

Effective visualization during upper tract endourology is supported by the balance between irrigation fluid inflow and outflow, and these factors influence intrarenal pressure (IRP).¹

The current literature discusses that automated irrigation pumps (AIP) may provide consistent flow and efficient processes.² This may support staff satisfaction and potentially help avoid pressure peaks that may be associated with other types of irrigation, such as, manual irrigation systems.²



Fluid management and IRP featured evidence and contemporary views

Clear visualization

“Clear visualization during upper tract endourology is dependent on inflow of irrigation fluid, and outflow drainage. The interplay of these factors determines the pressure experienced by the urinary system. The precise pressure ranges experienced, and the pressure threshold at which complications increase, are incompletely understood.”

Croghan, et al. *BJU Int.* 2023

Proactive inflow management

“The use of an automated irrigation pump (AIP) provides more consistent flow than irrigation devices that rely on pressure from external compression, such as pressure infusion sleeves that are inflated manually. Manual hand pump (HP) infuser irrigation systems do not maintain steady pressure and flow continuously, as compression from the pressurized sleeve decreases as irrigation fluid leaves the infusion bag.”

Jefferson, et al. *J Endourol.* 2020

“Proper control of irrigation flowrate during ureteroscopy is important to manage thermal and pressure risks.”

Rezakahn, et al. *J Endourol.* 2022

Proactive management of inflow and prevention of intraluminal pressure peaks.

“Controlling intraoperative parameters such as intrarenal pressure (IRP) and temperature (IRT) is mandatory to avoid (barotraumatic and septic) complications.”

Panthier, et al. *Curr Opin Urol.* 2023

“Recent evidence suggests that IRP and IRT are closely related. IRP depends on inflow and outflow rates. Continuous monitoring would help to avoid surgical and infectious complications. IRT depends on the laser settings and irrigation flow.”

Panthier, et al. *Curr Opin Urol.* 2023

Workflow efficiencies

Regarding a randomized controlled study comparing HP vs. AIP irrigation for unilateral URS or PCNL:

“During URS and PCNL, use of the AIP resulted in a significant decrease in total irrigation pump management time. In addition, the AIP was associated with significantly improved nurse satisfaction during both URS and PCNL.”

Jefferson, et al. *J Endourol.* 2020

1. Croghan SM, Skolarikos A, Jack GS, et al. Upper urinary tract pressures in endourology: a systematic review of range, variables and implications. *BJU Int.* 2023;131:267–279.
2. Jefferson FA, Sung JM, Limfueco L, et al. Prospective randomized comparison of standard hand pump infuser irrigation vs an automated Irrigation pump during percutaneous nephrolithotomy and ureteroscopy: assessment of operating room efficiency and surgeon satisfaction. *J Endourol.* 2020 ;34:156–162.
3. Rezakahn Khajeh N, Hall TL, Ghani KR, Roberts WW. Determination of irrigation flowrate during flexible ureteroscopy: methods for calculation using renal pelvis pressure. *J Endourol.* 2022;36:1405–1410.
4. Panthier F, Pauchard F, Traxer O. Retrograde intra renal surgery and safety: pressure and temperature. a systematic review. *Curr Opin Urol.* 2023;33:308–317.