American College of Radiology
ACR Appropriateness Criteria®
Postmenopausal Subacute or Chronic Pelvic Pain

Variant 1: **Postmenopausal subacute or chronic pelvic pain, localized to the deep pelvis. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
US pelvis transvaginal	Usually Appropriate	O
US duplex Doppler pelvis	Usually Appropriate	O
US pelvis transabdominal	Usually Appropriate	O
MRI pelvis without and with IV contrast	May Be Appropriate	O
CT abdomen and pelvis with IV contrast	May Be Appropriate	☢☢☢
CT pelvis with IV contrast	May Be Appropriate	☢☢☢
MRI pelvis without IV contrast	May Be Appropriate (Disagreement)	O
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT abdomen and pelvis without IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT pelvis without IV contrast	Usually Not Appropriate	☢☢☢
Radiography abdomen and pelvis	Usually Not Appropriate	☢☢☢

Variant 2: **Postmenopausal subacute or chronic pelvic pain, clinically suspected pathologies in perineum, vulva, or vagina. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
US duplex Doppler pelvis	Usually Appropriate	O
US pelvis transabdominal	Usually Appropriate	O
US pelvis transvaginal	Usually Appropriate	O
MRI pelvis without and with IV contrast	May Be Appropriate	O
MRI pelvis without IV contrast	May Be Appropriate (Disagreement)	O
CT abdomen and pelvis with IV contrast	Usually Not Appropriate	☢☢☢
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT abdomen and pelvis without IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis with IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT pelvis without IV contrast	Usually Not Appropriate	☢☢☢
Radiography abdomen and pelvis	Usually Not Appropriate	☢☢☢

POSTMENOPAUSAL SUBACUTE OR CHRONIC PELVIC PAIN

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Summary of Literature Review

Introduction/Background

Chronic pelvic pain, defined as cyclical or noncyclical pain involving the pelvis, lower abdomen, vulva, vagina, or perineum and lasting for at least 6 months, affects as many as a quarter of women worldwide and is the single most common presenting complaint at gynecologic office visits [1,2]. The morbidity, public health impact, and downstream costs are substantial but poorly quantified in part due to the large variety of etiologies and lack of definitions associated with chronic pelvic pain. For purposes of this document, the term "subacute" is added to distinguish our target entities from diagnoses that most commonly present with acute or even emergent symptoms. This guideline is limited to postmenopausal women, which further limits the range of potential pain etiologies.

Subacute or chronic pelvic pain is a broad clinical presentation common to a variety of gynecologic, urinary, gastrointestinal, and musculoskeletal disorders. There are specific ACR Appropriateness Criteria documents pertaining to many of these diagnoses, which are detailed in Appendix 1. In particular, we emphasize the importance of both vaginal bleeding and suspected adnexal mass in postmenopausal women because of the prevalence of endometrial and ovarian neoplasia in this age group. These clinical features, if present, should take precedence over the general complaint of pelvic pain in directing the management algorithm. Patients with acute pain, suspected pelvic floor dysfunction, or urinary complaints may be managed in accordance with the respective algorithms for those conditions. Imaging evaluation for suspected endometriosis is not considered here as endometriosis is estrogen dependent and usually regresses after menopause [3]. If a postmenopausal woman is experiencing pain from endometriosis, it is likely secondary to scarring or reactivation that is due to postmenopausal hormonal therapy. In cases of persistent endometriosis-related symptoms after menopause, readers are referred to ACR Appropriateness Criteria guidance for the premenopausal age group (see Appendix 1).

Finally, like other types of chronic pain, pelvic pain is a complex process with incompletely mapped cognitive and neurologic contributors. As such, there is a growing body of literature regarding potential use of neurologic imaging in patients with chronic pelvic pain [4-7]. However, central nervous system functional imaging remains in the research domain for evaluation of chronic pelvic pain at this time, so we will not consider it formally among the discussed imaging procedures.

When all of these aspects of subacute and chronic pelvic pain in postmenopausal women are excluded from direct consideration, a handful of clinically significant conditions remain. We group these according to location of clinical symptoms: pain localized to the deep or internal pelvis, with potential etiologies and associated conditions, including pelvic venous disorders (commonly termed pelvic congestion syndrome), intraperitoneal adhesions, hydrosalpinx, chronic inflammatory disease, or cervical stenosis versus chronic pain localized to the perineum, vulva, or vagina that arises from suspected vaginal atrophy, vaginismus, vaginal or vulvar cysts, vulvodynia, or pelvic myofascial pain.

Special Imaging Considerations

When there is suspected local pathology in the vulva, perineum, or vaginal wall, translabial/transperineal ultrasound (US) or side-firing transvaginal probes may provide better visualization than end-firing transvaginal

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US probes [8]. There is scant evidence for imaging recommendations at this level of specificity, and it is assumed that the performing sonographer and sonologist will make appropriate technical adjustments to optimize imaging in these relatively uncommon clinical scenarios.

