

IODINATED CONTRAST AGENTS (computed tomography)

Iodinated contrast agents are generally safe to use but doing so may result in risk of acute renal failure in certain circumstances. Since patients are exposed to a higher risk of acute renal damage, it should first be assessed whether the diagnostic information obtained through the use of iodinated contrast agents might be available through alternative examinations. The physician providing the referral will assess the risk.

Measuring renal function

It is necessary to assess renal function in people at risk of acute renal failure before going ahead with the scan using a contrast agent. This is done by measuring creatinine content in blood plasma (P-Crea, $\mu\text{mol/l}$) and calculating the glomerular filtration rate on the basis thereof (eGFR, estimated glomerular filtration rate, $\text{mL/min}/1.73 \text{ m}^2$).

The CKD-EPI equation is recommended for determining eGFR. **Please note! The equation provides a reliable GFR value only if the renal function is stable (not in cases of acute renal failure).**

Risk group

The most important risk factor for acute renal failure is reduced renal function before injecting the contrast agent. eGFR must be determined in known cases of:

- chronic renal failure ($\text{eGFR} < 60 \text{ mL/min}/1.73 \text{ m}^2$);
- proteinuria;
- diabetes;
- severe heart failure (NYHA 3-4);
- hypertension;
- gout.

The eGFR of people in the risk group must be determined as part of preparing for the computed tomography scan. If the patient's renal function and the condition thereof are stable, it is sufficient to determine eGFR within three months before the scan. Patients whose condition is unstable and who do not suffer from acute renal failure may have their eGFR determined within one week before the scan. In the case of acute renal failure, the risk of sustaining further damage with the injection of a contrast agent is increased regardless of the eGFR value, meaning that contrast agents should be avoided.

The risk of sustaining damage to the kidneys after exposure to a contrast agent is especially high in the case of:

- $\text{eGFR} < 30 \text{ mL/min}/1.73 \text{ m}^2$;
- repeated doses of a contrast agent within up to 72 hours;
- existing acute renal failure.

After the scan

There is no need to establish eGFR on a regular basis.

Metformin and iodinated contrast agents

Metformin is a medicinal product used for diabetes that is secreted through the kidneys. If the injection of a contrast agent is followed by acute renal failure, the use of metformin can lead to acute metabolic acidosis.

- If eGFR is >30 mL/min/1.73 m² and there is no indication of acute renal failure, it is allowed to continue taking the medicinal product.
- **HOWEVER**, in cases of **existing acute renal failure**, metformin intake should be stopped.
- Determine eGFR within 24-48 hours after computed tomography using a contrast agent. It is permitted to consider continuing with metformin intake if renal function is not reduced.

Medicinal products impacting renal function

The physician responsible for the referral assesses whether it is necessary or possible to pause the intake of simultaneously taken medicinal products impacting renal function for the duration of the scan. Such medicinal products include ACE inhibitors and sartans, NSAIDs and diuretics.

Selection and reduction of dosage of iodinated contrast agents

The scan uses a contrast agent in the smallest diagnostic dose possible. CT scans include protocols where the doses can be reduced in the case of renal failure.

Pregnancy and breastfeeding

Iodinated contrast agents can be used as normal in the case of pregnancy. Breastfeeding after a scan with iodinated contrast agents is safe because the quantities secreted in breast milk are minuscule. Secretion stops completely within 24 hours.