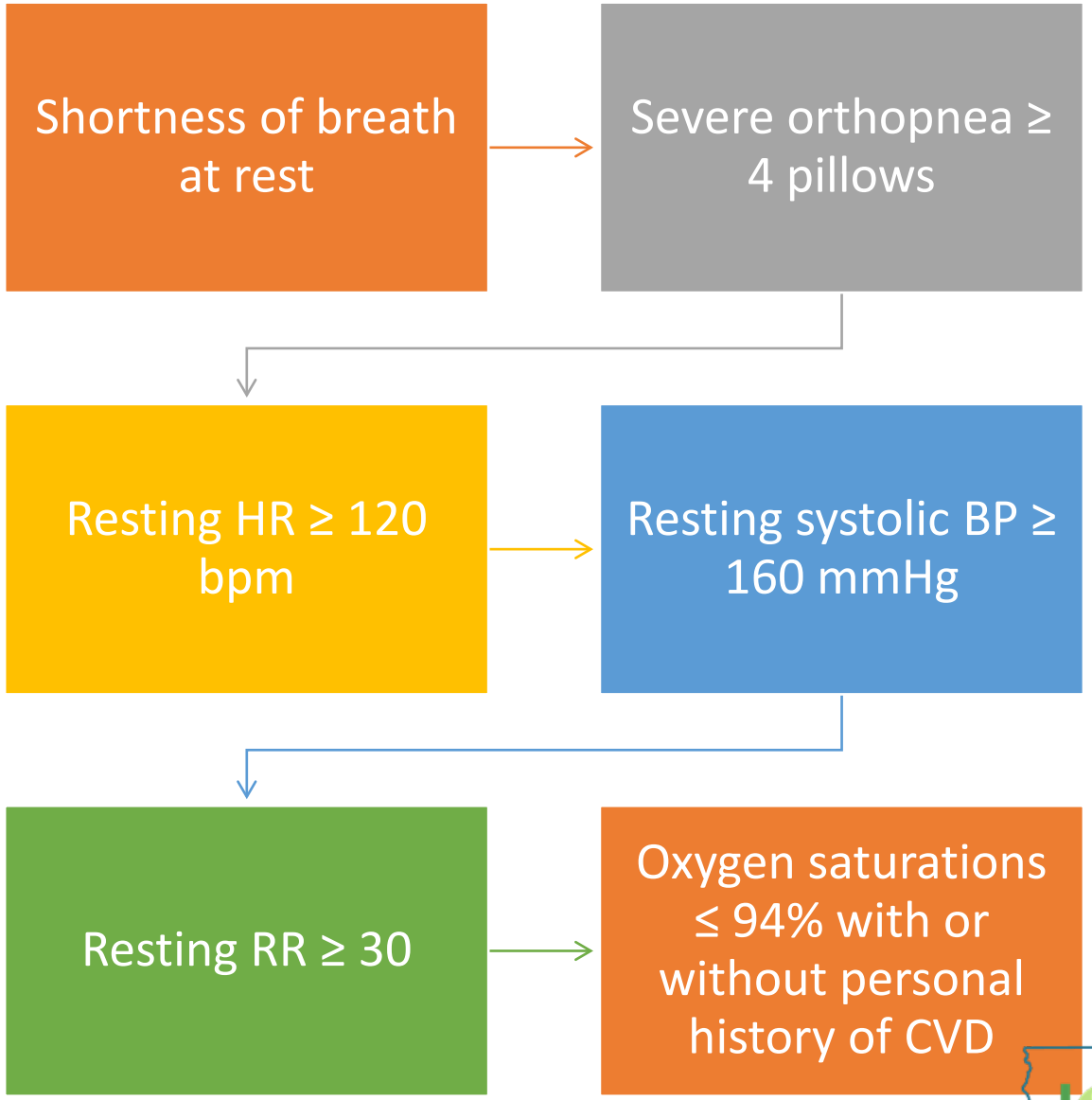
- Normal level < 100 pg/ml
- 100 – 400 dependent on other symptoms and findings of heart failure
- > 400 indicative of heart failure

Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit Teaching Slideset for Professionals | California Maternal Quality Care Collaborative (cmqcc.org)

