

# Education for the Emergency Medicine Colleagues: Cardiac Diseases in Pregnancy

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This portion of the bundle is aimed at emergency medicine, first responders and other medical professionals that may be risk assessing pregnant people to encourage universal readiness, recognition and response to cardiac disease in pregnancy.

# Readiness- Every Unit

- Train all obstetric care providers (including non obstetric care providers that see/triage pregnant people) to perform a basic Cardiac Conditions Screen.



## Bundle Tools:

- Slide deck for & outreach to emergency medicine colleagues

- Establish a protocol for rapid identification of potential pregnancy-related cardiac conditions in all practice settings to which pregnancy and postpartum people may present



## Bundle Tools:

- Emergency Department or Urgent Care Algorithm for pregnant or recently postpartum

- Establish coordination of appropriate consultation, co-management and/or transfer to appropriate level of maternal or newborn care.



## Bundle Tools:

- Transfer Checklist

# Recognition and Prevention– 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 pregnant or has been pregnant within the past year.
- Assess if escalating warning signs for an immediate cardiac event are present.



## Bundle Tools:

- Ask about pregnancy education
- Maternal Urgent Warning Signs

- Utilize standardized cardiac risk assessment tools to identify and stratify risk.



## Bundle Tools:

- Screening Tool

- Conduct a risk-appropriate work-up for cardiac conditions to establish diagnosis and implement the initial management plan.

# Response- Every Patient

- Facility-wide standard protocols with checklists and escalation policies for management of people with known or suspected cardiac conditions.



## Bundle Tools:

- Disease Specific Guidelines
- Transfer Checklist

- Provide patient education focused on general life-threatening postpartum complications and early warning signs including instructions of who to notify if they have concerns, and time and date of a scheduled postpartum visit.



## Bundle Resources:

- Maternal Urgent Warning Signs






# Deliverables Related to NEW Symptoms or Concern for New Cardiac Disease

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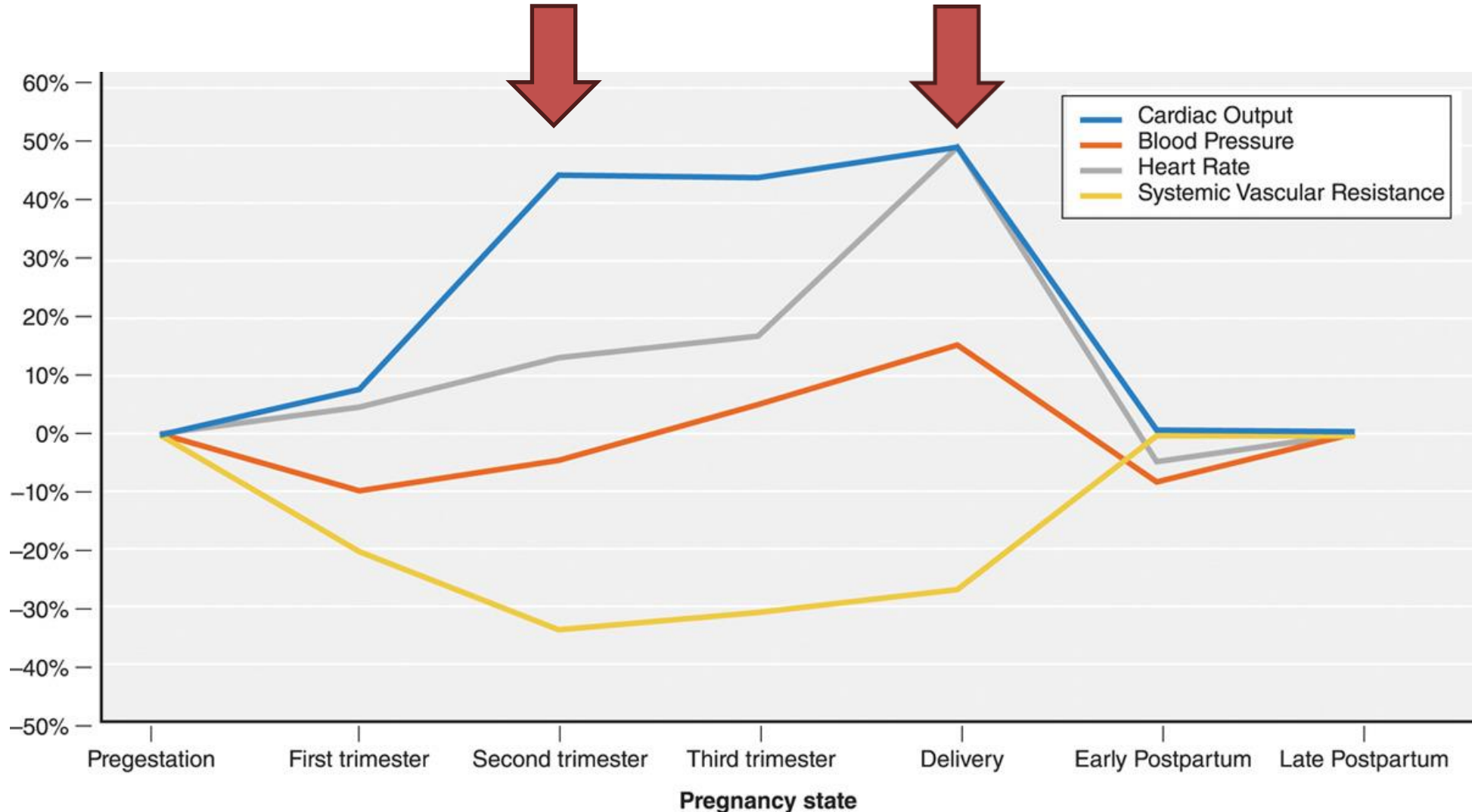
## Risk Assessment Tools:

