

# Cardiac Arrest During Pregnancy

Sim Center

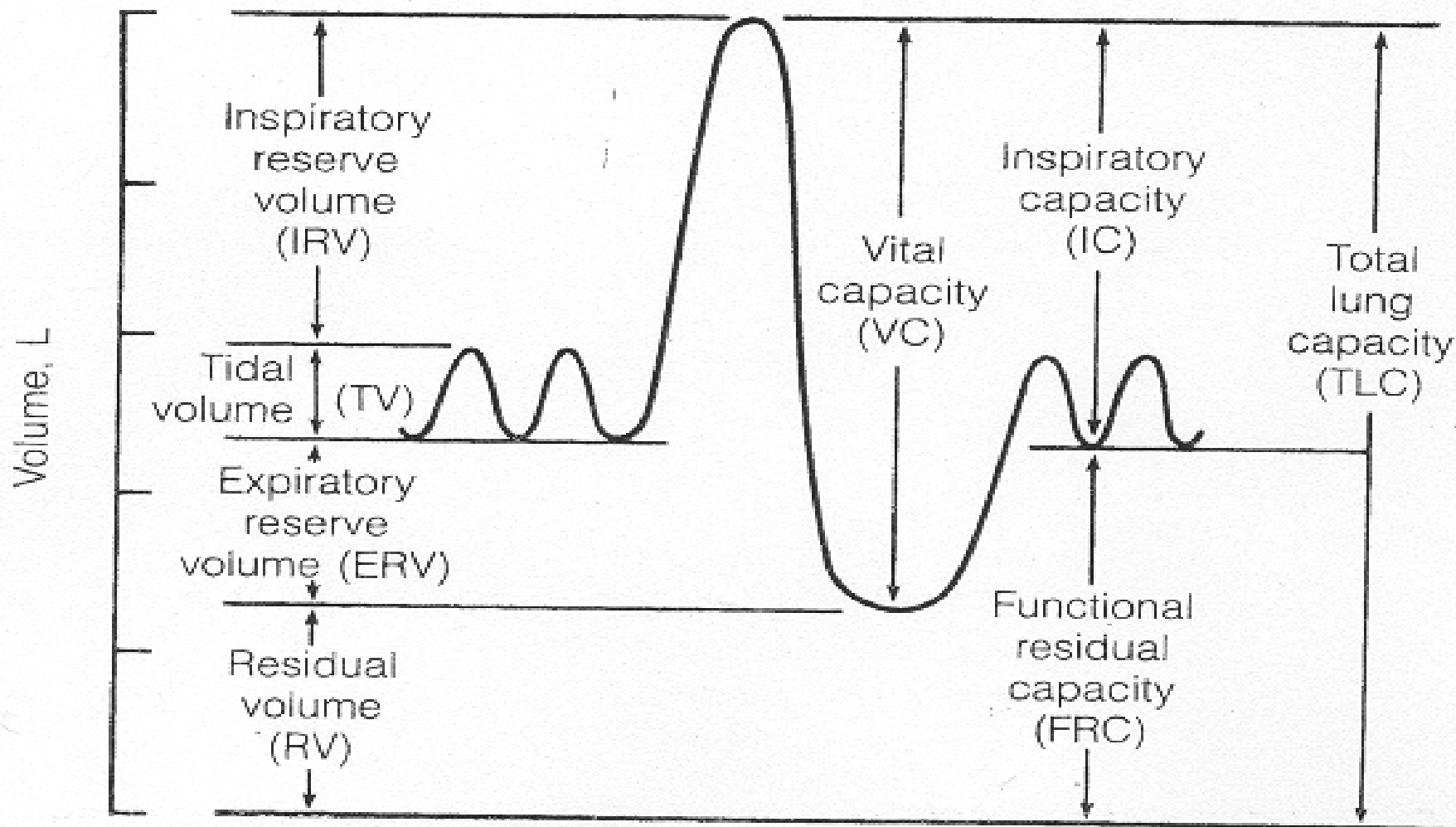


# Cause of Arrest

- Injury/trauma – most common
- Obstetric complications: amniotic fluid embolism, hemorrhage, malignant HTN, cardiomyopathy, eclampsia
- Iatrogenic complications: aspiration, anesthetic o/d, hypermagnesemia
- Medical: PE, air, fat embolism; aortic dissection; sepsis; preexisting conditions