CVD Algorithm for Pregnant and Postpartum Women

Red Flags

Red Flags – Prompt Evaluation



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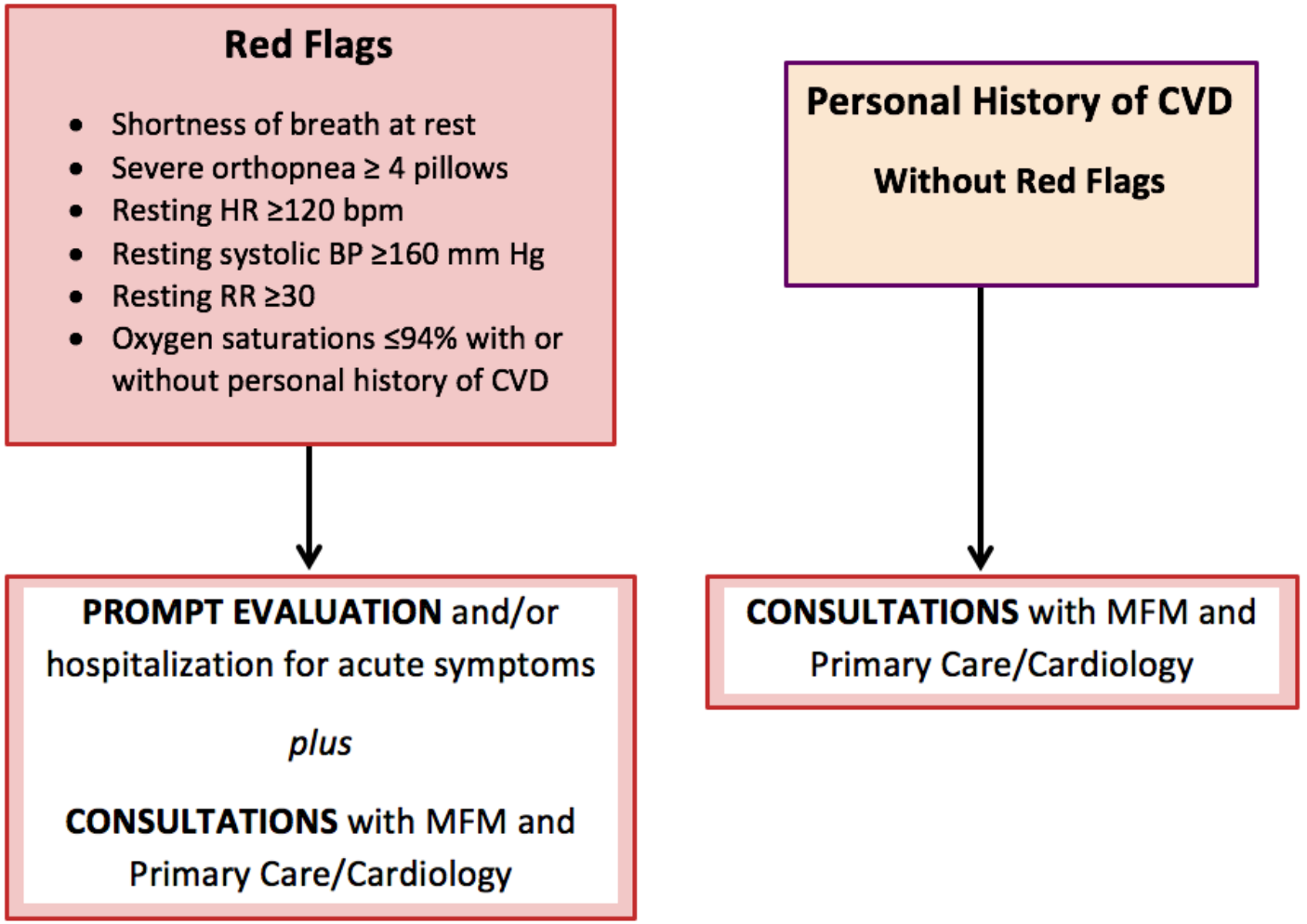
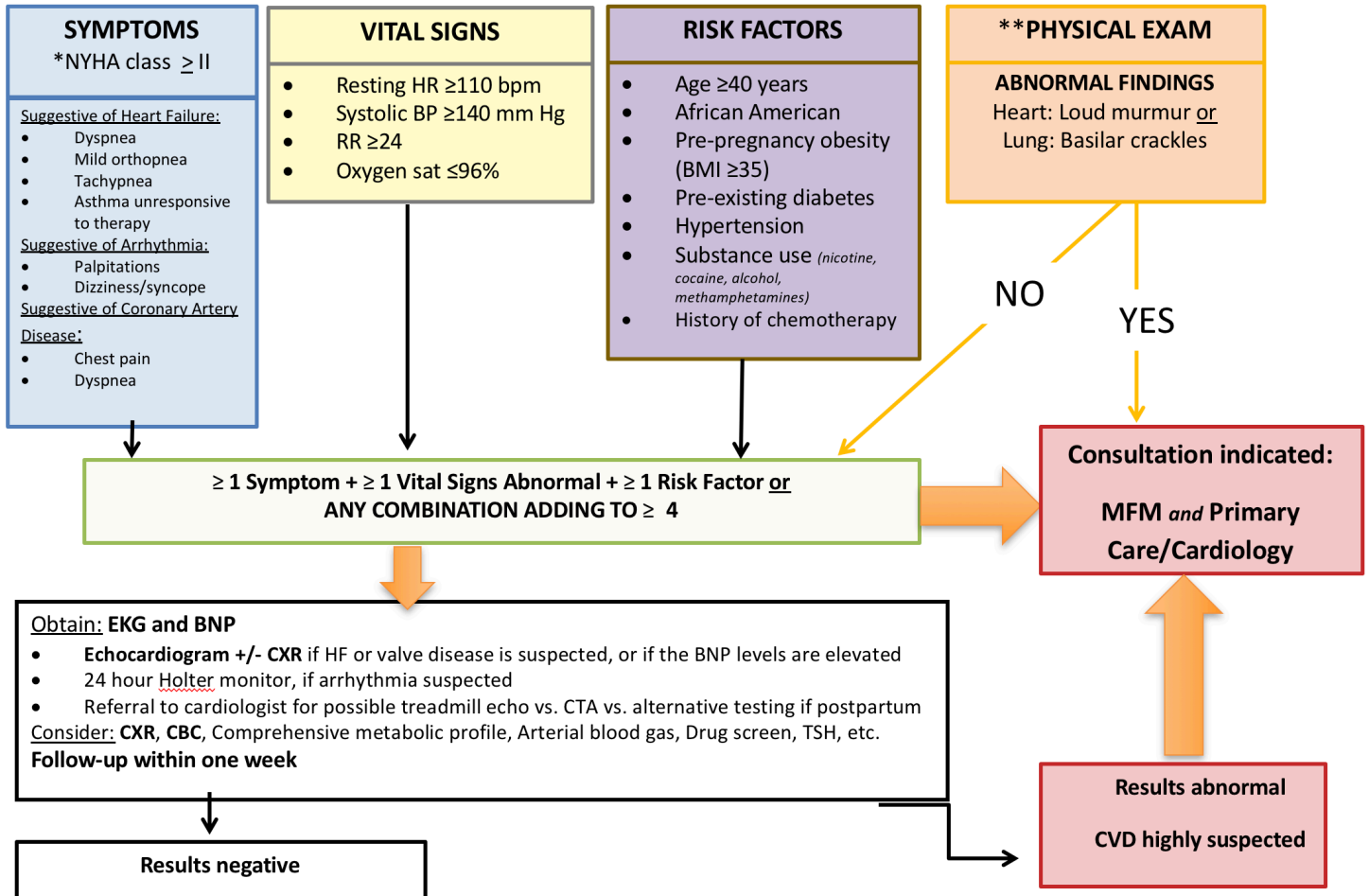
[CCOC Implementation Webinar Recording.mp4 (dropbox.com)]

