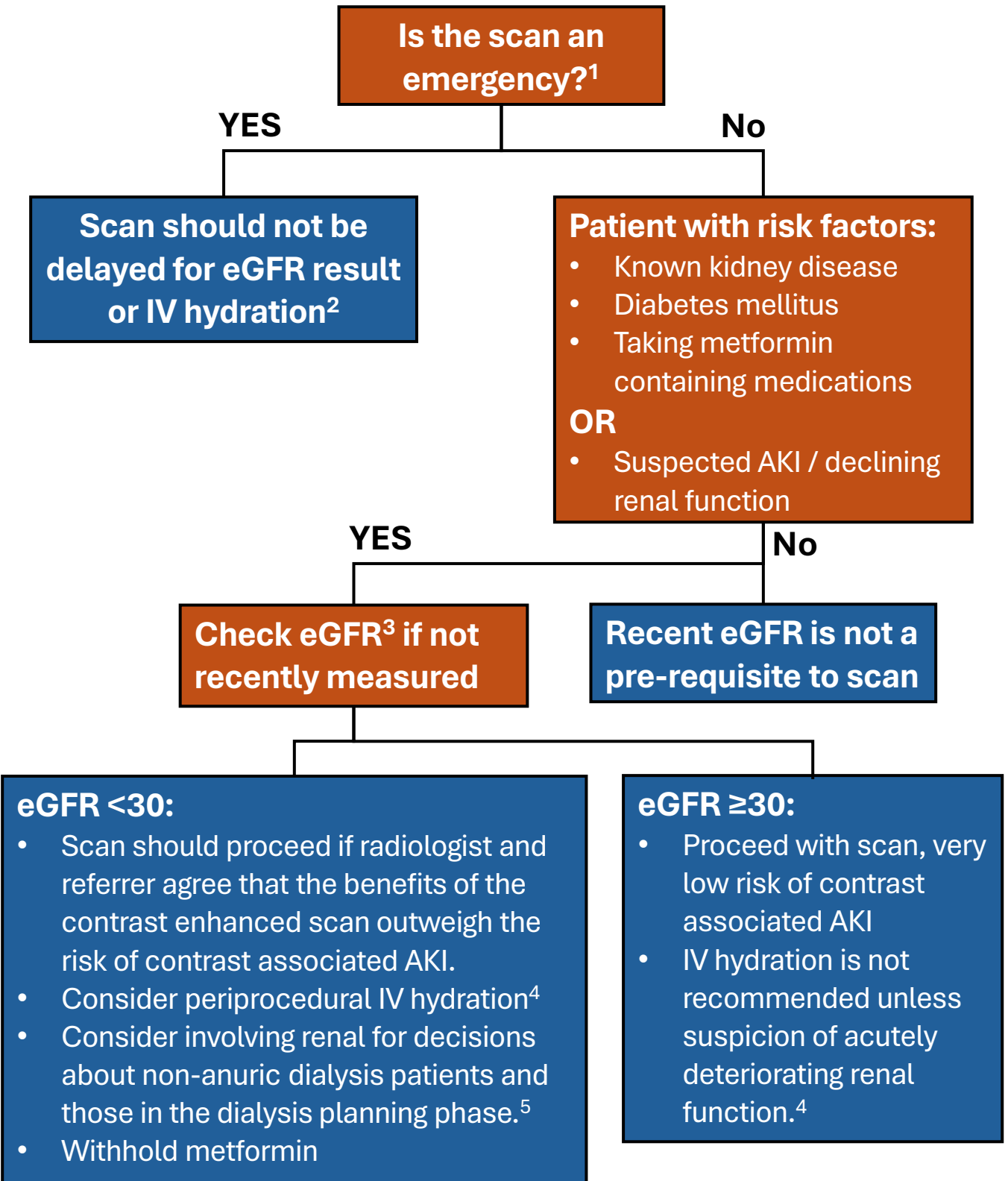




SCGH ED: IV iodinated contrast agent consensus guideline for CT imaging in ED

This guideline applies to patients requiring iodinated contrast enhanced scans in Sir Charles Gairdner emergency department. It has been adapted from the RANZCR 2018 Iodinated Contrast Media Guideline.





