

Medical Imaging Recommendations Guide

For Healthcare Providers



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Contrast Guidelines

<i>Exam</i>	<i>Clinical Diagnosis</i>	<i>Contrast Usage</i>
CT/CTA		
CT Abdomen/Pelvis	Eval Abdominal Organs, Abdomen Pain, Eval or F/u Cancer, Eval Hernia, Post-Trauma for Injury to Organs	With IV Contrast
CT Abdomen/Pelvis	Kidney Stones, Contraindication to IV Iodine (Allergy, Poor Kidney Function)	Without IV Contrast
CTA Abdomen/Pelvis	Known AAA, AAA Endograft for Leak, Eval for Abdominal Aortic Dissection	Without & With IV Contrast
CT Chest (High-Res)	Eval Interstitial Lung Disease (ILD)	Without IV Contrast
CT Chest (Routine)	Eval Lung Mass/Abnormalities on X-ray, Susp. Primary Lung Cancer, Susp. Mediastinal Mass, Susp. Lung Abscess/Empyema, Initial Assessment of Pulmonary Nodules	With IV Contrast
CT Chest (PE)	Pulmonary Embolism	With IV Contrast
CT Chest	Surveillance of Known Lung Nodules	Without IV Contrast
CTA Chest	Acute Aortic Syndromes, Including Aortic Dissection, Intramural Hematoma Penetrating Atherosclerotic Ulcer, Aortic Aneurysm	Without & With IV Contrast
CT Enterography	Crohn's Disease, Eval Small Bowel Polyps	With IV and Special Oral Contrast
CT Facial Bones	Trauma, Post-Op or Pre-Surgery Planning, Eval Hardware	Without IV Contrast
CT Facial Bones/Neck	Eval Facial Swelling/Redness, Rule-Out Abscess/Mass, Lymphadenopathy	With IV Contrast
CT Head	Headaches, Post-Trauma for Injury/Bleeds, Post-Op Eval, Shunt or Other Placements	Without IV Contrast
CT Head (If MRI Contraindicated)	Eval Tumor(s)	With IV Contrast
CTA Head or Neck	Eval Arteries in Brain for Poss. Aneurysms and/or Blockage, Eval for Stroke	With IV Contrast
CT Liver w/ Pelvis (Triphasic)	Eval Liver Masses, HCC, Elevated LFTs, Liver Failure	With IV Contrast
CT Orthopedic/MSK		Without IV Contrast
CT Pancreas w/ Pelvis	Eval Pancreatic Masses	Without & With IV Contrast
CT Urogram	Renal Mass/Hematuria/UTIs, Rule-Out Urinary Tract Cancer	Without & With IV Contrast
CT Sinus	Acute/Chronic Sinusitis	Without IV Contrast
CT Soft Tissue Neck	Neck Mass, Soft Tissue Pathology, Neck/Facial Swelling/Redness	With IV Contrast
CT Spine (If MRI Contraindicated)	Trauma, Post-Op Eval, DDD/Narrowing	Without IV Contrast
CT Temporal Bones	Hearing Loss, Ear Pain, Trauma	Without IV Contrast

Contrast Guidelines

<i>Exam</i>	<i>Clinical Diagnosis</i>	<i>Contrast Usage</i>
MRI/MRA		
All MRA/MRI Abdomen /Pelvis Exams	Adrenal, Aorta, Liver, Gynecologic Organs, Kidney, Pancreas, Penis/Scrotum, Prostate, Rectum/Anus, Renal Arteries	Without & With IV Contrast
MRCP	Suspected CBD stone	Without IV Contrast
MRI Brain	Headache, Dizziness, Confusion, Stroke	Without IV Contrast
MRI Brain	Tumor, Infection	Without & With IV Contrast
MR Enterography	Abdominal Pain, Crohn's Disease	Without & With IV and Special Oral Contrast
MRI/MRA Neck		Without & With IV Contrast
MRI Orthopedic/MSK		Without IV Contrast
MRI Orthopedic/MSK	Suspected Tumor or Infection	Without & With IV Contrast
MRI Spine	HNP, Pain, Extremity Weakness, Tenderness, Cauda Equina	Without IV Contrast
MRI Spine	Suspected Abscess, Tumor, Recent Spine Surgery	Without & With IV Contrast

NOTES:

- If pt has history of recent or active cancer, order exam without & with IV contrast.

