Management of Cardiac Arrest in the Parturient

Dr.Javaheri
(Anesthesiologist and ICU manager)

Etiology of Maternal Death

- Cardiac arrest: 1 in 30,000 (۱:۲۰۰۰۰) deliveries.
- After CPR survival rate of 6.9%.

- Higher risk: adv maternal age, race, lack of prenatal care, unwed mothers

- ***PE***: most common ***medical*** cause

- ***Homicide***: most common ***overall*** cause

Key Interventions to Prevent Arrest in critically Parturient (Class I):

- ***Place the patient in the full left-lateral position*** to relieve possible compression of the inferior vena cava.

- ***Give 100% oxygen***.
- ***Establish intravenous (IV) access above the diaphragm***.
- ***Assess for hypotension***; maternal hypotension that warrants therapy has been defined as a ***systolic blood pressure <100 mm Hg or 80% of baseline.***
  In the patient who is not in arrest, both crystalloid and colloid solutions have been shown to increase preload.
- ***Consider reversible causes of critical illness and treat*** conditions that may contribute to clinical deterioration as early as possible.

Etiologies of Maternal C/P arrest

- **Obstetric**
  - Hemorrhage*
    - Uterine atony
    - Placental abruption/previa
    - DIC
  - HTN*
  - Amniotic fluid embolism
- **Iatrogenic**
  - Failed intubation
  - Aspiration
  - IV local anesthetic OD
  - Drug error, Overdosis, allergy
  - Mg Toxicity

Etiologies of Mat C/P arrest (cont'd)

- **PE****
  - Thrombus
  - Air
  - Fat
- ***Trauma***
  - Homicide*
  - Suicide
- **Infection/Sepsis***
- **Stroke**

Modifications of Basic and Advanced Life support for pregnant victims (1)

1 – Airway Management.

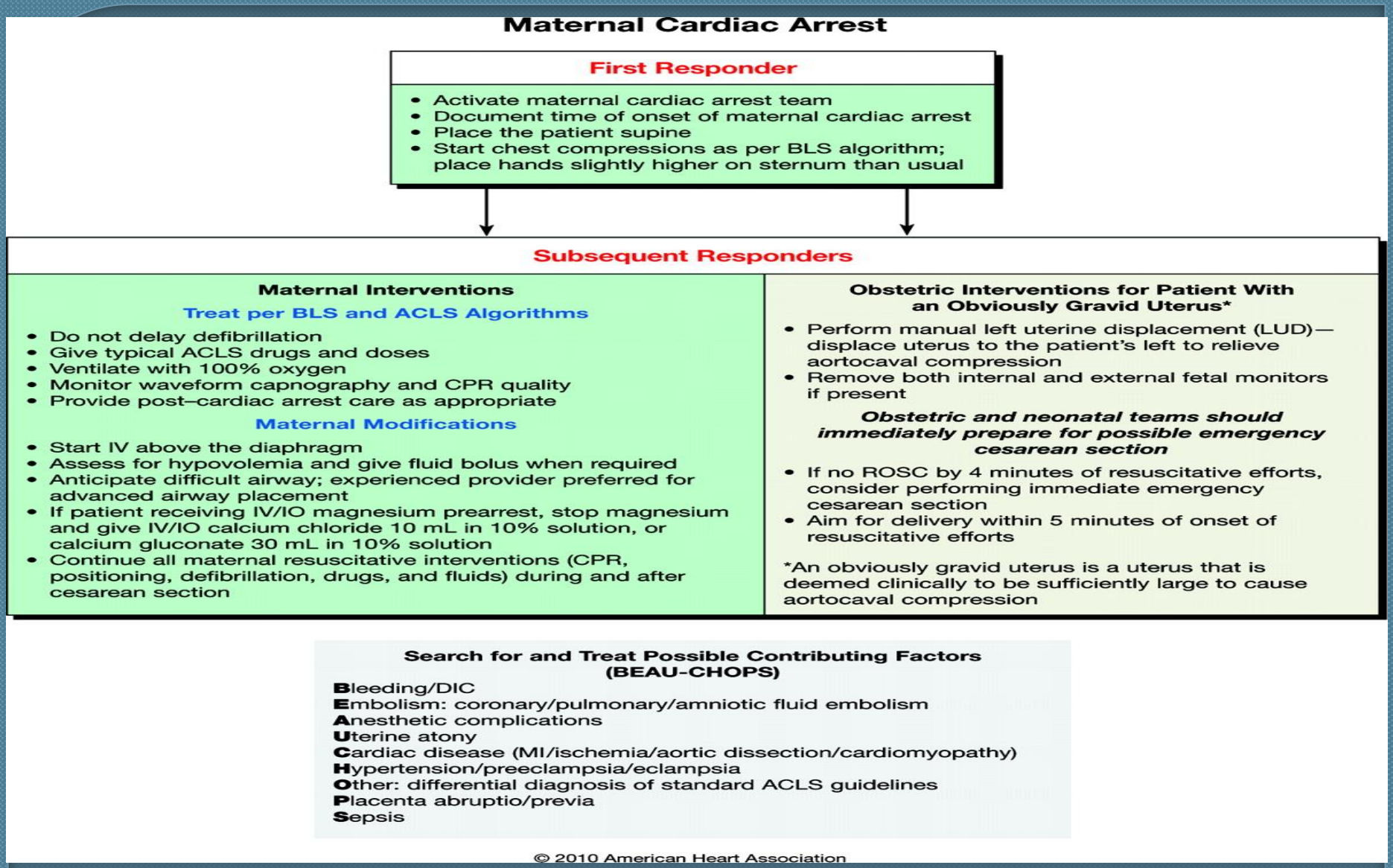
2 – Uterin Displacement.

