
WHEN TO ORDER CT vs. MRI

Physician's guide on when to order CT or MRI for body imaging, musculoskeletal imaging and neurologic imaging.

Have questions? Please feel free to call a physician at Premier Radiology.

We are a progressive group of sub-specialized, board-certified radiologists who work with physicians and hospitals to bring state-of-the-art diagnoses to patients throughout Southwestern Michigan.

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Body Imaging

	CT	MRI
Lungs	<p>CT Chest with contrast for initial screening/evaluation of lung disease, generalized chest pain or other lung pathology. Also for follow up of a known malignancy.</p> <p>CT PE Protocol when looking for PE.</p> <p>CT Chest without contrast to follow up pulmonary nodules.</p>	<p>Unless directed by a radiologist, it is not recommended to order an MRI for initial evaluation of lung or mediastinal pathology. A radiologist may recommend an MRI of the chest subsequent to CT for further evaluation.</p>
Breast	<p>MRI of the breast is indicated when:</p> <ul style="list-style-type: none"> A patient has breast cancer and is scheduled for surgery. A physician wants to follow the effectiveness of chemotherapy. A patient is at high risk of developing breast cancer. A patient has very dense breasts which limits the sensitivity of mammography. A patient has breast implants. A patient has had breast reconstruction following cancer surgery. A patient's mammogram/ultrasound shows a suspicious spot. <p>Breast MRI is not designed to replace traditional mammography, but in certain clinical situations, a physician may order a breast MRI in order to provide additional information to complement a mammogram.</p>	
Heart	<p>Cardiac CTA - for detailed evaluation of the coronary arteries, coronary artery disease or coronary artery anomalies.</p> <p>CT Calcium Scoring - for risk stratification of coronary artery disease.</p>	<p>Cardiac MRI - for evaluation of myocardial infarction, cardiac viability, cardiac function or morphology.</p>
Abdomen/ Pelvis	<p>For generalized screening of abdominal pain, order a CT Abd/Pelvis with iv and oral contrast. For more specific concerns, see individual organs below.</p>	
Liver/ Biliary	<p>CT Liver Protocol - For initial workup of the liver for suspected mass lesion or other abnormality.</p>	<p>If there is a known liver lesion or biliary system lesion, it is best to order an MRI/MRCP Liver/Pancreas. If MRI is contraindicated, follow up with a CT Liver Protocol.</p>
Pancreas	<p>For initial workup of the pancreas, order a CT Pancreatic protocol.</p> <p>You will then be directed by the radiologist as to if an MRI is needed.</p>	
Spleen	<p>If there is no known abnormality but there is a concern and a general screen is needed, order a CT Abdomen with contrast.</p>	<p>If there is a known splenic lesion it is best to order an MRI Abdomen with contrast.</p>
Kidneys	<p>CT Renal Stone Protocol - If there is concern for hematuria, flank pain or renal stone.</p> <p>CT IVP - For full evaluation of the renal collecting system, ureters.</p>	<p>If there is a known renal lesion for which follow up is required, it is best to order an MRI Renal Protocol.</p>
Adrenal Glands	<p>MRI Adrenal Protocol - For evaluation of known adrenal gland pathology. If MRI is contraindicated, a CT Adrenal Protocol is recommended.</p>	
Bowel	<p>CT Appendicitis Protocol for evaluation of appendicitis.</p> <p>For all other concerns related to the bowel, it is best to order a CT Abd/Pelvis with IV and oral contrast. If IV contrast is contraindicated, CT Abd/Pelvis with oral contrast will suffice.</p>	

Uterus/ Ovaries	MRI with and without contrast for evaluation of the uterus and ovaries.
Bladder	For evaluation of bladder pathology, order an MRI of the pelvis with contrast . If MRI is contraindicated, order a CT with and without contrast .