Body Imaging - Recommendations Guide

Clinical Signs & Symptoms

Clinical Diagnosis

Imaging Modality

Abdomen/Pelvis

Abdominal-Specific Indications

Abdominal Pain or Mass	Mass or Inflammation	CT
Acute Abdomen	Perforation, Free Air, Diverticulitis, Shortness of Breath, Ischemic Bowel, IBD, Omental Infarct	CT
Right Lower Quadrant Pain	Appendicitis	1. CT 2. Ultrasound
Weight Loss	Occult Primary Cancer	1. CT 2. MR

Adrenal-Specific Indications

Adrenal Mass	Cyst, Myelolipoma, Hemorrhage, Met, Lymphoma	1. CT (Adrenal Washout) Without & With IV 2. MR
Cushing's or Conn's Syndrome	Hyperplasia, Adenoma, Cancer	CT (Adrenal Washout)
Hypertension, Flushing, Rash	Pheochromocytoma	1. CT (Adrenal Washout) Without & With IV 2. MR
Non-Hyperfunctioning Adenoma	Met vs. Adenoma	1. CT (Adrenal Washout) Without & With IV 2. MR

Aorta-Specific Indications

Pulsatile Abdominal Mass	Aortic Aneurysm: 1. Screening or F/u 2. Rupture 3. Pre-Op Planning 4. Post-Op F/u	1. Ultrasound 2. CT 3. CTA or MRA 4. CTA
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Biliary-Specific Indications

Abnormal Liver Function Test	Mass or Obstruction	1. Ultrasound 2. CT 3. MR Cholangiography/ MR Liver
Cholangitis	Choledocholithiasis	1. Ultrasound 2. MRCP
Painless Jaundice	Biliary Obstruction	1. CT Pancreas 2. MR/MRCP
RUQ Pain	Acute Cholecystitis, Cholelithiasis, Biliary/Gallbladder Dysfunction	1. Ultrasound 2. CT 3. MRCP 4. HIDA (Nuc Med)

Body Imaging - Recommendations Guide

Clinical Signs & Symptoms

Clinical Diagnosis

Imaging Modality

Abdomen/Pelvis

Gastroenterology-Specific Indications

Abdominal Pain	Known or Suspected Crohn's Disease, or Other Inflammatory Bowel Disease (younger pts or previous significant radiation exposure)	1. CT Enterography 2. MR Enterography
Chronic GI bleed		CT Enterography
Post-Prandial Pain/Nausea	Gastric Outlet Obstrn/Gastroparesis	1. CT 2. Gastric Emptying (Nuc Med)
Rectal Cancer (Known)	Local Staging	MR
Rectal Pain, Fever	Perineal Abscess, Perianal Fistula	MR

Liver-Specific Indications

Abnormal Liver Function Test, Steatosis	Fatty Infiltration	MR
Hepatocellular Cancer/Mass	Cirrhosis, Hepatitis B	1. MR 2. CT Triphasic
Hypervascular Liver Metastases	Renal, Carcinoid, GTD, Thyroid, Melanoma, Islet Cell Cancer Pancreas, Leiomyosarcoma, GI Tract	1. MR 2. CT Triphasic
Mass <2cm	Cyst vs. Met vs. Hemangioma	MR
Mass >2cm	Hemangioma, Met, FNH, Adenoma	MR

Pancreas-Specific Indications

Elevated Amylase-Lipase	Acute Pancreatitis	CT
Endocrine Abnormality	Islet Cell Tumor Pancreas	1. CT Pancreas 2. MR
Pain, Steatorrhea	Chronic Pancreatitis	1. CT Pancreas 2. MRCP/MR
Recurrent Pancreatitis	Pancreas Divisum	MRCP/MR
Weight Loss, Back Pain	Pancreatic Cancer Suspected or Known (Staging)	1. CT Pancreas 2. MR/MRCP

Body Imaging - Recommendations Guide

Clinical Signs & Symptoms

Clinical Diagnosis

Imaging Modality

Abdomen/Pelvis

Urologic-Specific Indications

Complex Cyst on Ultrasound / CT	Hemorrhagic Renal Cyst	MR
Hematuria	Rule-Out Renal Cancer, TCC, Bladder Cancer	1. CT Urogram 2. MR
Hypertension	Renal Artery Stenosis	1. MR Angiography 2. CT Angiography, If Stent
Increase in PSA, Abnormal Digital Exam	Prostate Cancer	1. Multiparametric MR 2. Transrectal US Biopsy 3. CT
Pyuria, Fever, Flank Pain	Pyelonephritis/Hydronephrosis	1. US 2. CT Urogram
Renal Colic, Hematuria	Ureteral Stone	CT
Scrotal Mass/Pain	Testicular Cancer	1. US 2. MR

