SPECIAL CIRCUMSTANCES OF RESUSCITATION

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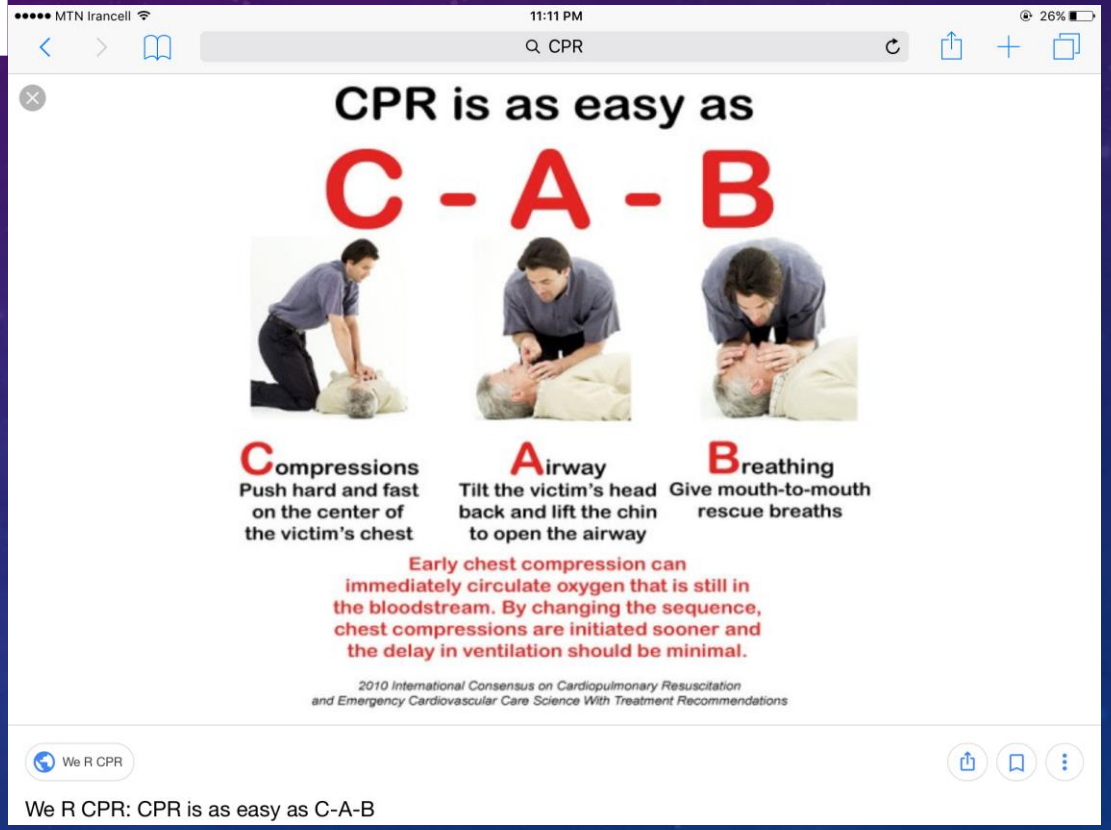
TUMS



- Special tretmentvor procedures other than BLS and ACLS

- manage-ment of resuscitation in several critical situations,
- cardiac arrest associated with pregnancy
- pulmo-nary embolism (PE)
- and opioid-associated resuscita-tive emergencies, with or without cardiac arrest.
- PCI

CARDIAC ARREST ASSOCIATED WITH PREGNANCY

- Rare
- The best outcomes for both mother and fetus are likely to be achieved by successful maternal resuscitation.
- The most common causes of maternal cardiac arrest are hemorrhage, cardiovascular diseases (including myocardial infarction, aortic dissection, and myocarditis), amniotic fluid embolism, sepsis, aspiration pneu-monitis, PE, and eclampsia
- Important iatrogenic causes of maternal cardiac arrest include hypermagnesemia from magne-sium sulfate administration and anesthetic complications.

PATIENT POSITIONING DURING CPR

- Important strategy to improve CPR quality
- Aortocaval compression :20 ges weeks
- Manual left lateral uterine displacement (LUD) effectively relieves aorto-caval pressure in patients with hypotension.

