



## Ch 30 - Acute Pelvic Pain

### EPISODE CONTENT BASED ON ROSEN'S EMERGENCY MEDICINE (9TH ED.)

*Italicized text is quoted directly from Rosen's.*

#### Key Concepts:

- 1. Acute pelvic pain in women is often from a gynecologic source, but urinary and intra abdominal sources are also common. Less frequently, the pain may arise from vascular, musculoskeletal, neurologic, or psychiatric sources.*
- 2. Potentially lethal diagnoses are associated with acute pelvic pain include ectopic pregnancy, ovarian cyst with significant hemorrhage, domestic violence; highly morbid conditions presenting with acute pelvic pain include pelvic inflammatory disease and ovarian torsion.*
- 3. Nearly all women of childbearing age with pelvic pain should have a pregnancy test performed, and most also require a pelvic ultrasound examination.*
- 4. Ectopic pregnancy should be excluded in the pregnant patient with pelvic pain. Bedside ultrasound is an excellent test for confirming an intrauterine pregnancy (IUP); it excludes ectopic pregnancy with a high degree of certainty in patients who are not undergoing assisted reproduction.*
- 5. In the non-pregnant patient, the pain of PID generally begins gradually and during menses. Ovarian cyst-related pain is maximal mid-cycle, and is also gradual and cyclic, although it can be sudden and severe if rupture has occurred.*
- 6. Pregnant patients with acute pelvic pain may also have non-pregnancy-related disorders; appendicitis, nephrolithiasis, and ovarian torsion remain in the differential diagnosis.*
- 7. Many patients with acute pelvic pain require imaging as part of their assessment. If a gynecologic source is suspected, begin with an ultrasound and then progress to CT or MRI, if needed. The presence of an ovarian cyst on imaging does not necessarily explain the patient's pain, and further evaluation may be required.*

#### Core Questions

1. Outline the anatomic contents of the female pelvis
2. Describe an approach to the history in a patient with acute pelvic pain
3. Describe an approach to the physical examination in the patient with acute pelvic pain
4. List 10 differential diagnoses for the patient presenting with acute pelvic pain
5. Outline an approach to ancillary testing for the patient presenting with acute pelvic pain.
6. What must be seen on bedside ultrasound to confirm a definitive intrauterine pregnancy (IUP)?



## Wisecracks

1. What is the incidence of domestic violence in patients presenting with pelvic pain?
2. What is the incidence of heterotopic pregnancy in the general population and in those that have conceived using reproductive technology?
3. Under what circumstances can a pelvic examination be omitted in a patient presenting to the ED with acute pelvic pain?
4. What is the classic triad of pelvic inflammatory disorder (PID)?

## Rosen's in Perspective

Alright, everyone. We are back again with another episode of CRACKCast. We hope the holiday season has treated you well and that you are all gearing up for another year kickin' it in the ED. Today's episode covers Chapter 30 in Rosen's 9th Edition - Acute Pelvic Pain. While it may not be the most interesting topic to focus on, it is again an important one. Approximately 1/3rd of reproductive age women will experience some sort of non-menses related pelvic pain in their lifetime. About 50% of those patients that present to the ED will have infectious causes of their pain (e.g., PID, cervicitis, Bartholin's gland abscesses), while the remainder is largely secondary to menstrual disorders, non-inflammatory ovary/Fallopian tube disease (e.g., cyst, tumor). In pregnant patients, ectopic pregnancy accounts for up to 20% of diagnoses in patients with pelvic pain and vaginal bleeding. Pain from these sources can be interpreted in a multitude of ways by patients given our not-so-logical wiring, and as a result, can often trick practitioners of Emergency Medicine. Because of this, your guard has to be up when you encounter these patients, because writing that seemingly benign gnawing suprapubic pain in bed 6 off as "dysmenorrhea NYD" might harm more than just your insurance premiums.