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1. An emergency is defined as a patient with a condition that is a risk to life or limb OR in whom a delay in diagnosis will delay the commencement of immediate definitive therapy with potentially adverse consequences. The decision regarding whether a scan is an emergency should be made by a consultant or senior registrar in emergency medicine.
2. In this group, the benefit of timely / accurate diagnosis and commencement of therapeutic intervention outweighs the theoretical risk of contrast associated AKI.
3. RANZCR recommend eGFR over serum creatinine for assessing risk.¹ Note that eGFR can be calculated using the 2021 CKD-EPI Equation if a patient's creatinine, sex and age are known. Serum creatinine is readily available on blood gas and can be imputed into the CKD-EPI equation available online: <https://www.mdcalc.com/calc/3939/ckd-epi-equations-glomerular-filtration-rate-gfr>. This may be preferable than waiting for laboratory eGFR in certain circumstances.
4. The evidence for periprocedural IV hydration suggests no benefit for eGFR >30 and a potential benefit for eGFR <30. Studies have reported a reduction in the incidence of contrast associated AKI with periprocedural IV hydration in the latter group. However, it is unclear if volume expansion prevents contrast induced renal impairment or simply treats underlying AKI due another cause (an unknown confounder).² Current practice favours use of periprocedural hydration in patients with eGFR <30. However, decisions about IV hydration should consider the clinical context: such as the patient's pre-test risk of cardiac failure / pulmonary oedema due to IV fluid administration. Anuric patients receiving regular dialysis do not require periprocedural IV hydration. 0.9% NaCl should be used for periprocedural IV hydration, but the ideal infusion rate / volume is not known. RANZCR guidelines suggest 0.9% intravenous saline, 1.0-1.5 ml/kg/h, for at least 6 hours before and after contrast media injection.² Other common regimes are 1 hour before contrast and 3-12 hours after with longer infusions being more effective. Typical doses include 500ml before and 500 ml after or continuous weight-based volumes (1-3 ml kg/hr).³
5. Residual renal function is a predictor of survival in dialysis patients. There is widespread reluctance to use IV contrast in non-anuric dialysis patients due to the theoretical risk of damaging residual renal function. Therefore, the renal team may wish to be involved in decisions regarding these patients. It is worth noting, however, that a 2020 systematic review did not find a significant decrease in residual renal function following IV contrast administration.⁴



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Background

This guideline was adapted from the RANZCR iodinated contrast media guideline 2018.¹ The aim was to produce a consensus document between the emergency department (ED), radiology department and specialty teams, such as renal, regarding the use of intravenous iodinated contrast media (ICM) in ED patients. Specifically, the guideline provides a framework for decision-making in patients at risk of contrast associated acute kidney injury (CA-AKI). We hope that its use will reduce delays to emergency imaging which may lead to diagnostic uncertainty and delay to definitive management.

The rationale for proceeding with emergency scans prior to determining renal function is due to the lack of evidence regarding a causal relationship between modern ICM and AKI. There are no large randomised controlled trials comparing outcomes in patients receiving enhanced and non-enhanced scans. Most of our understanding of the relationship between ICM and renal function is from retrospective observational research prone to bias and confounding. Historically, much of this research reported CA-AKI in patients receiving high volumes of arterial ICM or high-osmolar contrast media, which is no longer used. And of the observational research, although a possible association between intravenous ICM and AKI has been reported, there is not a significant association between intravenous ICM and outcomes such as mortality or the need for dialysis.⁵

More recent research using advanced statistical techniques such as propensity score-matched analysis and regression discontinuity analysis fail to demonstrate a causal relationship between intravenous ICM and AKI, especially in patients with eGFR >30.⁶⁻¹⁰ Given the uncertain relationship between ICM and renal function, many are adopting the term contrast *associated* AKI rather than contrast *induced* AKI, which implies a causal relationship.

In the absence of strong evidence of harm, the benefits of timely diagnosis and early intervention are compelling arguments for use of intravenous ICM in emergency patients regardless of renal function. This is reflected in guidelines around the world which advocate ICM enhanced scans in emergency settings without delays for up-to-date eGFR or pre-scan IV hydration.^{1,2,11}



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