Part 10.1: Cardiac Arrest Associated With Pregnancy[ALS 436]

Cardiac arrest associated with pregnancy is rare in high-income countries. Maternal cardiac arrest occurs in approximately 1:12 000 admissions for delivery in the United States.[12] Maternal cardiac arrest rates appear to be increasing in the United States, from 7.2 deaths per 100 000 live births in 1987 to 17.8 deaths per 100 000 live births in 2009.[13] Maternal mortality rates are lower in Canada, where maternal mortality is reported as 6.1 deaths per 100 000 deliveries, with a decreasing trend from 2001 until 2011.[14,15]

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The 2015 ILCOR systematic review addressed the questions of patient positioning during CPR and the role of perimortem cesarean delivery (PMCD) in the management of pregnant women in cardiac arrest during the second half of pregnancy.

2015 Evidence Summary

The evidence regarding advanced treatment strategies for cardiac arrest in pregnancy is largely observational. As a result, the recommendations are based on application of physiologic principles and on close examination of observational studies that are susceptible to bias. The lack of high-quality studies examining treatment of cardiac arrest in late pregnancy represents a major scientific gap.

Patient Positioning During CPR

Patient position has emerged as an important strategy to improve the quality of CPR and resultant compression force

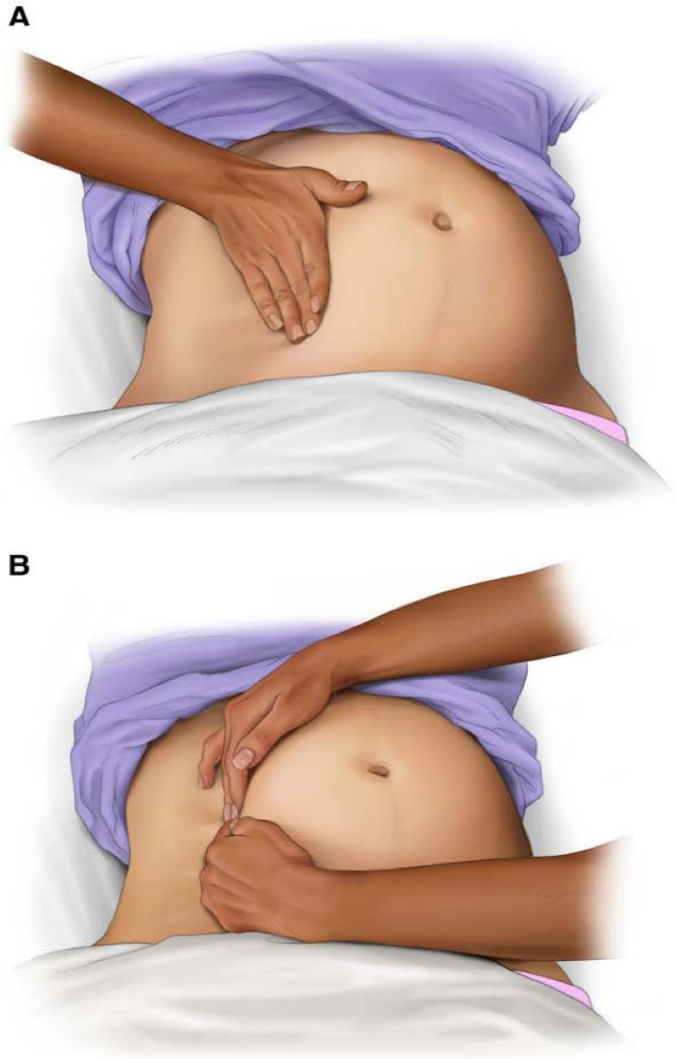


Figure 1. A, Manual LUD, performed with one-handed technique. **B**, Two-handed technique during resuscitation.

EMERGENCY CESAREAN DELIVERY IN CARDIAC ARREST

- In the latter half of pregnancy, PMCD may be considered part of maternal resuscitation, regardless of fetal viability.
- Timing:Survival of the mother has been reported up to 15 minutes after the onset of maternal cardiac arrest.
- Neonatal survival has been documented with PMCD performed up to 30 minutes after the onset of maternal cardiac arrest.

