

PELVIC IMAGING GUIDELINES

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MedSolutions, Inc. Clinical Decision Support Tool for Advanced Diagnostic Imaging

Common symptoms and symptom complexes are addressed by this tool. Imaging requests for patients with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician may provide additional insight.

This version incorporates MSI accepted revisions prior to 11/30/06

ABBREVIATIONS for PELVIC GUIDELINES

CA-125: cancer antigen 125 test

CT: computed tomography

GTN: gestational trophoblastic neoplasia

HCG: human chorionic gonadotropin

KUB: kidneys, ureters, bladder (plain frontal supine radiograph of the abdomen)

MRA: magnetic resonance angiography

MRI: magnetic resonance imaging

mSv: milliSievert

PA: posteroanterior projection

PID: pelvic inflammatory disease

TA: transabdominal

TV: transvaginal

WBC: white blood cell count

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PELVIC IMAGING GUIDELINES

PV-1~GENERAL GUIDELINES

- Abdominal imaging begins at the diaphragm and extends to the umbilicus or iliac crest.
- Pelvic imaging begins at the umbilicus and extends to the pubis.
- CT imaging is a more generalized modality.
- MRI imaging is preferred as a more targeted study, in cases of renal failure, or for patients allergic to iodinated contrast.
- CT of each body area delivers about 10 mSv of ionizing radiation. For each 10 mSv of radiation, the risk of developing a future cancer according to the BEIR VII report is 1:1000 to 1:2000 (chest x-ray, PA/Lateral = 0.4 mSv; KUB abdomen = 1.5 mSv).
 - Radiation exposure is particularly important in children and women of child bearing age.
 - To avoid radiation exposure, pediatric imaging should consider the use of ultrasound or MRI where it is a clinical option.
 - To avoid radiation exposure, pregnant women should be evaluated by ultrasound or MRI where it is a clinical option.
- Pelvic CT or MRI may be indicated to further evaluate abnormalities seen on other imaging modalities such as plain x-rays, ultrasound, etc.
- **Pediatric guidelines:** The Pelvic guidelines are the same for both the pediatric population and the adult population, unless there are specific Pediatric guidelines (highlighted in yellow).

PELVIC SIGNS AND SYMPTOMS – FEMALE

PV-2~ABNORMAL UTERINE BLEEDING

- Initial evaluation includes ultrasound, saline infusion sonography,* hysteroscopy and possible biopsy. MRI pelvis without contrast (CPT 72195) is indicated only if other tests are equivocal and the MRI results will affect treatment.
**Obstet Gynecol 2003;102:659-662*
- Gynecology specialist evaluation is helpful for women with abnormal uterine bleeding.*
**Management of Abnormal Uterine Bleeding. Slide presentation modified from: APGO Educational Series on Women's Health Issues*

PV-3~ADENOMYOSIS

- Adenomyosis is a histologic diagnosis and imaging has limitations.
- Adenomyosis is suspected by history and physical examination.

- Pelvic ultrasound is the primary screening modality for imaging the female pelvis. Transvaginal ultrasonography (along with color Doppler ultrasound) is the diagnostic procedure of choice for the initial evaluation of suspected adenomyosis and is useful to evaluate other potential etiologies of the patient's symptoms.
- If transvaginal ultrasound is inconclusive and a more definitive diagnosis is necessary because invasive treatment is being considered, MRI pelvis without contrast (CPT 72195) can be useful.
- If hormonal therapy is going to be tried first, then MRI is not indicated in patients with suspected adenomyosis.

PV-4~SUSPECTED ADNEXAL MASS

- Adnexal masses have a long list of diagnostic possibilities and ultrasound results must be correlated with history and laboratory testing.
- Transabdominal (TA) and transvaginal (TV) ultrasound imaging techniques should be combined for the evaluation of adnexal masses.
 - Color Doppler ultrasound may be helpful in selected situations.
- Sonographic identification of a simple cystic mass establishes a benign process in almost 100% of premenopausal women and 95% of postmenopausal women.
 - Adnexal cysts 5 cm or smaller in postmenopausal women are not considered malignant, although a 3 cm to 5 cm cyst may need correlation with CA-125 and color Doppler findings.
- Complex adnexal masses are usually ovarian in origin, and in premenopausal women, most commonly represent hemorrhagic cysts or endometriomas.
 - Ultrasound characteristics usually suggest the diagnosis, and in premenopausal women, a follow up ultrasound can be done in six weeks or following a menstrual cycle to evaluate for resolution.
 - A pregnancy test is important to narrow the differential diagnosis.
- In postmenopausal women with a complex adnexal mass by ultrasound, MRI pelvis without and with contrast (CPT 72197) may be indicated for further characterization.*

