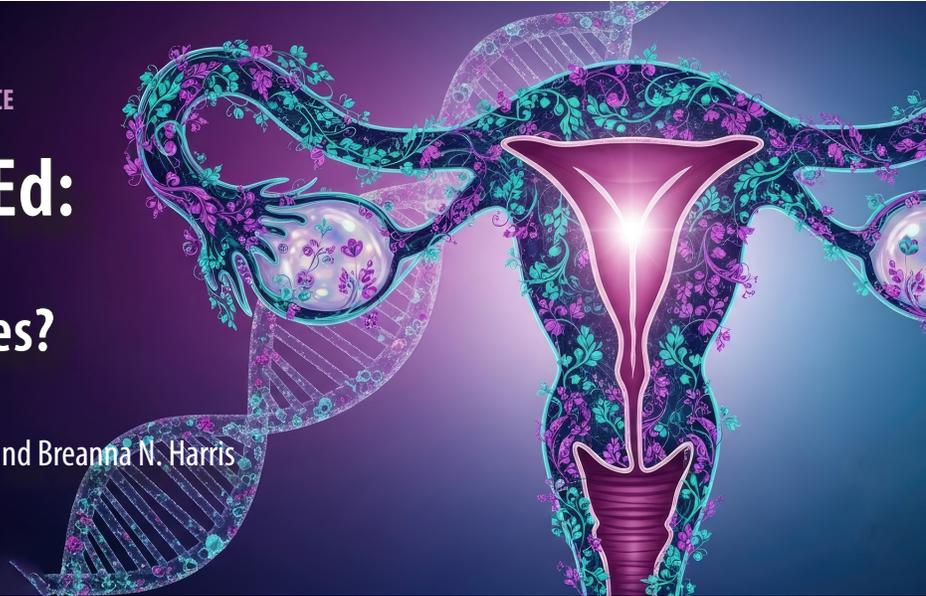


No Plan B for Med Ed: Abortifacients or Emergency Contraceptives?

by

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Introduction

Becky Marshall, a fourth-year medical student (M4) in Texas, had recently been selected to represent her class at a board meeting tasked with updating the medical school's curriculum. A variety of topics were addressed, including: the preparation for medical students to openly discuss abortion with patients; opportunities for medical students to learn about details of abortion procedures, best practices, and care during their clinical rotations in OB/GYN; and opportunities to observe or assist in both surgical and medication abortions. However, as abortions were currently illegal in Texas, the medical school realized it needed to establish partnerships with affiliated hospitals in neighboring states where abortions were legal so that students could gain hands-on experience during their OB/GYN clinical rotations. This reality raised additional questions concerning traveling costs, scheduling, duration and scope of abortion training, and educational consistency across different states with varying policies. All of these issues were discussed.

During the meeting, Becky, who applied for OB/GYN residency, brought up an experience she had had during her interview. She had been asked, "How would you respond to a patient with an ectopic pregnancy who refuses to consider an abortion because she believes abortions cause infertility?" Becky had been given 90 seconds to respond. Becky admitted that despite her academic achievements and preparations, she had been caught off guard and did not feel confident in her knowledge. She had felt underprepared to respond to common misinformation with evidence-based information. She said the lack of abortion training and patient counseling she had received in her medical school curriculum was a concern. She knew that an ectopic pregnancy was nonviable and life-threatening, but she did not know how to present the facts without overstepping her scope. This had never been discussed in her coursework and so she had not really known how to respond professionally.

Becky's lack of preparedness to address medical misinformation and discuss a culturally sensitive topic raised concerns. Board members were worried that their medical students were underprepared for real-world scenarios that they might encounter during their residency. The board wanted to use evidence-based decision making to determine how to address this concern.

