Gadolinium-based contrast agents (GBCAs) are used for a wide range of clinical applications and play an essential role in modern medical diagnosis. In 2008, approximately 29% of the 36 million MRI procedures performed in the US employed a GBCA, including more than one million contrast-enhanced MRAs, an “off-label” use (i.e. non-FDA approved) of GBCAs. While MRI and GBCA use has continued to rise, the revelation of an association (likely causative) between GBCAs and nephrogenic systemic fibrosis (NSF) in 2006 has led to important changes in clinical practice and a precipitous decrease in the number of new cases of NSF.

Changes in clinical practice engendered by NSF include;

- Increased use of macrocyclic GBCAs and decreased use of non-ionic linear agents. As of 2008 (the last year for which industry data is available) the use of ionic linear agents has increased slightly in the US.

- Increased use on non-contrast MRI/MRA and other alternative imaging algorithms rather than GBCA-enhanced MRI/MRA in patients with compromised renal function

- Screening for CKD and AKI prior to administration of GBCA has become common, although screening practices vary widely

- “High dose” MRI/MRA has become less common

- “Low dose” (i.e. lower than FDA approved dose) MRI/MRA, has become common, especially using high relaxivity GBCAs

- Patients with compromised renal function are less likely to get repeat doses of GBCA at short time intervals

- Weight-based dosing is more common

- Accurate documentation of dose and specific GBCA is more common

An FDA Medical Advisory Panel meeting on December 8, 2009 addressed the relative risks (NSF, CIN, others) associated with the various GBCAs and raised a concern about the possible impact that changes in clinical practice may have on patient care. There is anecdotal evidence, but no hard data, to suggest that, in effort to limit risk of NSF, some may be using suboptimal or non-diagnostic dose in some instances.