3 – Deeper Chest Compression.

4 – Deliver within 5 min .

Modifications of Cardiovascular Life Support (2)

- ***positive-pressure ventilation (BMV) with O2%100***
  Continuous cricoid pressure
- ***chest compressions***
  should be performed slightly above the midpoint of the sternum
- Intubation as early as possible (0.5-1.0 mm smaller ETT)
- ***tidal volume***
  may need to be reduced because of elevation of the diaphragm.

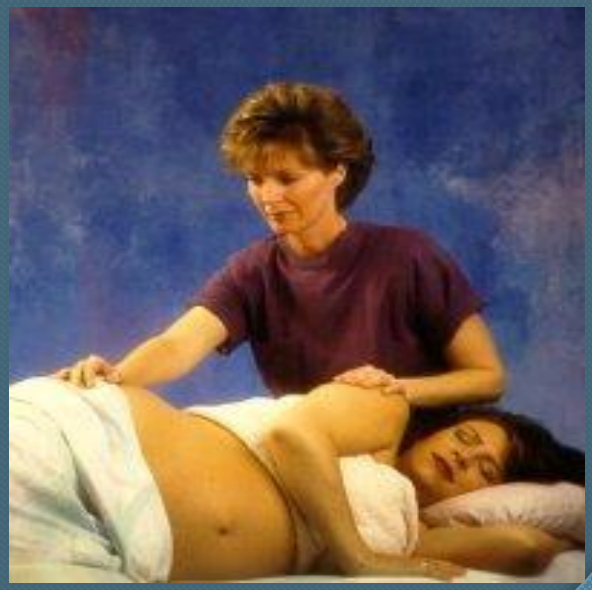


Maternal cardiac arrest algorithm

American Heart Association
Learn and Live

Limiting Aortocaval Compression

- 1)Manually displace uterus to LEFT
- 2)Tilt pt 15-30˚ on tiltable
- 3) Place roll or Cardiff wedge under pt's right hip/flank
- Consider "human wedge" bystander CPR



