



TITLE: CT Administration of Iodinated Contrast Media			
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Approved by: CT Quality and Safety Committee			

TITLE: *CT Administration of Iodinated Contrast Media*

PURPOSE: To provide guidelines to reduce the incidence of adverse effects from iodinated contrast agents in patients who undergo contrast-enhanced computed tomographic imaging.

POLICY:

1. Contrast media injections are performed by a physician, nurse or by technologist who has documented training in IV puncture and is familiar with this policy.
 - a. Staff who administer contrast must complete an annual IV in-service.
2. Outpatients are given a screening form to fill out.
3. Patients who are on Metformin/Glucophage (Glucovance, Advanamet, Metaglip, ACTOplusmet, Janumet, Fortamet, Glumetza, Riomet, Glycon, etc.) for Diabetes should refrain from taking this medication for 48 hours after the administration of IV iodinated contrast (unless instructed otherwise by their physician).
4. Patients who indicate they are “high risk” on the screening form will be questioned by the technologist as to why. Further decision making will be left to the Radiologist.
5. Indications for Glomerular Filtration Rate (GFR) measurement before intravascular administration of iodinated contrast include:
 - a. Age ≥ 60 years
 - b. History of “kidney disease” or renal insufficiency, including tumor or transplant
 - c. Hypertension
 - d. Diabetes
 - e. Collagen vascular diseases
 - f. Paraproteinemia syndromes/diseases (e.g. myeloma)
 - g. Collagen vascular diseases
6. Lab results obtained within the last 30 days are considered current and sufficient. If lab results were obtained more than 30 days ago, repeat labs will need to be drawn.

7. GFR \geq 30 is considered safe for administration of iodinated contrast media. The technologist MUST consult with a radiologist prior to administration of contrast to patients with GFR $<$ 30 or who is receiving temporary dialysis. This consultation should be documented in the RIS. The GFR value is based on 2 recent studies cited in the 2016 ACR Manual on Contrast Media. <https://www.acr.org/Quality-Safety/Resources/Contrast-Manual>
8. If a patient has well-documented end-stage renal disease with no significant residual renal function (patient does not make significant urine) and no hope of recovering native renal function, then iodinated contrast can be given regardless of the patient's dialysis schedule. For these patients, there is no reason to adjust their dialysis schedule.
9. For ED and Inpatients, labs and pertinent medical history are reviewed prior to performing contrast-enhanced studies by the technologist. The technologist may question the patient to obtain additional information and determine if the patient is high risk.
10. The technologist will document the amount, concentration, and type of iodinated contrast administered to the patient.
11. All medications including contrast media are kept under lock and key when not in use. Contrast media is controlled, distributed and inventoried by the UMC Pharmacy.
12. **Contrast Reactions:** Adverse events (i.e., hives, rash, etc.) following contrast injection should be reported immediately to a licensed physician and the radiology nurse assigned to the location or department where the contrast is being administered. The physician called to assess the patient will determine the appropriate action based upon the severity of the contrast reaction.
 - a. If the physician concludes that the patient is undergoing a severe allergic reaction, including cardiac or respiratory arrest:
 - i. Hospital-based: A Code Blue is called to active the hospital rapid response team to the relevant imaging department.
 - ii. Outpatient center: 911 will be called; the physician, nurse and technologists will provide Basic Life Support measures until arrival of EMS.
 - b. Posters containing contrast reaction treatment algorithms are posted in the CT scanning suites for quick reference.
 - c. Complete Crash Carts are located in the CT and Interventional Radiology areas. In addition, there are complete "Crash Boxes" maintained and supplied by pharmacy. These boxes are checked and logged every shift in the Radiology Emergency Box Log Book by the supervisor or designee.
 - d. All patients with adverse occurrences should be evaluated by a physician prior to administration of medication.
 - e. All patients with adverse occurrences should be evaluated by a physician prior to leaving the department/imaging center.

- f. An incident report must be submitted to the UHC Safety Intelligence system and documentation should be entered into the Radiology Information System (RIS) and in the radiology report for future reference.
 - g. All Adverse Drug Events have a retrospective review performed by pharmacy.
13. **Contrast Pre-Treatment:** If the patient has suffered an IV contrast reaction, the patient will need to be pre-medicated for future exams. This should be documented in the radiology report as well as the RIS.
- a. The following pre-procedure medication should be given:
 - i. Methylpredisolone 32mg PO 12 hours and 2 hours prior to procedure
 - ii. Benadryl 50mg PO 1 hour prior to procedure
 - iii. OR per ordering MDs recommendation
 - b. If the patient had a true anaphylactic reaction they should never receive IV contrast.
 - c. Patients receiving Benadryl will need supervised transportation; Benadryl is a sedative.
 - d. The patient can still be given contrast if Benadryl is not given prior to the examination; there is no need to reschedule. The steroids are the important component of the pre-treatment regimen.
14. **Extravasations:** In the event of a contrast extravasation, the technologist must submit an incident report to the UHC Safety Intelligence system and documentation should be entered into the RIS. The extravasation amount, intervention, and outcome should all be documented.
- a. All patients with IV infiltration should be evaluated by a physician prior to leaving the department.
 - b. Affected extremity should be elevated; cool compress should be applied.
 - c. Pulses and neuro checks distal to the site of extravasation should be performed periodically to evaluate for vascular or neurologic compromise.
15. **Oral Contrast:** When to give oral contrast and what type of oral contrast to give should be left to the discretion of the radiologist if there is a question. The radiologist can make an informed decision based on the clinical question and, if need be, in consultation with the referring physician. Some general guidelines include:
- a. Patients with IV contrast allergies should never receive oral iodine-based contrast agents such as Gastrografin or Omnipaque. If oral contrast is needed, Barium-based contrast agents should be used.
 - b. Barium is preferred in patients who are high-risk for aspiration.
 - c. Water-soluble iodinated contrast agents such as Gastrografin or Omnipaque are preferred in patients who are at risk for bowel perforation.
 - d. Standard preparation of oral contrast for CT scanning is 30 ml water-soluble contrast (Gastrografin) diluted in 1000 ml clear fluid OR 450 ml of barium solution.
 - i. Outpatients are typically given a Barium-based PO contrast solution. Barium comes in ready-made 450 ml suspensions of 2 concentrations: 2% Barium Sulfate (ReadiCat2) and 0.1% Barium Sulfate (VoLumen).
 - 1. VoLumen is the contrast agent of choice for CT enterography
 - 2. For most other indications ReadiCat is preferred

- ii. Inpatients and ED patients are typically given a water-soluble iodine-based PO contrast solution as risk of perforation is higher among this patient population.
- iii. Oral contrast is typically administered at least 60 minutes prior to the scan, but timing of administration should be tailored to the patient and the clinical question.