

New Major Recommendations from the American College of Radiology and the National Kidney Foundation: Imaging Patients with Kidney Disease

In 2020 and 2021, new major recommendations were released from the American College of Radiology (ACR) and the National Kidney Foundation (NKF) summarizing the CT- and MR-based imaging of patients with kidney disease.

These recommendations supersede pre-existing guidance from the ACR and should greatly improve and standardize contrast media policies across the United States.

A summary of these consensus statements are in tabular format below.



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Table 1. Summary of Major ACR-NKF Consensus Statements on Use of Intravenous Iodinated Contrast Media in Patients with Kidney Disease (from [1])

1. The terms contrast-associated acute kidney injury (CA-AKI) or post-contrast acute kidney injury (PC-AKI) are recommended for use in clinical practice due to the large proportion of AKI events correlated with but not necessarily caused by contrast media administration.
2. Contrast-induced acute kidney injury (CI-AKI) is only feasible to diagnose in the context of a well-matched controlled study.
3. KDIGO AKI criteria are recommended for the diagnosis of AKI, and KDIGO CKD criteria are recommended for the diagnosis of CKD.
4. The risk of CI-AKI from intravenous iodinated contrast media is lower than previously thought. Necessary contrast-enhanced CT without a suitable alternative should not be avoided solely on the basis of CI-AKI risk.
5. CI-AKI risk should be determined primarily by CKD stage and AKI. High-risk patients include those with recent AKI and those with eGFR <30 mL/min per 1.73m ² , including those receiving maintenance dialysis who have significant residual kidney function.
6. Kidney function screening is indicated to identify patients at high risk for CI-AKI. Personal history of kidney disease (CKD, remote AKI, kidney surgery or ablation) are the strongest risk factors indicating the need for kidney function assessment.
7. Radiologist-clinician discussions about risks and benefits of contrast-enhanced imaging can be helpful in patients at high-risk for CI-AKI.
8. There are no clinically relevant differences in CI-AKI risk between iso-osmolality (IOCM) and low-osmolality (LOCM) iodinated contrast media.
9. Prophylaxis with intravenous normal saline is indicated for patients not on dialysis who have eGFR <30 mL/min per 1.73m ² or AKI. In individual high-risk circumstances, prophylaxis may be considered in patients with eGFR 30-44 mL/min per 1.73 m ² at the discretion of the ordering clinician.
10. Prophylaxis is not indicated for patients with stable eGFR ≥45 mL/min per 1.73m ² .
11. Kidney replacement therapy should not be initiated or have the schedule adjusted solely on the basis of contrast media administration.
12. The presence of a solitary kidney should not independently influence decision-making regarding the risk of CI-AKI.
13. In patients at high-risk of CI-AKI, ad hoc lowering of contrast media dose below a known diagnostic threshold should be avoided. Rather, the minimum routine clinical diagnostic dose should be used.
14. When feasible, nephrotoxic medications should be held by the referring clinician in high-risk patients.
15. Data on risk of CI-AKI in pediatric patients is extrapolated from data in adult patients. Pediatric-specific research in this area is a major unmet need.

Table 2. Summary of Major ACR-NKF Consensus Statements on Use of Intravenous Gadolinium-Based Contrast Media in Patients with Kidney Disease (from [2])

1. Patients undergoing renal replacement therapy, patients with AKI, and patients with stage 4 or 5 CKD who are exposed to a group I GBCM, especially repeated doses of a higher off-label dose of a group I GBCM, are at greatest risk of NSF.
2. Risk of NSF differs between GBCM and can be stratified into three GBCM groups (Group I: highest risk, Group II: very low risk, Group III: likely very low risk but insufficient confirmatory evidence).
3. The risk of NSF increases with larger doses of group I GBCM. The dose-related risk of NSF from group II and group III GBCM is unknown, but in general the lowest diagnostic dose of GBCM should be used.
4. Group II GBCM should not be withheld or delayed if harm would result from not proceeding with an indicated contrast-enhanced MRI.
5. Kidney function screening is optional for group II GBCM, but is necessary for group III GBCM.
6. Direct communication between the radiologist and referring provider regarding risk of NSF is not necessary for group II GBCM administration, but is suggested for group III GBCM administration in patients with eGFR <30 mL/min per 1.73 m² or AKI.
7. The risk of NSF is very low for a standard dose (0.1 mmol/kg) of group II GBCM, even in patients with eGFR <30 mL/min per 1.73 m² or AKI.
8. Prophylaxis is not indicated for the prevention of NSF. Risk mitigation strategies can include awaiting kidney function recovery and use of group II GBCM.
9. Dialysis should not be initiated or altered based on group II or group III GBCM administration.
10. On-label dosing of group II or group III GBCM does not have a clinically important risk of nephrotoxicity.
11. If multiple urgent group II or group III GBCM doses are indicated, subsequent dose(s) should not be delayed for fear of NSF. If not urgent, delaying the subsequent dose(s) >24 hours or performing intercurrent dialysis can promote GBCM clearance.
12. The above recommendations should not be altered in patients receiving nephrotoxic medications, chemotherapy, or contrast-enhanced CT.
13. The above recommendations also apply to pediatric patients. The risk of NSF in pediatric patients appears to be low but data are limited. The “Bedside Schwartz” equation should be used to assess eGFR in infants and children.

Acronyms

NKF: National Kidney Foundation

ACR: American College of Radiology

KDIGO: Kidney Disease Improving Global Outcomes

AKI: acute kidney injury

CI-AKI: contrast-induced acute kidney injury

CA-AKI: contrast-associated acute kidney injury

CKD: chronic kidney disease

GBCM: gadolinium-based contrast media

NSF: nephrogenic systemic fibrosis

eGFR: estimated glomerular filtration rate



References

1. Davenport MS, Perazella MA, Yee J, et al. Use of intravenous iodinated contrast media in patients with kidney disease: consensus statements from the American College of Radiology and the National Kidney Foundation. *Radiology* 202; 294:660-668.
2. Weinreb JC, Rodby RA, Yee J, et al. Use of intravenous gadolinium-based contrast media in patients with kidney disease: consensus statements from the American College of Radiology and the National Kidney Foundation. *Radiology* 2021; 298:28-35.