TRAUMA ALERT

Welcome to the Trauma Alert Education Newsletter brought to you by Beacon Trauma Services.

2021- Edition 8

The Pregnant Trauma Patient

Source: https://tinyurl.com/y2ybo7gr

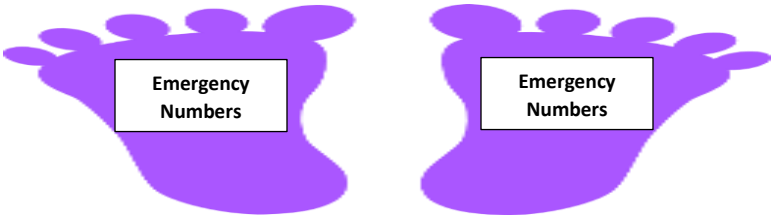
- Trauma is the leading cause of death in women of child bearing age.
  - Trauma accounts for 1/5 of all non-obstetric deaths.
  - The leading cause of mortality is head injury and hemorrhage.
- Clinicians who treat pregnant trauma patients must remember that there are two patients.
  - The best initial treatment for the fetus is to provide optimal resuscitation of the mother. The number one cause of death of the fetus is maternal shock.
  - Initial treatment priorities and the primary survey for an injured pregnant patient remain the same as for the nonpregnant patient.
  - Every female of reproductive age with significant injuries should be considered pregnant until proven otherwise.
  - Every pregnant trauma patient over 20 weeks should have obstetric monitoring done in the emergency department.

        - Healthy pregnant patients can lose 1,200 to 1,500 ml of blood before exhibiting signs and symptoms of hypovolemia.
            - This amount of hemorrhage may be reflected by fetal distress, as evidenced by an abnormal fetal heart rate. The normal fetal heart rate is 120 to 160.
        - Fetal distress may be the first clue that the mother is deteriorating.
        - Maternal shock equals an 80% fetal mortality rate.
- The top three causes of injury are:
    - Motor vehicle crashes
        - 34 to 64% of females are unrestrained in these crashes.
    - Falls
        - Falls occur more frequently in the second and third trimesters when the center of gravity changes for the female.
        - She also experiences vasodilation that leads to hypotension, dizziness, and syncopal episodes.
    - Intimate partner violence
        - All females should be screened carefully.

Source: https://tinyurl.com/yxhkkfjt

        - Seventeen percent of injured pregnant patients experience trauma inflicted by another person, and 60% of these patients experience repeated episodes of intimate partner violence.
        - Indicators that suggest the presence of intimate partner violence include:
            - Injuries inconsistent with the stated history.
            - Diminished self-image, depression, and/or suicide attempts.
            - Self-abuse and/or self-blame for injuries.
            - Frequent ED or doctor's visits.
            - Symptoms suggestive of substance abuse.
            - Isolated injuries to the gravid abdomen.

- Partner insists on being present for interview and examination and monopolizes the discussion.



Source: https://tinyurl.com/y5sl3mlk

- As part of the discharge process it may be necessary to provide the patient with important phone numbers to shelters, police, counseling, hotlines, etc.
- A good way to communicate this to the victim and keep it concealed from the alleged abuser to make a drawing of a foot and place the important phone numbers on the foot and have the victim place it in his/her shoe at discharge.

Airway

Source: https://tinyurl.com/y2wxmlbx

- A decrease in gastric emptying can cause an increase of reflux and a potential for aspiration during intubation.
- There is an increase in oxygen use and a decrease in oxygen reserve so oxygen administration is an important therapy.
- Pre-oxygenation prior to intubation should be employed to prevent desaturation and potential fetal demise.
- The most experienced clinician should intubate the patient and back up airway devices and adjuncts should be available.
- Airway mucosal edema is common and airway resistance is increased so using a smaller sized ET tube may improve first pass success at intubation.

Breathing

Source: https://tinyurl.com/y2wxmlbx

- SpO2 of $\geq$ 95% should be maintained.
- Hyperventilation and a lower paCO2 of 25 to 30 mm Hg is normal. A normal paCO2 may indicate impending respiratory failure.
- Failed intubation is eight times more common than in the general population.
- The large uterus will displace the diaphragm upward by 4 - 7 cm. Because of this if a chest tube is needed placement may need to be 1 - 2 spaces higher.

