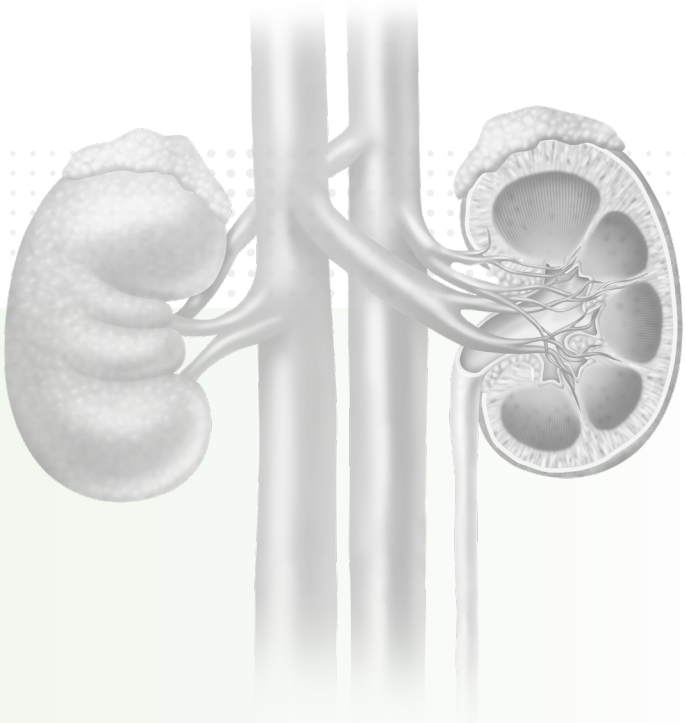
IHH Healthcare

Minimally Invasive Partial Nephrectomy

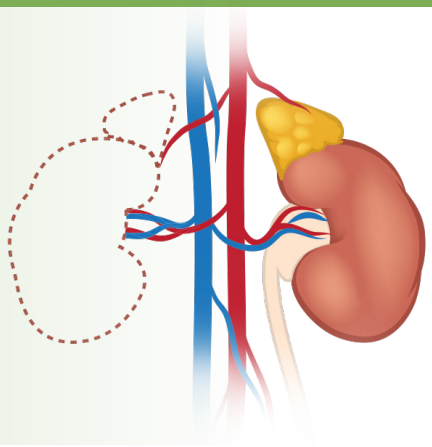
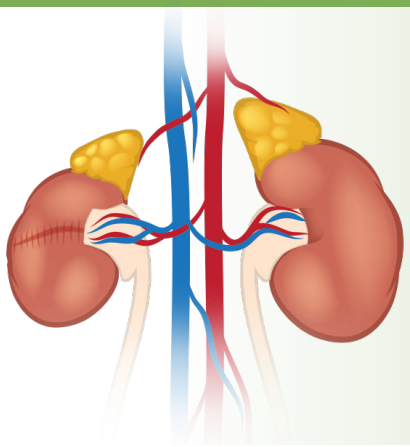


KEY PROCEDURE HIGHLIGHTS

1. **Gold standard** for removal of renal masses with excellent functional and oncological outcomes. [1,3,4]
2. **Benefit of maintaining two functioning kidneys** and reducing the risk of kidney failure. [1,6]
3. **98% of the patients remain cancer-free** for 5 years post partial nephrectomy. [2,3,4,12]
4. **Faster return to normal activity** after minimally invasive partial nephrectomy, when compared to open partial nephrectomy. [5]

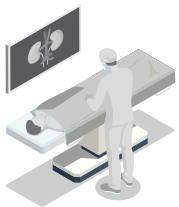
STANDARD FOR REMOVAL OF SMALL MASSES

Partial nephrectomy is the reference standard for removal of small masses and an effective option for larger localized renal masses. It offers acceptable surgical morbidity, equivalent cancer control, better preservation of kidney function, and potential for better long-term survival when compared to radical nephrectomy.

