

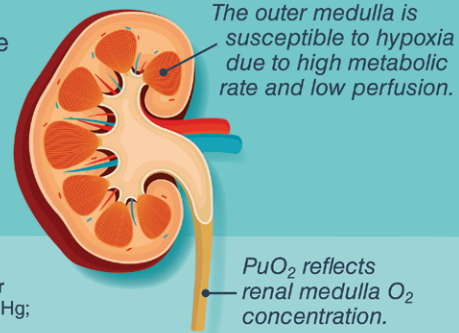
INFOGRAPHICS IN ANESTHESIOLOGY

Complex Information for Anesthesiologists Presented Quickly and Clearly



Time for a New Monitor? Urine Oxygenation Is Associated with Acute Kidney Injury

In this issue, Silverton *et al.*¹ describe a novel device that monitors oxygen partial pressure in urine (PuO_2). PuO_2 independently correlated with acute kidney injury (AKI) in 86 nonoliguric cardiac surgery patients studied, and crucially is available in real time.



Surgery Timeline

CPB

There was no difference during CPB, but patients who developed AKI had lower post-CPB PuO_2 (mean difference, 6 mmHg; 95% CI, 0 to 11; $P = 0.038$).

Post-CPB

Other real-time monitors include urine output monitoring, which is not informative for AKI, and TEE-measured renal resistive index, which is not fully characterized.²

6 h Postop

Biomarkers such as urine IL-18, urine NGAL and serum NGAL, are released at the time of renal tubular injury. While they correlate with AKI, they peak 6 h after surgery.³

Urine TIMP-2 and IGFBP7 are also associated with AKI, having a bimodal distribution that has one peak intraop and another at 6 h.⁴

12 h Postop

Urine KIM-1 rises between 12 and 24 h postop and is also associated with AKI.⁵

Day 2 Postop

In patients with AKI in Silverton *et al.*'s study, serum creatinine was not elevated until postop day 2.

KDIGO allows for perioperative AKI to be detected for up to 7 days based on urine output and serum creatinine.



Multicenter studies are needed to validate PuO_2 , and interventional studies are needed that can demonstrate clinical value in PuO_2 monitoring.

CPB, cardiopulmonary bypass; IGFBP7, insulin-like growth factor binding protein 7; IL-18, interleukin-18; KDIGO, Kidney Disease: Improving Global Outcomes; KIM-1, kidney-injury-molecule-1; NGAL, neutrophil gelatinase-associated lipocalin; TEE, transesophageal echocardiography; TIMP-2, tissue inhibitor of metalloproteinase 2.

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