Circulation

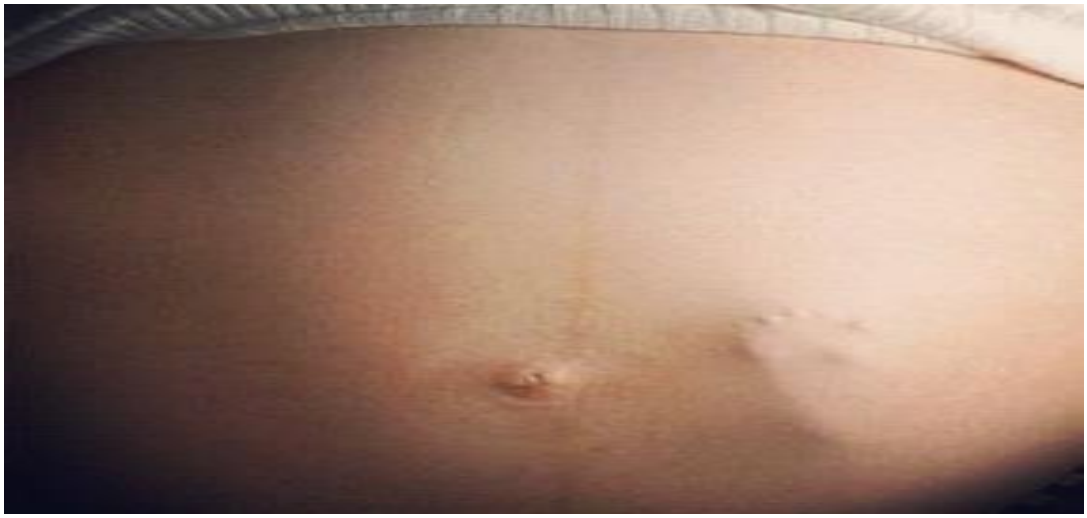
Source: https://tinyurl.com/y2wxmlbx

- Uterine blood flow takes 20% of the maternal cardiac output.
- Hematocrit level is slightly lower at 31% to 35%.
- The heart rate increases to 10 to 15 beats per minute over baseline.
- The blood pressure falls 5 to 15 mm Hg below baseline after the second trimester.
- Supine hypotension occurs when the pregnant patient is lying flat causing the pregnant uterus to compress on the vena cave. Tilting the patient to one side will relieve this.
- Compression of the IVC can decrease cardiac output by 30%.
- An increase in hormones will cause dry, warm skin even in the presence of shock.
- During a trauma catecholamines will shunt blood away from the uterus which will cause fetal distress before mother distress.
- PT and PTT decreases in 3rd trimester.

Other Systems

Source: https://tinyurl.com/y2wxmlbx

- Abdominal muscles are stretched and laterally displaced resulting in less protection of the internal organs.
- A full bladder can result in a ruptured bladder so caution should be used prior to inserting a urinary catheter.
- Engorged pelvic vessels can contribute to massive bleeding after blunt trauma and associated pelvic fractures. Early pelvic binding should be a consideration.
- The benefit of doing X-rays, CT's, and ultrasound procedures outweigh the risk to the fetus. It is necessary to determine the extent of injury to the mother and to implement lifesaving interventions.



Source: https://tinyurl.com/y5fhy684

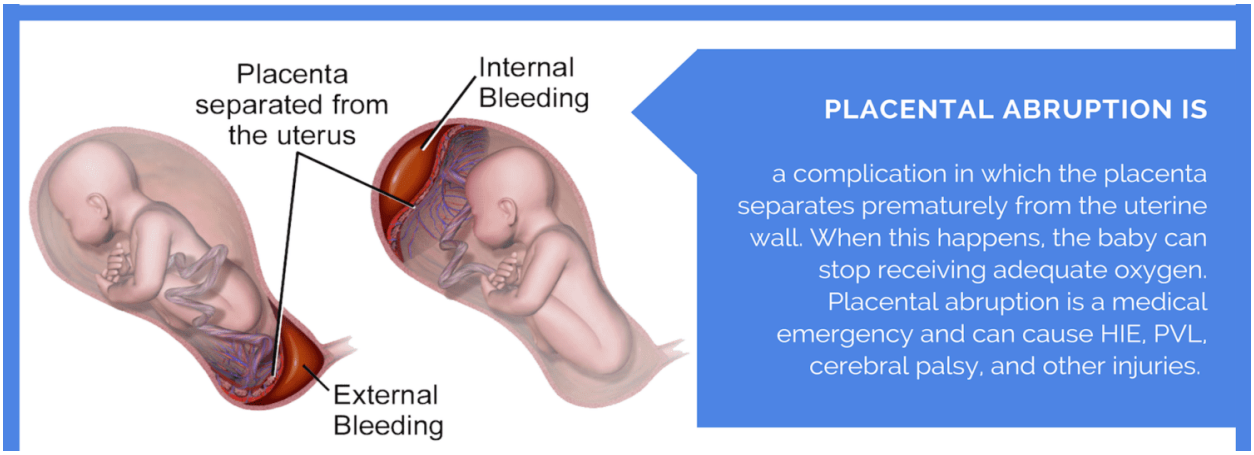
Don't get distracted by the second patient.
The best support for the baby is support of the mom.