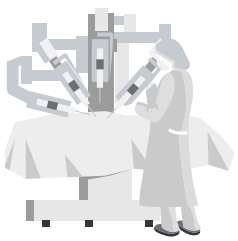
After Radical Nephrectomy	After Partial Nephrectomy
	
Left with one functioning kidney	Preservation of two functioning kidneys
Reduced glomerular filtration rate in kidney function [1]	Better post-operative kidney function with significantly higher glomerular filtration rate [1]
Higher risk of chronic kidney disease [1]	Significantly reduced risk of post-operative onset of chronic kidney disease

MINIMALLY INVASIVE PARTIAL NEPHRECTOMY (MIPN)

At Parkway Hospitals Singapore, we have highly experienced specialists who can perform **minimally invasive laparoscopic partial nephrectomy (LPN)** and **robotic partial nephrectomy (RPN)**.



Laparoscopic Partial Nephrectomy is an effective approach for partial removal of the kidney. Surgeons insert handheld videoscopic equipment and instruments through small incisions in the abdomen to view and remove the kidney tumour.

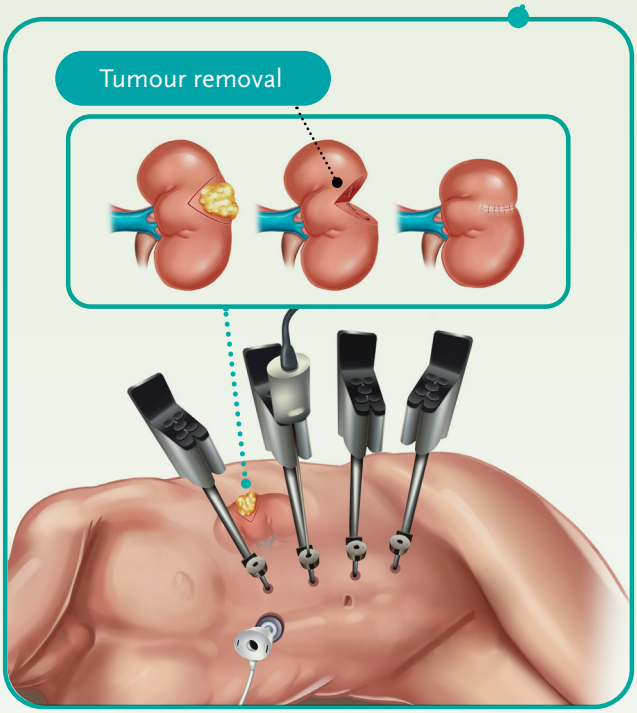


Robotic Partial Nephrectomy enables the surgeon to achieve greater precision with high-definition 3D vision. The 7-degree-of-freedom wristed instruments offer a greater range of motion than the human hand, when performing intra-corporeal suturing for kidney reconstruction.

This facilitates procedure completion with reduced warm ischemic time and shorter operative time. [7,8]

MIPN involves the following steps:

1. Patient positioning
2. Trocar placement
3. Mobilisation of the colon
4. Identification of the ureter and gonadal vein
5. Renal hilar dissection
6. Tumour removal
7. Renorrhapy and closure



Compared to LPN, RPN allows renorrhaphy to be done more efficiently with the following benefits:

- Good closure of the collecting system after tumour removal
- Preventing indirect trauma to cortex, vessels and arteries
- Shorter operative and ischemia time
- Less blood loss

BENEFITS OF MIPN

The benefits of MIPN when compared to an open partial nephrectomy approach are[7]:

APPROACHES / BENEFITS	OPN	MIPN	BENEFITS OF MIPN
INCISION	Long midline or rooftop incision	Small incisions	✓ Less blood loss ✓ Quicker recovery ✓ Reduced infection risk ✓ Less pain ✓ Minimal scarring ✓ Shorter hospital stay
ESTIMATED RECOVERY PERIOD	6 to 8 weeks	4 to 6 weeks	
LENGTH OF STAY	5 to 8 days	2 to 3 days	