CVD Assessment Algorithm
For Pregnant and Postpartum Women



[Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum | California Maternal Quality Care Collaborative (cmqcc.org)]

(No Red Flags and/or no personal history of CVD, and hemodynamically stable)



[Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum | California Maternal Quality Care Collaborative (cmqcc.org)]

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Key Points

- First Presentation of CVD may be during pregnancy or early postpartum
- The highest risk period for CVD worsening is between 24-28 weeks or postpartum
- CVD symptoms or vital sign abnormalities should not be ignored in pregnant
- Symptoms related to physiologic changes of pregnancy should be improving in the postpartum period
- ANY visits to the ED for dyspnea should raise suspicion for cardiovascular disease
- Postpartum dyspnea or new onset cough in concerning or CVD

Hameed AB, Morton CH, and A Moore. Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Developed under contract #11-10006 with the California Department of Public Health, Maternal, Child and Adolescent Health Division. Published by the California Department of Public Health, 2017.

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Key Points

- New onset asthma is rare in adults
- Bilateral crackles on lung examination are most likely associated with congestive heart failure
- Improvement of dyspnea with bronchodilators does not confirm the diagnosis of asthma as CHF may also improve with bronchodilators
- Likewise a lack of response to bronchodilators should prompt the entertainment of a diagnosis other than asthma

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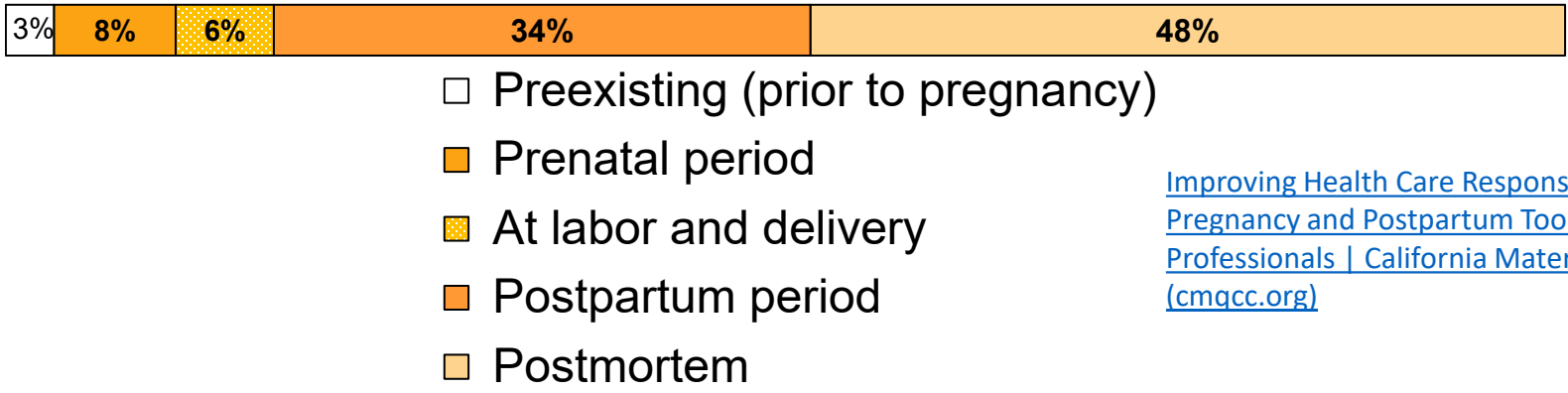
Postpartum Presentations to the ED, PCP or OB Provider

- Symptoms of cardiac disease may be falsely attributed to the common discomforts of pregnancy
  - Shortness of breath
  - Fatigue
- Pre-existing cardiovascular disease and/or new onset peripartum cardiomyopathy may initially be present during pregnancy or in the post-partum period

Hameed AB, Morton CH, and A Moore. Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Developed under contract #11-10006 with the California Department of Public Health, Maternal, Child and Adolescent Health Division. Published by the California Department of Public Health, 2017.

CA-PAMR Findings
Timing of Diagnosis and Death
2002-2006

- Timing of CVD Diagnosis (n=64)



[Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit Teaching Slideset for Professionals | California Maternal Quality Care Collaborative (cmqcc.org)]

- Timing of Death
  - 30% of all CVD deaths were >42 days from birth/fetal demise vs. 7.3% of non CVD pregnancy-related deaths
  - Driven by Cardiomyopathy deaths, with 42.9% deaths >42 days

Hameed A, Lawton E, McCain CL, et al. Pregnancy-Related Cardiovascular Deaths in California: Beyond Peripartum Cardiomyopathy. *American Journal of Obstetrics and Gynecology* 2015; DOI: 10.1016/j.ajog.2015.05.008

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Questions to ask upon presentation

- Shortness of Breath
  - Worsened level of exercise tolerance
  - Difficulty performing activates of daily living unexpected fatigue
  - Symptoms that are deteriorating – especially chest pain, palpitations, or dizziness
  - New onset coughing or wheezing
  - Leg edema and if it is improving or deteriorating
  - Inability to lay flay – if this is a change, how many pillows used to sleep
  - Failure to lose weight or unusual weight gain and how much
  - A history of cardiac or pulmonary conditions
  - A history of substance use/tobacco use
  - Has been seen by other providers or in other Emergency Departments since giving birth

Hameed AB, Morton CH, and A Moore. Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Developed under contract #11-10006 with the California Department of Public Health, Maternal, Child and Adolescent Health Division. Published by the California Department of Public Health, 2017.