Chest

Abnl CXR-Hilar or Mediastinal Mass	Lung Cancer, Lymphoma, Sarcoid	CT
Abnl CXR-Interstitial Lung Disease	IPF, UIP, Sarcoid	CT w/ high resolution thin sections
Abnl CXR-Nodule	Lung Cancer, Metastasis, Granuloma	CT
Abnl CXR-Pleural Fluid and/or Mass	Empyema, Pleural Mass, Mesothelioma	CT
Dysphagia	Rule-Out Esophageal Cancer	CT or Esophogram
Known Lung Nodule $\geq 10\text{mm}$	Characterize, Rule-Out Malignancy	PET/CT
Lung Cancer (Known)	Staging	PET/CT
Non-Cardiac Chest Pain	Aortic Dissection	CT Angiogram
SOB, Dyspnea, Chest Pain	Pulmonary Embolus	CT Angiogram



Body Imaging - Recommendations Guide

Clinical Signs & Symptoms

Clinical Diagnosis

Imaging Modality

Pelvis/Abdomen

General Indications

Mass, Leg Swelling	Lymphadenopathy, Tumor	CT
Posterior Buttock/Leg pain	Lumbosacral Plexopathy	1. MR 2. CT

Gynecologic

Cervical Cancer	Local Staging	1. MR 2. CT
Endometrial Cancer	Local Staging	1. Ultrasound 2. MR 3. CT
Elevated BETA HCG	Gestational Trophoblastic Disease	1. Ultrasound 2. MR 3. CT
Abdominopelvic Mass (Suspected), Ascites, Increase in CA 125 Antigen	Rule-Out Ovarian Neoplasm	1. CT 2. MR
Adnexal Mass (Known)	Characterize	1. Transvaginal Ultrasound 2. MR
Infertility	Congenital Anomaly	1. Ultrasound 2. MR
Infertility	Tubal Patency	Hysterosalpingogram
Pelvic Pain, Anemia	Ectopic Pregnancy	Ultrasound
Pelvic Pain, Fever, Leucocytosis	Tubo-Ovarian Abscess	1. Ultrasound 2. CT
Pelvic Pain, Menorrhagia	Leiomyoma vs. Adenomyosis	1. Ultrasound 2. MR
Abnormal Post Uterine Bleeding	Hyperplasia, Polyp, Cancer	1. US w/ Possible Hysterosonography 2. MR

Thyroid

Thyroid Nodule or Goiter	Rule-Out Thyroid Cancer	US, Possible Biopsy
Hyper/Hypothyroidism	Assess Thyroid Function	I-123 Thyroid Scan (Nuc Med)
Thyroid Cancer (Known)	Initial Staging	1. Ultrasound 2. CT
Thyroid Cancer (Known)	Restaging	1. PET/CT 2. CT

Musculoskeletal Imaging - Recommendations Guide

<i>Clinical Signs & Symptoms</i>	<i>Clinical Diagnosis</i>	<i>Imaging Modality</i>
Musculoskeletal		
Ankle	Pain, Occult Fracture, Osteochondritis Dissecans, Achilles Tendon Tear, Tendon Tears, Tendonitis, Avascular Necrosis, Infection/Osteomyelitis, Tumor/Mass	MR
Ankle	Impingement	MR Arthrogram
Ankle	Complex Fracture	CT
Elbow	Pain, Occult Fracture, Distal Biceps Tendon Tear, Epicondylitis, Avascular Necrosis, Tumor/Mass, Infection/Osteomyelitis	MR
Elbow	Collateral Ligament Tear	MR
Elbow	Complex Fracture	CT
Foot	Pain, Occult Fracture, Infection/Osteomyelitis, Tumor/Mass, Plantar Fasciitis, Tarsal Coalition, Tendon Tears, Tendonitis, Avascular Necrosis	MR
Foot	Complex Fracture	CT
Hip	Pain, Occult Fracture, Avascular Necrosis, Infection/Osteomyelitis, Tumor/Mass, Bursitis, Myositis/Tendonitis	MR
Hip	Acetabular Labral Tear, Impingement	MR Arthrogram
Hip/Pelvis	Complex Fracture, Painful Arthroplasty	CT
Knee	Pain, Occult Fracture/Contusion, Avascular Necrosis, Meniscal Tear, Cruciate Ligament Tear, Collateral Ligament Tear, Osteochondritis Dissecans, Infection/Osteomyelitis, Tumor/Mass	MR
Knee	Internal Derangement—MR Contraindicated	CT Arthrogram
Knee	Complex Fracture, Painful Arthroplasty	CT
Shoulder	Rotator Cuff Tear, Occult Fracture, Pain, Tendonitis, Bursitis, Impingement Syndrome, Proximal Biceps Tendon Tear, Avascular Necrosis, Tumor/Mass, Infection/Osteomyelitis	MR
Shoulder	Glenoid Labrum Tear	MR Arthrogram
Shoulder	Internal Derangement—MR Contraindicated	CT Arthrogram
Shoulder	Complex Fracture, Painful Arthroplasty	CT
Wrist	Pain, Occult Fracture, Avascular Necrosis, Carpal Tunnel Syndrome, Tumor/Mass, Infection/Osteomyelitis	MR
Wrist	TFCC/Interosseous Ligament Tear	MR Arthrogram
Wrist	Complex Fracture	CT
Known Myeloma		1. PET/CT
Suspected Skeletal Metastasis	Bone Pain	1. Bone Scan (Nuc Med)
Suspected Soft Tissue Mass or Abscess		1. MR 2. CT (if MR contraindicated)
Ulcer/Infection	Rule-Out Osteomyelitis	1. MR 2. CT (if MR contraindicated or hardware present) 3. Bone Scan (Nuc Med)

