ACR Appropriateness Criteria Teaching Module

About the ACR Appropriateness Criteria

The ACR Appropriateness Criteria® are evidence-based guidelines to assist referring physicians and other providers in making the most appropriate imaging or treatment decision for a specific clinical condition. By employing these guidelines, providers enhance quality of care and contribute to the most efficacious use of radiology.

Includes 230 clinical topics with over 1100 clinical variants.

American College of Radiology
ACR Appropriateness Criteria®

Clinical Condition: **Right Lower Quadrant Pain—Suspected Appendicitis**

Variant 1: **Fever, leukocytosis, and classic clinical presentation for app**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen and pelvis with IV contrast	8	Oral or rectal contrast may not be needed depending on institutional preference.	☢☢☢☢
CT abdomen and pelvis without IV contrast	7	Use of oral or rectal contrast depends on institutional preference.	☢☢☢☢
US abdomen	6	Perform this procedure with graded compression.	O
US pelvis	5	This procedure is appropriate in women with pelvic pain.	O
MRI abdomen and pelvis without and with IV contrast	5		O
X-ray abdomen	4	This procedure may be useful when there is concern for perforation and free air.	☢☢
CT abdomen and pelvis without and with IV contrast	4	Oral or rectal contrast may not be needed in i	☢☢☢☢
MRI abdomen and pelvis without IV contrast	4		O
X-ray contrast enema	2		☢☢☢
Tc-99m WBC scan abdomen and pelvis	2		☢☢☢☢

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,

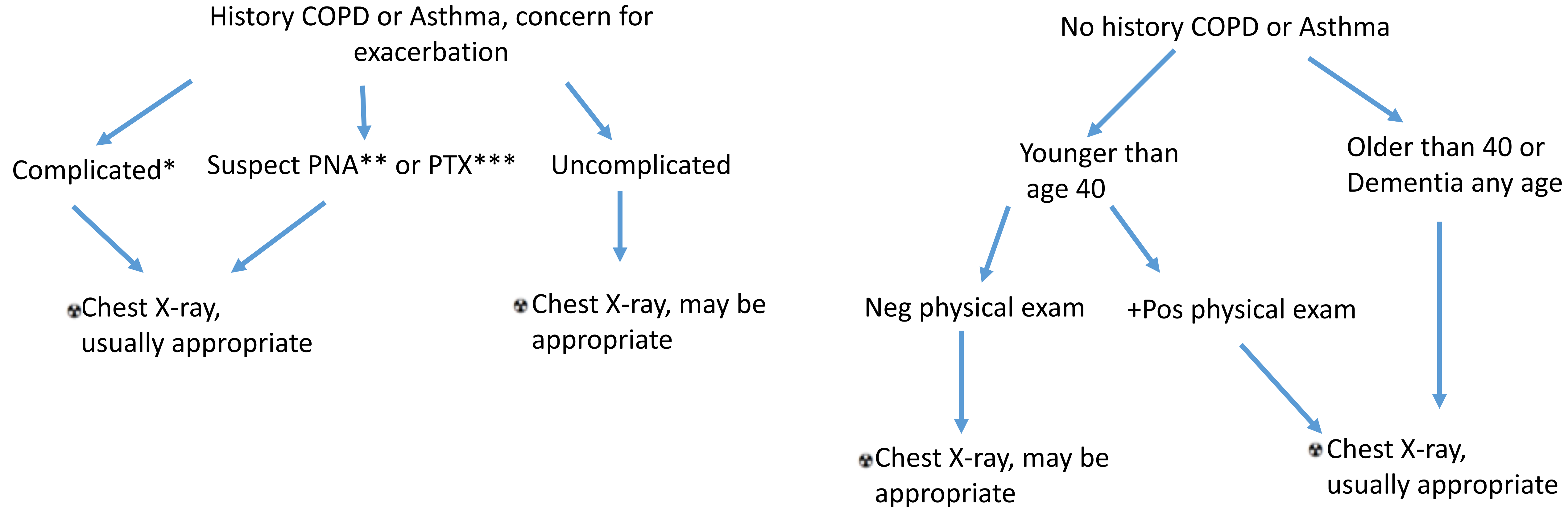
*Relative Radiation Level

Here is the ACR Appropriateness Criteria for RLQ pain when appendicitis is highest on the differential

The Relative Radiation Level indicates the relative amount of radiation of that exam compared to others. This may factor into decision making for young or pregnant patients.