- Slide deck for emergency medicine colleagues
- Emergency Department/Urgent Care screening Algorithm for pregnant or recently postpartum
- Transfer Checklist
- Ask about pregnancy education
- Maternal Urgent Warning Signs
- Disease specific guidelines

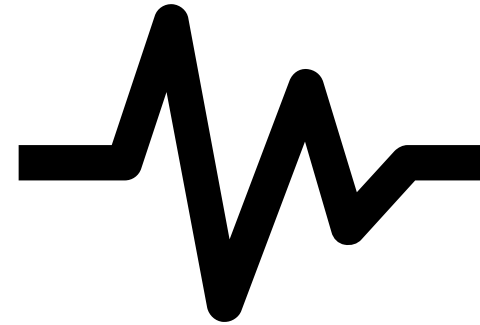
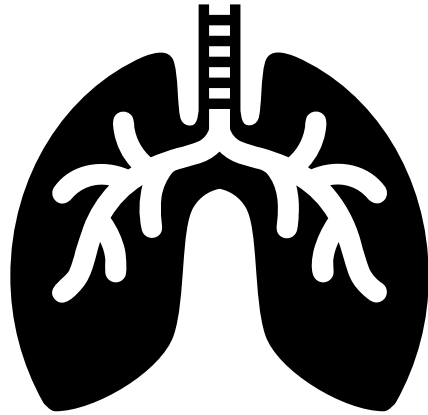
# Expected Cardiovascular Changes in Pregnancy

-  **Maternal Heart Rate (15–30% in first trimester)**
-  **Stroke Volume (20–35%)**
-  **SVR (approx. 30%)**
-  **Blood pressure (in first trimester and gradually increases in second and third trimester to pre-pregnant levels)**
-  **Cardiac Output (30–50%) [Term pregnancy output is 7L/minute]  
Uterus gets 12% Cardiac output by term**

