



AMC TRAUMA PRACTICE MANANGEMENT GUIDELINE: Diagnosis and Management of Injury in the Pregnant Patient



Important Note

The intent of the Albany Medical Center Best Practices Guidelines is to provide health care professionals with evidence-based recommendations regarding care of the trauma patient. The Best Practices Guidelines do not include all potential options for prevention, diagnosis, and treatment and are not intended as a substitute for the provider's clinical judgment and experience. The responsible provider must make all treatment decisions based upon his or her independent judgment and the patient's individual clinical presentation. Albany Medical Center and any entities endorsing the Guidelines shall not be liable for any damages, including without limitation any direct, indirect, special, incidental, consequential or punitive damages, related to any use of the information contained herein. Albany Medical Center may modify the Best Practices Guidelines at any time without notice.

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PURPOSE: To provide an evidence-based, approach to the management of female trauma patients of childbearing age, and to guide management of trauma patients determined to have a viable pregnancy. Adapted from Reference 1.

SUPPORTIVE DATA:

Definitions:

Fetal viability: For the purpose of this guideline, fetal age at or greater than 20 weeks will be considered viable and the recommendations detailed below will apply.

Kleihauer – Betke Analysis (or Acid-Elution Test): This is the standard method of quantitating the presence of fetal-maternal hemorrhage and takes advantage of differential resistance of fetal hemoglobin to acid. A maternal blood smear is performed to ascertain if fetal red blood cells are present and if so, this suggests the transfer of fetal hemoglobin from the fetus to the mother's bloodstream. It is generally used to determine the need and dosage of Rh immune globulin when an Rh positive fetus is carried by an Rh negative mother.

Emergent Cesarean section: This should be differentiated from perimortem Cesarean section. Emergent C-section may be undertaken for fetal distress, premature rupture of membranes, maternal distress, or other reasons as determined by the OB Attending.

Perimortem Cesarean section: Refers to that which is performed at the time of maternal death and/or during trauma arrest resuscitation.

ACOG: American Congress of Obstetricians and Gynecologists

Policy Statements: There are controversies and inconsistencies in diagnosis, management, prognostics and outcomes involving the care of the injured pregnant patient. The anatomy and physiology of pregnancy make diagnosis and treatment difficult. Advanced Trauma Life Support teaches that “the best initial treatment for the fetus is the provision of optimum resuscitation of the mother and the early assessment of the fetus.”² The most common cause of fetal demise is maternal demise.

Background: Trauma during pregnancy is the leading cause of nonobstetric death and has an overall 6% to 7% maternal mortality. Fetal mortality has been quoted as high as 61% in major trauma and 80% if maternal shock is present.

The duration of fetal monitoring has been debated and no large, prospective studies exist to support a specific length of time for cardiotocographic monitoring. Abruptio placentae, which is the main obstetric cause of fetal demise, can occur up to 48 hours post-injury.

Recommendations regarding diagnostic radiation doses that are harmful to the fetus are lacking and are extrapolated from atomic bomb blast data or large series cancer registries. The fetus is most at risk for central nervous system effects from 8-15 weeks and the threshold appears to be at least 20-40 rad. ACOG recommendations consider that 5 rad (or 50 mGy) exposure to the fetus is not associated with any increased risk of fetal loss or birth defects. Most X-rays are a fraction of a mGy or rad and fetal exposure without shielding is approximately 30% of maternal exposure. A 10 mm cut

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Abdominal CT scan has an estimated 2.6 rad exposure to the fetus. CT of the head or chest has an exposure of less than 0.1 rad.

Perimortem cesarean section should be considered if the fundus extends above the level of the umbilicus where aortocaval compression can occur regardless of gestational age. Several case reports of PMCD during a maternal cardiac arrest resulted in ROSC or improvement in hemodynamic status only after the uterus had been emptied³).

PROCESS:

See attached algorithm.

PROCEDURES/THERAPEUTIC INTERVENTIONS:

The best treatment for the fetus is optimum resuscitation of the mother and early assessment of the fetus.

Recommendations and Levels of Evidence:

1. All female patients of childbearing age with significant trauma should have a human chorionic gonadotropin (urine β -HCG) performed and be shielded from X-rays whenever possible. (Level III)
2. Concern about possible effects of high-dose ionizing radiation exposure should not prevent medically indicated maternal diagnostic X-ray procedures from being performed. Consider other diagnostic imaging procedures during pregnancy if feasible. Mandatory shielding should be performed for all radiographic imaging except pelvic and lumbar spine films or CT scans. Ultrasound and MRI are not associated with known adverse fetal effects, but there is little evidence therefore MRI is not recommended during the first trimester (Level III)
3. Obstetric consult should be obtained in all cases of injury in pregnant patients.
4. Notify on-call OB team immediately for trauma in pregnant patient ≥ 20 weeks EGA and if gestational age is unknown, notify team if fundus is at the level of the umbilicus. The OB team will determine level of fetal monitoring needed after assessment of patient. This assessment should occur as soon as possible, generally within 30 minutes of being contacted.
5. Kleihauer-Betke analysis should be performed in all pregnant patients with > 12 weeks gestation to rule out abruptio placentae, as a predictor of pre-term labor, and as a guide for the need for Rh immune globulin administration. Blood typing of the mother should also be performed to aid in determining the latter. (Level II)
6. Maintain the pregnant patient tilted left side down at 15 degrees to maximize blood return through the vena cava and prevent supine hypotension syndrome. (Level III) If CPR is in progress, in order to maintain high-quality chest compressions, patient should be supine with a rescuer manually displacing the uterus to the left. (Jeejeebjoy et al, 2015).
7. Perimortem Cesarean section should be considered in any moribund pregnant woman where the fundus can result in aortocaval compression thus interfering with maternal hemodynamics. (Level III). This serves two purposes: to save the fetus when mortality of the mother is certain and to remove the fetus to allow for potential resuscitation of the mother in the case of cardiac arrest or severe hemorrhage. To minimize risks of neurological damage, PMCD should begin at 4 minutes to effect delivery at 5 minutes after failed resuscitative efforts³ Emergent Cesarean section should be

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pursued if it is ensured that saving the fetus will not adversely affect the maternal outcome.

8. There was insufficient evidence in the literature of any class to support recommendations regarding management of penetrating trauma to the anterior abdomen or flank; resuscitative fluids and endpoints of resuscitation; use of blood products; use of invasive and/or non-invasive hemodynamic monitoring devices and techniques; indications for hysterectomy or hysterotomy; or management of severe pelvic fractures.

REFERENCES

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3. Jeejeebhoy, et al. Cardiac Arrest in Pregnancy. A Scientific Statement From the American Heart Association. DOI: 10.1161/CIR.0000000000000300
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