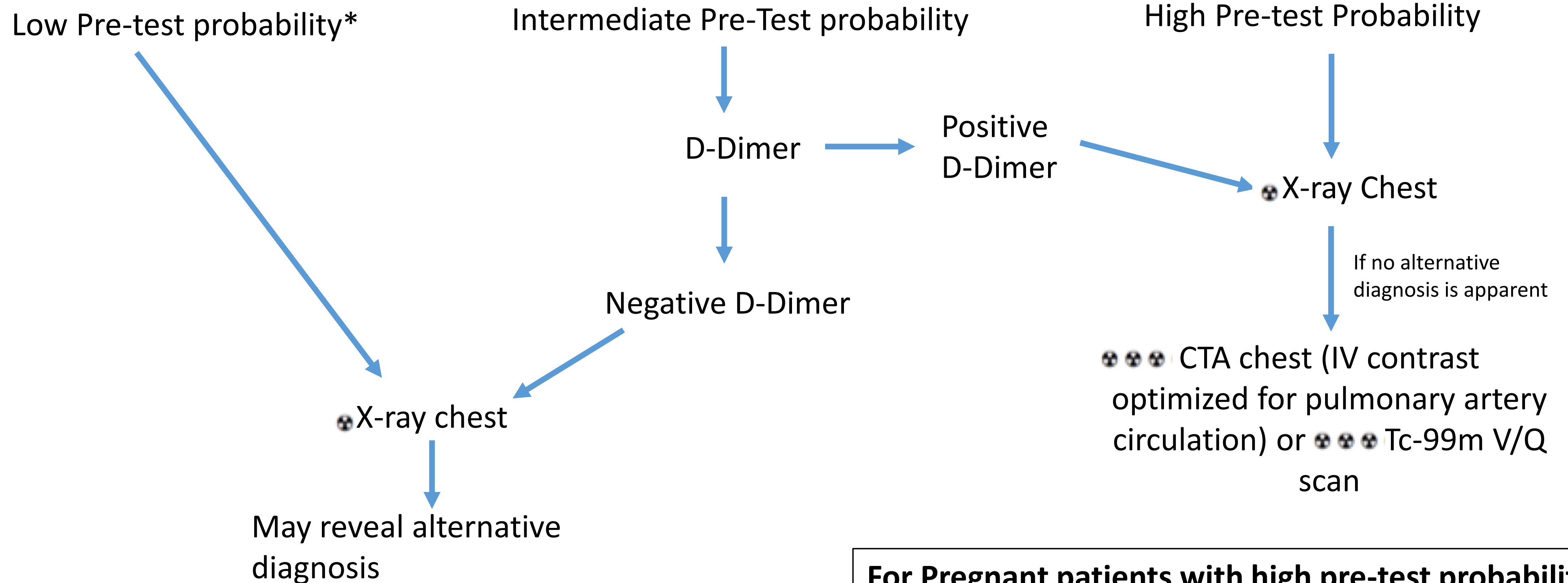
Smith MP, Katz DS, Rosen MP, et al. Right Lower Quadrant Pain – Suspected Appendicitis. Available at https://acsearch.acr.org/docs/69357/Narrative/. ACR. Accessed 1/11/2017.

Acute respiratory illness in immunocompetent patient



*Complicated: fever, leukocytosis, history of coronary artery disease, congestive heart failure, chest pain. Uncomplicated none of these signs present.
**PNA-pneumonia.
***PTX pneumothorax

Acute Chest Pain – Suspected Pulmonary Embolism (PE)



For Pregnant patients with high pre-test probability

1. X-ray chest (may do frontal view only) to look for alternative diagnosis.
2. Ultrasound duplex Doppler lower extremity first. If positive for DVT, patient is treated for DVT/PE.
3. If negative or indeterminate, perform CTA chest with IV contrast OR Tc-99m V/Q lung scan.

Determining Pre-Test Probability

Well's Criteria for Pulmonary Embolism.
PERC Rule- complete when you have low pre-test probability.

