

## Gadolinium Contrast Agents and Your Magnetic Resonance (MRI)

The FDA approved gadolinium-based contrast agents (GBCA) in 1988 and since then they have been used in more than 300 million patients worldwide to guide diagnosis and treatment, according to the American College of Radiology (ACR). ACR affirmed that gadolinium-based contrast agents “provide crucial, life-saving medical information.”

### *Why is contrast needed?*

Contrast agents (also known as contrast media or contrast materials), are used to improve images of the inside of the body produced by xrays, CT, MRI, and ultrasound. Contrast is used to allow the radiologist to distinguish normal from abnormal conditions. When it enters the body prior to an imaging exam, a contrast agent can make certain structures or tissues in the body appear different on the images than they would if no contrast agent had been used.

### *What is gadolinium-based contrast?*

Gadolinium is the key component of the contrast agent used in MRI exams. When this substance is present in the body, it changes the magnetic properties of nearby water molecules, which enhances the quality of MRI images. Gadolinium is less likely to produce an allergic reaction than the iodine-based agents used for x-rays and CT imaging. Very rarely, patients are allergic to gadolinium-based contrast agents and experience hives and itchy eyes. Reactions usually are mild and easily controlled by medication. Severe reactions are rare. Gadolinium-based contrast agents may be withheld in some patients with severe kidney disease.

### *What types of diagnoses would be missed without the contrast?*

There are countless examples. A few include cancer and blood clots. Use of a contrast agent is not only important for diagnosis and exclusion of many critical diagnoses, but it also is necessary for monitoring treatment response and defining disease extent in many conditions.

### *What to expect before and after receiving gadolinium-based contrast:*

When the gadolinium is injected (usually in the arm), it is normal to feel coolness at the site for 1-2 minutes. The needle may cause you some discomfort when it is inserted. Once it is removed, you may experience some bruising. If you have not been sedated, no recovery period is necessary. You may resume your usual activities and normal diet immediately after the exam. Increased fluid intake will help eliminate the contrast material from your body.

### *Are concerns warranted?*

Gadolinium containing compounds have been administered to hundreds of millions of patients and, compared with other drugs, have a very robust safety profile in most clinical settings. However, the ACR, Radiological Society of North America (RSNA), and other radiology organizations are taking the issue of gadolinium retention (a.k.a. gadolinium deposition) seriously. The radiology community continues to encourage research to better understand its clinical significance. In the meantime, the risk-benefit equation in most situations favors continued use of gadolinium-containing contrast media for indicated examinations according to ACR guidelines.

The concern is that tiny traces of gadolinium may be retained in different organs of the body, including the brain, after contrast-enhanced MRI exams, as with other medical concerns, patients should speak with their doctor about their individual care decisions. Both the choice to receive a contrast agent and the choice to refuse a contrast agent, when it otherwise would be indicated, can have potential health consequences.

*Where can patients learn more about this subject?*

Patients who are considering an imaging exam that may involve contrast material may visit [www.RadiologyInfo.org](http://www.RadiologyInfo.org), under the Safety, Contrast Materials section. This is a public information website co-operated by the American College of Radiology and Radiological Society of North America. It provides information that may answer many questions about medical imaging exams, related procedures, and radiation therapy techniques. This information can empower patients to ask questions of their health care providers.

*Do some patients have a higher risk for gadolinium retention?*

Patients who may be at higher risk for gadolinium retention include those requiring multiple MRI with contrast exams particularly when closely spaced in time, children, and patients with inflammatory conditions. However, to date, the only known adverse health effect related to gadolinium retention is a rare condition called nephrogenic systemic fibrosis (NSF) that occurs in a small subgroup of patients with pre-existing kidney failure.

Be sure to tell your health care professional about all your medical conditions, including

- The date of your last MRI with contrast and if you have had repeat scans with contrast
- If you have kidney problems
- If you are pregnant or think you might be pregnant

*Is gadolinium-based contrast safe for pregnant women?*

Gadolinium will not be administered if you are known to be pregnant. Prior to any imaging exam, women should always inform their physician and the MRI technologist if there is any chance they are pregnant.