Vascular Imaging

Aorta/ Vascular	<p>There are many specific CTA or MRA studies that can be ordered for the vascular system.</p> <p>For upper and lower extremity vascular imaging either MRA or CTA may be ordered.</p> <p>There are various specific orderables as well:</p> <p>CTA/MRA Upper Extremity CTA/MRA Lower Extremity CTA/MRA Abdominal Aorta CTA/MRA Chest/Aorta CTA/MRA Pelvis CTA/MRA Mesenteric Ischemia CTA Pulmonary Embolism Protocol CTA Pulmonary Venous Protocol CTA Aortic Endograft Protocol CTA Coronary Arteries CT Calcium Scoring</p>
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Musculoskeletal Imaging

	CT	MRI
Musculoskeletal	MRI is the most accurate examination available for joints and the surrounding tendons, ligaments, and cartilage. It is especially helpful for any sports-related injuries. MRI is also helpful for persistent unexplained joint pain in the elderly as it is very sensitive in the detection of occult fracture in patients with osteopenia or osteoporosis.	CT is utilized under certain circumstances in evaluation of the bony structures and is usually requested specifically by the orthopedic surgeon. For most musculoskeletal issues, MRI is the imaging procedure of choice.

Neurologic Imaging

	CT	MRI
Brain	CT Head without contrast for initial evaluation of trauma/hemorrhage.	<p>MRI Brain with and without contrast for evaluation of infection, inflammation and neoplasm. If MRI contraindicated then a CT Head with and without contrast.</p> <p>MRI Brain without contrast for brain screen, acute stroke, TIA, dementia evaluation.</p> <p>MRI Brain with and without contrast for all others including suspected infection, inflammation, known malignancy, and seizure.</p>

	CT	MRI
Soft Tissue Neck	CT Soft Tissue Neck with contrast for evaluation all neck pathology except for suspected salivary gland mass, tongue and nasopharyngeal pathology.	MRI Soft Tissue Neck with and without contrast for evaluation of salivary gland mass, tongue and nasopharyngeal pathology or if recommended after initial CT.
Paranasal Sinuses	CT Sinuses without contrast for initial sinus evaluation.	MRI Sinuses with and without contrast for evaluation of sinus neoplasm or invasive inflammatory process if recommended after initial CT.
Face	CT Facial Bones without contrast for initial evaluation all pathologies including trauma.	MRI face with and without contrast subsequent to initial CT evaluation.
Orbits	CT Orbits without contrast for trauma evaluation or with and without contrast if MRI contraindicated.	MRI Orbits with and without contrast for initial evaluation infection, inflammation, neoplasm.
Pituitary	CT Pituitary with and without contrast only if contraindicated.	MRI Brain and Pituitary Gland for all suspected Pituitary/Sellar suprasellar and cavernous sinus pathology.
Temporal Bone	CT Temporal Bones without contrast for evaluation ossicles and other bony structures. Initial evaluation for all congenital, infectious, inflammatory and neoplastic processes.	MRI Internal Auditory Cancals with and without contrast for hearing loss and tinnitus or if recommended following initial CT.
Neck Vessels, Circle of Willis and Intracranial Circulation	CTA Head/Neck with and without contrast if there is a contraindication to MRI or for additional evaluation subsequent for initial MRA. For circle of Willis, performed with and without contrast and for directed evaluation of the neck vessel, perform with contrast only.	MRA Head without contrast for intracranial circulation-circle of Willis. MRA Neck with and without contrast for neck vessels. MRV Head with and without contrast for intracranial veins and dural venous sinuses.
Tempor-mandibular Joints (TMJ)	CT TMJ's/Mandible without contrast if MRI contraindicated.	MRI TMJ without contrast.
Spine	CT Spine without contrast for initial spine trauma evaluation.	MRI Spine with and without contrast for evaluation infection, inflammation, neoplasm and post operative spine. MRI without contrast for initial evaluation of neck and back pain with/without radiculopathy, or after initial CT for trauma. MRI with and without contrast for myelopathy, spinal cord compression, post operative spine, known or suspected malignancy, infectious or inflammatory process. If MRI is contraindicated then a CT with and without contrast should be performed.
Brachial Plexus	CT not indicated.	MRI Brachial Plexus for any suspicious brachial plexus pathology with and without contrast for suspected infection or neoplasm.