Acute Chest Pain – Suspected Aortic Dissection

Acute Chest Pain with
Suspected Aortic Dissection

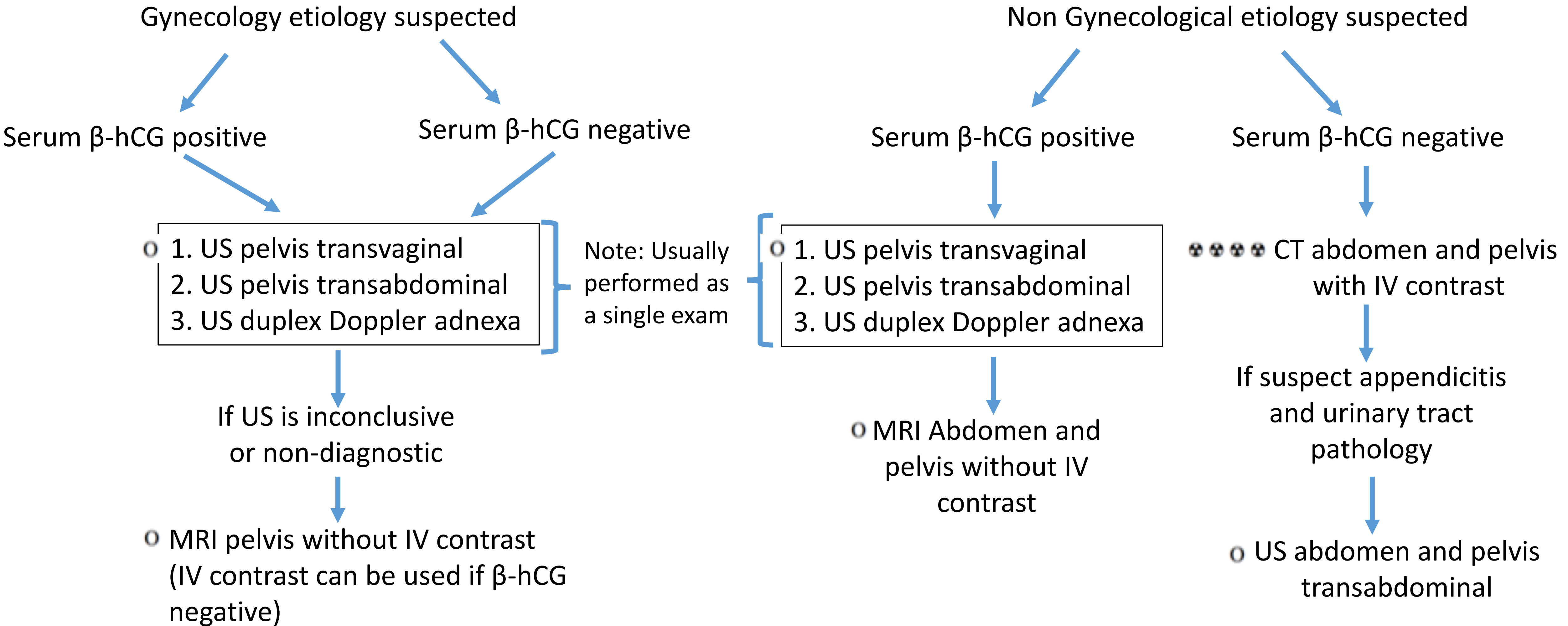
☢ Chest x-ray
if readily available and it doesn't
delay CT or MRI scan

Note: A normal chest x-ray does not preclude a diagnosis of aortic dissection – further imaging should be pursued despite normal x-ray

