

## Contingency Plan & Protocols for CT Contrast Exams

### CT Studies Requiring Iodinated Contrast Media

Examination
<ul style="list-style-type: none"> <li>• CT pan-scan for major trauma category</li> </ul>
<ul style="list-style-type: none"> <li>• CTA/CTP stroke code</li> </ul>
<ul style="list-style-type: none"> <li>• CTA aorta for evaluation of aortic dissection in an unstable patient</li> </ul>
<ul style="list-style-type: none"> <li>• CTA pulmonary embolism</li> </ul>
<ul style="list-style-type: none"> <li>• CT abdomen for ischemic bowel</li> </ul>
<ul style="list-style-type: none"> <li>• Initial staging with established cancer diagnosis</li> </ul>

- Delay exams up to 3 months for routine contrast-enhanced CT examinations for follow-up of diseases such as cancer, stable aneurysm, post-treatment aneurysm (when the patient is asymptomatic and without clinical evidence for disease progression). Delaying imaging should be a consideration both for exams being scheduled and those already scheduled.
- Non-contrast CT could be considered for some initial screening examinations, such as CT of the head and neck to evaluate for infection. If there is a positive finding potentially indicating infected fluid collection, follow-up MRI can be performed, or if contraindicated, CT with contrast. Patients undergoing CT of the abdomen and pelvis for abdominal pain or distension with concern for hernia, diverticulitis, appendicitis, abscess, or bowel obstruction can be performed without ICM. Similarly, oncology patients undergoing follow-up CT of the chest, abdomen, and pelvis for testicular or prostate cancer, lymphoma, leukemia or myeloma, or CT neck in the setting of lymph node follow-up, can be performed without ICM. Follow-up CT imaging post abscess drainage or immediate post-surgical CT scans can also be performed without ICM. Imaging for patients with minor trauma can also be done without contrast.
- Due to shortage of IV contrast and to maintain a supply for exams in which IV contrast is critical to use, the radiology department is now temporarily recommending NO IV CONTRAST for the following indications.

Neck – possible infection	CT Neck without contrast
Chest – infection or pleural effusion	CT Chest without contrast
Abdominal or pelvic wall hernia	CT Abdomen and pelvis without contrast
Diverticulitis, appendicitis, bowel obstruction	CT Abdomen and pelvis without contrast
Abscess	CT Abdomen and pelvis without IV (with optional oral)
Abdominal Pain or distension	CT Abdomen and pelvis without contrast
Testis, prostate, lymphoma, leukemia, myeloma	Certain cancer follow-up not always require IV

- Immediate changes to the administered dose of ICM may be considered. For departments that use weight-based dosing protocols, dose reduction by 20 - 30% may be successfully implemented. Online weight-based calculators are available for dose calculation. For imaging departments not using weight-based dosing for CT, we suggest an across-the-board reduction in dose by 20-30 mL for all indications when using multi dose vials and injectors. For single use vials, imaging departments may consider rounding down to the dose available in the nearest lower single-use vial if within 10-20 ml. For example, if 110 ml is needed based on weight-based dosing, round down to use the 100 ml vial (rather than 125 ml vial). For the smallest adults, consider adjusting the lowest administered dose to 60 ml.
- Imaging departments are encouraged to review CT protocol parameters to maximize image contrast for any given dose of ICM, including implementing a) lower kV image acquisition and b) dualenergy CT for dose reduction. In all cases an attempt should be made to minimize repeat administration of ICM by reviewing and reinforcing image acquisition timing strategies and breath- holding instructions.

## **Oral Contrast**

- **STAT cases:**
  - Hold oral contrast except in cases of confirmed or suspected GI tract perforation, or in cases deemed necessary by the ordering clinician and/or radiologist. Use water soluble contrast (I.e. Isovue or Omnipaque) in these select cases.
- **Outpatient cases:**
  - Hold oral contrast, except in cases deemed necessary by the ordering clinician and/or radiologist.
  - Routine outpatient exams (such as oncology follow-up) requiring oral contrast can use Redicat (dilute barium).
  - Routine outpatient exams in cases of known or suspected GI tract perforation should still use water soluble contrast (I.e. Isovue or Omnipaque).

