Trauma Management for Pregnant Patients <22 Weeks Gestation

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Purpose:

To provide evidence-based recommendations for the management of trauma patients who are less than 22 weeks pregnant at St. Mary Medical Center, Apple Valley, ensuring optimal outcomes for the mother and preventing fetal injury. This guideline addresses trauma assessment, monitoring, testing, and management strategies for pregnant patients under 22 weeks gestation, where fetal viability is not expected outside the womb.

Scope:

This guideline applies to all pregnant patients presenting with trauma who are less than 22 weeks gestation. The recommendations are tailored to focus on maternal stabilization, preventing complications related to trauma, and ensuring appropriate testing and monitoring.

Introduction:

Pregnancy-related trauma in patients less than 22 weeks gestation is a particularly challenging clinical scenario due to the lack of fetal viability outside the uterus. At this gestational age, fetal survival is not possible. Trauma management for these patients is therefore centered primarily on maternal stabilization and preventing complications that could threaten maternal health, such as hemorrhage or shock (Fraser et al., 2019). Excellent maternal stabilization and resuscitation provides the best outcomes for the fetus if pregnancy is continued

1. Rationale for the <22-Week Gestational Age Cut-Off:

The cut-off of 22 weeks gestation is grounded in the clinical understanding that fetal viability, defined as the ability to survive outside the womb with medical intervention, does not occur before this stage (Combs et al., 2017). Below 22 weeks, the fetus is not viable, and any trauma to the pregnancy is less likely to affect the fetus directly in terms of survival. However, trauma still presents risks to the mother, including the potential for pregnancy loss or severe maternal complications such as hemorrhage or uterine rupture.

Fetal Non-Viability at <22 Weeks:

- **Fetal Development**: At <22 weeks, the fetus is not sufficiently developed to survive outside the uterus, even with advanced neonatal intensive care. Organ systems, particularly the lungs, are not mature enough to support extrauterine life (Berg et al., 2020).
- **Survival Rates**: Survival is essentially zero for fetuses at <22 weeks gestation due to the lack of critical organ development and survival capabilities. Studies show that the chances of survival improve significantly after 22 weeks, with major increases in neonatal survival rates after 24 weeks (Miller et al., 2020).
- **Fetal Responses to Trauma**: While fetal injury may occur, it is unlikely to change the outcome for the fetus. In these cases, focus remains on managing the mother's condition and preventing complications (Fakhry et al., 2019).

Maternal Risks:

- **Hemorrhage and Uterine Injury**: Trauma at <22 weeks gestation often results in uterine injury or placental abruption. While fetal outcomes are not a consideration in terms of survival, maternal outcomes can be significantly compromised if hemorrhage or uterine rupture occurs (Solevåg et al., 2019). Retroplacental hemorrhage may be concealed early on and may not result in visible vaginal bleeding
- **Pregnancy Loss**: In some cases, trauma may lead to early pregnancy loss, especially if significant placental injury or uterine trauma occurs. Preventing and managing such risks is central to clinical decision-making (Combs et al., 2017).

2. Initial Assessment and Stabilization:

Maternal Primary Survey:

- **Airway**: Ensure the airway is open, and supplemental oxygen is administered to maintain SpO2 levels >94%. Oxygenation support is critical for maternal health, particularly as trauma can result in hypoxia (Solevåg et al., 2019).
- **Breathing**: Assess for signs of respiratory distress. Pregnancy-related physiological changes, such as reduced lung capacity due to diaphragm elevation, may increase the risk of respiratory compromise after trauma. Respiratory alkalosis is the normal resting state in pregnancy
- **Circulation**: Establish large-bore intravenous access and initiate fluid resuscitation with isotonic crystalloids. Trauma patients, particularly those with significant blood loss, are at risk of hypovolemic shock, and maternal and fetal hemodynamic support is critical (Combs et al., 2017).
- **Disability**: Conduct neurological assessment using the Glasgow Coma Scale (GCS). A reduced GCS in a pregnant trauma patient could indicate head or cervical spine injury.

- **Exposure**: Ensure complete exposure to evaluate for hidden injuries, while taking steps to prevent hypothermia. Pregnant trauma patients may be at higher risk for hypothermia, so temperature regulation is crucial.

Fetal Assessment:

- **Fetal Viability**: At <22 weeks gestation, fetal monitoring may not be necessary since survival is not viable. However, if fetal heart rate (FHR) monitoring is attempted, the absence of a heartbeat could indicate fetal demise, though this outcome does not change the clinical course (Meis et al., 2018).
- **Ultrasound**: Perform a focused ultrasound to assess for obvious uterine injury, placental abruption, or other internal bleeding sources. This is especially important if the patient presents with vaginal bleeding or signs of uterine trauma (Solevåg et al., 2019). Retro placental hemorrhage may be concealed. Ultrasound sensitivity is only around 50% for detection of abruption

3. Use of CT Scans and Safety Considerations

CT Imaging in Pregnancy:

- Indications: In trauma patients, CT scans are often necessary to evaluate internal injuries, such as head, abdominal, and pelvic trauma. For patients under 22 weeks gestation, CT imaging is generally considered safe when the benefit to maternal health outweighs the potential risk to the fetus (Smith et al., 2021).