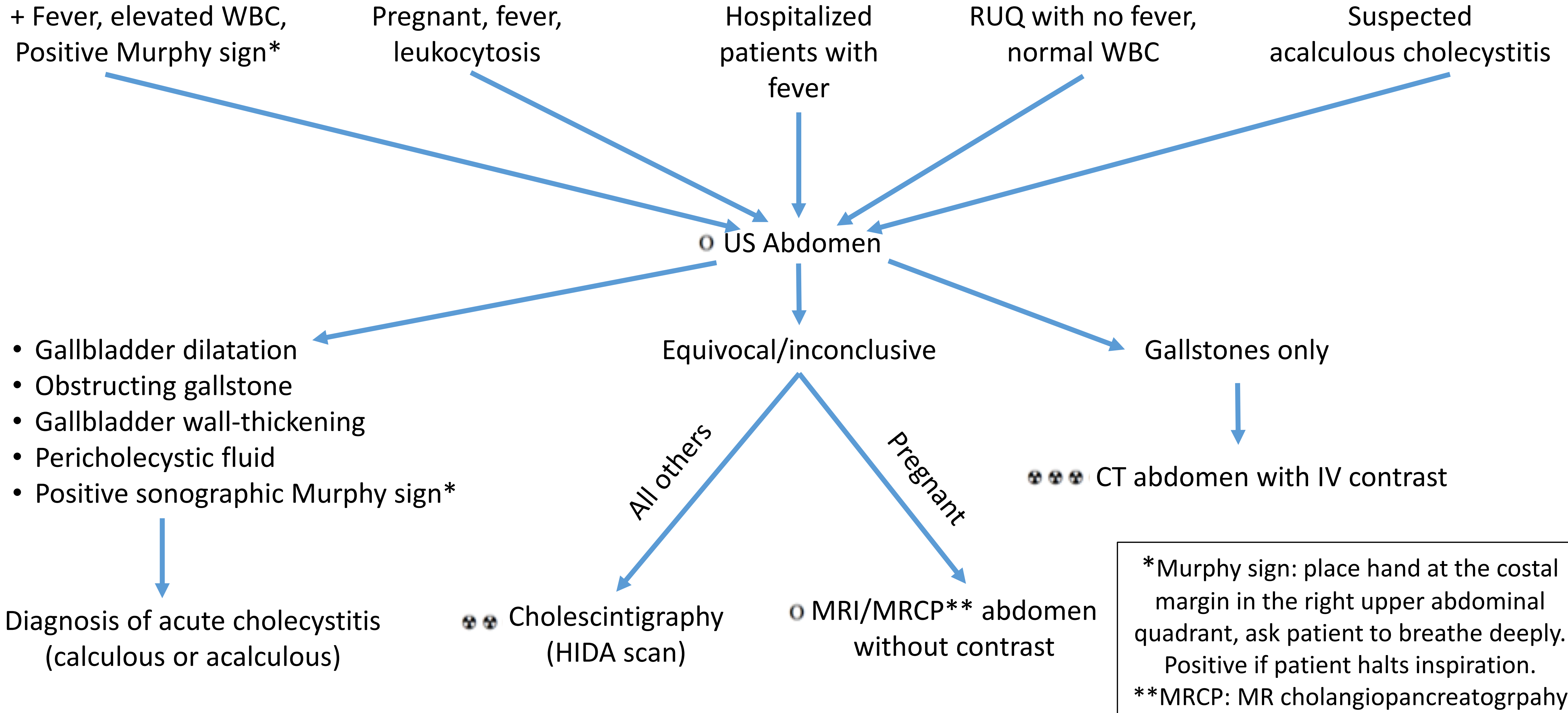
☢☢☢ CTA chest and abdomen
with IV contrast

Note: If CT is contraindicated (i.e. IV contrast allergy),
MRA chest and abdomen without and with IV contrast

Acute Pelvic Pain in the Reproductive Age Group



Right Upper Quadrant Pain



Jaundice

Acute abdominal pain with one of the following:

1. Fever
2. History of Biliary surgery
3. Known cholelithiasis

1. US abdomen

Can also complete:

2. CT Abdomen without and with IV contrast

3. CT Abdomen with IV contrast

If concerned for cholangitis, use of contrast in addition to MRCP

MRI abdomen without and with IV contrast with MRCP

Painless with one of the following: Weight loss, Fatigue, Anorexia, Symptoms for more than 3 months, Otherwise healthy

1. US abdomen

Can also complete:

2. CT Abdomen without and with IV contrast

3. CT Abdomen with IV contrast

If concern for malignancy causing obstruction, can use MRI abdomen without and with IV contrast with MRCP

Clinical condition and laboratory examination make mechanical obstruction unlikely