## Triage of Vascular and Interventional Procedures Requiring Use of Iodinated Contrast Media

	<b>Emergent (Do Now)</b>	<b>Delay by up to 1 month</b>	<b>Delay by 3 months</b>
Vascular Procedures	<ul style="list-style-type: none"> <li>• Active hemorrhage</li> <li>• Large aneurysms with concern for impending rupture (ex: splenic aneurysms)</li> <li>• Bowel ischemia</li> <li>• Limb ischemia</li> <li>• Arteriovenous malformation/fistulas with clinical manifestation of cardiac decompensation</li> <li>• Large renal angiomyolipoma at risk of impending rupture</li> <li>• Interventional oncology procedures</li> <li>• Acute venous thromboembolic event with clinical instability</li> <li>• TIPS for acute bleeding refractory to GI procedures</li> <li>• Dialysis arteriovenous graft/fistula occlusion</li> </ul>	<ul style="list-style-type: none"> <li>• Stable endoleak s/p AAA repair</li> <li>• Stable splenic artery aneurysm embolization</li> <li>• Venography dialysis access interventions</li> <li>• TIPS revision</li> </ul>	<ul style="list-style-type: none"> <li>• Uterine fibroid embolization</li> <li>• Prostate artery embolization</li> <li>• Stable angiomyolipoma embolization</li> <li>• Stable arteriovenous or venous malformations embolization</li> <li>• Chronic venous recanalization</li> <li>• Venous stenting</li> <li>• Venous embolization</li> <li>• IVC filter retrieval</li> <li>• Venous sampling</li> </ul>
Neuro-interventional Procedures	<ul style="list-style-type: none"> <li>• Acute stroke thrombectomy</li> <li>• Aneurysmal rupture</li> <li>• Active hemorrhage</li> </ul>	<ul style="list-style-type: none"> <li>• Stable/small aneurysm/arteriovenous fistula, arteriovenous malformation</li> <li>• Inferior petrosal sinus sampling</li> </ul>	<ul style="list-style-type: none"> <li>• Follow-up diagnostic angiograms</li> <li>• Tumoral embolization</li> <li>• Middle meningeal artery embolization</li> <li>• Spinal angiogram</li> <li>• Wada testing</li> </ul>
Non-vascular Procedures	<ul style="list-style-type: none"> <li>• Obstruction of the biliary or renal collecting system</li> </ul>	•	•

**Potential Imaging Alternatives to Be Considered Due to Shortage of CT with Iodinated Contrast Media**

<b>Indication for CT scan with iodinated contrast</b>	<b>Alternative Examination</b>
Renal obstruction	Renal ultrasound
Biliary obstruction	RUQ or abdominal ultrasound or MRI/MRCP
Metastatic work-up	PET/CT
Renal mass work-up	Contrast-enhanced ultrasound or MRI
Chest pain (coronary CTA)	Nuclear medicine cardiac stress testing, MRI stress perfusion
Abdominal wall hernia	Soft tissue ultrasound, non-contrast CT
Pancreatitis	MRI/MRCP or non-contrast CT
GI bleed	Nuclear medicine tagged RBC scan
Abdominal or pelvic mass characterization	MRI abdomen or pelvis
Venous obstruction (CT venogram)	MR venogram
Inflammatory bowel disease	MR enterography
Stroke	MR & MRA brain
Suspected ascending aorta dilatation	MRA chest
Upper and Lower extremity arterial disease	MRA or Ultrasound
Deep venous thrombosis	Ultrasound or MRV
Acute cholecystitis	RUQ ultrasound or nuclear medicine scintigraphy