# Common Physiologic Changes in Pregnancy



# Final Common Pathway



**Common Pathways For All Types Of Cardiac Disease**

**Pulmonary edema**

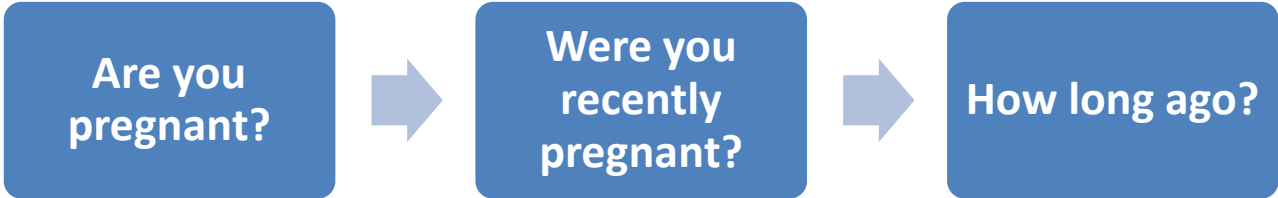
**Arrhythmias**



# Postpartum Patients are at High Risk

- In 2018 in NYS, all pregnancy related cardiac deaths occurred in the postpartum period
- The majority of these occurred **> 42 days** postpartum
- Patients can present months after a delivery with new onset pregnancy related cardiac disease
- It is important to ascertain if they have delivered in the past 12 months
- **The best way to know is to ask on intake/history assessment**

# The Most Important Questions to Ask...



# Signs and Symptoms to Trigger Concern

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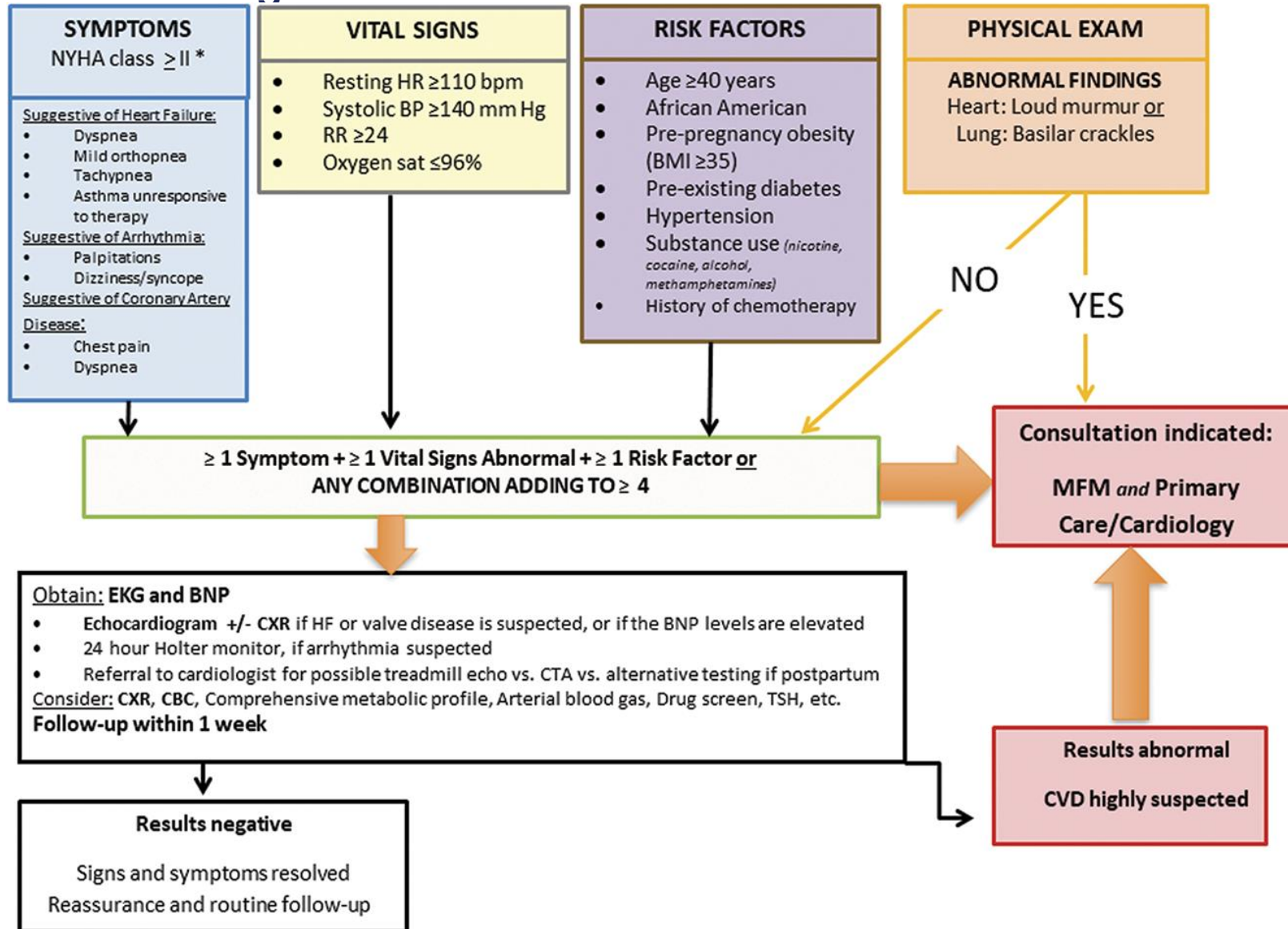
## Common Symptoms

