

## FIVE THINGS TO KNOW ABOUT ...

**Metformin and intravenous contrast**

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**Metformin is excreted by the kidneys**

Metformin is used in type 2 diabetes mellitus to decrease the amount of glucose produced by the liver and to increase the body's response to insulin. In patients with renal failure (acute or chronic), the renal clearance of metformin is decreased, and there is an associated risk of lactic acidosis, which has a mortality rate of up to 50%.<sup>1</sup> Some patients who receive intravenous contrast may experience a deterioration of renal function (contrast-induced nephropathy). Although the points in this article discuss the use of intravenous contrast, the same principles apply to intra-arterial contrast.

**For most patients, metformin should be stopped at the time of contrast administration**

There is some controversy about when to stop and restart metformin for patients scheduled to undergo intravenous contrast-enhanced examinations.<sup>4</sup> The guidelines from the Canadian Association of Radiologists<sup>2</sup> state that patients taking metformin who have an estimated glomerular filtration rate (eGFR) of less than 60 mL/min should stop taking metformin at the time of contrast administration. The European Society of Urogenital Radiology advocates stopping metformin 48 hours before CT for patients with an eGFR of less than 45 mL/min.<sup>5</sup>

**Restarting metformin depends on renal function and the volume of contrast used**

Guidelines from the Canadian Association of Radiologists<sup>2</sup> state that patients taking metformin who have an eGFR of less than 60 mL/min should restart the drug no sooner than 48 hours after contrast administration and only if renal function remains stable (< 25% increase in creatinine above baseline). Patients with an eGFR above 60 mL/min who receive a larger amount of intravenous contrast (> 100 mL; e.g., CT of the abdomen or pelvis, CT angiography of the aorta or lower extremities) should restart metformin no earlier than 48 hours after the procedure.<sup>3</sup>

**Use of metformin is not a contraindication to intravenous contrast administration**

Metformin in isolation is not considered a risk factor for contrast-induced nephropathy,<sup>2</sup> but particular attention must be paid to patients taking metformin who are scheduled to undergo contrast-enhanced examination (e.g., enhanced computed tomography [CT], angiography, venography).<sup>3</sup> Many physicians are particularly cautious in the case of elderly patients aged greater than 80 years.

**For small volumes of contrast, patients with normal renal function taking metformin may not require any changes in care**

If patients with normal renal function who are taking metformin receive less than 100 mL of intravenous contrast (e.g., enhanced CT of the brain), stopping metformin and/or rechecking creatinine levels 48 hours after the procedure may be unnecessary, because the risk of contrast-induced nephropathy in patients with normal renal function is very low.<sup>5</sup>

**References**

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