Señales & Síntomas de enfermedade del corazón *durante el embara y posparto*

En los Estados Unidos, las enfermedades del corazón son la principal causa de muerte en las mujeres que están embarazadas o que han dado a luz en los últimos 5 meses (posparto).

té atenta a los siguientes síntomas hacia el final de embarazo y hasta 5 meses después de dar a luz:

- Tos persistente
- Fatiga extrema
- Desmayos
- Hinchazón extrema o aumento de peso
- Dolor en el pecho o latido rápido del corazón
- Mucha dificultad para respirar (especialmente cuando está acostada)

TA: Aunque algunos de estos síntomas son comunes al final del embarazo, nbién pueden ser una señal de una enfermedad del corazón, especialmente si son ves y no desaparecen después de tener un tratamiento.

Si usted tiene cualquiera de los sínto anteriores y éstos no desaparecen:

- Comuníquese con su obstetra, partera, médico gener proveedor de atención médica principal.
- Descríbale claramente sus síntomas y dígale lo mal qu
- Si sus síntomas aparecen después del parto, asegúres que su médico sepa que usted dio a luz hace poco.
- Si su médico u otro proveedor de atención médica le di síntomas son normales, pregúntele cuáles síntomas req usted le llame de nuevo o vuelva a su consultorio.

Vaya a la sala de emergencias si un dolor de pecho persistente, mucha dific respirar, o se siente extremadamente enfe alguna otra razón. De ser posible, trate de alguien le acompañe.

Cualquier mujer puede desarrollar una enfermedad del corazón durante el embarazo o el posparto, pero usted corre un riesgo más alto si:

- Ya tenía una enfermedad del corazón
- Tiene más de 40 años
- Es afroamericana (4 veces más riesgo y 8 a 10 veces más probabilidad de morir de una enfermedad del corazón)
- Tiene preeclampsia o presión arterial alta (hipertensión)
- Es obesa

Conclusión

- Confíe en sus instintos si siente que algo anda mal.
- Cuando consulte a su proveedor de atención médica, vaya con su pareja, amigo o amiga o algún familiar q le pueda apoyar y ayudarle a explicar a su médico que estos síntomas no son normales para usted.
- Busque una segunda opinión si siente que su proveedor de atención médica no le escucha o que no toma serio sus síntomas.

Obtenga apoyo e información en el internet: www.myheartsisters.com | www.womenheart.org | www.womenheart.org/

CMQCC California Maternal Quality Care Collaborative www.cmqcc.org PublicHealth

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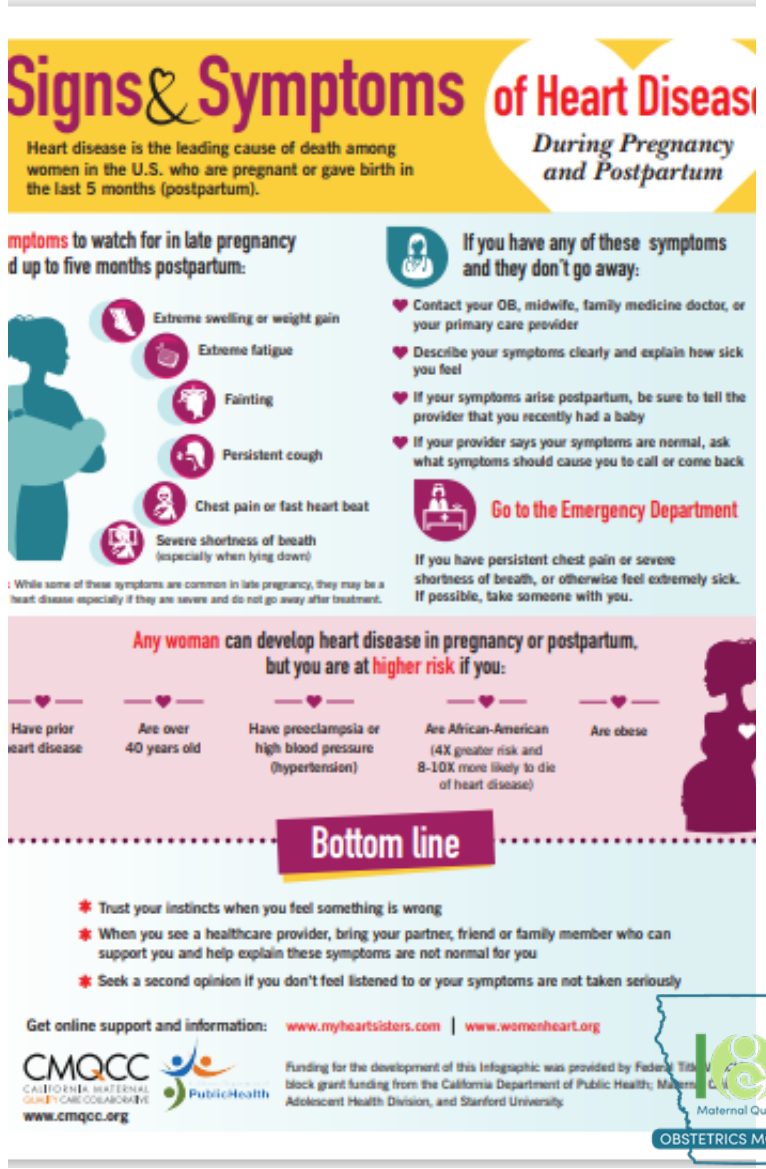

Signs & Symptoms of Heart Disease *During Pregnancy and Postpartum*

Heart disease is the leading cause of death among women in the U.S. who are pregnant or gave birth in the last 5 months (postpartum).

mptoms to watch for in late pregnancy d up to five months postpartum:

- Extreme swelling or weight gain
- Extreme fatigue
- Fainting
- Persistent cough
- Chest pain or fast heart beat
- Severe shortness of breath (especially when lying down)

While some of these symptoms are common in late pregnancy, they may be a heart disease especially if they are severe and do not go away after treatment.

If you have any of these symptoms and they don't go away:

- Contact your OB, midwife, family medicine doctor, or your primary care provider
- Describe your symptoms clearly and explain how sick you feel
- If your symptoms arise postpartum, be sure to tell the provider that you recently had a baby
- If your provider says your symptoms are normal, ask what symptoms should cause you to call or come back

Go to the Emergency Department

If you have persistent chest pain or severe shortness of breath, or otherwise feel extremely sick. If possible, take someone with you.