US abdomen to evaluate liver for stigmata of cirrhosis

If US equivocal or does not answer initial clinical question

1. MRI Abdomen without and with IV contrast with MRCP
2. CT abdomen multiphase liver

Suspected Small Bowel Obstruction

Suspected Intermittent or low grade SBO*

☢☢☢☢ CT abdomen and pelvis with IV +/- oral contrast

☢☢☢☢ CT enteroclysis**

O MR enteroclysis**

☢☢☢ X-ray small bowel enteroclysis**

Suspected high grade small bowel obstruction*

☢☢☢☢ CT Abdomen and pelvis with IV Contrast. Oral contrast is contraindicated***

If IV Contrast is contraindicated, CT Abdomen and pelvis without IV Contrast

***Note: oral contrast wastes time, adds expense, may worsen patient discomfort, and can lead to complications such as vomiting and aspiration

*Based on clinical evaluation or on initial radiography (if performed)

**May not be readily available at most institutions. Should not be used in acute setting

Acute Onset of Flank Pain – Suspicion of Stone Disease

Suspect renal stone – not pregnant

Recurrent renal stone disease

*

*Note: ☢ Ultrasound color Doppler kidneys and bladder may be used to assess for hydronephrosis in the acute setting reduce patient's lifetime exposure to radiation given recurrent episodes

☢☢☢☢ CT Abdomen/pelvis without IV contrast, reduced-dose techniques preferred

Suspect renal stone – pregnant

O US color Doppler kidneys and bladder

If positive for hydronephrosis, but no etiology is detected, could be stone vs. physiologic hydronephrosis of pregnancy**

☢☢☢☢ 1. Low dose CT abdomen and pelvis without IV contrast

O 2. MR urography (lower sensitivity)

**Physiologic hydronephrosis occurs in >80% of pregnant women, more commonly occurring on the right than the left and usually seen beginning in the 2nd trimester.