Neuroradiology Imaging - Recommendations Guide

Clinical Signs & Symptoms

Clinical Diagnosis

Imaging Modality

Brain/Head

Any brain/head order with a diagnosis of aneurysm or family history of aneurysm will have an MRA of the Circle of Willis (COW) in addition to the routine brain scan.

Head/Brain

Acute Headache	Subarachnoid Hemorrhage	CT
Cranial Nerve Dysfunction	Neuritis, Tumor	MR
Fever and Headache	Brain Abscess, Encephalitis	MR
Fluctuating Neurologic Symptoms	Multiple Sclerosis, Lyme Disease	MR
Galactorrhea, Elevated Prolactin	Pituitary Adenoma	MR Pituitary
Head, Neck, Vascular Work-Up	TIA, Stroke	MRA Carotid and Circle of Willis (COW) CTA if MRA Contraindicated
Head Trauma	Subdural Hematoma, Parenchymal Hemorrhage	CT
Headache With Neurologic Deficit	Tumor	MR
Headache Without Neurologic Deficit	Tension Headaches	CT
Known Malignancy With Neurologic Deficit	Metastasis, Carcinomatosis	MR
Progressive Neurologic Symptoms	Tumor	MR
Seizures	Congenital Anomaly, Tumor	MR
Temporal Visual Field Cut	Pituitary Adenoma	MR Pituitary
Transient Ischemic Attack/Stroke (Symptoms less than 6 hours)	Bleed/Infarct	1. CT 2. MR
Transient Ischemic Attack/Stroke (Symptoms greater than 6 hours)	Bleed/Infarct	MR

Eye, Ear, Nose and Throat

Double Vision, Diplopia	Neuritis, Tumor	Brain and Orbit MR
Facial Pain, Draining Nose	Sinusitis	Sinus CT
Infection, Draining Ear	Cholesteatoma	Temporal Bone CT
Proptosis	Orbital Mass	CT Orbit and Pituitary Region
Tinnitus, Sensorineural Hearing Loss	Acoustic Neuroma	MR
Lymphadenopathy/Mass (Neck)		1. CT 2. MR
Head & Neck Cancer (Known)	Staging/Restaging	PET/CT

Spine

Myelopathy	Spinal Stenosis	MR
Progressive Spinal Cord Symptoms	Transverse Myelitis, Cord Tumor	MR
Radiculopathy	Osteophyte, Disc Protrusion	MR
Spine Pain With Known Malignancy	Metastasis	MR
Trauma	Fracture	CT

Interventional Radiology (IR)

The Interventional Radiologists from Midwest Radiology perform a variety of procedures at various hospitals in the Twin Cities and surrounding communities, including

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Outpatient Imaging Scheduling Information

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Images & Reports

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Portal.Help@MidwestRadiology.com

Contact a Radiologist

To speak with a radiologist, please contact:

West Metro (7 am to 10 pm - 7 days per week): 763.792.1973

East Metro (7 am to 10 pm - 7 days per week): 651.602.7237

West Metro & East Metro (10 pm to 7 am - 7 days per week): 651.602.7237

Website

www.MidwestRadiology.com