Pregnancy and safety belts

Source: https://tinyurl.com/y2q2dtrl

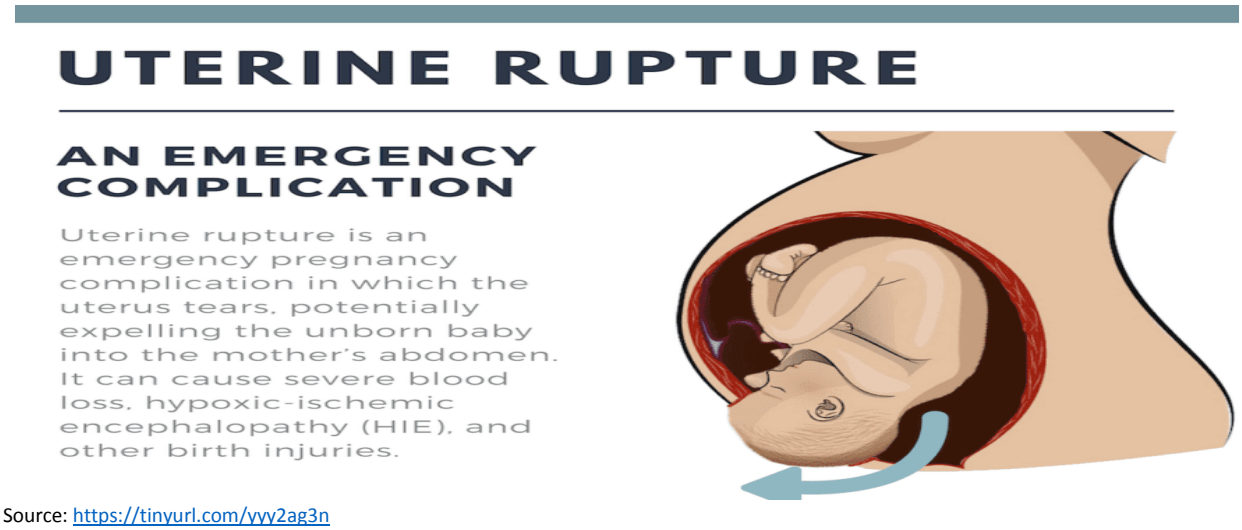
- Seatbelt use is universally recommended during all stages of pregnancy.
- Pregnant females should sit as far back from the front dash/steering wheel as possible to decrease the potential for airbag injury.
- The lap belt should be placed across the bony pelvis and below the gravid uterus.
- The shoulder belt should be placed across the shoulder and between the breasts.
- If driving adjust the steering wheel so it points up toward the chest instead of down toward the abdomen.

In addition to the trauma related injuries that a pregnant patient can present with there are some other OB/GYN injuries as a result of the trauma that can affect the mother and the fetus and that require emergency intervention from the emergency and trauma providers. For this reason an obstetrical consultation should also be obtained on all pregnant trauma patient.



Source: https://tinyurl.com/y3eu3nrk

- Providers should suspect an abruption if there is vaginal bleeding after trauma.
- Placental abruption is responsible for 60% - 70% percent of fetal deaths in a pregnant related trauma and may be misdiagnosed as pre term labor.
- The following risk factors may predispose the mother to this complication: hypertension, older age, increase parity, smoking, and cocaine use.
- Common signs and symptoms include: vaginal bleeding, abdominal pain, contractions, uterine tenderness, and a change in the fetal heart rate from tachycardia to bradycardia.
- Diagnosis is often made based on mechanism of injury and clinical presentation. Ultrasounds do not always detect an abruption.
- Complications may include: fetal and maternal death, and DIC.