Discussion of Procedures by Variant

Variant 1: Postmenopausal subacute or chronic pelvic pain, localized to the deep pelvis. Initial imaging.

Radiography Abdomen and Pelvis

To our knowledge, there is currently no evidence to support the use of radiography to evaluate postmenopausal subacute or chronic pelvic pain localized to the deep pelvis.

US Pelvis Transvaginal

Pelvic US using a combined transabdominal and transvaginal approach is the initial imaging study of choice to evaluate postmenopausal subacute or chronic pelvic pain localized to the deep pelvis [9-12]. US can provide anatomic information about uterine size and endometrial canal distension, fallopian tube dilation, ovaries, and adnexal masses. Regarding the sequencing of examinations, several authors have pointed out that if the etiology of pelvic pain remains obscure after CT, a subsequent US has the capacity to provide additional information about the adnexa in particular [13,14]. US is broadly used and clinically accepted worldwide. However, high-quality evidence, such as clinical trials supporting specific usefulness of US, is lacking.

Chronic pelvic inflammatory disease may be associated with pelvic fluid, hydrosalpinx or pyosalpinx, inflammatory adnexal masses, and peritoneal inclusions visible by US [15]. When pelvic adhesions are suspected, real-time dynamic US or cine clips may document abnormal adherence or lack of mobility of structures, particularly transvaginally. However, adhesive disease is a notoriously difficult diagnosis to confirm nonoperatively [16], and the evidence basis is anecdotal [15,17]. Furthermore, the causal linkage between adhesive disease and chronic pelvic pain remains unclear.

US Pelvis Transabdominal

As above, a combined transabdominal and transvaginal approach is most appropriate for pelvic imaging, combining the anatomic overview provided by the transabdominal approach with the greater spatial and contrast resolution of transvaginal imaging. These techniques should be performed together whenever possible. Please see the "US Pelvis Transvaginal" section for further details.

US Duplex Doppler Pelvis

Color and spectral Doppler are routinely employed in pelvic sonography to evaluate internal vascularity of pelvic observations and distinguish fluid and cysts from soft tissue. Although it is rated as a separate imaging procedure per ACR methodology, the expert panel considers Doppler imaging to be a standard component of pelvic sonography. Special considerations for women with chronic pelvic pain may include evaluation of uterine artery blood flow with low-resistance waveforms in women with chronic pelvic pain [12] and altered venous flow in the setting of pelvic congestion. When pelvic venous disorders are suspected clinically, color and spectral Doppler evaluation may be used to document engorged periuterine and periovarian veins (≥8 mm), low-velocity flow, altered flow with Valsalva maneuver, retrograde (caudal) flow of the ovarian veins, and direct connection between engorged pelvic veins and myometrial arcuate veins [9-11]. Increased pelvic vascularity may also be present in the setting of uterine or tubo-ovarian neoplasia; these guidelines assume normal imaging appearance of the pelvic organs.

Many women with pelvic venous disorders have morphologic findings of polycystic ovarian syndrome (enlarged ovaries with exaggerated central stroma and multiple small peripherally located follicles), but the associated clinical features of hirsutism and amenorrhea are rare [11,18]. Multiple investigators have identified a component of estrogen overstimulation in pelvic venous disorders, and symptoms may subside after menopause in some women [15]. There is a lack of clear definition and high-quality evidence in the clinical domain of pelvic venous disorders.

CT Abdomen and Pelvis

When pelvic venous disorders are clinically suspected, contrast-enhanced CT of the abdomen and pelvis may demonstrate engorged periuterine and periovarian veins, venous anatomic variants, and occasional compression of the left renal vein resulting in asymmetric left-sided pelvic varicosities [10,19-22]. However, CT lacks the capacity of US or MR to provide dynamic flow information [18].

In chronic pelvic inflammatory disease, CT may demonstrate pelvic fluid, peritoneal thickening, hydrosalpinx or pyosalpinx, and even tubo-ovarian abscess [23]. CT has the capacity to demonstrate architectural distortion and tethering in adhesive disease, but CT sensitivity and specificity for this diagnosis have not been documented to our knowledge. When adhesive disease is severe, small-bowel obstruction may result, and CT of the abdomen and pelvis with intravenous (IV) contrast is the imaging examination of choice. See Appendix 1 for the ACR Appropriateness Criteria® for "Suspected Small-Bowel Obstruction."