While the chapter in and of itself is quite short, it contains some important pearls to take with you on your next shift in the thunderdome. In this podcast, we will nicely package all of those pearls up and place them under the tree just like good ol' St. Nicholas did a couple of weeks ago. Further, we will go above and beyond and cover a solid approach to the history, physical exam, and investigation of these patients. We will also cover some relevant content that will help sharpen your ED point-of-care ultrasound (POCUS) skills the next time you pick up the chart reading "30Y female with pelvic pain and PV bleeding". Last, we will end with the classic Rosen's trivia we have all come to love. So, buckle up, take a sip of your warm hot chocolate, and enjoy the ride!

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## Core Questions:

**[1]** Outline the anatomic contents of the female pelvis

While Rosen's does not go full Netter's on pelvic anatomy, it lists some of the most relevant structures that exist in the female "true pelvis" to help you organize your next differential diagnoses list in the ED. These structures are:

1. Vagina
2. Uterus
3. Fallopian Tubes
4. Ovaries
5. Ureters
6. Urinary Bladder
7. Sigmoid Colon
8. Rectum
9. Related musculoskeletal and vascular structures

**[2]** Describe an approach to the history in a patient with acute pelvic pain

Owen and I have compiled a list of important historic features to interrogate the next time you encounter a patient with acute pelvic pain. These are:

1. Detailed pain history
  - a. Provocative or palliative factors
  - b. Pain pattern
  - c. Quality of pain
  - d. Region of most pain
  - e. Radiation of pain
  - f. Severity of pain
  - g. Timing of pain
    - i. Onset
    - ii. Duration
    - iii. Previous episodes
  - h. Patient's understanding of the potential cause of the pain
2. Presence or absence of symptoms of systemic infection (i.e., fevers, chills, diaphoresis, rigoring)
3. Presence or absence of associated vaginal bleeding and changes in vaginal discharge
4. Review of systems
  - a. Genitourinary - LUTS, flank pain, dysuria, dyspareunia, vulvar pain, etc...
  - b. Gastrointestinal - nausea, vomiting, changes in bowel movements, etc...
  - c. MSK - recent injuries, deformities, arthralgias, etc



5. OB/GYN History
  - a. Pattern of menses
  - b. Sexual activity and history of STI's
  - c. Previous gynecologic procedures
  - d. Obstetrical history, specifically looking for:
    - i. EDC, events of pregnancy, prenatal care/testing received - if applicable
    - ii. LMP
    - iii. Prior ectopic pregnancy
    - iv. Prior spontaneous abortion
    - v. Use of reproductive technologies
6. Social History
  - a. Specifically probing for potential abuse or domestic violence

**[3]** Describe an approach to the physical examination in the patient with acute pelvic pain

The physical examination of these patients is typically directed to the abdomen and pelvis. While we have all done these examinations in the past, here are a few things to consider:

#### **Abdominal Examination**

- Inspection
- Palpation
- Percussion
- Auscultation
- Special testing, specifically keeping in mind signs of appendicitis
- +/- DRE

#### **Pelvic Examination**

- Done in almost all female patients presenting to the ED with acute pelvic pain
  - This includes all pregnant patients up to 20 weeks gestation. Once you hit the 20 week mark, it is best to get an ultrasound to determine placental placement before performing this exam
- Important aspects of the pelvic examination include:
  - Inspection of external genitalia, specifically looking for areas of swelling, lesions, or gross vaginal discharge or blood
  - Speculum examination to evaluate the structural components of the vagina and cervix
  - Bimanual examination to evaluate the cervix for motion tenderness and the adnexa for masses/tenderness

**[4]** List 10 differential diagnoses for the patient presenting with acute pelvic pain (Box 30.1)

The following is largely taken from Rosen's Emergency Medicine, 9th Edition Box 30.1 - Causes of Pelvic Pain in Women. Please see the text for more information.