Any woman can develop heart disease in pregnancy or postpartum, but you are at higher risk if you:

- Have prior eart disease
- Are over 40 years old
- Have preeclampsia or high blood pressure (hypertension)
- Are African-American (4X greater risk and 8-10X more likely to die of heart disease)
- Are obese

Bottom line

- Trust your instincts when you feel something is wrong
- When you see a healthcare provider, bring your partner, friend or family member who can support you and help explain these symptoms are not normal for you
- Seek a second opinion if you don't feel listened to or your symptoms are not taken seriously

Get online support and information: www.myheartsisters.com | www.womenheart.org

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IOWA Maternal Quality Care Collaborative OBSTETRICS MOBILE SIMULATION UNIT

- [Signs-Symptoms-Print-Friendly.pdf]

DID YOU HAVE COMPLICATIONS DURING PREGNANCY?

You may be at a higher risk for heart disease over your lifetime

Which pregnancy complications can increase your risk for heart disease as you age?

HIGH BLOOD PRESSURE

5-10% of all pregnant women

GESTATIONAL DIABETES

7-14% of all pregnancies

PRETERM BIRTH

11.5% of babies were born preterm in 2012.

Can include:

- Gestational hypertension
- Preeclampsia
  once known as Pregnancy Induced Hypertension (PIH) and Toxemia
- Eclampsia
- HELLP syndrome

If you had **PREECLAMPSIA**, you have **2x** the risk of stroke, heart muscle damage, or blood clot and **4x** the risk of developing high blood pressure for the rest of your life!

Mothers who had gestational diabetes are more likely to have the condition again in a future pregnancy.

If you had **GESTATIONAL DIABETES**, you are **50%** more likely to develop Type II diabetes within 5 years, putting you at higher risk for heart disease.

Babies born before 37 completed weeks of pregnancy are preterm, or premature.

Women with **PRETERM BIRTH AND PREECLAMPSIA** have an **8-10x** higher chance of death from heart disease.

If you had complications in pregnancy, you can lower your risk:

New Mothers

- See your health care provider 3-6 months after birth to check your overall physical health. Discuss your pregnancy and any complications you experienced.
- Get a copy of your pregnancy and post-delivery medical records to share with your providers for the rest of your life. Don't wait – records may be destroyed.
- Breastfeed as long as possible. Women whose total lifetime breastfeeding is 6-12 months were 10% less likely to develop heart disease (and it's good for baby too).

Mothers With Kids Over One Year

- Get annual checkups and be screened for heart disease. At this visit, your provider should check your overall physical condition.
- Ask your provider what your test results mean and how you can lower your heart disease risk.

These screening numbers show desirable results.

Blood Pressure	< 120/80 mm hg	Fasting Blood Glucose	< 100 mg/dl
Total Cholesterol	< 200 mg/dl	Body Mass Index	< 25 kg/m2

- Try a mobile app to automatically retrieve and store your medical records, so you always have them handy.
- Eat healthy! A diet low in salt, fat, cholesterol and sugar can help you lower your risk for obesity, diabetes and heart disease.
- Maintain a healthy weight. Body Mass Index (BMI) is an estimate of body fat based on height and weight. Less than 25 is healthy.
- Get active for 30 minutes a day, or as recommended by your provider.
- If you smoke, make a plan to quit. Your provider may have resources to support you.
- Take medications as directed. Sometimes a healthy diet and exercise is not enough to lower your risk for heart disease, so your provider may prescribe medications to help.

If you had one of these complications, speak with your provider when planning your next pregnancy to optimize your health.

REMEMBER!

It's a **MYTH** that **ALL** pregnancy related high blood pressure and gestational diabetes complications go away after the baby is born!

Get more information and stay heart healthy.
www.cmqcc.org

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¿TUVO COMPLICACIONES DURANTE SU EMBARAZO?

Usted puede correr mayor riesgo de enfermedades del corazón por el resto de su vida

¿Cuáles son las complicaciones del embarazo que pueden aumentar el riesgo de enfermedades del corazón con el paso de los años?

PRESIÓN ARTERIAL ALTA

5-10% de todas las mujeres embarazadas

DIABETES GESTACIONAL

7-14% de todos los embarazos

NACIMIENTO PREMATURO

11.5% de todos los bebés nacieron prematuros en el 2012

Puede incluir:

- Hipertensión gestacional
- Preeclampsia, anteriormente conocida como hipertensión inducida por el embarazo o toxemia
- Eclampsia
- Síndrome HELLP (por sus siglas en inglés) que incluye hemólisis, enzimas hepáticas elevadas y un conteo bajo de plaquetas

Si tuvo **PREECLAMPSIA**, tiene **2 veces más** riesgo de tener un ataque al corazón, daño en los músculos del corazón o un coágulo de sangre, y **4 veces más** riesgo de desarrollar presión arterial alta por el resto de su vida.

Las madres que tuvieron diabetes gestacional tienen más probabilidad de volver a tenerla en un futuro embarazo.

Si usted tuvo **DIABETES GESTACIONAL**, tiene **50% más** probabilidad de desarrollar diabetes tipo II dentro de 5 años, lo que aumenta su riesgo de enfermedades del corazón.

Los bebés que nacen antes de las 37 semanas completas de embarazo son prematuros.

Las mujeres con **PARTO PREMATURO Y PREECLAMPSIA** tienen de **8-10 veces más** probabilidad de **morir** por enfermedades del corazón.

Si tuvo alguna complicación en su embarazo, usted puede disminuir su riesgo:

Nuevas mamás

- Consulte con su proveedor de atención médica de 3 a 6 meses después del parto para que le evalúe su salud física general. Cuéntele sobre su embarazo y cualquier complicación que haya tenido.
- Obtenga una copia de los registros médicos de su embarazo y posparto para poder compartir con sus proveedores el resto de su vida. No espere para hacerlo, ya que pueden destruir los registros.
- Amamante el mayor tiempo posible. Las mujeres que han amamantado por un total de **6 a 12 meses de toda su vida tienen 10% menos probabilidad** de desarrollar enfermedades del corazón (y también es bueno para el bebé).