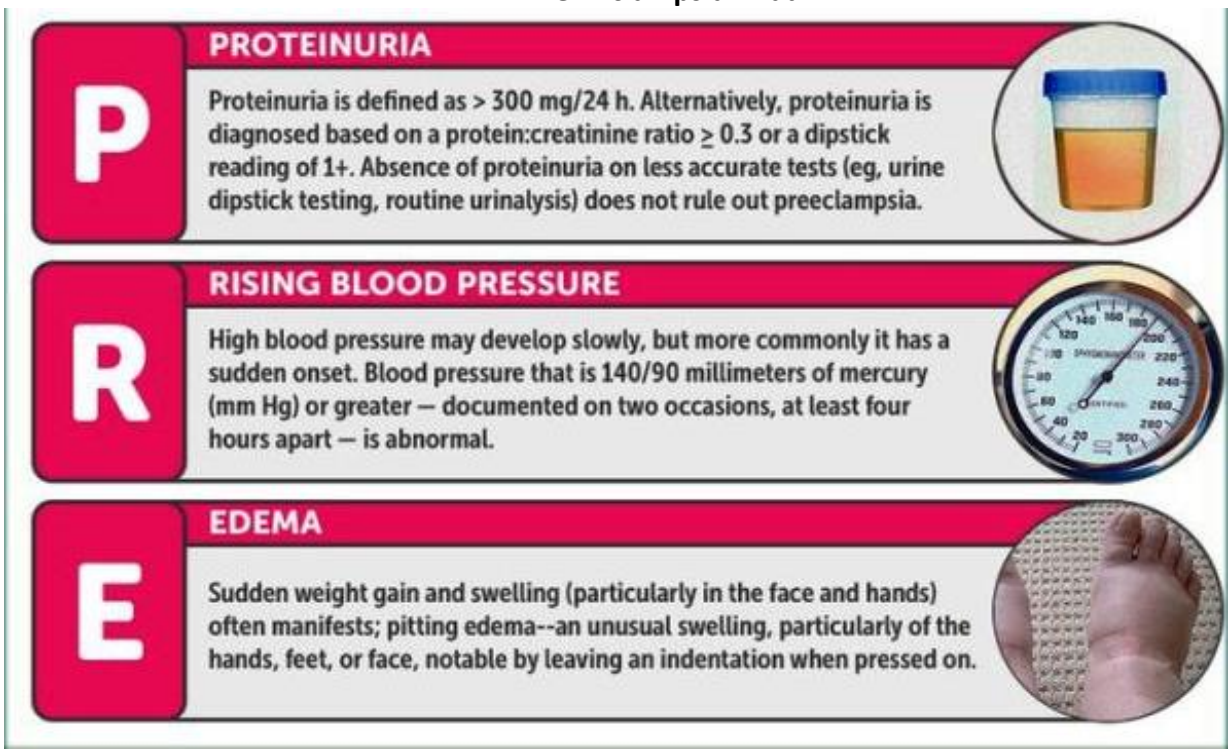
Source: https://tinyurl.com/yyy2ag3n

- This complication occurs in less than one percent of all maternal injuries and is most common in the late second and third trimester.
- A previous C-section and a VBAC may predispose the mother to this complication.
- Signs and symptoms can include: maternal shock, severe blood loss, abdominal distention, loss of uterine contour, fetal deceleration with an abnormal fetal heart rate and pattern, and palpable fetal parts.
- The patient should be prepared for an emergency delivery.

Eclampsia

- Eclampsia is a complication of late pregnancy that can mimic a head injury. Obtain a CT of the head to exclude intracranial bleeding.
- It should be ruled out if a pregnant trauma patient presents with seizures following an accident or injury, especially if the history reveals signs and symptoms of pre-eclampsia.

Pre - Eclampsia Triad



Source: https://tinyurl.com/y653jelk

Specific blood tests and medications post trauma in the pregnant patient

- Kleihauer-Betke (KB) test
    - Measures the percentage of red blood cells containing fetal hemoglobin in maternal blood.
    - Maternal – fetal bleeding/hemorrhage occurs in 10 to 30% of all pregnant trauma patients.
    - If Rh negative women undergo significant abdominal trauma and the KB test shows >30 ml of fetal blood, additional doses of anti-D immune globulin (RhoGAM) may be needed.
    - Complications from a positive KB test include maternal/fetal death, and maternal alloimminization, which is an immune response to foreign antigens.
- RhoGAM
    - This medication destroys RH positive fetal red cells in the maternal circulation.
    - If it is not given the mother develops antibodies to Rh positive fetal blood which crosses the placenta and can cause a hemolytic anemia in the fetus, splenomegaly, and possible fetal death.
    - Indications are an Rh negative test, abruption, ectopic, hemorrhage in all pregnant trauma even if relatively minor.
- DTaP- Tetanus acellular pertussis
    - A tetanus vaccine is recommended in pregnancy and should be administered as part of wound management when indicated.