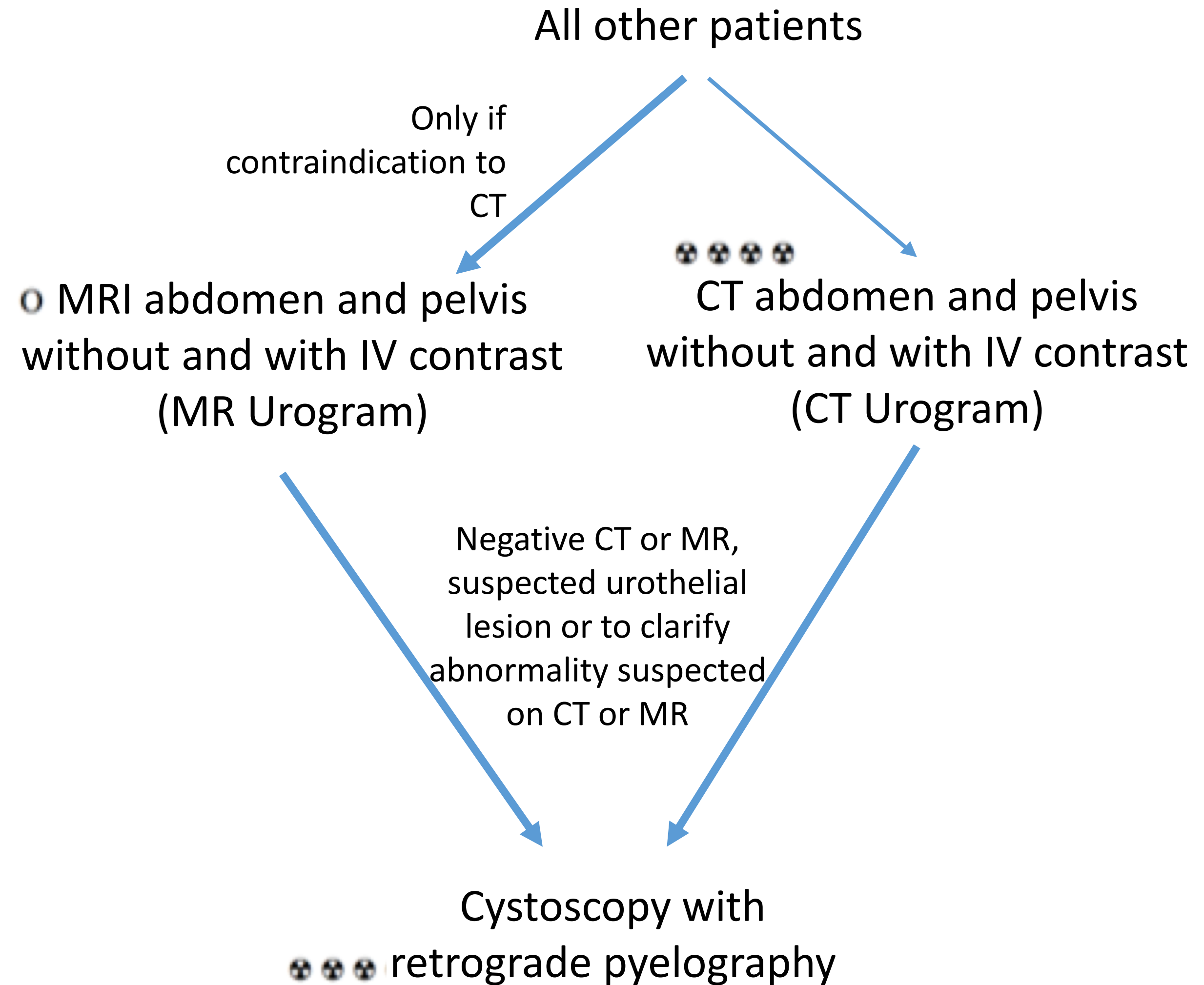
Hematuria

History of vigorous exercise, presence of infection or viral illness, present or recent menstruation

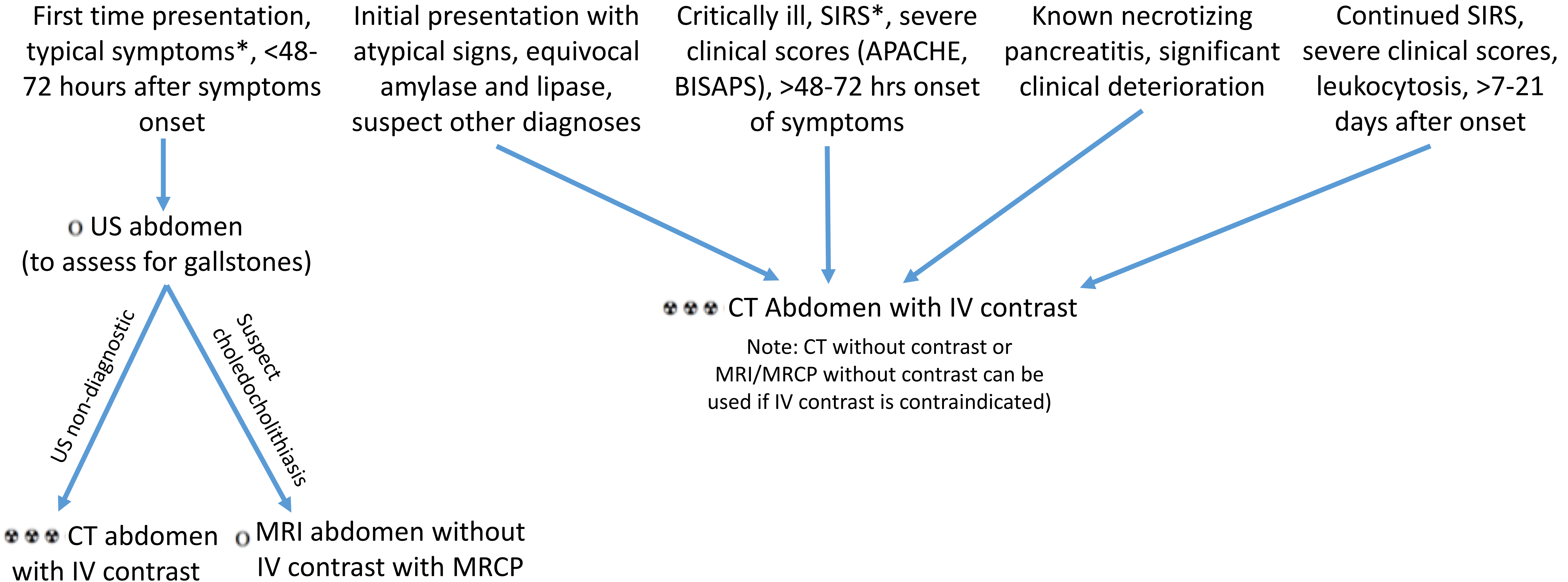
Imaging not usually appropriate

Renal parenchymal disease

US kidneys and bladder retroperitoneal



Acute Pancreatitis



*SIRS is Systemic Inflammatory Response Syndrome, Criteria discussed in explanation