Vanden Hoek T L et al. Circulation 2010;122:S829-S861

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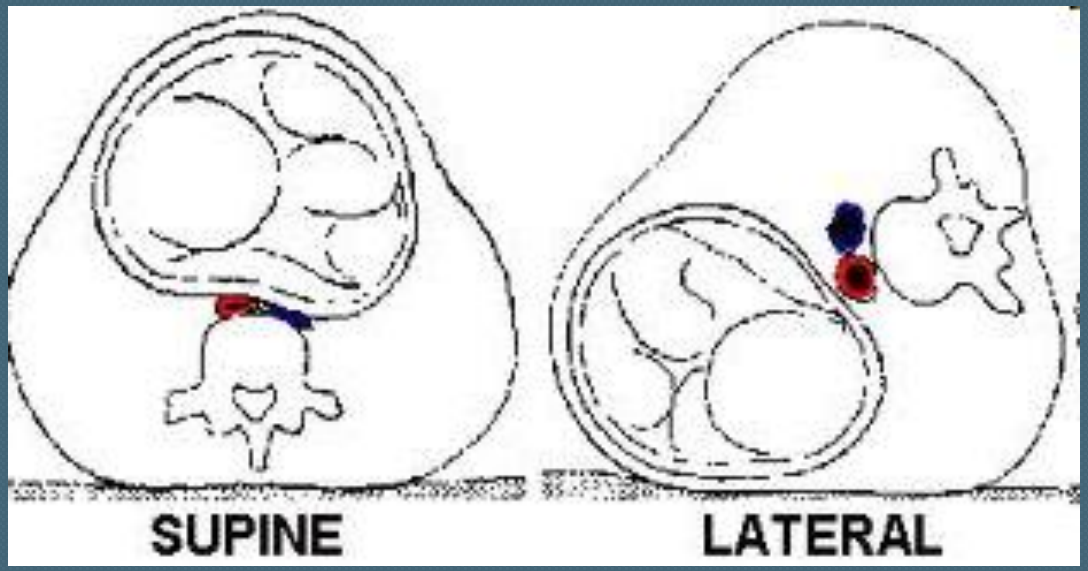
Use of an upturned chair and pillow as a wedge

Cardiff Wedge

Cardiff Wedge

- A hard surface and a human wedge may also be used.
- A person designated as a human wedge kneels on the floor, sitting on the heels.
- Stabilize the shoulders and the pelvis.

- Cardiac compressions are most efficiently accomplished on a hard surface.
- The Cardiff wedge, provides both relief of aortocaval compression and a firm surface.



Hypotension

- **LR or NS boluses**
- **Ephedrine** 5mg IV Q5 min, until response
- Avoid dopamine and epinephrine!

"Maternal resuscitation is the best fetal resuscitation".

Decision to perform C-section should be made by 4 min post-arrest, with delivery of the fetus by 5 min.

Rapid transport of infant to closest center providing neonatal services

- *If maternal cardiac arrest occurs before 24 weeks gestation, the rescuers only concern should be directed toward saving the mother.*
- *Beyond 24 weeks gestation, the resuscitation team must consider the lives of both the mother and the fetus.*
- It is essential that the resuscitation team maintain left uterine displacement during CPR.

Optimal Outcome

Immediate CPR → ACLS

Early intubation

Left Uterine displacement

Start Cesarean by 4 min

Delivery by 5 min

IS THIS REALISTIC OUTSIDE THE OR??

Post–Cardiac Arrest Care

One case report showed that post–cardiac arrest hypothermia can be used safely and effectively in early pregnancy without emergency cesarean section (with fetal heart monitoring), with favorable maternal and fetal outcome after a term delivery.

***Therapeutic hypothermia** may be considered on an individual basis after cardiac arrest in a comatose pregnant patient based on current recommendations for the nonpregnant patient.*

Therapeutic Hypothermia (32-34 C)

For improving neurologic outcome *in comatose adult patients with ROSC (ie, lack of meaningful response to verbal commands)* ***(Class I, LOE B)***

3 phases: ***Induction (#5 hrs, 32-34 °C)***

Maimtenance (12 - 24 h)

Recovery(0.25-0.5 C/h)

Complications: *Shivering- Arrythmia- Hypovolemia-Electrolyte imbalance- SVR ⇧ - C.O ⇩ - Hyperglycemia-Bleeding- Infection.*