- Orthopnea of 4 pillows
- Dyspnea on exertion
- Resting shortness of breath
- Chest pain
- Fatigue
- Increase in swelling
- Syncope

## Common signs

- Tachycardia
- Low O2 saturation
- Increased respiratory rate
- Hypotension
- S3 or S4
- Gallop
- Pitting peripheral edema

# California Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit Algorithm



ACOG recognizes that race is not a biological risk factor. Racism is a risk factor.

# Epic CV Screening Tool for Ob/Gyn Outpatient and Inpatient

Hyperspace - BRONX EAST PRACTICE OB/GYN GENERALISTS 1567 Orders 16 1 : Overdue Enc Completion

Patient Lookup | Remind Me | Personalize | HCS-ISTOP | UptoDate | NYC CIR | CPM Guidelines | Sign My Visits

Achilles, Virginia Pren...

Chart Review | Synopsis | Visit | Family Social Info. | Plan | Wrap-Up | Flowsheets | Review ... | Prep f... | Welc

**Visit**

**Achilles, Virginia Prenatal**  
 Female, 27 y.o., 12/3/1994  
 MRN: 05179001  
 Cur Location: BRONX EAST PRACTICE OB/GYN GENERALISTS  
 Code: Not on file (has ACP docs)  
 Primary Team: None  
 Observation Status: None

COVID-19 Vaccine: Unknown  
 Obstetrician: Me  
 Coverage: None  
 Allergies: Strawberry  
 GA, TWG: 12w2d, -120 lb 10.1 oz  
 7:45 AM NEW OBSTETRICAL VISIT  
 Weight: 136 lb >7 days  
 TWG: -120 lb  
 Pregravid BMI: 21.63 kg/m<sup>2</sup>

THIS PREGNANCY  
 Hx: G3P1011  
 GA: 12w2d (10/10/2022)  
 Blood Type: None

OB CVD ASSESSMENT

**Pull Data from Chart** Pull Data from the chart for 1st assessment of cardiovascular risk. To reassess risk, data items must first be entered before this button is used to recheck data

