



Intrarenal pressure during urological procedures

The need for intrarenal pressure (IRP) measurement

Fluid irrigation during flexible ureteroscopy is necessary to improve visibility and distention of the upper urinary tract. This can lead to elevated IRP with potential post-operative complications.^{1,2} Yet, there is currently no reliable way to measure IRP."

Considerations for reducing high IRP:

- Ureteral access sheaths may improve irrigation flow and visualization while decreasing IRP.¹²
- IRP cannot be reliably measured today. The current recommendation discussed in literature is to maintain IRP as low as possible while maintaining good visibility to prevent complications such as pyelovenous backflow and sepsis.^{2,11}

"IRP increase remains a neglected predictor of upper tract endourology complications and its intraoperative monitoring should be taken into consideration. Further research is necessary, to quantify pressures generated during upper tract endourology, and introduce means of controlling them."

Tokas T, Herrmann TRW, Skolarikos A, et al.
World Journal of Urology²

"Finding a simple, efficient, and precise way to monitor intra pelvic pressure seems essential. The high pressures are worrisome, and they are difficult to estimate by visual recognition alone."

Doizi S, Letendre J, Cloutier J, et al.
World Journal of Urology³

Complications of elevated IRP may include:

- PAIN^{4,5}
- RENAL DAMAGE and pathological changes^{2,4,6}
- SYSTEMIC INFLAMMATORY RESPONSE SYNDROME^{2,7}
- FLUID ABSORPTION^{1,2,4,8-10}
- FEVER^{2,7}
- INFECTION^{1,2,4,7,11}
- SEPSIS^{2,4,7,11}
- PYELOVENOUS BACKFLOW^{2,4,8-10}

For more information about IRP or stone management in general, visit [StoneSmart.eu](https://www.stonesmart.eu) and join the discussions on social media today.

Bench test and pre-clinical results may not necessarily be indicative of clinical outcomes. Results from clinical studies are not predictive of results in other studies. Results in other studies may vary.

REFERENCES: 1. Proietti S, Dragos L, Somani B, et al. In vitro comparison of maximum pressure developed by irrigation systems in a kidney model. J Endourol. 2017 May;31(5):522-7. 2. Tokas T, Herrmann TRW, Skolarikos A, et al. Pressure matters: intrarenal pressures during normal and pathological conditions, and impact of increased values to renal physiology. World J Urol. 2019 Jan;37(1):125-31. 3. Doizi S, Letendre J, Cloutier J, et al. Continuous monitoring of intrapelvic pressure during flexible ureteroscopy using a sensor wire: a pilot study. World J Urol. 2021 Feb;39(2):555-561. 4. Osther PJS, Pedersen KV, Lildal SK, et al. Pathophysiological aspects of ureterorenoscopic management of upper urinary tract calculi. Curr Opin Urol. 2016 Jan;26(1):63-9. 5. Pedersen KV, Liao D, Osther SS, et al. Distension of the renal pelvis in kidney stone patients: sensory and biomechanical responses. Urol Res. 2012 Aug;40(4):305-16. 6. Schwalb DM, Eshghi M, Davidian M, et al. Morphological and physiological changes in the urinary tract associated with ureteral dilation and ureteropyeloscopy: an experimental study. J Urol. 1993 Jun;149(6):1576-85. 7. Zhong W, Leto G, Wang L, et al. Systemic inflammatory response syndrome after flexible ureteroscopic lithotripsy: a study of risk factors. J Endourol. 2015 Jan;29(1):25-8. 8. Twum-Ampofo JK, Eisner BH. The relationship between renal pelvis pressures and pyelovenous backflow during ureterorenoscopy in alive porcine model. AUA Abstract. 2020. 9. Loftus C, Byrne M, Monga M. High pressure endoscopic irrigation: impact on renal histology. Int Braz J Urol. 2021 Mar-Apr; 47(2):350-6. 10. Guzelburc V, Balasar M, Colakogullari M, et al. Comparison of absorbed irrigation fluid volumes during retrograde intrarenal surgery and percutaneous nephrolithotomy for the treatment of kidney stones larger than 2 cm. Springerplus. 2016 Oct 4;5(1):1707. 11. Gutierrez-Aceves J, Negrete-Pulido O, Avila-Herrera P. Perioperative Antibiotics and Prevention of Sepsis in Genitourinary Surgery. In Smith AD, Badlani GH, Preminger GM, Kavoussi LR (Eds.), Smith's Textbook of Endourology. New York, NY: Blackwell Publishing Ltd., 2012:38-52. 12. Kaplan AG, Lipkin ME, Scales CD Jr, et al. Use of ureteral access sheaths in ureteroscopy. Nat Rev Urol. 2016 Mar;13(3):135-40. All images are the property of Boston Scientific. All trademarks are the property of their respective owners. URO-1148403-AA © 2024 Boston Scientific Corporation or its affiliates. All rights reserved.