**ACR Appropriateness Criteria for Women's Imaging, 2002*

**Radiol. Clin. North Am 2002 May;40(3):591-608*

- MRI pelvis without and with contrast (CPT 72197) is superior to CT scan (CT is useful only when the identification of fat and calcifications is important, such as in benign teratoma) in evaluating whether a complex adnexal mass is ovarian cancer when ultrasound is indeterminate.
 - The probability that a lesion is ovarian cancer in a premenopausal woman with an indeterminate ovarian mass on ultrasound decreases to less than 2% with a negative MRI.*

**Radiology 2005;236:85-94*

- Complex or solid ovarian masses may require surgical removal.
 - With complex or solid ovarian masses, preoperative evaluation of the abdomen and pelvis without and with contrast using CT (CPT 74170 and 72194) or MRI (CPT 74183 and 72197) can be performed.

PV-5~ENDOMETRIOSIS

- Endometriosis is a surgical diagnosis and imaging is of little value unless the pelvic clinical exam is abnormal.
- Pelvic ultrasound is the first line diagnostic exam for suspected endometriosis.
 - Although ultrasound is able to diagnose endometriosis in most locations, it has limited sensitivity for posterior locations such as utero-sacral ligaments, cul-de-sac of Douglas, torus uterinus, vagina, recto-sigmoid, and occasionally the bladder.
- In most patients, ultrasound followed by medical treatment or laparoscopy should be considered prior to advanced imaging.
 - Laparoscopy remains the definitive test for diagnosis and evaluation of endometriosis in most patients.*

**Eur Radiol 2006 Feb;16(2):285-298*

**ACOG Committee Opinion, Number 310, April 2005*

- MRI has shown high accuracy for both anterior and posterior endometriosis and can enable complete lesion mapping prior to surgery.*
 - MRI pelvis without and with contrast (CPT 72197) can be considered for preoperative planning. This is the minority of patients and MRI should not, in general, be used for diagnosing endometriosis in women with pelvic pain.

**Eur Radiol 2006 Feb;16(2):285-298*

**Aeby TC, Hiraoka MKY. Endometriosis. Updated May 15, 2006
<http://www.emedicine.com>. Accessed November 20, 2006*

PV-6~PELVIC INFLAMMATORY DISEASE (PID)

- Ultrasound is the initial study for imaging of pelvic inflammatory disease (PID) that does not respond well to antibiotic therapy or for complicated PID.
- In rare cases where there is extensive abscess formation or a percutaneous drainage procedure is planned, CT of the abdomen and pelvis with contrast (CPT 74160 and CPT 72193) may be helpful.

PV-7~PELVIC PAIN, FEMALE

- Pelvic ultrasound remains the imaging study of choice for the initial evaluation of pelvic pain, with color Doppler ultrasound where ovarian torsion is a consideration.
- Advanced imaging is generally not indicated for pelvic pain unless accompanied by fever, elevated WBC or palpable mass, the pelvic ultrasound is nondiagnostic or equivocal, or there is a suspicious pelvic exam. In this setting, CT pelvis with contrast (CPT 72193) can be performed.

PV-8~LEIOMYOMATA

- Transabdominal and transvaginal ultrasound are the preferred screening procedures for leiomyomata.
- Preoperative ultrasound should be performed prior to myomectomy.
 - If ultrasound is indeterminate, MRI pelvis without contrast (CPT 72195) may be considered.
 - MRI pelvis without and with contrast (CPT 72197) can be performed if leiomyoma necrosis is suspected.
- MRI pelvis without and with contrast (CPT 72197) is warranted in those cases in which arterial embolization is contemplated. MRI accurately assesses the number, location, and size of leiomyomata for pretreatment planning and post treatment response.*
**AJR 2003;181:851-856*
- There is no literature support for the addition of MRA pelvis (CPT 72198) to the preoperative evaluation.
- There are currently no published guidelines regarding follow up MRI in patients who have undergone uterine artery embolization.
 - Although there are no compelling data to support the need for follow up MRI in asymptomatic patients who are status post uterine artery embolization, consensus opinion suggests that one follow up pelvic MRI (CPT 72197) post embolization will be allowed 3 to 6 months after the procedure.
 - In patients with persistent or recurrent symptoms, pelvic MRI without and with contrast (CPT 72197) should be performed.
 - In patients with fever, pain, or other acute symptoms status post embolization, pelvic MRI without and with contrast (CPT 72197) should be performed.