CT Pelvis

When pelvic venous disorders are clinically suspected, contrast-enhanced CT of the pelvis may demonstrate engorged periuterine and periovarian veins, although their drainage into the renal vein or cava will not be evaluated without CT coverage of the abdomen [10,19-22]. In chronic inflammatory disease, CT may demonstrate pelvic fluid, peritoneal thickening, hydrosalpinx or pyosalpinx, and tubo-ovarian abscess [23].

MRI Pelvis

MRI is widely regarded as the problem-solving imaging examination of choice for chronic pelvic pain, particularly when US findings are nondiagnostic or inconclusive [11,15,24]. When MRI is clinically indicated, the use of a gadolinium-based IV contrast agent is preferred. Please see the ACR Manual on Contrast Media for additional information [25].

The diagnostic performance of MRI/MR angiography is comparable to conventional venography for identifying pelvic venous disorders [26,27]. The use of MRI for this indication is growing accordingly [28], necessitating standardized interpretation and reporting [29]. T2-weighted imaging has the capacity to demonstrate pelvic varices, but signal intensity varies with flow velocity. Vein conspicuity and flow directional assessment are superior using time-resolved postcontrast T1-weighted imaging, which can directly demonstrate ovarian vein reflux [10,30]. Noninvasive imaging with MRI has largely supplanted conventional venography for diagnostic purposes, but venography may still be performed in the context of intended intervention.

In chronic pelvic inflammatory disease, MRI with T2-weighted imaging may demonstrate edema, fluid collections, and distension of endometrial canal or fallopian tubes [15]. When infection is long standing, distinguishing between inflammatory and neoplastic masses is particularly difficult. Postcontrast T1-weighted imaging and diffusion-weighted imaging are particularly important in this setting [23]. Adhesive disease may be directly evident at MRI as low-signal bands between structures on nonfat saturated T2-weighted imaging or inferred in the presence of peritoneal inclusion cysts [11,15].

Variant 2: Postmenopausal subacute or chronic pelvic pain, clinically suspected pathologies in perineum, vulva, or vagina. Initial imaging.

Physical examination is the foundation of clinical evaluation of suspected pathology in the perineum, vulva, or vagina. The evidence supporting the use of imaging procedures in this clinical context largely assumes that the physical examination is abnormal.

Radiography Abdomen and Pelvis

To our knowledge, there is currently no evidence to support the use of radiography to evaluate postmenopausal subacute or chronic pelvic pain localized to the perineum, vulva, or vagina.

US Pelvis Transvaginal

Physical examination is the basis of diagnosis for most conditions localized to the vulvar skin [31]. Perineal and vaginal cysts are subcutaneous but often palpable and are appropriately evaluated with either translabial or transvaginal US, or both [8]. As with pelvic pain localized to the deep pelvis, US is widely regarded as the initial imaging study of choice for pelvic pain localized to the perineum, vulva, or vagina, but there is little high-quality evidence specifically supporting its use.

US Pelvis Transabdominal

As above, a combined transabdominal and transvaginal approach is most appropriate for pelvic imaging, combining the anatomic overview provided by the transabdominal approach with the greater spatial and contrast resolution of transvaginal imaging. These techniques should be performed together whenever possible. Please see the "US Pelvis Transvaginal" section for further details.

US Duplex Doppler Pelvis
Color and spectral Doppler are routinely used in pelvic sonography to evaluate internal vascularity of pelvic observations and distinguish cysts from soft tissue. Although it is rated as a separate imaging procedure per ACR methodology, the expert panel considers Doppler imaging to be a standard component of pelvic sonography. Special considerations for women with chronic pelvic pain may include evaluation of uterine artery blood flow, with low-resistance waveforms having been described in women with chronic pelvic pain [12].

CT Abdomen and Pelvis
To our knowledge, there is currently no evidence to support the use of CT for primary evaluation of postmenopausal subacute or chronic pelvic pain localized to the perineum, vulva, or vagina.

CT Pelvis
To our knowledge, there is currently no evidence to support the use of CT for primary evaluation of postmenopausal subacute or chronic pelvic pain localized to the perineum, vulva, or vagina.

MRI Pelvis
When MRI is clinically indicated, the use of a gadolinium-based IV contrast agent is preferred. Please see the ACR Manual on Contrast Media for additional information [25].

When a cyst or mass is identified by US in the perineum, vulva, or vagina, MRI provides additional anatomic detail and evaluation of any enhancing soft-tissue components that might favor infection or neoplasia [11,24,32,33]. MRI has an important role as a problem-solving examination for lesion characterization and surgical planning, but there is, to our knowledge, no direct evidence to support the use of MRI as the initial or primary imaging examination for evaluation of pelvic pain localized to the perineum, vulva, or vagina, particularly when the physical examination is normal. However, there is emerging evidence to support the first-line utility of MRI when endometriosis or fistulizing disease are suspected [34]; readers are again referred to specific ACR Appropriateness Criteria guidelines for these clinical scenarios (see Appendix 1).