The board planned to do their own background, but also tasked Becky to collaborate with other medical students to create a presentation that included supplemental research to answer common myths about abortion. Becky and three other medical students, Addison, Minji, and Lorenzo, got to work. They designed a survey to capture the concerns, views, and needs of their peers. They scoured the literature on the topic of abortion education and training in medical schools. They also did some on-the-ground investigation of local crisis pregnancy centers and searched online discussion boards and social media posts. They realized TikTok and Instagram were full of reproductive health care (mis)information. Finally, the students came up with common, recurring myths and several facts about abortion and abortion care.

In this case study, you will help these medical students work through and address one of these myths: "abortifacients are the same as emergency contraception."

Part I – Physiology and Mechanisms

Becky's friend and fellow medical student, Daphne, sent Becky a TikTok video with the caption "Things Your Big Sister Should Have Taught You." The video contained a popular influencer stating that abortifacients (drugs that induce an abortion) are the same as "Plan B." This video had over half a million likes and shares; the comments section included people either reinforcing or debating the claim. Over the next few days, Becky and her peers scrolled through social media and found other users talking about abortifacients as a form of contraception. They saw several pharmaceutical terms being incorrectly used interchangeably.

During the TikTok video and in the thread, the medical students saw mention of mifepristone, misoprostol, and Plan B (which they found is levonorgestrel). They also saw mention of intrauterine devices (IUDs) and ulipristal acetate.

First, the students gathered some basic notes from an online book from the National Library of Medicine. The section of StatPearls titled "Abortion," mentions that there are two main types of abortions: medication and procedural. Becky and Daphne wrote up these notes from the book:

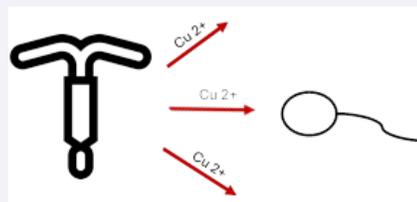
Abortion: The medical termination of a pregnancy before the embryo/fetus has developed enough to survive outside of the womb.

Procedural abortions are those that physically remove the pregnancy through various procedures such as manual vacuum aspiration and dilation and evacuation.

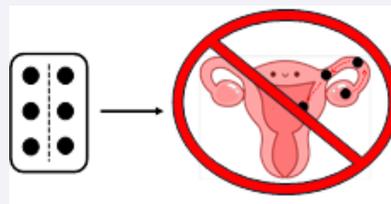
Medication abortions are abortions that are performed using medications, such as mifepristone and misoprostol. Medication abortions can be performed by the patient taking either misoprostol alone, or a combination of misoprostol and mifepristone. The combination of mifepristone and misoprostol is the most effective method. Typically, the patient takes a mifepristone pill first, and either right after or 48 hours after, takes a misoprostol pill.

After reading about types of abortions, Becky and her peers decided to investigate emergency contraceptives. Using the same online textbook, they found the emergency contraceptives section. In this section they learned that there are two main groups of emergency contraceptives, the copper intrauterine device (IUD) and oral pills, and they wrote the following notes:

Copper IUD: Copper IUDs help prevent pregnancies by releasing copper ions (Cu^{2+}) which are toxic to sperm and oocytes, ultimately inhibiting fertilization. The Cu-IUD also causes an inflammatory response in the endometrium, which further inhibits implantation. The Cu-IUD is often less accessible to women; however, it is long-acting and highly effective.



Oral emergency contraceptive pills: These medications include either a single dose of Ulipristal acetate or Levonorgestrel (a progestin), or combined ingestion of estradiol and levonorgestrel (Yuzpe method). These medications work by preventing or delaying ovulation. Levonorgestrel works by blocking the LH surge, which then prevents follicular development/rupture. Levonorgestrel is no longer effective when taken after ovulation or once the LH surge has begun. Ulipristal acetate works by binding to progesterone receptors, suppressing/delaying ovulation, and thinning endometrial thickness.