**Typical presentation: (1) acute onset of epigastric/abdominal pain that radiates to the back, increases in severity with no relief, (2) increased amylase and lipase

Right Lower Quadrant Pain - Suspected Appendicitis

Classic clinical presentation*

Possible appendicitis, atypical presentation, older than 14

Possible appendicitis, atypical presentation, younger than 14

Pregnant

☢☢☢☢ CT abdomen/pelvis with IV contrast (oral or rectal contrast based on institutional preferences)

O US abdomen, perform w/ graded compression

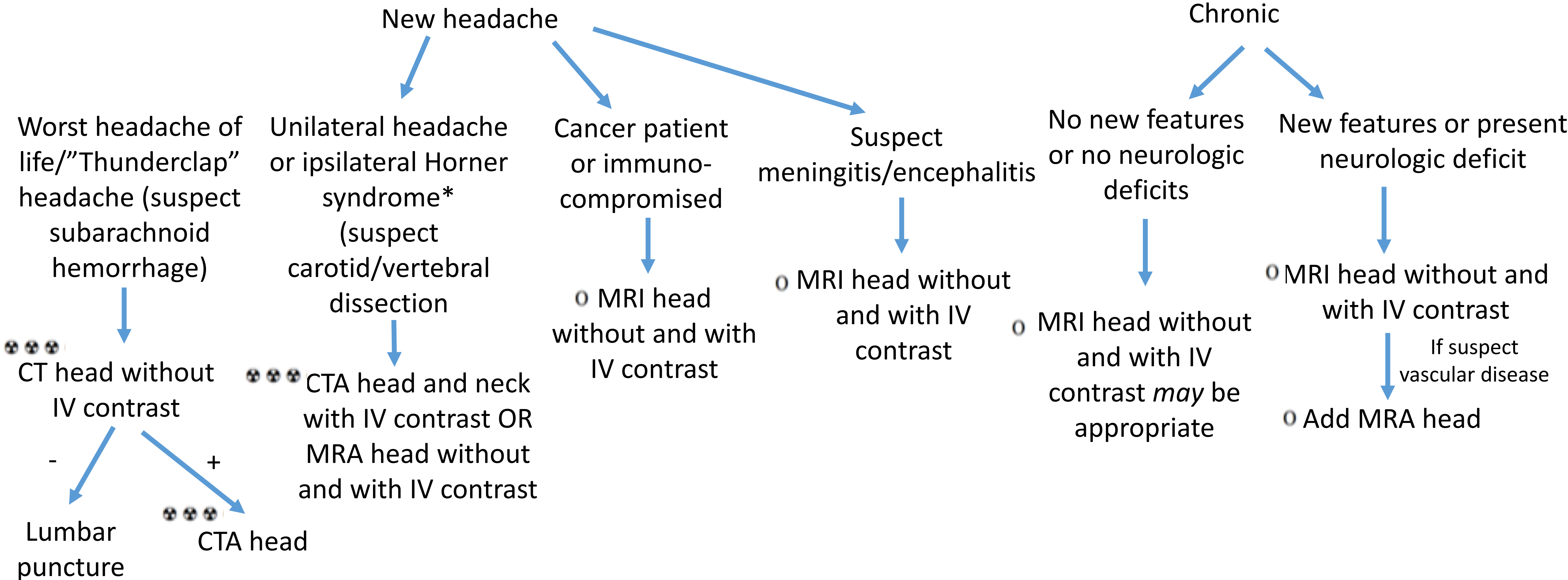
If negative or equivocal US

☢☢☢☢ CT abdomen and pelvis with IV contrast

O MR abdomen and pelvis without IV contrast

*Classic clinical presentation of appendicitis: Nausea, anorexia, fever, Initially vague, periumbilical abdominal pain that migrates to right lower quadrant, rebound tenderness and guarding, Palpation of LLQ worsens RLQ pain (Rovsing)