**Self Reported Symptoms (\*NYHA Class Vital Signs > = II)**

**Suggestive of Heart Failure**

Shortness of breath	Yes	No	Resting HR >=110 bpm	Yes	No
Short of breath lying flat	Yes	No	Systolic BP >=140 mmHg	Yes	No
Rapid heart rate	Yes	No	Respiratory Rate >=24	Yes	No
Asthma unresponsive to therapy	Yes	No	Oxygen Sat <=96%	Yes	No

**Suggestive of Arrhythmia**

Palpitations	Yes	No
Fainting or loss of consciousness	Yes	No

**Suggestive of Coronary Artery Disease**

Chest pain	Yes	No
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**Physical Exam**

Heart: Loud murmur	Yes	No
Lungs: Basilar crackles	Yes	No

**Risk Factors**

Age 40+	Yes	No
African American	Yes	No
Pre-pregnancy obesity (BMI >=35)	Yes	No
Pre-existing diabetes	Yes	No
Hypertension	Yes	No
Cancer Diagnosis or History	Yes	No
History of chemotherapy or chest radiation	Yes	No

**Substance Use**

Nicotine use:	Yes	No
Alcohol use:	Yes	No
Use of risky drugs: Cocaine, Depressants (Alcohol),	Yes	No

Mark All Symptoms Negative

+ ADD ORDER | + ADD DX (0)

ACOG recognizes that race is not a biological risk factor. Racism is a risk factor.



# Race Isn't a Risk Factor... Racism is

**Race is often listed as a risk factor in Cardiovascular risk calculators**  
**Misleadingly suggests it is a biological cause**

- Race is listed as a risk factor for various chronic conditions
  - Pathology texts contain false assertions that African Americans have different disease profiles
  - Citations of biologic and/or genetic differences between races are entirely unsupported by epidemiological literature
- Majority of patient in cardiac studies are white men
  - Risk for non-white people are over/under risked
  - Few women, and almost no minoritized women, and no pregnancy “risks” in calculators
- Social drivers of health resulting from systemic racism are risk factors for anyone experiencing them

# ED or Urgent Care screening Algorithm - pregnant or recently postpartum patients (i.e., within 1 year)

## Non-urgent Evaluation

### Intermediate Vital Signs      Intermediate Symptoms

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>Resting HR <math>\geq</math> 90-119</li> <li>Resting RR <math>\geq</math> 16-25</li> <li>SpO2 <math>\leq</math> 95-97%</li> </ul> | <ul style="list-style-type: none"> <li>SOB with moderate exertion</li> <li>New onset, persistent cough</li> </ul> |
|--|---|



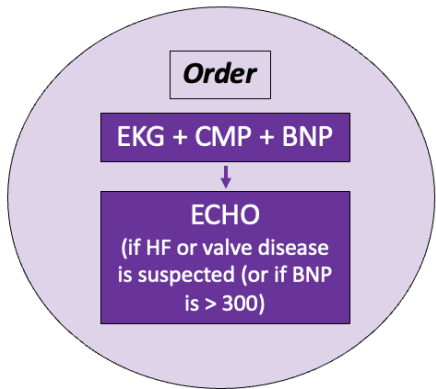
OUTPATIENT EVALUATION WITH CBC, CMP, BNP, ECHO within 2 weeks

## Urgent Evaluation

### Red Flag Vital Signs      Red Flag Symptoms

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>Resting HR <math>\geq</math> 120</li> <li>Resting RR <math>\geq</math> 24</li> <li>SpO2 <math>\leq</math> 94%</li> </ul> | <ul style="list-style-type: none"> <li>Shortness of breath at rest</li> <li>Severe Orthopnea <math>\geq</math> 4 pillows</li> </ul> |
|---|---|

