

APPENDIX 2. Summary of Evidence

Supplementary Table 1. Treatment of small renal masses: Summary of evidence							
1A. Perioperative							
Study characteristics				Outcomes			
Author	Population	Year	Type of study	Followup (mo)	Renal bleed	Urine leak	Overall rate of complications
Ma ¹	T1a; RFA; n=52	2014	Retrospective review	60	—	—	—
Katsanos ²	T1a; RFA vs RN; n=587	2014	Meta-analysis	60	—	—	RFA 7.4% RN 11%
Bahouth ³	T1a Surveillance; n=70	2015	Retrospective review	34	—	—	—
Olweny ⁴	T1a; n=74 RFA vs. PN	2012	Retrospective review	72	—	—	—
Chang ⁵	T1a; n=90 RFA vs. PN	2015	Retrospective review	60	Blood loss: RFA: 75 ml PN: 243 ml	—	Major complications: RFA: 2.2 % PN: 4.4%
Park ⁶	T1a; n=126 RFA vs. RPN	2018	Retrospective review	24	—	—	PN: 5% RFA: 5%
Pierorazio ⁷	T1a; n= 497 AS vs. PI	2015	Prospective cohort	25	—	—	—
Jewett ⁸	T1a; AS; n=178	2011	Prospective cohort	28	—	—	—
Klatte ⁹	T1a; n=1191; PN vs CA	2014	Meta-analysis	26	PN: 8.4% CA: 4.9%	PN: 3% CA: 0.4%	PN: 22% CA: 10%
Gervais ¹⁰	T1a-T2; n=85; RFA	2005	Retrospective review	27	RFA: 6%	RFA: 1%	RFA: 10%
McKiernan ¹¹	T1a; n=8818; RFA or CA vs. PN	2012	Retrospective review	34	—	—	—
Pavlovich ¹²	T1a; n=21; RFA	2002	Retrospective review	2	RFA: 5%	RFA: 0%	Minor: 19% Major: 0%
Thompson ¹³	cT1; n=1424; CA vs. RFA vs. PN	2015	Retrospective review	35	—	—	—
Maurice ¹⁴	T1; n=411 OPN vs. RAPN	2017	Retrospective review	6	RAPN: 1.3% OPN: 2%	RAPN: 0% OPN: 2%	RAPN: 20% OPN: 36%

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Pierorazio ¹⁵	T1-2; RFA or CA vs. PN vs. RN	2016	Comparative effectiveness review	—	RN: 2–7% PN: 2–16% RFA: 0–5%	RN: 0% PN: 2.6% RFA: 0–4%	Major complications: RN: 3% PN: 6–25% RFA: 6%
Young ¹⁶	T1; RFA; n=298	2012	Retrospective review	20	RFA: 1%	RFA: 1.5%	RFA: 29%
Tsai ¹⁷	T1; n=9906; OPN vs. RAPN	2018	Meta-analysis	No absolute values reported	No absolute values reported	No absolute values reported	No absolute values reported
Patel ¹⁸	T1-2; RN vs. PN vs. RFA vs. AS	2017	Meta-analysis	-	-	-	-
Van Poppel ¹⁹⁻²¹	T1-T2; n=541; RN vs. PN	2007, 2011	RCT	112	Hemorrhage: RN: 1.2% PN: 3.1%	RN: 0% PN: 4.4%	Reoperation rate: RN: 2% PN: 4%
Potretzke ²²	T1–T4	2016	Retrospective review Literature review	—	—	Retrospective: RAPN: 0.8% Literature: OPN: 1–11.8% RAPN: 0.8–3% LPN: 1.9–16.5%	—

AUA: American Urology Association; CA: cryoablation; mo: months; OPN: open partial nephrectomy; PN: partial nephrectomy; RCT: randomized controlled trial; RAPN: robotic assisted partial nephrectomy; RFA: radiofrequency ablation; RN: radical nephrectomy; —: do not report own data.

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1B. Long-term outcomes										
Study characteristics					Outcomes					
Author	Population	Year	Type of study	Follow-up (mo)	Recurrence	OS	RFS	Metastases	Progress to treatment	Decrease in renal function
Ma ¹	T1a; RFA; n=52	2014	Retrospective review	60	5.1%	RFA: 95.7% (5-yr)	94.2%	0%	5.8%	
Katsanos ²	T1a; RFA vs. RN; n=587	2014	Meta-analysis	60	3.6% RFA 3.6% RN	-	No difference	-	7.2% retreatment for RFA	-14.6 MD of eGFR decline favouring RFA
Bahouth ³	T1a; AS; n=70	2015	Retrospective review	34	-	100%	-	0%	10%	-
Olweny ⁴	T1a; n=74 RFA vs. PN	1998–2005	Retrospective review	72	PN: 5% RFA: 8%	PN: 100% RFA: 97%	CSS: PN: 100% RFA: 97%	PN: 8% RFA: 3%	PN: 3%	-
Chang ⁵	T1a; n=90 RFA vs. PN	2015	Retrospective review	60	PN: 4% RFA: 5%	PN: 93% RFA: 90%	Recurrence-free survival: PN: 98% RFA: 95% Cancer-specific survival: PN: 98% RFA: 96%	PN: 4% RFA: 4%	-	RFA: -12% eGFR PN: -27% eGFR No HD
Park ⁶	T1a; n=126 RFA vs. RPN	2018	Retrospective review	24	RPN: 0% RFA: 5%	—	RPN: 100% RFA: 95%	RPN: 0% RFA: 2%	-	RFA: -13% eGFR RPN: -8% eGFR