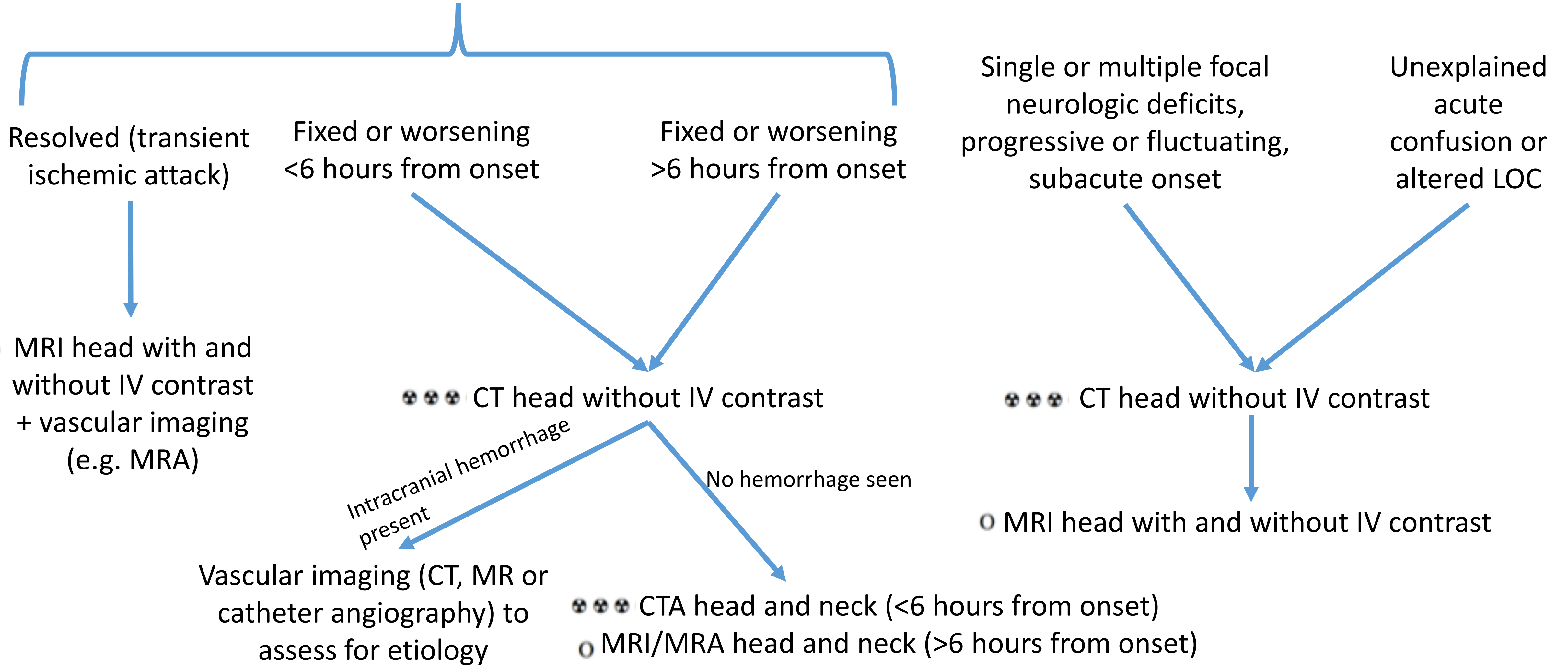
Headache



*Horner Syndrome: miosis (constricted pupil), ptosis (eyelid droop), and anhidrosis (loss of hemifacial sweating) all on same side of face.

Pregnancy: MRI without contrast > CT without contrast
MR or CT venography may be appropriate if clinical suspicion for venous or dural thrombosis

Focal Neurological Deficit/Cerebrovascular disease



Suspected osteomyelitis of foot with history of diabetes mellitus

Soft tissue swelling without neuropathic arthropathy* or ulcer

Soft tissue swelling with ulcer but without neuropathic arthropathy*

Soft tissue swelling with neuropathic arthropathy* but without ulcer

Soft tissue swelling with ulcer and neuropathic arthropathy

Initial Study: X-ray foot

MRI foot without and with IV contrast (complementary to x-ray. Both are indicated.)

*Neuropathic arthropathy: patients with diabetes have loss of peripheral sensation which can lead to degeneration of weight bearing joint

Continue to consult the ACR Appropriateness Criteria when you need clarification about appropriate imaging

Visit here: https://acsearch.acr.org/list