<b>Causes of Pelvic Pain in Women</b>
<p><b>Reproductive Tract</b></p> <ul style="list-style-type: none"><li>Ovarian torsion</li><li>Ovarian cyst</li><li>PID</li><li>Salpingitis</li><li>TOA</li><li>Endometritis</li><li>Endometriosis</li><li>Uterine perforation</li><li>Uterine fibroids</li><li>Dysmenorrhea</li><li>Neoplasm</li></ul>
<p><b>Pregnancy-related</b></p> <p><b>First Trimester</b></p> <ul style="list-style-type: none"><li>Ectopic pregnancy</li><li>Threatened abortion</li><li>Nonviable pregnancy</li><li>Ovarian hyperstimulation syndrome</li></ul> <p><b>Second and Third Trimester</b></p> <ul style="list-style-type: none"><li>Placenta previa</li><li>Placental abruption</li><li>Round ligament pain</li><li>Labor</li><li>Braxton-Hicks contractions</li><li>Uterine rupture</li></ul>
<p><b>Intestinal Tract</b></p> <ul style="list-style-type: none"><li>Appendicitis</li><li>Diverticulitis</li><li>Ischemic bowel</li><li>Perforated viscus</li><li>Bowel obstruction</li><li>Incarcerated or strangulated hernia</li><li>Fecal impaction or constipation</li><li>IBD</li><li>Gastroenteritis</li><li>IBS</li></ul>



<p style="text-align: center;"><b>Urinary Tract</b></p> <p style="text-align: center;">Pyelonephritis Cystitis Ureteral stone</p>
<p style="text-align: center;"><b>Vascular</b></p> <p style="text-align: center;">Septic pelvic thrombophlebitis Ovarian vein thrombosis Sickle cell anemia Pelvic congestion syndrome</p>
<p style="text-align: center;"><b>Musculoskeletal</b></p> <p style="text-align: center;">Muscular strain or sprain Hernia Abdominal wall hematoma Pelvic fracture</p>
<p style="text-align: center;"><b>Neurologic or Psychiatric</b></p> <p style="text-align: center;">Depression Domestic violence Sexual abuse Abdominal migraine Herpes zoster</p>

**[5]** Outline an approach to ancillary testing for the patient presenting with acute pelvic pain.

Owen and I have compiled a list of lab tests that should be ordered when evaluating a patient with acute pelvic pain. These are:

- Most useful:
  - CBC
  - Creatinine, BUN
  - Liver enzymes (AST/ALT/GGT/ALP)
  - VBG with lactate
  - Beta HCG - quantitative will be most useful
  - Urinalysis
  - Urine G+C or swabs for same



- Can consider:
  - Blood type and crossmatch - if suspected significant bleeding or shock
  - Blood type and Rh - if pregnant with minimal bleeding and hemodynamically stable
  - Coagulation profile (ie., INR/aPTT) - if menorrhagia and not previously evaluated

Now, let's talk a little bit about an approach to imaging these patients. The vast majority of these patients will require imaging of some kind. The first thing you all should reach for (if it is available in your centre) is a bedside ultrasound. This will do a great deal to help you evaluate the female patient with acute pelvic pain. First, you can look for free fluid in the abdomen while performing a FAST scan. While not 100% sensitive, this can help you determine who needs immediate surgical consultation and those who can await further testing to determine disposition. Repeat FAST examinations are also very helpful, particularly if there is a sudden change in the status of your patient. Additionally, POCUS will allow you to, in a large portion of female patients, determine the presence of an IUP. While gestational age will affect the utility of bedside transabdominal pelvic ultrasound in detecting IUP's, using this test in conjunction with your quantitative beta HCG and patient's history of reproductive technology use will help you determine who needs to undergo formal ultrasound and evaluation by OB/GYN.

In terms of imaging strategies in non-pregnant patients, Rosen's appreciates how dang difficult it is to ascertain the exact origin of a patient's pelvic pain. Largely, your approach to imaging will depend on your gestalt given all of the information gathered by your history, physical examination, and lab testing. If you suspect that a patient has a gynecologic source of their symptoms, proceed with a formal ultrasound of the pelvis and abdomen (specially interrogating the appendix). If this study is unremarkable/inconclusive or if you suspect an intraabdominal cause of the patient's pain, consider proceeding with either CT or MRI of the abdomen and pelvis.