The students were on a roll, but before tackling this myth, Becky and her peers first wanted to make sure they reviewed basic information about the hormones that play key roles in ovulation and the menstrual cycle, which was clearly important information for tackling the myth. So they decided to do a quick review and rewatched a segment of their first-year lecture. They also took some general notes on a table.

Question

1. Watch the following video and then explain the basic function of each hormone by completing Table 1. For feedback type, please list negative or positive.
 - Osmosis.org. (2022). *The Menstrual Cycle*. Running time: 10:57 min. <<https://youtu.be/7HIHGLr1hTA>>.

Table 1. Hormones of the menstrual cycle.

<i>Hormone</i>	<i>Hormone abbreviation</i>	<i>Released from</i>	<i>Hormone function</i>	<i>Feedback type during follicular phase</i>	<i>Feedback type just prior to ovulation</i>	<i>Feedback type during luteal phase</i>
Gonadotropin-releasing hormone				---	---	---
Luteinizing hormone				---	---	---
Follicle stimulating hormone				---	---	---
17 β estradiol	E2 or E ₂					
Progesterone	P, P4, or PRG			---	---	
Inhibin						

Next, the students wanted to make sure they understood the mechanism of action by which the pharmaceuticals mentioned in the TikTok video work. They summarized their findings in a table.

Question

2. Use the links provided to complete Table 2 (next page) on the uses, the basic mechanisms of action, and instructions for each of the options listed below.
 - Mifepristone (Mifeprex): <https://www.ncbi.nlm.nih.gov/books/NBK557612/>
 - Misoprostol (Cytotec): <https://www.ncbi.nlm.nih.gov/books/NBK539873/>
 - Levonorgestrel (Plan B): <https://www.ncbi.nlm.nih.gov/books/NBK539737/>

- Copper IUD (Paragard): <https://www.ncbi.nlm.nih.gov/books/NBK559157/> & “Technique or Treatment” section of <https://www.ncbi.nlm.nih.gov/books/NBK557403/>
- Ulipristal acetate (Ella): <https://pubmed.ncbi.nlm.nih.gov/articles/PMC3138379/>

Table 2. Uses, mechanisms of action, and instructions for use.

<i>Name</i>	<i>Uses of drug</i>	<i>Mechanism of action</i>	<i>Administration</i>	<i>How it works to induce an abortion (if it does not induce an abortion, state that)</i>
Mifepristone (Mifeprex)				
Misoprostol (Cytotec)				
Levonorgestrel (Plan B)				
Copper IUD (Paragard)				
Ulipristal acetate (Ella)				

“This is really useful information as I was curious about that ulcers comment on TikTok,” said Becky.

“Which one?” asked Minji.

“The one that said not to trust doctors because they are giving women ulcer medication as birth control,” Becky replied.

“Yeah, that was super weird,” said Daphne. “I remember seeing misoprostol, or Cytotec, in our gastroenterology unit. The drug is a synthetic prostaglandin and is FDA-approved to protect the stomach lining, thus reducing the risk of ulcers, following aspirin or non-steroidal anti-inflammatory drugs (NSAID). My grandpa takes it, which is why I remembered that bit from lecture.”

“Oh, yeah!” said Becky. “So, that comment about ulcers highlights that people are not fully grasping that drugs work via their mechanism of action, and the same mechanism can be useful in multiple scenarios.”

“Right!” said Daphne. “Now that we have the drug names and devices sorted out, let’s compare abortifacients to emergency contraceptives.”

Becky and her peers decided to create a table highlighting the differences between abortifacients like mifepristone and misoprostol, and emergency contraceptives like Plan B or an intrauterine device (IUD).

Question

- Using the information gathered from the articles and the students’ notes, fill out Table 3 below to list the key differences between abortifacients and emergency contraceptives.

Table 3. Key differences between abortifacients and emergency contraceptives.

	<i>Abortifacients</i>	<i>Emergency Contraceptives</i>
Product Purpose		
Drugs Used		
Drug Mechanism(s) of Action		