PV-9~PERIURETHRAL CYSTS AND URETHRAL DIVERTICULA

- Also see AB-37 Urinary Tract Infection (last bullet).
- Symptomatic infection of congenital periurethral glands can result in urethral diverticula. Symptoms include pain, urinary urgency, frequency of urination, recurrent urinary tract infection, dribbling after urination, or incontinence.
 - MRI pelvis without and with contrast (CPT 72197) is superior to transvaginal ultrasound for evaluating these entities but should be reserved for patients in whom ultrasound, voiding cytourethrography, or retrograde urethrography are equivocal.*

*ACR Appropriateness Criteria, Recurrent Lower Urinary Tract Infections in Women, 2005

PV-10~ UTERINE ANOMALIES

- In the detection of uterine anomalies, particularly during infertility evaluation, transabdominal and transvaginal ultrasound are the initial imaging modalities of choice.
- If ultrasound defines a complex anomaly or is not definitive, then pelvic MRI without contrast (CPT 72195) is recommended.*

*Radiographics 2003; 23:1401-1421 and 1423-1439

PREGNANCY RELATED

PV-11~ FETAL MRI

- Ultrasound (ideally performed at a tertiary care center) remains the predominant modality for evaluating disorders related to the fetus and pregnancy overall. MRI is used as an adjunct to ultrasound in evaluating fetal abnormalities.
- Most fetal MRI imaging occurs after 18 weeks gestation.
- Fetal MRI should be performed using sedation.
- Studies should be coded as noncontrast MRI abdomen and pelvis (CPT 74181 and 72195).
- The most common use of fetal MRI is to evaluate central nervous system abnormalities. Neural tube defects are usually well evaluated by ultrasound.
- Abnormalities in the fetal thorax, such as congenital diaphragmatic hernia and fetal lung development can also be evaluated by fetal MRI.
- Fetal MRI can be helpful in detecting fetal genitourinary abnormalities in pregnancies complicated by oligohydramnios.
- MRI is helpful in the antenatal evaluation of conjoined twins in whom postnatal separation is being anticipated.

- The added utility of fetal MRI in the evaluation of organ systems other than central nervous system, thorax, and urogenital system has not yet been demonstrated.*

* *Applied Radiology 2004;33:9-25*

PV-12 ~ MOLAR PREGNANCY AND GESTATIONAL TROPHOBLASTIC NEOPLASIA (GTN)

- A recurrent molar pregnancy is called gestational trophoblastic neoplasia (GTN). These cells can metastasize to other organs such as lungs, brain, bone, and vagina.
- Treatment is usually methotrexate.
- Patients should have head CT without and with contrast (CPT 70470), CT abdomen and pelvis with contrast (CPT 74160 and 72193), and chest x-ray as a metastatic work up.
- Weekly HCG tests are performed until they fall to zero.

PV-13~ PELVIMETRY

- Pelvimetry for cephalic dystocia (failure to progress in active labor because of a disproportion between the fetal head and the size of the bony pelvis) is investigational.
- Pelvimetry may be done for breach presentations in which vaginal delivery is anticipated.
- Pelvimetry is usually done with plain x-ray, low dose CT pelvis without contrast (CPT 72192), or MRI pelvis without contrast (CPT 72195).
 - Low dose CT is institution specific and if protocol is not followed, the fetus will receive full ionizing radiation dose.
- References:
 - *Obstet Gynecol 2004;104:647-651*
 - *Obstet Gynecol 2003;102:1445-1454*

PELVIC SIGNS AND SYMPTOMS – MALE

PV-14~IMPOTENCE/ERECTILE DYSFUNCTION

- Brain MRI without and with contrast (CPT 70553) should be restricted to hypogonadism as documented by low bio-available/free testosterone of <20 ng/dl or total serum testosterone of less than 80% of the lower limit of normal (i.e. <150 ng/dl is lower limits for most labs), or patients with elevated prolactin.
 - Also see HD-28 Male hypogonadism in the Head guidelines
- Erectile dysfunction is frequently an early symptom of peripheral vascular disease.

- Also see PVD-1 General Guidelines (Bullet 5) in the Peripheral Vascular Disease guidelines.
- Functional MRI or PET studies are considered investigational.
- Reference:
 - *J Clinical Endocrinology and Metabolism* 2001;86(6):2391-2394

PV-15 PROSTATITIS/PUDENDAL NEURALGIA/CHRONIC PELVIC PAIN

- Chronic prostatitis is a clinical diagnosis and advanced imaging is not indicated.
- Urology consultation is helpful in patients with Pudendal Neuralgia/Chronic Pelvic Pain.
 - Confirmatory tests include Pudendal Nerve Terminal Motor Latency Test and Quantitative Sensory Threshold Test.
 - MRI of the lumbar spine without contrast (CPT 72148) and/or sacral plexus MRI without contrast (CPT 72195) may be requested but are rarely abnormal. *

*Antolak SJ, Jr. *Male Pelvic Pain. International Pelvic Pain Society, Atlanta, GA, October 2005*

