



Marietta Imaging Center

SUMMIT
RADIOLOGY SERVICES P.C.**INFORMING AND EDUCATING THE MEDICAL
COMMUNITY****MRI CONTRAST AGENT GADOLINIUM and
NEPHROGENIC SYSTEMIC FIBROSIS****ERIC LINDSTROM M.D.**

WE AT SUMMIT RADIOLOGY RECOGNIZE THE IMPORTANCE OF SCREENING OUR PATIENT'S PRIOR TO GADOLINIUM EXPOSURE AND WANT TO PASS THIS INFORMATION ON TO YOU SO THAT YOU MAY ASSIST US WITH RISK STRATIFICATION AND AVOIDANCE OF EXPOSURE WHEN NECESSARY.

History: Since 1997 there have been approximately 200 case reports of an adverse reaction to Gadolinium contrast in patients with severe renal deficiency resulting in a process called Nephrogenic Systemic Fibrosis. NSF was previously known as Nephrogenic Fibrosing Dermopathy however after evidence surfaced that the condition could also affect the internal organs, the description of this rare disorder was altered. A small study by Deo et al, Clinical Journal of the American Society of Nephrology reports the risk of NSF in patients with ESRD to be 2.4%. Assessing the true risk of this disease is difficult given the rarity of this disorder and the limited power of any ensuing study. The risk of this reaction in patients with mild to moderate renal insufficiency is unknown. There have been no reports by the FDA of NSF in Stage 1-3 renal insufficiency(GFR>30) by the FDA as of 5/07, their most recent advisory.

Description: Patients with this condition develop fibrosis of the skin and connective tissues throughout their body. The skin thickening may inhibit flexion and extension of joints resulting in contractures. In addition, patients may develop widespread fibrosis of other organs. A skin biopsy is necessary to confirm the diagnosis. The condition may be debilitating or cause death. Its cause is unknown and there is no consistently successful treatment. There has been conjecture that the cause is precipitation of Gadolinium in the soft tissues from the parent compound and reports of improvement with Sodium Thiosulfate (chelating agent); however this is speculative at this point.

Inciting agents: NSF has been reported following administration of all five FDA approved gadolinium-based contrast agents (Magnevist, MultiHance, Omniscan, OptiMARK, and ProHance). There have been mixed reports in regards to relative risk among agents.

Latency: The reported time between receiving Gadolinium and subsequent diagnosis of NSF diagnosis is highly variable. Reported times range between 2 days to 18 months. Screening (adapted from FDA and ACR guidelines 5/07 and 7/07):

SCREENING GUIDELINES ON REVERSE

PLEASE ASK YOUR PATIENTS THE FOLLOWING QUESTIONS PRIOR TO REQUESTING A CONTRAST ENHANCED MRI. A "YES" TO ANY OF THESE QUESTIONS PROMPTS THE NEED FOR OBTAINING A CREATININE ON YOUR PATIENT'S BEHALF IF NO VALUE IS AVAILABLE WITHIN THE LAST 6 WEEKS.

- 1. Renal disease (including solitary kidney, renal transplant, renal tumor)**
- 2. Age >60**
- 3. History of Hypertension**
- 4. History of Diabetes**

FOR PATIENTS WITH A HISTORY OF THE FOLLOWING, CREATININE LEVEL MUST BE AVAILABLE DATED NO MORE THAN ONE WEEK PRIOR TO EXAM:

- A. History of severe hepatic disease/liver transplant/pending liver transplant.**

IF PATIENT ANSWERS "NO" TO ALL QUESTIONS, MRI EXAM MAY BE SCHEDULED WITHOUT DELAY.

IF PATIENT ANSWERS "YES" TO ANY OF THE ABOVE, YOU MAY CALCULATE GFR UTILIZING A SLIDE RULE, CALCULATOR, OR ONLINE AT www.nephron.com. At some institutions Creatinine Clearance is included with standard BMP.

FOR PATIENTS ANSWERING "YES" TO QUESTIONS 1-4:

IF GFR IS <30 ML/MIN/1.73M² THEN THE PATIENT CANNOT RECEIVE GADOLINIUM AND NONCONTRAST EXAM OR ALTERNATIVE MODALITY SHOULD BE CONSIDERED.

IF GFR IS >30 THEN PATIENT WILL BE CONSENTED.

FOR PATIENTS ANSWERING YES TO QUESTION A, IF GFR IS BELOW 60 CONTRAST MAY NOT BE ADMINISTERED.

This screening is adapted from FDA and ACR guidelines 5/07 and 7/07

Final thought: Although the risks of NSF following Gadolinium exposure are relatively minute and approach that of iodinated contrast for CT, this disease does not typically regress and is usually devastating to those afflicted. We appreciate your cooperation in minimizing risks to your patient. Physicians with remaining questions can consult our staff as needed and I can be reached at lindstrom.md@gmail.com