Mamás con niños mayores de un año

- Hágase un chequeo anual y pruebas de detección para las enfermedades del corazón. En su visita anual, su proveedor debe evaluarle su condición física en general.
- Pregúntele a su proveedor qué significan los resultados de sus pruebas y cómo puede reducir su riesgo de las enfermedades del corazón.

Estos son los resultados deseables de las pruebas de detección:

Presión arterial	< 120/80 mm hg	Glucosa en la sangre, en ayunas	< 100 mg/dl
Colesterol total	< 200 mg/dl	Índice de masa corporal	< 25 kg/m²

- Pruebe una aplicación móvil que pueda automáticamente recuperar y almacenar sus registros médicos para que siempre los tenga a la mano.
- ¡Cambie usted! Una dieta baja en sal, grasa, colesterol y azúcar puede ayudar a reducir el riesgo de obesidad, diabetes y enfermedades del corazón.
- **Mantenga un peso saludable.** El índice de masa corporal (IMC) es un cálculo de la grasa corporal que se basa en la estatura y el peso. Lo saludable es tener un índice menor de 25.
- Manténgase activo por 30 minutos al día o lo que le recomiende su proveedor.
- Si fuma, haga un plan para dejar de fumar. Su proveedor puede tener recursos para ayudarle.
- **Tome los medicamentos siguiendo las indicaciones.** A veces, no es suficiente seguir una dieta saludable y hacer ejercicio para reducir el riesgo de las enfermedades del corazón. Por eso, quizás su proveedor le recete medicamentos que le pueden ayudar.

Si usted tuvo una de estas complicaciones, consulte con su proveedor de atención médica al planear su siguiente embarazo para mantenerse lo más saludable posible.

¡RECUERDE!

Es un **MITO** que **TODA** presión arterial alta relacionada con el embarazo y **TODAS** las complicaciones de la diabetes gestacional desaparecen después de que nace el bebé.

Obtenga más información y mantenga su corazón sano.
www.cmqcc.org (en inglés)

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Perimortem C-Sections

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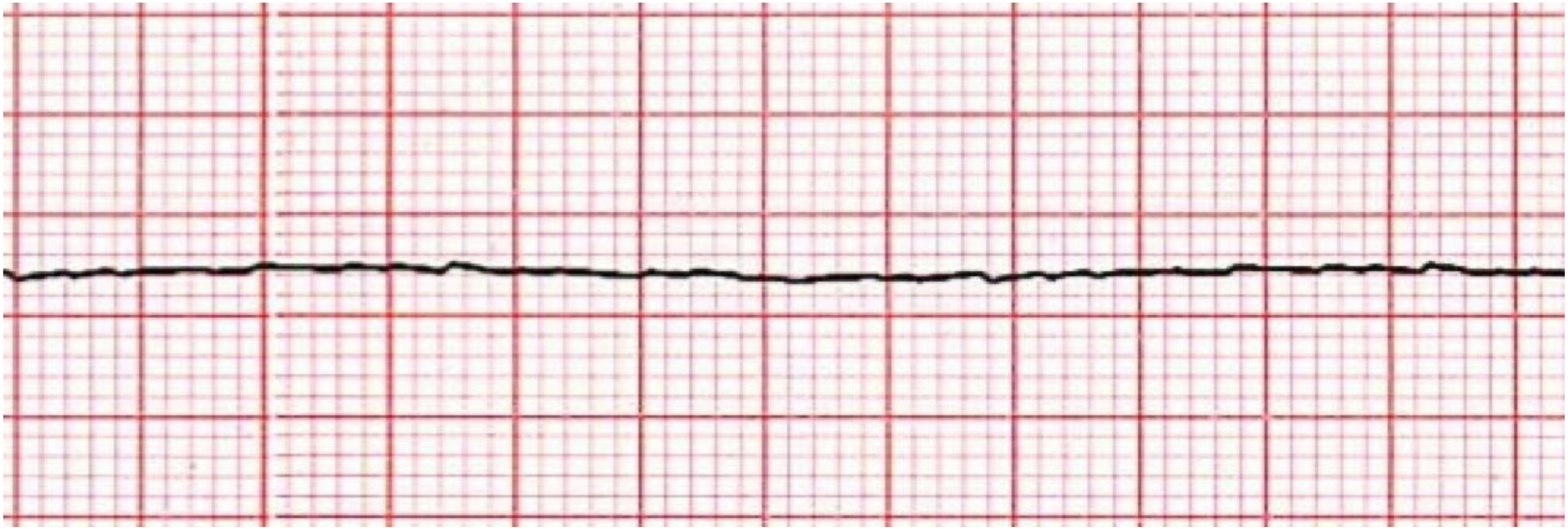
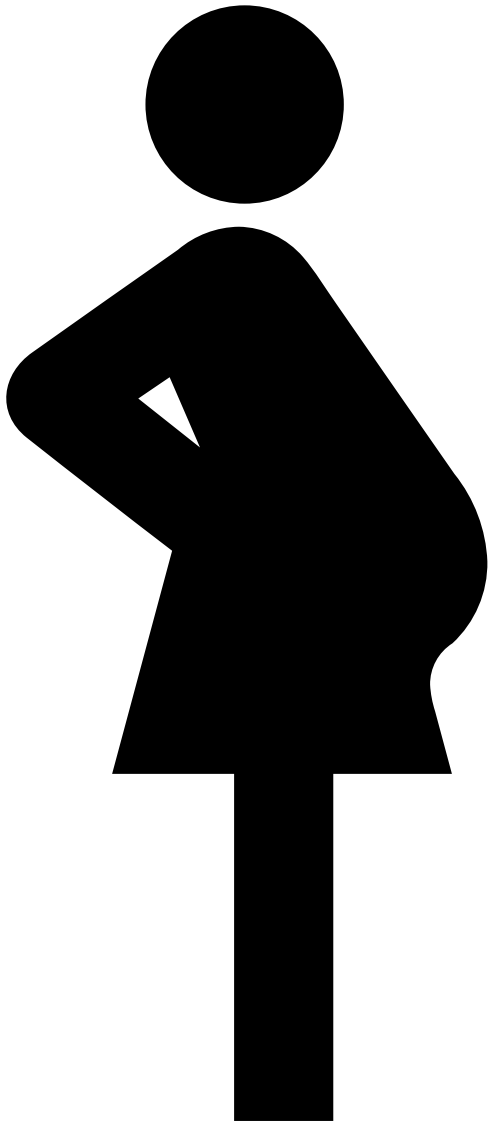