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										CKD III-IV: RFA: 13% RPN: 10%
Pierorazio ⁷	T1a; n= 497 AS vs. PI	2015	Prospective cohort	25	Intervention: 4%	PI: 92% AS:75% (5 yrs)	CSS: PI: 99% AS:100% (5 yrs)	Interventio n: 0.5% AS: 0%	9% AS crossover to intervention	
Jewett ⁸	T1a; AS; n=178	2011	Prospective cohort	28	-	94%	—	1%	12% progressed 5% treated	—
Klatte ⁹	T1a; n=1191; PN vs CA	2014	Meta-analysis	26	PN: 0.4% CA: 9.4%	-	—	PN: 0.4% CA: 4.4%	—	—
Gervais ¹⁰	T1a-T2; n=85; RFA	2005	Retrospective review	27	-	RFA: 93%	—	RFA: 0%	—	—
McKiernan ¹¹	T1a; n=8818; RFA or CA vs. PN	2012	Retrospective review	34	-	PN: 98.3% RFA/CA: 96.6%	PN: 98.2% RFA/CA: 94.4% (5yrs)	—	—	—
Thompson ¹³	cT1; n=1424; CA vs. RFA vs. PN	2015	Retrospective review	35	RFA: 3% CA: 2% PN: 3%	PN: 95% CA: 88% RFA: 82%	RFA: 98% CA: 98% PN: 98%	PN: 1.6% CA: 0% RFA: 2%	—	—
Maurice ¹⁴	T1; n=411 OPN vs. RAPN	2017	Retrospective review	6	—	—	—	—	—	eGFR preservation: OPN: 90% RAPN: 89%

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Pierorazio ¹⁵	T1-2; RFA or CA vs. PN vs. RN vs. AS	2016	Comparative effectiveness review	—	PN: 1-5% RFA: 7-9%	3 yr: RFA: 84-94% 5yr: PN: 93% RN: 86% 10yr: PN: 74% RN: 71%	CSS: RN: 97% (T1a) PN: 99% (T1a) RFA: 94% (5yr)	PN: 2-4% RN: 4-6%	—	Change in eGFR: RN: -39 to -0.1 PN: -18 to +4 RFA: -8 to -2 AS: -1 to -2 CKD III-IV: RN: 32–70% PN: 12–20% RFA: 13–28% AS: 3% ESRD: RN: 1–3% PN: 0.5–1% RFA: 1–2%
Young ¹⁶	T1; RFA; n=298	2012	Retrospective review	20	RFA: 4%	-	RFA: 92%	RFA: 0.2%	—	—
Patel ¹⁸	T1-2; RN vs. PN vs. RFA vs. AS	2017	Meta-analysis	—	—	—	—	—	—	Change in eGFR: RN: -22 PN: -7 RFA: -6 AS: -3
Van Poppel ¹⁹⁻²¹	T1-T2; n=541; RN vs. PN	2007, 2011	RCT	112	PN: 2% RN: 0.4%	PN: 76% RN: 81% (10yr)	—	PN: 3% RN: 4%	PN: 4% RN: 3%	CKD III-IV: PN: 6.3% RN: 10% ESRD: PN: 1.6% RN: 1.5%

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AUA: American Urology Association; CA: cryoablation; CKD: chronic kidney disease; ESRD: end-stage renal disease; mo: months; OS: overall survival; ; PN: partial nephrectomy; RCT: randomized controlled trial; RFA: radiofrequency ablation; RFS: recurrence-free survival; RN: radical nephrectomy; –: do not report own data.

1C. Renal mass biopsy outcomes							
Study characteristics				Outcomes			
Author	Population	Year	Type of study	Diagnostic	Bleeding	Tumor seeding	Overall complication rate
Richard ²³	T1a; n=373	2017	Retrospective review	87% 18% benign	0.6%	0%	-
Marconi ²⁴	T1; n=5228	2015	Meta-analysis	92%	4% hematoma 0.7% transfusion 3% hematuria	0.02%	8% 3% lumbar pain
Pierorazio ¹⁵	T1-2; n=2422	2016	Comprehensive effectiveness review	-	5% hematoma 0.4% hemorrhage	0%	1.2% pain

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