gastrointestinal problems, including appendicitis, cholecystitis, infections, intestinal obstruction, diverticulitis, and inflammatory bowel disease. Urinary tract and musculoskeletal disorders are also common causes of pelvic pain.

APPROACH TO THE PATIENT: **Pelvic Pain**

As with all types of abdominal pain, the first priority is to identify life-threatening conditions (shock, peritoneal signs) that may require emergent surgical management. The possibility of pregnancy should be identified as soon as possible by menstrual history and/or testing. A thorough history that includes the type, location, radiation, and status with respect to increasing or decreasing severity can help identify the cause of acute pelvic pain. Specific associations with vaginal bleeding, sexual activity, defecation, urination, movement, or eating should be specifically sought. Determination of whether the pain is acute versus chronic and cyclic versus noncyclic will direct further investigation **(Table 69-1)**. However, disorders that cause cyclic pain occasionally may cause noncyclic pain, and the converse is also true.

ACUTE PELVIC PAIN

Pelvic inflammatory disease most commonly presents with bilateral lower abdominal pain. It is generally of recent onset and is exacerbated by intercourse or jarring movements. Fever is present in about half of these patients; abnormal uterine bleeding occurs in about one-third. New vaginal discharge, urethritis, and chills may be present but are less specific signs. *Adnexal pathology* can present acutely and may be due to rupture, bleeding or torsion of cysts, or, much less commonly, neoplasms of the ovary, fallopian tubes, or paraovarian areas. Fever may be present with ovarian torsion. *Ectopic pregnancy* is associated with right- or left-sided lower abdominal pain, with clinical signs generally appearing 6–8 weeks after the last normal menstrual period. Amenorrhea is present in ~75% of cases and vaginal bleeding in ~50% of cases. Orthostatic signs and fever may be present. Risk factors include the presence of known tubal disease, previous ectopic pregnancies, a history of infertility, diethylstilbestrol (DES) exposure of the mother in utero, or a history of pelvic infections. *Threatened abortion* may also present with amenorrhea, abdominal pain, and vaginal bleeding. Although more common than ectopic pregnancy, it is rarely associated with systemic signs. *Uterine pathology* includes endometritis and, less frequently, degenerating leiomyomas (fibroids). Endometritis often is associated with vaginal bleeding and systemic signs of infection. It occurs in the setting of sexually transmitted infections, uterine instrumentation, or postpartum infection.

TABLE 69-1 CAUSES OF PELVIC PAIN

	Acute	Chronic
Cyclic pelvic pain		Premenstrual symptoms
		Mittelschmerz
		Dysmenorrhea
		Endometriosis
Noncyclic pelvic pain	Pelvic inflammatory disease	Pelvic congestion syndrome
	Ruptured or hemorrhagic ovarian cyst, endometrioma, or ovarian torsion	Adhesions and retroversion of the uterus
	Ectopic pregnancy	Pelvic malignancy
	Endometritis	Vulvodynia
	Acute growth or degeneration of uterine myoma	Chronic pelvic inflammatory disease
	Threatened abortion	Tuberculous salpingitis
		History of sexual abuse

A sensitive pregnancy test, complete blood count with differential, urinalysis, tests for chlamydial and gonococcal infections, and abdominal ultrasound aid in making the diagnosis and directing further management.

TREATMENT ACUTE PELVIC PAIN

Treatment of acute pelvic pain depends on the suspected etiology but may require surgical or gynecologic intervention. Conservative management is an important consideration for ovarian cysts, if torsion is not suspected, to avoid unnecessary pelvic surgery and the subsequent risk of infertility due to adhesions. Surgical treatment may be required for ectopic pregnancies; however, approximately 35% of ectopic pregnancies are unruptured and may be appropriate for treatment with methotrexate, which is effective in ~90% of cases.

CHRONIC PELVIC PAIN

Some women experience discomfort at the time of ovulation (*mittelschmerz*). The pain can be quite intense but is generally of short duration. The mechanism is thought to involve rapid expansion of the dominant follicle, although it also may be caused by peritoneal irritation by follicular fluid released at the time of ovulation. Many women experience premenstrual symptoms such as breast discomfort, food cravings, and abdominal bloating or discomfort. These moliminal symptoms are a good marker of prior ovulation, although their absence is less helpful.

Dysmenorrhea *Dysmenorrhea* refers to the crampy lower abdominal midline discomfort that begins with the onset of menstrual bleeding and gradually decreases over the next 12–72 h. It may be associated with nausea, diarrhea, fatigue, and headache and occurs in 60–93% of adolescents, beginning with the establishment of regular ovulatory cycles. Its prevalence decreases after pregnancy and with the use of oral contraceptives.

Primary dysmenorrhea results from increased stores of prostaglandin precursors, which are generated by sequential stimulation of the uterus by estrogen and progesterone. During menstruation, these precursors are converted to prostaglandins, which cause intense uterine contractions, decreased blood flow, and increased peripheral nerve hypersensitivity, resulting in pain.

Secondary dysmenorrhea is caused by underlying pelvic pathology. *Endometriosis* results from the presence of endometrial glands and stroma outside the uterus. These deposits of ectopic endometrium respond to hormonal stimulation and cause dysmenorrhea, which begins several days before menses. Endometriosis also may be associated with painful intercourse, painful bowel movements, and tender nodules in the uterosacral ligament. Fibrosis and adhesions can produce lateral displacement of the cervix. Transvaginal pelvic ultrasound is part of the initial workup and may detect an endometrioma within the ovary, rectovaginal or bladder nodules, or ureteral involvement. The CA125 level may be increased, but it has low negative predictive value. Definitive diagnosis requires laparoscopy. Symptomatology does not always predict the extent of endometriosis. The prevalence is lower in black and Hispanic women than in Caucasians and Asians. *Other secondary causes* of dysmenorrhea include adenomyosis, a condition caused by the presence of ectopic endometrial glands and stroma within the myometrium. Cervical stenosis may result from trauma, infection, or surgery.

TREATMENT DYSMENORRHEA

Local application of heat; dietary dairy intake; use of vitamins B_1, B_6, and E and fish oil; acupuncture; yoga; and exercise are of some benefit for the treatment of dysmenorrhea. Studies of vitamin D_3 are not yet adequate to provide a recommendation. However, nonsteroidal anti-inflammatory drugs (NSAIDs) are the most effective treatment and provide >80% sustained response rates. Ibuprofen, naproxen, ketoprofen, mefanamic acid, and nimesulide are all superior to