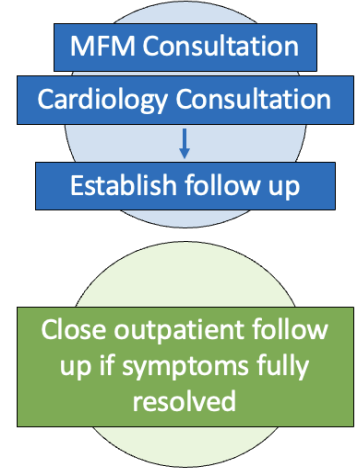
URGENT ED OR IN PATIENT EVALUATION



- Considerations...**
- Age > 40
  - Pre-pregnancy obesity
  - Pre-gestational DM
  - CHTN
  - Substance Use Disorder
  - Racism
  - Implicit Bias

**Abnormal**  
*Cardiovascular risk elevated*

**Normal**



# BNP in Pregnancy/ Postpartum baseline

Trimester	BNP level median in pg/ml
First	20 (10-115)
Second	18 (10-112)
Third	26 (10-143)
Postpartum	18 (10-62)

- Low concentrations of BNP <100pg/ml have high negative predictive value, but elevated levels should prompt further work up
- Elevated BNP can indicate heart failure or right heart strain associated with pulmonary embolism (and not ischemia).



# POCUS: Application to Critically Ill Parturients

## Heart & Lung Views

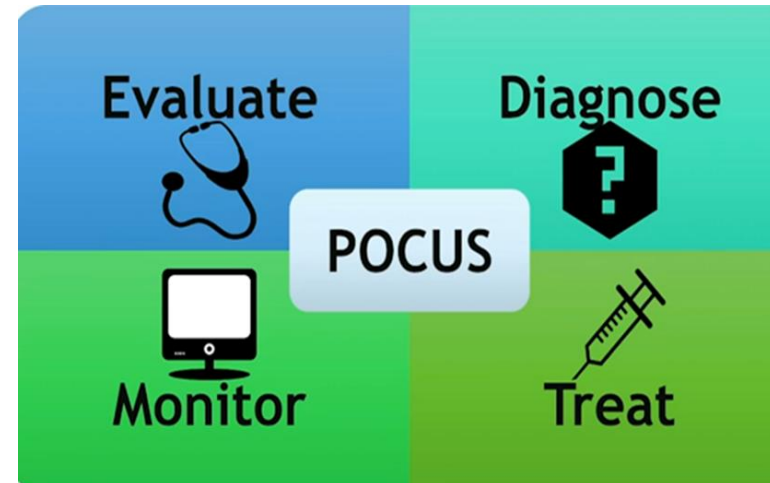
- Lung Apices
- Lung Bases
- LVOT
- 4 Chamber View
- IVC

## Rapid and Easily Accessible

- LV systolic dysfunction
- Pulmonary Edema
- Pleural and Pericardial Fluid
- RV Enlargement
- Elev. Central Venous Pressure

## Preg related dz that can benefit from assessment

- Preeclampsia w/ SF
- Sepsis
- Cardiopulmonary Collapse
- COVID Pneumonia



# Maternal Urgent Warning Signs:

## Cardiac symptoms are included!

\*Available in 39 different languages: [Click Here](#)\*


### URGENT MATERNAL WARNING SIGNS

- Headache that won't go away or gets worse over time
- Dizziness or fainting
- Thoughts about hurting yourself or your baby
- Changes in your vision
- Fever
- Trouble breathing
- Chest pain or fast-beating heart
- Severe belly pain that doesn't go away
- Severe nausea and vomiting (not like morning sickness)
- Baby's movements stopping or slowing
- Vaginal bleeding or fluid leaking during pregnancy
- Vaginal bleeding or fluid leaking after pregnancy
- Swelling, redness, or pain of your leg
- Extreme swelling of your hands or face
- Overwhelming tiredness

**If you have any of these symptoms during or after pregnancy, contact your health care provider and get help right away.**

If you can't reach your provider, go to the emergency room. Remember to say that you're pregnant or have been pregnant within the last year.

Learn more: <https://saferbirth.org/aim-resources/aim-cornerstones/urgent-maternal-warning-signs/>



Take a photo to learn more

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