Posted 5/13/09

UAB Department of Radiology Guideline on IV Injection Techniques and Quality Monitoring for CT – University and UAB Highlands Hospitals

This document addresses the decision-making process regarding issues of IV contrast administration. The following topics are covered:

- **Procedure for technologists to determine whether to administer IV contrast for CT and the appropriate dose**
- **Acceptable intravenous access routes and lines**
- **Contrast Infiltration/Extravasation**

Procedure for technologists to determine whether to administer IV contrast for CT and the appropriate dose

The CT technologist will review the clinical indication entered by the requesting physician and administer IV contrast per radiologist protocol according to the following process:

The CT technologist will review the patient's most recent creatinine and estimated GFR. The technologist will also check for a pending creatinine. An estimated GFR in RadNet is not acceptable. An original laboratory report must be reviewed. The technologist must discuss an abnormal creatinine/GFR with the appropriate radiologist prior to IV contrast administration, for their decision whether to administer IV contrast and, if so, the appropriate dose.

- The CT technologist will review the patient's chart, Cerner and Horizon for allergy information and relate all pertinent information to the appropriate radiologist prior to IV contrast administration.

- The CT technologist will review the patient's medical history and relate significant information to the radiologist prior to scanning. To include:

    - Contrast Allergy or Multiple Food / Drug Allergy History
    - Renal Disease/Renal Insufficiency
    - Abnormal Serum Creatinine and/or Estimated GFR
    - Use of Metformin
    - Pregnancy
    - Breastfeeding
    - Over 70 years old

- The CT technologist will document the following in the logbook for all patients receiving IV Contrast:

- Name, strength, and volume of IV contrast given and estimated GFR
    - Current creatinine value, date and verifying technologist's initials.
    - Verification of patient identification
    - Patient weight
    - Name of radiologist approving contrast administration if the creatinine/estimated GFR is abnormal
    - Name of radiologist requiring IV contrast be given when the CT order was requested without contrast
    - Name of radiologist who was informed of pertinent disease status and the dose of contrast the radiologist approved.

- A chief resident, fellow, or attending physician in the Department of Surgery, Emergency Medicine, or Neurology has the authority to instruct the CT technologist to proceed with administration of IV contrast if either the creatinine or estimated GFR are abnormal. The CT technologist will notify the radiologist and document in the CT Logbook "Creatinine (or eGFR) [insert value]. IV contrast approved by Dr._____ because emergent."

- A chief resident, fellow, or attending physician in the Department of Surgery, Emergency
  Medicine, or Neurology may determine that CT cannot safely be delayed until a creatinine is obtained. These physicians have the authority to instruct the CT technologist to proceed with the administration of IV contrast in the absence of an available creatinine value. The CT technologist will notify the appropriate radiologist and document in the CT Logbook "Labs deferred per emergent order of Dr.______."

Acceptable intravenous access routes and lines

- Administration of IV contrast using a power injector should be through a 20 gauge or larger IV access. Acceptable needles, lines and routes for power injection:
    - 18 gauge preferred for CT Angiograms.
    - External Jugular (EJ) angiocath may be used with maximum injection rate of 2 ml per second and 150 psi.
    - CT Injectable PICC, Power PICC, and Power Port lines may be used to inject IV contrast after aspirating and discarding blood from the line.
    - Trauma Cath
    - Pressure injectable central venous catheter
    - Lower Extremity IV access will be reviewed case by case with the appropriate Radiologist and the radiologist will determine the most appropriate method of contrast administration.

- Consult radiologist if there is no other IV access. Patient should not be turned away without consulting the radiologist or radiology resident. 3-phase exams will not be performed using IV access in lower extremity; nor will any CT technologists place an IV access in the lower extremity.

- Administration of IV contrast by **hand injection only** for the following catheters:
    - 22 gauge angiocath
    - Hickman
    - Central Venous Catheter
    - Internal Jugular (IJ) angiocath

- **Special Note:** Vas-Cath® and Permcath® catheters being used for dialysis may be used to administer IV contrast **only with the approval** of the radiologist who will interpret the exam and the nephrologist requesting the CT exam. The Vas-cath or Permcath line should be aspirated, to remove the heparin, prior to injecting saline or contrast.

- **Unacceptable** lines for IV contrast injection:
    - Swan-Ganz
    - Mediport
    - Groshon
    - PICC line, if not one of the injectable types noted above

Contrast Infiltration/Extravasation

Documentation of contrast infiltrations will be performed through Trend Tracker incident tracking system, logbook documentation; and a scout image should be taken, which includes the infiltration site, using the following procedure:

- A scout image of the injection site should be taken, and sent to PACS.

- A radiologist, radiology resident, or ED physician should evaluate the contrast infiltration/extravasation site.

- A radiologist or radiology resident and nurse responsible for the patient should be notified of the contrast infiltration/extravasation.

- The IV access should be removed after the physician evaluates the infiltration/extravasation site.

- Logbook documentation should reflect the volume of the infiltration, name of radiologist who was notified, and radiologist adjusted contrast dose.

- The Trend Tracker incident report (for Risk Management) will be completed to document the contrast infiltration/extravasation. The following information should be included in the Trend Tracker incident report:

    - Estimated volume and type of the contrast infiltrated/extravasated.
    - Gauge of IV access.
    - Location of the IV access

- Who started the IV access
- Who monitored the injection of contrast
- The rate of injection
- Name of radiologist and nurse who were notified of the contrast infiltration/extravasation.
- Patient's room number
- Level of pain expressed by the patient. (i.e. Mild, Moderate, or Severe)

Policy approved by:

______________________________________ ____________________

Lincoln L. Berland, M.D. Date

Vice-Chair for Quality Improvement and Patient Safety

______________________________________ ____________________

Reginald Munden, D.M.D., M.D. Date

Chairman, Department of Radiology

Version: May 13, 2009