MRI also enables accurate depiction of pelvic floor muscular anatomy, integrity, and function [35,36]. Pelvic floor dysfunction is discussed in detail in a separate ACR Appropriateness Criteria document (see Appendix 1), but specific note is made here of the usefulness of MRI for assessment of muscular hypertonicity in chronic pelvic pain syndromes [37].

Summary of Recommendations

- **Variant 1:** US pelvis transvaginal, US duplex Doppler pelvis, and US pelvis transabdominal are usually appropriate for the initial imaging of postmenopausal subacute or chronic pelvic pain localized to the deep pelvis. These procedures are complementary and should be performed together.
- **Variant 2:** US duplex Doppler pelvis, US pelvis transvaginal, and US pelvis transabdominal are usually appropriate for the initial imaging of postmenopausal subacute or chronic pelvic pain with clinically suspected pathologies in the perineum, vulva, or vagina. These procedures are complementary and should be performed together.

Summary of Evidence

Of the 38 references cited in the *ACR Appropriateness Criteria® Postmenopausal Subacute or Chronic Pelvic Pain* document, all of them are categorized as diagnostic references including 1 well-designed study, 4 good-quality studies, and 10 quality studies that may have design limitations. There are 23 references that may not be useful as primary evidence.

The 38 references cited in the ACR Appropriateness Criteria® *Postmenopausal Subacute or Chronic Pelvic Pain* document were published from 2005 to 2017.

Although there are references that report on studies with design limitations, 5 well-designed or good-quality studies provide good evidence.

Appropriateness Category Names and Definitions

Appropriateness Category Name	Appropriateness Rating	Appropriateness Category Definition
Usually Appropriate	7, 8, or 9	The imaging procedure or treatment is indicated in the specified clinical scenarios at a favorable risk-benefit ratio for patients.
May Be Appropriate	4, 5, or 6	The imaging procedure or treatment may be indicated in the specified clinical scenarios as an alternative to imaging procedures or treatments with a more favorable risk-benefit ratio, or the risk-benefit ratio for patients is equivocal.
May Be Appropriate (Disagreement)	5	The individual ratings are too dispersed from the panel median. The different label provides transparency regarding the panel's recommendation. "May be appropriate" is the rating category and a rating of 5 is assigned.
Usually Not Appropriate	1, 2, or 3	The imaging procedure or treatment is unlikely to be indicated in the specified clinical scenarios, or the risk-benefit ratio for patients is likely to be unfavorable.

Relative Radiation Level Information

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults (see Table below). Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® Radiation Dose Assessment Introduction document [38].

Relative Radiation Level Designations		
Relative Radiation Level*	**Adult Effective Dose Estimate Range**	**Pediatric Effective Dose Estimate Range**
O	0 mSv	0 mSv
☢	<0.1 mSv	<0.03 mSv
☢ ☢	0.1-1 mSv	0.03-0.3 mSv
☢ ☢ ☢	1-10 mSv	0.3-3 mSv
☢ ☢ ☢ ☢	10-30 mSv	3-10 mSv
☢ ☢ ☢ ☢ ☢	30-100 mSv	10-30 mSv
*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (eg, region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as "Varies".		

Supporting Documents

For additional information on the Appropriateness Criteria methodology and other supporting documents go to www.acr.org/ac.

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Appendix 1. Related ACR Appropriateness Criteria Topics

Subject area	AC topic
Vaginal bleeding in postmenopausal women	Abnormal Vaginal Bleeding
Clinically suspected adnexal mass	Clinically Suspected Adnexal Mass
Acute pelvic pain in postmenopausal women	Postmenopausal Acute Pelvic Pain – Topic under development
Pelvic floor dysfunction	Pelvic Floor Dysfunction
Endometriosis	Infertility
Pelvic inflammatory disease	Acute Pelvic Pain in the Reproductive Age Patient
Leiomyomas	Abnormal Vaginal Bleeding and Clinically Suspected Adnexal Mass
Urinary tract infection	Recurrent Lower Urinary Tract Infections in Women
Endometrial cancer	Pretreatment Evaluation and Follow-up of Endometrial Cancer
Vaginal cancer	Staging and Follow-up of Vaginal Cancer – Topic under development
Vulvar cancer	Staging and Follow-up of Vulvar Cancer – Topic under development
Hematuria	Hematuria
Diverticulitis	Left Lower Quadrant Pain-Suspected Diverticulitis
Left lower quadrant pain	Left Lower Quadrant Pain-Suspected Diverticulitis
Right lower quadrant pain	Right Lower Quadrant Pain-Suspected Appendicitis
Suspected small bowel obstruction	Suspected Small-Bowel Obstruction