PV-16~SCROTAL PATHOLOGY

- Acute scrotal pain, masses, trauma, inguinal hernia, varicocele, or inflammation should be evaluated by ultrasound. MRI in these patients is not supported by evidence-based data.*

*ACR Appropriateness Criteria, *Acute Onset Scrotal Pain, 2005*

PV-17~UNDESCENDED TESTIS

- Men or boys with a history of cryptorchid (undescended) testes have a several fold risk increase of testicular cancer. Therefore, it is important to diagnose and treat this condition either by bringing the undescended testis into the scrotum, or resecting the testis.
 - MRI abdomen and pelvis without and with contrast (CPT 74183 and 72197) can be performed.
- MRI pelvis without and with contrast (CPT 72197) can be used to evaluate abnormalities of the scrotum if ultrasound is inconclusive.
- Children should be evaluated initially with ultrasound, and if inconclusive, MRI pelvis (CPT 72197) can be performed.* CT and MRI have a high false negative rate and in general are not reliable as diagnostic tools.
 - Urology evaluation is helpful in determining the most appropriate imaging pathway.

- *Undescended Testicle or Cryptorchidism. Cornell University Dept. of Urology, 2006*
<http://www.cornellurology.com/pediatrics>. Accessed November 21, 2006

MISCELLANEOUS

PV-18~FISTULA IN ANO

- MRI pelvis without and with contrast (CPT 72197) is indicated for the assessment of complex or recurrent fistulas. Preoperative MRI frequently alters the surgical approach and MRI guided surgery can significantly decrease postoperative recurrence in complex cases by 75%.*

* *AJR* 2004;183:135-140

PV-3 ~ ADENOMYOSIS

Evidence Based Clinical Support

- Adenomyosis is characterized by benign invasion of ectopic endometrium into the myometrium with hyperplasia of adjacent smooth muscle.
- Common symptoms include dysmenorrhea, menorrhagia, and abnormal uterine bleeding, and enlarged uterus.
- Differentiation of adenomyosis from leiomyoma is important because treatment will differ. Hysterectomy is the only definitive treatment for symptomatic adenomyosis. Embolization of adenomyosis has poor long term results with only 55% of treated patients showing clinical improvement after 2 years.*
**Radiology 2005;234:948-953*
- The only way to accurately diagnose adenomyosis is pathologically after hysterectomy.
- Transvaginal ultrasound has a reported sensitivity of 53%-89% in diagnosing adenomyosis, and a specificity of 67%-98%.*
**Radiographics 2005;25:21-40*
- MRI has a sensitivity of 78%-88% and specificity of 67%-93% in diagnosing adenomyosis.*
**Radiographics 2005;25:21-40*

PV-4 ~ SUSPECTED ADNEXAL MASS

Evidence Based Clinical Support

- A study of 505 consecutive resected adnexal masses over 3.5 years showed that 457 (90%) were benign. Lesions smaller than 4 cm were benign in 211 of 218 cases (97%). 246 of 287 lesions (86%) larger than 4 cm were benign. Every lesion that did not have a solid component was benign. Every non-benign lesion had some solid component. 244 of 250 (98%) of lesions without Doppler flow were benign, while lesions with flow were benign in 76 of 106 (72%) cases.*
**RSNA meeting 2003*

PV-8 ~ LEIOMYOMATA

Evidence Based Clinical Support

- For uterine artery embolization, size of the dominant fibroid must be considered. Some studies have reported treatment failure to be more likely with fibroids >8 cm.*
**Obstet Gynecol Surv 2002;57:810-815*

- Interventional radiologists have, as part of their protocol, a follow-up MRI post embolization generally 3 to 6 months post procedure in asymptomatic patients. MRI results are used for prediction, and for some, any gadolinium accumulation is followed by another embolization.

<p style="text-align: center;">PV-13 ~ PELVIMETRY Evidence Based Clinical Support</p>

- Low Dose CT utilizes a single view with 0.25 mSv radiation exposure, but most facilities will do multiple views with total exposure of 10 mSv (same as a normal CT pelvis).

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PV-4~Suspected Adnexal Mass

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PV-5~Endometriosis

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PV-8~Leiomyomata

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PV-9~Periurethral Cysts and Urethral Diverticula

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PV-10~Uterine Anomalies

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PV-13~Pelvimetry

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PV-14~Impotence/Erectile Dysfunction

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PV-15~Prostatitis/Pudendal Neuralgia/Chronic Pelvic Pain

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PV-16~Scrotal Pathology

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PV-17~Undescended Testis

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PV-18~Fistula in Ano

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PV-3~Adenomyosis, Evidence Based Clinical Support

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PV-4~Suspected Adnexal Mass, Evidence Based Clinical Support

- *RSNA meeting* 2003

PV-8~Leiomyomata, Evidence Based Clinical Support

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