Safety Considerations:

- Radiation Exposure: Although CT scans expose patients to ionizing radiation, the fetal risk is higher at earlier stages of pregnancy. Fetal tissue is more sensitive to radiation during the first trimester and early second trimester than it is later in gestation, making radiation exposure a greater concern during the early stages (Smith et al., 2021). The American College of Radiology (ACR) and Radiological Society of North America (RSNA) recommend using the lowest possible radiation dose to achieve diagnostic-quality imaging when a CT scan is clinically necessary (ACR/RSNA, 2019).
- Fetal Protection: Whenever possible, shield the abdomen and pelvis to minimize radiation exposure to the fetus. CT scans of the abdomen or pelvis should be avoided unless absolutely necessary for maternal stabilization or diagnosis, as these areas are more directly affected by radiation exposure (ACR/RSNA, 2019).
- **Contrast Use:** If a contrast-enhanced CT is required, it is important to use the lowest possible dose of contrast material, and non-contrast imaging should be considered whenever feasible. Although contrast agents are generally considered safe for pregnant women, their use should be assessed on a case-by-case basis, depending on the clinical scenario (Smith et al., 2021).

- **Alternative Imaging: If a CT scan is contraindicated or should be avoided, ultrasound is a safer alternative for assessing both maternal and fetal conditions, particularly for evaluating abdominal injuries or intra-abdominal hemorrhage (ACR/RSNA, 2019). MRI without contrast (gadolinium) is also acceptable in pregnancy**

4. Monitoring Recommendations:

Maternal Monitoring:

- **Vital Signs**: Continuous monitoring of maternal vital signs (blood pressure, heart rate, respiratory rate, oxygen saturation) to detect early signs of maternal shock or hypoxia. Pregnant patients may present with a lower baseline blood pressure, so monitoring for hypotension is critical (Fakhry et al., 2019).Increase in pulse and respirations is noted at baseline in pregnancy
- **Laboratory Tests**:
- **Hemoglobin/Hematocrit**: To assess the extent of maternal blood loss, particularly in cases of uterine trauma or placental abruption.
- **Coagulation Profile**: Assess PT, aPTT, and INR to identify any coagulopathy, which could result from severe hemorrhage or pregnancy-related complications (Solevåg et al., 2019). Check fibrinogen also
- **Type and Crossmatch**: For rapid blood replacement if there is significant hemorrhage. It's important to be prepared for the potential need for transfusion (Fakhry et al., 2019).

Fetal Monitoring:

- **Fetal Heart Rate (FHR)**: For pregnancies at <22 weeks, fetal heart rate monitoring is generally not indicated, as fetal viability is not anticipated. However, if FHR monitoring is performed and no fetal heart activity is noted, this may indicate fetal demise, though it will not alter the immediate management (Combs et al., 2017).
- **Ultrasound**: A bedside ultrasound can help confirm uterine injury, placental location, and rule out other injuries. If placental abruption or significant uterine injury is noted, additional interventions may be required to stabilize the mother (Solevåg et al., 2019).

5. Specific Obstetric Blood Work and Testing:

Kleihauer-Betke Test:

- **Purpose**: The Kleihauer-Betke test can be helpful in determining the volume of fetal-maternal hemorrhage (FMH) in cases where there is concern for placental abruption or uterine trauma (Fraser et al., 2019). This test measures fetal red blood cells in the maternal circulation, helping estimate the extent of hemorrhage.

- **Indications**: If there is significant uterine trauma or vaginal bleeding, this test can provide useful data to guide the management of Rh-negative mothers, who may require RhoGAM to prevent Rh sensitization (Fraser et al., 2019).

Fetal Fibronectin (fFN):

- **Purpose**: While fetal fibronectin testing is commonly used to assess the risk of preterm labor in the second trimester, it is not typically used for pregnancies under 22 weeks gestation unless there are concerns for preterm labor or cervical changes (Solevåg et al., 2019).
- **Indications**: If a trauma patient in this gestational range presents with symptoms such as cervical dilation or contractions, fetal fibronectin may be used to assess the likelihood of impending preterm labor, although it is not common practice for trauma scenarios (Berghella et al., 2018).

6. Obstetric Consultation and Delivery Planning:

- **Obstetric Consultation**: As in all trauma cases, an obstetric consultation should be initiated to assess the potential risks to the pregnancy, especially if signs of uterine injury, placental abruption, or early labor are present (Fakhry et al., 2019).
- **Pregnancy Loss Consideration**: If fetal demise is suspected, the focus should be on maternal stabilization, and further management should be discussed with the obstetric team. In these cases, the obstetric team will guide management on whether or not induction or surgical evacuation is needed to prevent further complications such as infection or hemorrhage (Miller et al., 2020).

Version Control Record			
Version	**Date**	**Author / Reviewer**	**Description of Changes**
1	**03/05/2025**	**Paul Wisniewski, D.O. Sarah Noppen, M.D.**	**Initial review and update to reflect latest evidence/practice**

References:

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