Pitfalls in caring for the pregnant trauma patient

Source: https://tinyurl.com/yxcoe29r

- Failure to save mom. Remember the best treatment of the fetus is to treat mom.
- Failure to start early fetal monitoring. Remember fetal monitoring is a marker for blood loss.
- Failure to provide supplemental oxygen. Birth mother and baby need oxygen saturations kept at ≥ 95%.
- Failure to recognize that a normal paCO2 may indicate impending respiratory failure.
- Failure to anticipate the need for early intubation and that the intubation may be more difficult than in the general population.
- Failure to recognize shock in mom. Remember the pregnant trauma patient can mask blood loss in her clinical presentation despite significant injury. She will normally have a

higher heart rate and lower blood pressure. Assume every pregnant trauma patient is bleeding to death until proven otherwise.

- Failure to displace uterus off vena cava by turning the mother to the left.
- Failure to recognize eclampsia verses a head injury.
- Failure to perform imaging to determine injuries. Remember ultrasound can rule in, not rule out.
- Failure to recognize intimate partner violence.

Source: https://tinyurl.com/yaq4y9qk

1. Which of the following are true regarding the airway of a pregnant trauma patient?
    a. A decrease in gastric emptying can increase reflux and the potential for aspiration.
    b. Airway mucosal edema is common and there is an increase in airway resistance making an intubation more complicated.
    c. There is an increase in oxygen use and a decrease in oxygen reserve so oxygen therapy should be considered early.
    d. All of the above.

2. Which of the following are true regarding the breathing of a pregnant trauma patient?
    a. A lower paCO2 level of 25-30 mm Hg is normal.
    b. A normal paCO2 level may indicate signs of impending respiratory failure.
    c. The large uterus will displace the diaphragm upward by 4 - 7 cm requiring a chest tube placement of 1 - 2 spaces higher.
    d. All the above.

3. Which of the following is true regarding the circulation of the pregnant trauma patient?
    a. The heart rate will increase by 10 - 15 beats per minute over baseline.
    b. The blood pressure will decrease by 5 - 15 mm Hg below baseline.
    c. An increase in hormones will cause dry, warm skin even in the presence of shock.
    d. All the above.

4. Which of the following are true about the pregnant trauma patient?
    a. Engorged pelvic vessels can cause significant blood loss so early pelvic binding should be considered.
    b. Imaging procedures should be done to determine the extent of injuries.
    c. Abdominal muscles are stretched and displaced laterally resulting in less protection of internal organs.
    d. All the above.

Answers at the end.

Recognition/Thank You

- January 1- New Year's Day- Good bye 2020!
- January 9th- National Law Enforcement Appreciation Day
- January 12th- National Pharmacist Day
- January 24-30- National CRNA Week
- January 25th- National IV Nurses Day
- National Blood Donor Month
- Winter Sport TBI Awareness Month

Welcome to the Trauma Team

Crystal Foster

Crystal Foster MSN, RN is one of the new Trauma Coordinators for Trauma Services.
She has been employed at Memorial Hospital for 22 years in various roles:

- Cardiac Intermittent Care Center
- Health Professionals which included the coordination of Transfer Direct, Float Team, Emergency Care Center, and Outpatient Cardiac Rehab.
- Most recently, as Heart Failure Care Coordinator, where assisted in the Heart Failure recertification process.

Tanya Toth

Tanya Toth MSN, MBA/HCM,RN is one of the new Trauma Coordinators for Trauma Services.

She has served in various roles at Memorial Hospital on the medical surgical unit and the OR. She has several OR RN certifications including CRNFA and CNOR and has been an adjunct faculty/academic coach for Purdue University Northwest.

Congratulations

Lynn Coleman, Trauma Service Community Violence Liaison

Beacon November Associate of the Month

Trauma isn't a one dog show, it takes a team!

Source: https://tinyurl.com/y9qy28c6

Test your knowledge Answers-

1. D 2. D 3. D 4. D

References-

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For questions or future submissions contact Stacie Bobeck MSN, RN, CEN, CPEN, TCRN, SANE-A Beacon Trauma Educator and Outreach/Injury Prevention Coordinator at sbobeck@beaconhealthsystem.org