BLS MODIFICATION: RELIEF OF AORTOCAVAL COMPRESSION

- Priorities for the pregnant woman in cardiac arrest are provi-sion of high-quality CPR and relief of aortocaval compres-sion (Class I, LOE C-LD).
- If the fundus height is at or above the level of the umbilicus, manual LUD can be beneficial in relieving aortocaval compression during chest compressions (Class IIa, LOE C-LD).

ALS MODIFICATION: EMERGENCY CESAREAN DELIVERY IN CARDIAC ARREST

- Because immediate ROSC cannot always be achieved, local resources for a PMCD should be summoned as soon as car-diac arrest is recognized in a woman in the second half of pregnancy (Class I, LOE C-LD).
- Systematic preparation and training are the keys to a successful response to such rare and complex events. Care teams that may be called upon to manage these situations should develop and practice standard institutional responses to allow for smooth delivery of resus-citative care (Class I, LOE C-EO).

WHEN PMCD??

- During cardiac arrest, if the pregnant woman with a fundus height at or above the umbilicus has not achieved ROSC with usual resuscitation measures plus manual LUD, it is advisable to prepare to evacuate the uterus while resuscitation contin-ues (Class I, LOE C-LD)
- In situations such as nonsurvivable maternal trauma or prolonged pulselessness, in which mater-nal resuscitative efforts are obviously futile, there is no rea-son to delay performing PMCD (Class I, LOE C-LD).
- PMCD should be considered at 4 minutes after onset of maternal car-diac arrest or resuscitative efforts (for the unwitnessed arrest) if there is no ROSC (Class IIa, LOE C-EO).

CARDIAC ARREST ASSOCIATED WITH PULMONARY EMBOLISM

PE-related cardiac arrests may occur within hours of symptom onset.
Between 5% and 13% of unex-plained cardiac arrests are associated with fulminant PE.

- Less than 5% of patients with acute PE progress to cardiac arrest.

- Conventional thrombo-embolism risk factors, prodromal dyspnea or respiratory dis-tress, and witnessed arrest are features associated with cardiac arrest due to PE.
- Pulseless electrical activity is the present-ing rhythm in 36% to 53% of PE-related cardiac arrests, while primary shockable rhythms are uncommon.

TX:

- Anticoagulation
- Advanced tretment options:,systemic thrombolysis or surgical or endovascular techniques

CONFIRMED PULMONARY EMBOLISM

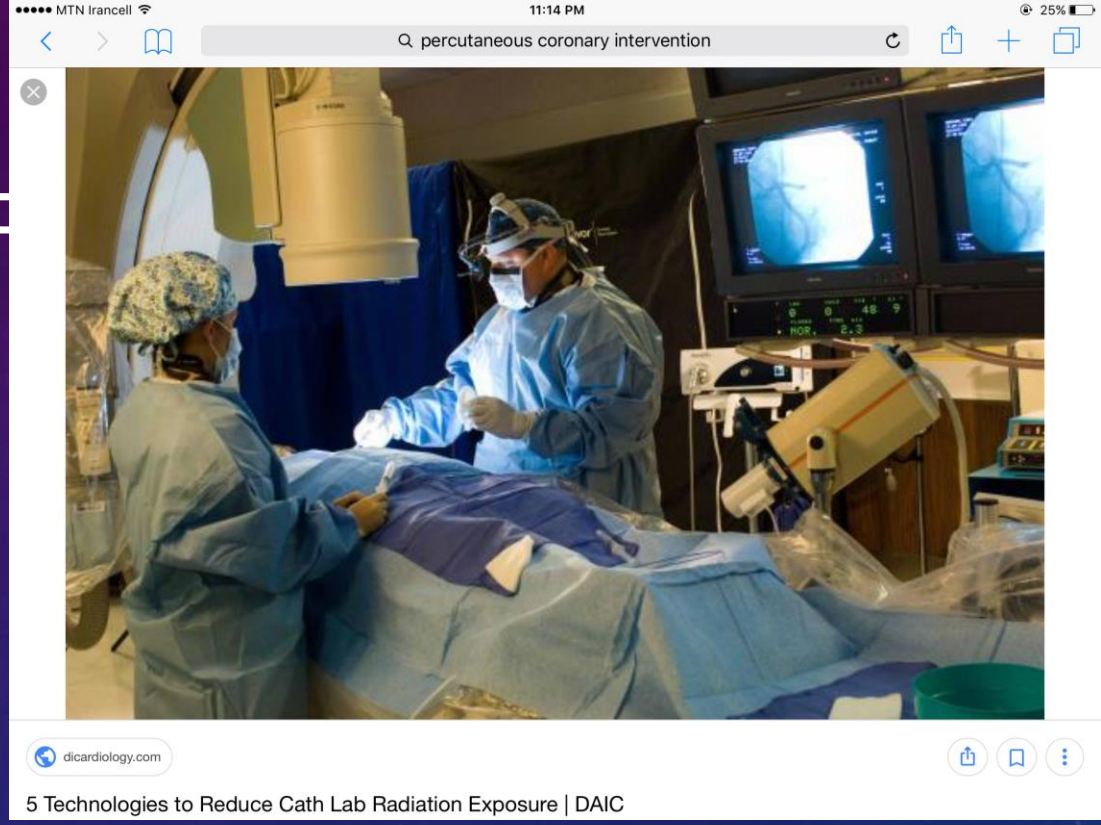
- Systemic thrombolysis is associated with ROSC and short-term survival in PE-related cardiac arrest in nonrandomized observational studies.
- alteplase 50 mg intravenous (IV) bolus with an option for repeat bolus in 15 minutes, or single-dose weight-based tenecteplase
- Early administration of systemic thrombolysis is associated with improved resuscitation outcomes
- The feasibility of embolectomy under uncontrolled CPR conditions is not known.