https://www.proacls.com/training/video/asystole

- 2 potential patients
- Best hope for fetal survivor is maternal survival
- At 20 weeks the size of the uterus begins to adversely affect the attempted resuscitation



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Medications

- Treatment during pregnancy is the same as in non pregnant patients
- Exception – amiodarone, long half life and should be avoided
- Most antiarrhythmic drugs except adenosine, cross the placenta
- Can give Lidocaine

Knotts RJ, Garan H. Cardiac arrhythmias in pregnancy. Semin Perinatol. 2014 Aug;38(5):285-8. doi: 10.1053/j.semperi.2014.04.017. Epub 2014 May 27. PMID: 25037518.
AAFP – ALSO

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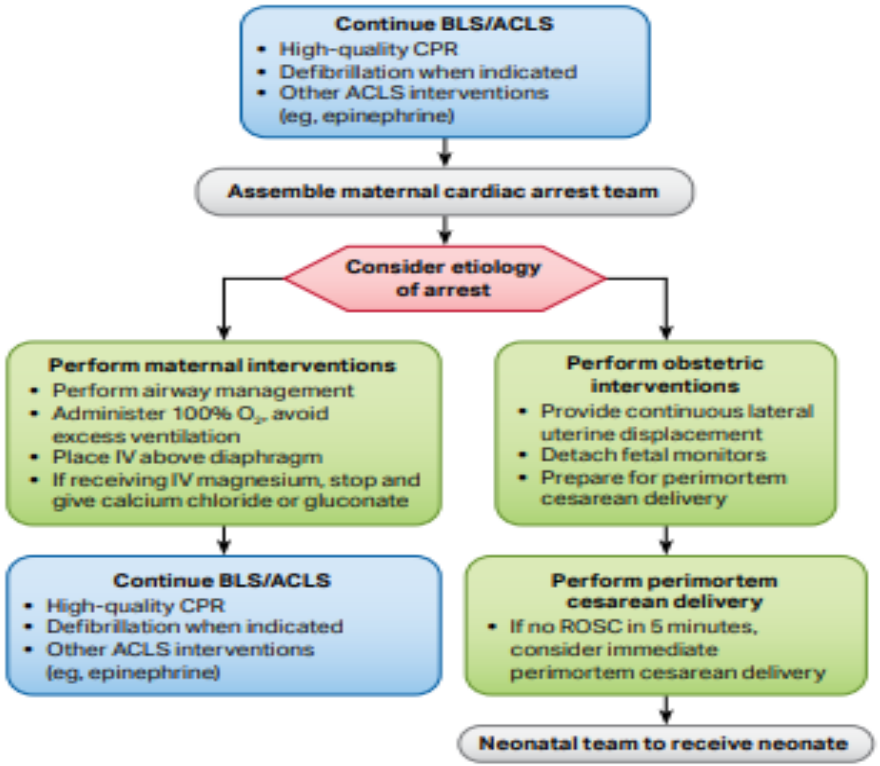
Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm



Maternal Cardiac Arrest

- Team planning should be done in collaboration with the obstetric, neonatal, emergency, anesthesiology, intensive care, and cardiac arrest services.
- Priorities for pregnant women in cardiac arrest should include provision of high-quality CPR and relief of aortocaval compression with lateral uterine displacement.
- The goal of perimortem cesarean delivery is to improve maternal and fetal outcomes.
- Ideally, perform perimortem cesarean delivery in 5 minutes, depending on provider resources and skill sets.

Advanced Airway

- In pregnancy, a difficult airway is common. Use the most experienced provider.
- Provide endotracheal intubation or supraglottic advanced airway.
- Perform waveform capnography or capnometry to confirm and monitor ET tube placement.
- Once advanced airway is in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions.

Potential Etiology of Maternal Cardiac Arrest

A Anesthetic complications
B Bleeding
C Cardiovascular
D Drugs
E Embolic
F Fever
G General nonobstetric causes of cardiac arrest (H's and T's)
H Hypertension

[Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm (heart.org)]

