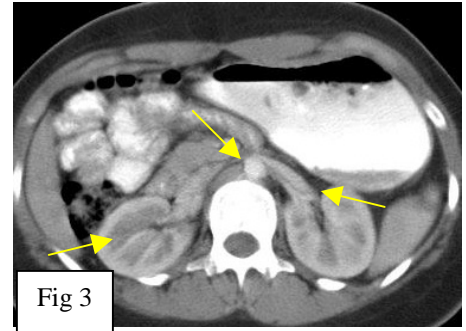
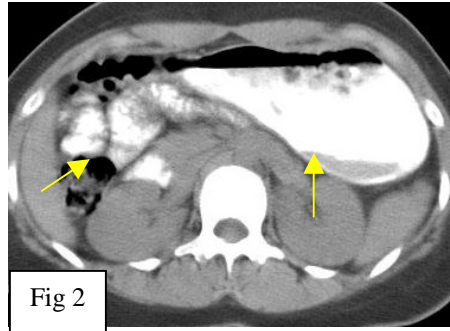
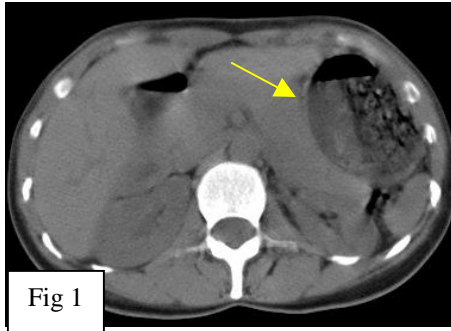


## When Is A Contrast Agent Necessary?



Contrast agents, also referred to as dye, are used to emphasize specific areas in question so that organs, vessels, and tissues being imaged are visible in better detail. By increasing the visibility of surfaces and internal portions of the tissues being studied, contrast helps the interpreting physician determine the presence and degree of injury or disease. For the convenience of both referring physicians and patients, the following is a brief guide of the contrast agents used at Advanced Imaging Center. For specific questions regarding a patient or study, please feel free to contact us at any time.

### CT Contrast

**Oral:** Oral contrast is used to opacify the lumen of the gastrointestinal tract in studies of the abdomen and pelvis. At AIC, two types of oral contrast are used: barium sulfate and gastrografin. Barium sulfate is like a milkshake in appearance and consistency. It is biologically inert and is not absorbed or metabolized by the body. Gastrografin is a clear, water-based drink mixed with iodine. In some instances, contrast is given rectally to better opacify distal bowel. In general, both barium and gastrografin contrast are safe. Minor side effects such as stomach upset may occur. More serious side effects are rare (approximately 1 in 1,000,000 patients).

**Intravenous:** Intravenous (IV) contrast is used to enhance vessels and organs in all studies except those that are done to specifically evaluate the skeletal system. Structures highlighted by this process show up as bright areas on CT images. The contrast agent is a clear, iodine-based substance that is injected through a small IV during part of the exam. The kidneys eliminate the contrast from the body within a few hours. Iodine is a safe contrast agent. At AIC, we use what is called a low osmolar contrast material. It is more expensive than standard contrast, but provides for lower rates of adverse reactions. Serious reactions occur in roughly 0.01% of patients. Contrary to popular belief, patients who have asthma or an allergy to shellfish are only slightly more likely to have a reaction.

### MRI Contrast

**Intravenous:** Intravenous contrast is also used to enhance vessels and organs in MRI. The contrast used in MRI is gadolinium and is very different from iodine-based contrast agents used for CT studies. At AIC, the specific type of contrast we use is called gadopentate dimeglumine. This contrast is derived from a rare earth metal and is a clear, sterile, colorless liquid. This contrast has unique magnetic properties that result in characteristic behavior when placed in a magnetic field such as in an MRI machine. Gadolinium helps to enhance vessels and regions of the head, neck, spine, and other tissues and organs. This is especially helpful in subtle lesions or areas of the body where a person has had previous surgery. In some cases, gadolinium can even be injected intraarticularly to give exquisite detail of a joint. Gadolinium is extremely safe. Minor reactions such as nausea occur in less than 1% of patients. More serious reactions are exceedingly rare.

So, how does all of this look? **Figure 1** is a CT of the abdomen **without contrast**. Organ borders and vessels are poorly distinguished. Only the stomach can be easily identified. **Figure 2** is a CT with **oral contrast**. The stomach and loops of bowel are opacified and distended, but vasculature and organ details are still limited. **Figure 3** is a CT with **oral and IV contrast** that highlights vessels and organ details and provides high diagnostic value for lesions that might be in bowel or other areas of the abdomen.