# Physiologic Changes of Pregnancy

- Larynx: increased blood flow, edema
- Increased O<sub>2</sub> consumption, TV and MV
- Decreased FRC and ERV due to elevated diaphragm
- Rapid desaturation due to decreased FRC and high O<sub>2</sub> consumption
- PaCO<sub>2</sub> 28-32 with metabolic compensation
- Limited ability to buffer an acid load
- Increased CO and plasma volume. CO declines toward nonpregnant levels late in gestation
- Physiologic anemia



**FIGURE 163-1** The subdivisions of lung volume as recorded by a spirometer. The record is generated on paper calibrated for volume in the vertical direction and time in the horizontal. The term capacity is applied to a subdivision composed of two or more volumes. The definitions of these subdivisions are found in Table 163-1.

# Physiologic Changes of Pregnancy

- Decreased SVR and PVR
- IVC and aorta compression by uterus beyond 20 weeks gestation – especially in supine position
- Incompetent GE sphincter – risk of aspiration
- Need to consider two patients – mother and fetus

# Physiologic Changes of Pregnancy

- Maternal perfusion pressure determines uteroplacental and fetal blood flow
- Gravid uterus can compromise the effectiveness of resuscitation
- Do not administer medications through a subdiaphragmatic (femoral) vein

# Fetal Physiology

- Fetal Hgb is better saturated at low PaO<sub>2</sub>
- One case report of intact newborn survival after 20 min of uninterrupted CPR during cesarean delivery
- Window of reversible damage – 4-5 min

# Modifications to BLS Guidelines

- Place the patient on her left side with the back angled 15-30 degrees from the left lateral position, then start chest compressions
- Defibrillation shocks transfer no significant current to the fetus
- Remove any fetal or uterine monitors before shock delivery



# Airway management

- Insert advanced airway early to reduce risk of aspiration
- May need to use a slightly smaller ETT
- Monitor for excessive bleeding
- The most experienced provider
- Effective preoxygenation
- RSI with cricoid pressure
- Minimize hypotension

# Modifications to ACLS Guidelines

- Adjust ventilatory support to accommodate need for increased minute ventilation
- Use standard doses of all resuscitation medications
- Decide whether to perform emergency hysterotomy
- Identify and treat reversible causes of arrest

# Treatment

- Excess Mg sulfate – 1 g Ca gluconate
- Massive PE - fibrinolytics are relatively contraindicated but successful use has been reported
- Amniotic fluid embolism – use of CPB has been reported
- Acute coronary syndrome - PCI

# Persistent Arrest

- Hypoxic and acidotic blood supply may prove fatal to the fetus
- The key to the resuscitation of the infant is resuscitation of the mother
- After 20 – 23 weeks: the key to resuscitation of the mother is removal of the fetus from the gravid uterus (relieves IVC and aortic compression)

# Emergency Hysterotomy

- Intervention of desperation
- Allows immediate newborn resuscitation
- Corrects maternal physiology
- Gestational age < 20 weeks – no need for urgent hysterotomy if single fetus
- Infant survival: unlikely if gestational age <24-25 weeks and birth weight < 500 g.

# Infant Survival

- Short interval between mother's arrest and delivery: < 5 min – excellent; 5- <10 min – good; 10- <15 min – fair; 15 – <20 min poor; 20 min – 1 case report
- No sustained pre-arrest hypoxia
- No or minimal signs of fetal distress
- Effective and aggressive CPR
- Medical center with NICU