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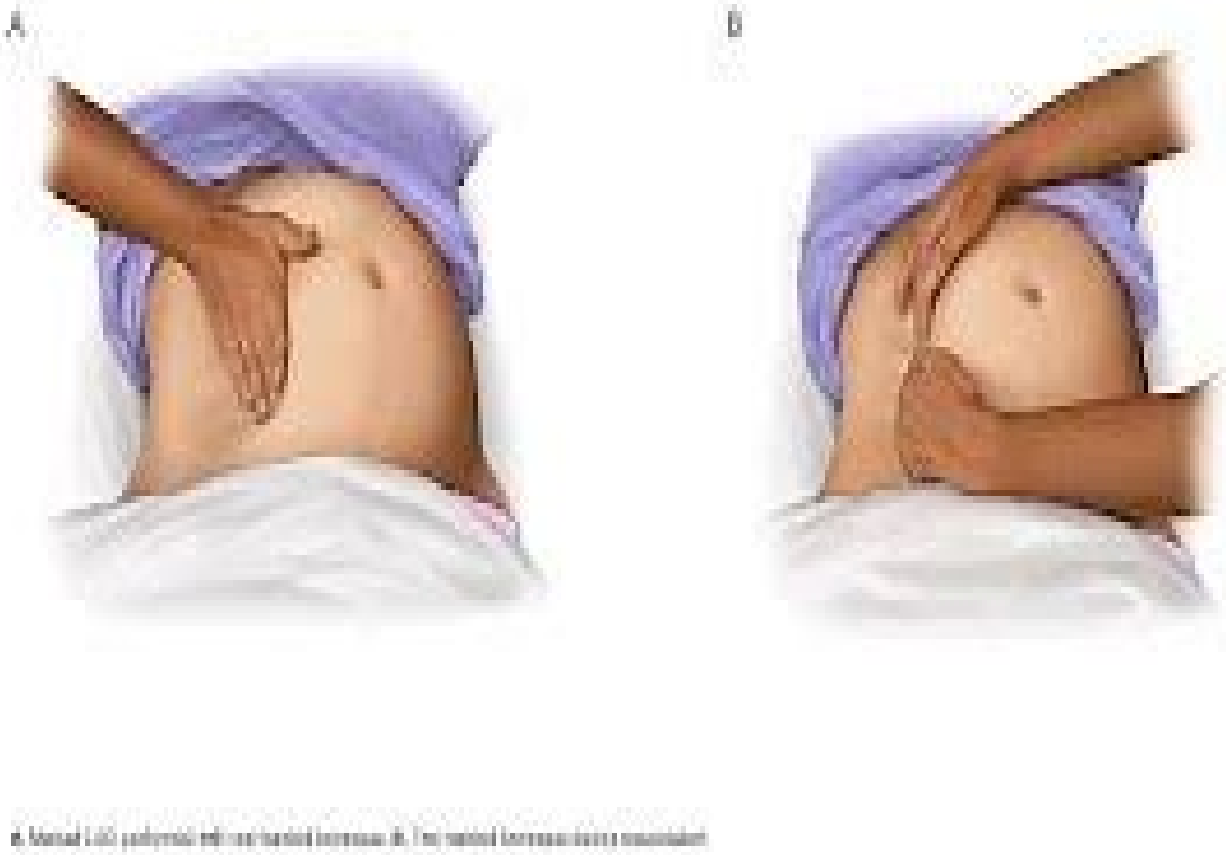
Uterine Displacement

- One person so provide uterine displacement
- Left Lateral
- One or two handed method
- Relieve compression of inferior vena cava and the aorta by shifting the gravid uterus left and upward off the maternal vessels



Chest Compressions

Lateral

Left lateral

- Relieve possible compression of the inferior vena cava
- Uterine obstruction of venous return can produce hypotension and could precipitate arrest in the critically ill pt

Move up

Move up a bit – remember heart enlarges during pregnancy

Check

Check Femoral pulse to see if compressions adequate

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Intubation

- Advance airway sooner
- Trachea is more narrow
- Smaller tube – 6.0
- Increased secretions
- Lungs are higher – listen higher
- $ETCO_2$ recommended

[ALS OB (healthstream.com)]

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Perimortem C-Section

- Goal is to improve maternal and fetal outcomes
- Goal – 5 minutes !

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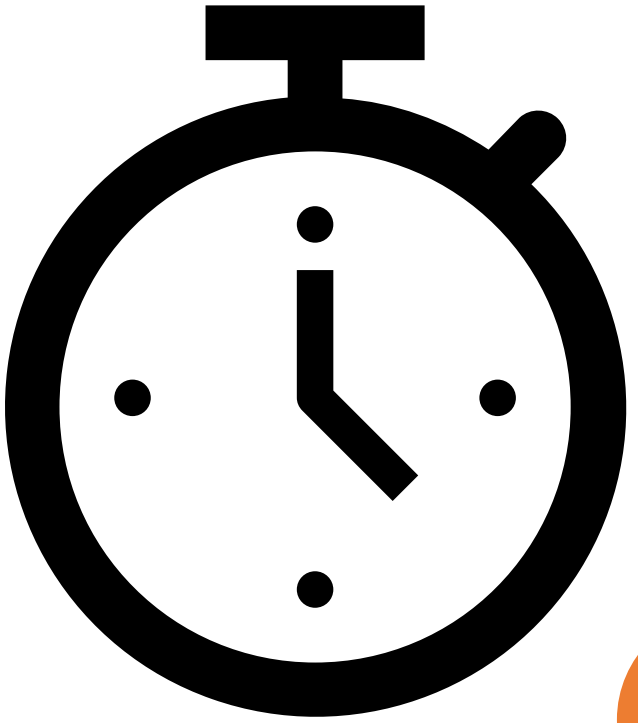
ALS OB (healthstream.com)

- At 4 minutes with no ROSC
- 5 minutes



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ALS OB (healthstream.com)

Perimortem C-Sections

- Taking Care of Mom is Taking Care of Baby
- Consider GA – 20 wks or > and singleton
  - 20 – 23 weeks mom benefits
  - 24 and greater both benefit
- Provider –Who can do C-Section?
- No Prep Indicated
- No need to go to OR
  - Scalpel
  - Provider
  - Gloves

[Perimortem Cesarean Delivery - StatPearls - NCBI Bookshelf (nih.gov)]

Maternal Code

- UT Nashville OBGYN Residents: Management of Maternal Code - Bing video

References and Resources

- FINAL_AIM_Bundle_CCOC-Resources.pdf (safehealthcareforeverywoman.org)
- 2021 Iowa Maternal Mortality Review Committee Report.pdf
- Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm (heart.org)
- Urgent Maternal Warning Signs Educational Materials | CDC
- Goland S, Modi K, Hatamizadeh P, Elkayam U. Differences in clinical profile of African-American women with peripartum cardiomyopathy in the United States. J Card Fail. 2013 Apr;19(4):214-8. doi: 10.1016/j.cardfail.2013.03.004. PMID: 23582086.
- Pregnancy Mortality Surveillance System | Maternal and Infant Health | CDC
- Jugular Vein Distention: Symptoms and Causes (clevelandclinic.org)

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