**Rationale**: Ferumoxytol (Feraheme) is approved for use as an iron replacement therapy. The agent can also be used off-label as an MRI contrast agent.

* Pharmacokinetics: Due to its large particle size, this blood pool agent remains in the intravascular space for much longer than typical gadolinium containing contrast agents. Over time (days to weeks) the agent is processed by the reticuloendothelial system and will eventually collect in the reticuloendothelial system (i.e., the liver and spleen).
* Safety profile: The major concern is the development of **anaphylaxis**, which occurs in roughly 1:10,000 patients and death occurring in 1:50,000 patients. In 2015, the FDA released a box warning for Ferumoxytol outlining the risk of anaphylaxis
  + Additionally, the most common adverse reactions are nausea (3.1%), dizziness (2.6%), hypotension (2.0%) and peripheral edema (2.0%).

**Indications**: **(1)** *Contrast-enhanced MRA in patients with renal disease*. Due to the risk of nephrogenic systemic fibrosis in patients with a GFR < 30, gadolinium based contrast agents are contraindicated. Although ferumoxytol is not approved for use as an MRI contrast agent, it has no known nephrotoxicity and may be considered *when there is clinical benefit of ferumoxytol-enhanced MRI that outweighs the risk of allergic reaction*. **(2)** Ferumoxytol may also be use when its role as a blood pool MRI contrast agent is deemed clinically indicated by both the referring provider and radiologist.

**Protocol**:

* Patient screening: all studies should be approved by an attending radiologist.
  + Consent is required prior to administration (can be obtained by trainee) using standard procedure consent form
  + Ferumoxytol is contraindicated in patients with history of allergic reactions to iron formulations (iron dextran, ferrlecit or venofer).
  + Consider carefully the risk of allergic reaction in patients with multiple drug allergies or serious medical conditions.
* Administration: Ferumoxytol comes in a 17 mL vial with 510 mg of iron (30 mg / mL).
  + Dilution: The agent will be diluted with saline by nursing (12 mL of Ferumoxytol with 48 mLs of saline to make a total volume of 60 mLs).
    - Typical steady-state imaging uses 40 mLs of diluted agent (1-5 mg /kg).
    - A test bolus is not required prior to administration.
  + Infusion should only be performed in the hospital setting where nursing and physician support is available during regular business hours on a gurney.
  + Whenever possible, the diluted agent should be injected as a **slow infusion** in the holding room prior to MR imaging.
    - As protocoled, certain indications may require dynamic imaging and injection may occur within the magnet at a rate of 1-2 mL/s followed by a saline bolus. Injection should be observed by nursing or physician staff.
* Observation: During injection patients should be observed for signs of anaphylaxis. Additionally patients should be queried about symptoms of reaction (dizziness, light headedness, trouble breathing) prior to leaving the imaging facility. Patients should not leave the department until at least **30 minutes** after Ferumoxytol administration.