RECOMMENDATIONS

Confirmed Pulmonary Embolism

- In patients with confirmed PE as the precipitant of cardiac arrest, thrombolysis, surgical embolectomy, and mechanical embolectomy are reasonable emergency treatment options (Class IIa, LOE C-LD)
- Thrombolysis can be beneficial even when chest compressions have been provided
- Thrombolysis may be considered when cardiac arrest is sus-pected to be caused by PE (Class IIb, LOE C-LD)

CARDIAC ARREST DURING P
CORONARY INTERVENTION



- Rare,1.3%catheterization.
- Higher in emergency procedures like PPCI
- Better outcome than in hospital arrests .
- high quality CPR and rapid defib
- mechanical devices available to provide hemodynamic support during cardiac catheterization in high-risk patients presenting with cardiogenic shock

- number of case reports and case series have reported the use of mechanical CPR devices to facilitate prolonged resuscitation, no comparative studies
- Mechanical CPR devices may also allow the use of fluoroscopy during chest compressions without direct irradiation of personnel.
- Ventricular assist devices, intraaortic balloon pumps (IABP), and ECPR are all rescue treatment options avail-able to support circulation and permit completion of the PCI.
- The use of ECPR is also feasible and associated with good outcomes when used as a bridge to coronary artery bypass grafting

- The combina-tion of ECPR and IABP has been associated with increased survival when compared with IABP alone for patients who present with cardiogenic shock, including those who have a cardiac arrest while undergoing PCI.
- observational studies often implement ECPR 20 to 30 min-utes after cardiac arrest
- IABP counterpulsation increases coronary perfusion, decreases myocardial oxygen demand, and improves hemo-dynamics in cardiogenic shock states, but it is not associated with improved patient survival in cardiogenic shock.

- In patients with cardiogenic shock or cardiac arrest and failed PCI, mechanical CPR devices and/or ECPR have been used as rescue bridges to coronary artery bypass graft.

2015 RECOMMENDATIONS

- It may be reasonable to use mechanical CPR devices to pro-vide chest compressions to patients in cardiac arrest during PCI (Class IIb, LOE C-EO).
- It may be reasonable to use ECPR as a rescue treatment when initial therapy is failing for cardiac arrest that occurs dur-ing PCI (Class IIb, LOE C-LD).
- Due to a lack of comparative studies, it is not possible to recommend one approach (manual CPR, mechanical CPR, or ECPR) over another when options exist.
- Because patients can remain on ECPR support for extended periods of time without pos-sibility of recovery, practical and ethical considerations must be taken into account in determining which victims of cardiac arrest should receive ECPR support.j

CPR IS TEAM WORK