It is important to note here that you will not always get to the bottom of the cause of the patient's pain. With that said, as long as you have ensured you have ruled out life-threatening pathologies, considered atypical presentations of serious disease, and ensured the patient is not currently a victim of domestic abuse, the patient will generally be safe to be evaluated as an outpatient.

**[6]** What must be seen on bedside ultrasound to confirm a definitive intrauterine pregnancy (IUP)?

As per the Canadian Association of Emergency Physicians' EDTU Manual (2015), the following are required to confirm IUP with POCUS:

“The criteria for determining a definitive intrauterine pregnancy (DIUP) are threefold after ensuring bladder-uterine juxtaposition. In the absence of one of these criteria, there is no definitive intrauterine pregnancy (NDIUP).



1. Decidual reaction — thick white echogenic layer surrounding the gestational sac
2. Gestational sac (GS) — anechoic (black) area within the uterus
3. Yolk sac (YS) in the uterus — white ring (2D) about 5 mm in diameter within the GS

If you see an INTRAUTERINE (initially noting bladder-uterine juxtaposition) pregnancy with these components then you can call this a DIUP. Additional features which will assist in confirming that the identified structure represents a viable pregnancy are: • Fetal pole — AKA fetus. If identified in the uterus = DIUP • Cardiac flicker — AKA fetal heart = sign of viability if >90 bpm Normal heart rate for crown rump length 5–15 mm is 100–120 bpm.”

Link here: <https://caep.ca/wp-content/uploads/2018/05/EDTU-Manual.pdf>

## Wisecracks:

**[1]** What is the incidence of domestic violence in patients presenting with pelvic pain?

Answer:

While estimates vary and research is limited, one study from the UK of gynecology outpatient clinic attendees noted that of patients who had suffered domestic abuse, 47.9% noted with either lower abdominal pain, abdominal discomfort, or vaginal pain. You can find the study here: <https://obgyn.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1471-0528.2004.00290.x>

It is important to note that this study may not directly apply to our patients in the ED. However, it illustrates the importance of making sure you get a good social history and specifically ask about domestic abuse when encountering patients with acute pelvic pain. You may just save a life.

**[2]** What is the incidence of heterotopic pregnancy in the general population and in those that have conceived using reproductive technology?

Answer:

While the numbers vary, it is generally accepted that the incidence of heterotopic pregnancy in women who have naturally conceived is about 1 in 30,000. In patients that have used reproductive technologies to conceive, the incidence increases to approximately 1 in 6000-8000, with some estimates as high as 1 in 3900. This is important to remember when encountering patients with pelvic pain and a positive pregnancy test in the ED. You cannot use POCUS to rule out the possibility of a heterotopic pregnancy in patients who have not conceived spontaneously.





Check out the following links for more information:

1. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5029978/#:~:text=Background%3A%2A%20heterotopic%20pregnancy%20is,assisted%20reproductive%20technology%20\(ART\).](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5029978/#:~:text=Background%3A%2A%20heterotopic%20pregnancy%20is,assisted%20reproductive%20technology%20(ART).)
2. <https://emergencymedicinescases.com/episode-18-part-2-more-point-of-care-ultrasound/>

**[3]** Under what circumstances can a pelvic examination be omitted in a patient presenting to the ED with acute pelvic pain?

Answer:

Pretty well no one. Rosen's does note that "*there are not sufficient data to select reliable women in whom the pelvic examination need not be performed, although pelvic examination may be deferred in patients who are planned to undergo immediate imaging (usually ultrasound) for a suspected critical condition such as ruptured ectopic pregnancy. Depending on the imaging results, a subsequent speculum or bimanual pelvic examination may or may not be necessary.*"

Long-and-short, when in doubt, do the exam.

**[4]** What is the classic triad of pelvic inflammatory disorder (PID)?

Answer:

1. Cervical motion tenderness
2. Uterine tenderness
3. Adnexal tenderness

It is important to note that as per the Centers for Disease Control and Prevention (CDC) guidelines in 2015, only one sign is required to initiate treatment in certain clinical settings.