PATIENT SELECTION

MIPN is the gold standard for removal of small masses. It reduces the risk of renal insufficiency by preserving kidney function, which is particularly important for the following patient indications with or at risk of compromised kidney function:

T1 and T2 localised tumours [10,11]

Multifocal masses or comorbidities, and of young age, that are likely to impact future renal function [10]

An anatomical or functional solitary kidney or chronic kidney disease [9,10]

Bilateral tumours, known familial renal cell carcinoma or pre-existing CKD or proteinuria [10]

REFERENCES

1. Mir MC, Derweesh I, Porpiglia F, Zargar H, Mottrie A, Autorino R. Partial nephrectomy Versus Radical Nephrectomy for Clinical t1b and T2 Renal Tumors: A systematic review and meta-analysis of comparative studies. *European Urology*. 2017;71(4):606-617. doi:10.1016/j.eururo.2016.08.060
2. Pierorazio PM, Johnson MH, Patel HD, et al. Management of renal masses and localized renal cancer: Systematic review and metaanalysis. *Journal of Urology*. 2016;196(4):989-999. doi:10.1016/j.juro.2016.04.081
3. Lane BR, Gill IS. 7-year oncological outcomes after laparoscopic and open partial nephrectomy. *Journal of Urology*. 2010;183(2):473-479. doi:10.1016/j.juro.2009.10.023
4. Lane BR, Campbell SC, Gill IS. 10-year oncologic outcomes after laparoscopic and open partial nephrectomy. *Journal of Urology*. 2013;190(1):44-49. doi:10.1016/j.juro.2012.12.102
5. Adamy A, Favaretto RL, Nogueira L, et al. Recovery of renal function after open and laparoscopic partial nephrectomy. *European Urology*. 2010;58(4):596-601. doi:10.1016/j.eururo.2010.05.044
6. MacLennan S, Imamura M, Lapitan MC, et al. Systematic review of perioperative and quality-of-life outcomes following surgical management of localised renal cancer. *European Urology*. 2012;62(6):1097-1117. doi:10.1016/j.eururo.2012.07.028
7. Banapour, P., Abdelsayed, G. A., Bider-Canfield, Z., Elliott, P. A., Kilday, P. S., & Chien, G. W. (2018). Nephrometry score matched ROBOTIC vs. LAPAROSCOPIC vs. Open Partial nephrectomy. *Journal of Robotic Surgery*, 12(4), 679–685. https://doi.org/10.1007/s11701-018-0801-x
8. Khalifeh, A., Autorino, R., Hillyer, S. P., Laydner, H., Eyraud, R., Panumatrassamee, K., Long, J.-A., & Kaouk, J. H. (2013). Comparative outcomes and assessment of trifecta in 500 robotic and laparoscopic Partial Nephrectomy cases: A single SURGEON EXPERIENCE. *Journal of Urology, 189*(4), 1236–1242. https://doi.org/10.1016/j.juro.2012.10.021
9. Guillotreau, J., Yakoubi, R., Long, J.-A., Klink, J., Autorino, R., Hillyer, S., Miocinovic, R., Rizkala, E., Laydner, H., Stein, R. J., Kaouk, J. H., & Haber, G.-P. (2012). Robotic partial nephrectomy for small renal masses in patients with pre-existing chronic kidney disease. *Urology, 80*(4), 845–851. https://doi.org/10.1016/j.urology.2012.05.038
10. Renal cancer: Renal mass & localized renal cancer guideline - american urological association. (n.d.). Retrieved September 19, 2021, from https://www.auanet.org/guidelines/guidelines/renalcancer- renal-mass-and-localized-renal-cancer-guideline.
11. Professionals, S.- O. (n.d.). *EAU guidelines: Renal cell carcinoma*. Uroweb. Retrieved September 19, 2021, from https://uroweb.org/guideline/renal-cell-carcinoma/#1.
12. Campbell SC, Novick AC, Belldegrun A, et al. Guideline for management of the clinical T1 renal mass. Journal of Urology. 2009;182(4):1271-1279. doi:10.1016/j.juro.2009.07.004

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