Guideline for Management of the Clinical T1 Renal Mass

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The complete document is available at http://www.auanet.org/content/guidelines-and-quality-care/clinical-guidelines/main-reports/renalmass09.pdf.

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† Financial interest and/or other relationship with Pfizer, Sanofi Aventis, Novartis, Aventis Pharmaceuticals.

‡ The Panel dedicates this work to Dr. Andrew Novick, who served as Chair of the Panel until his untimely death in 2008. Dr. Novick was well recognized for his contributions to renal surgery, and kidney cancer in particular.

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For other articles on a related topic see pages 1582, 1588 and 1594.

Abbreviations and Acronyms

AS = active surveillance
AUA = American Urological Association
CKD = chronic kidney disease
Cryo = cryotherapy
CT = computed tomography
LPN = laparoscopic partial nephrectomy
LRN = laparoscopic radical nephrectomy
MRI = magnetic resonance imaging
NSS = nephron-sparing surgery
OPN = open partial nephrectomy
ORN = open radical nephrectomy
PGC = Practice Guidelines Committee
PN = partial nephrectomy
RCC = renal cell carcinoma
RFA = radio frequency ablation
RN = radical nephrectomy
TA = thermal ablation

Detection of clinical stage 1 (<7.0 cm) renal masses has increased in frequency and is now a common clinical scenario for the practicing urologist.[1–4] These tumors are very heterogeneous, with 20% benign and only about 20–25% exhibiting potentially aggressive kidney cancer at the time of diagnosis.[5–8] Treatment options have expanded greatly, engendering much controversy in the field.[9] Traditionally, these tumors have been treated aggressively, most often with radical nephrectomy.[10–13] However, this predisposes patients to chronic kidney disease with attendant cardiovascular risks and increased mortality.[14,15] Nephron-sparing approaches such as partial nephrectomy,[16–20] thermal ablation[21–24] and active surveillance[25–29] have also emerged as viable options for the management of these patients. Recognizing that current practice is potentially discordant with what the literature supports, the Practice Guidelines Committee of the American Urological Association commissioned a Panel to review the literature and provide Guidelines for the management of this challenging patient population.

Literature searches on English-language publications were performed using the MEDLINE® database from January 1, 1996 to September 30, 2007 using the terms "renal carcinoma" and "renal mass" in conjunction with the interventions evaluated. A total of 114 articles met the

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Table 1. *Patient Demographics and Study Information*

	AS	Cryo	RFA	LPN	OPN	LRN	ORN
Patient Age (yrs) Mean/Median (# studies; # pts)	67.1/68.2 (12 studies; 390 pts)	66.9/66.3 (15 studies; 644 pts)	68.5/70.0 (19 studies; 745 pts)	60.5/60.1 (26 studies; 2245 pts)	60.1/60.0 (28 studies; 6418 pts)	60.9/61.0 (17 studies; 1581 pts)	62.5/63.0 (16 studies; 6235 pts)
Tumor Size (cm) Mean/Median (# studies; # pts)	2.7/2.2 (12 studies; 390 pts)	2.6/2.6 (15 studies; 644 pts)	2.7/2.7 (19 studies; 745 pts)	2.6/2.6 (26 studies; 2245 pts)	3.2/3.0 (25 studies; 5596 pts)	4.8/5.1 (15 studies; 1391 pts)	5.0/5.4 (14 studies; 5849 pts)
Follow-Up (mos) Mean/Median (# studies; # pts*)	29.6/29.0 (12 studies; 390 pts)	19.5/16.7 (10 studies; 463 pts)	22.9/19.4 (10 studies; 528 pts)	20.8/15.0 (17 studies; 1639 pts)	55.5/46.9 (22 studies; 5057 pts)	30.2/17.7 (8 studies; 795 pts)	60.8/58.3 (13 studies; 5294 pts)

* pts = patients; Note: numbers of studies and patients differ across variables because some studies did not report all information

inclusion criteria and were included in the systematic review and meta-analysis (for detailed methodology and meta-analytic findings, see the full guideline at *http://www.auanet.org/content/guidelines-and-quality-care/clinical-guidelines/main-reports/renalmass09.pdf*.). The panel evaluated data from studies of open and laparoscopic partial and radical nephrectomy, thermal ablation (radio frequency and cryoablation), and active surveillance; outcomes included procedural complications, recurrence, and survival.

As expected, the peer-reviewed literature was most substantial (ie the largest number of studies and patients) and mature (ie the longest followup) for open surgical approaches. The literature also revealed important differences in the demographics of patient populations exposed to the treatments evaluated, reflecting strong selection biases, as illustrated in table 1. For example, patients managed with radical nephrectomy tended to have larger tumors, and those managed with AS or TA tended to be older. Although these differences limited meaningful statistical comparisons across treatments, they provided important contextual information regarding the generalizability of treatments that assisted the Panel in structuring the treatment algorithm. The Panel also relied on a small number of statistically significant comparisons for which confounding factors were unlikely to account for differences. Other relevant limitations of the available literature are detailed on the website. Most importantly, the available studies were observational, there were almost no comparative studies, and length of followup was inadequate for many of the newer modalities.

Recognizing the strong data correlating RN to CKD,[14,30] nephron-sparing approaches are emphasized in the management of patients with clinical T1 renal masses, presuming that adequate oncologic control can be obtained. The importance of preserving long-term kidney function was considered with full understanding that surgical PN approaches may carry higher urologic comorbidity.[31] The meta-analysis revealed that PN procedures (open and laparoscopic) were associated with the highest risk of urologic complications, such as urine leak or postoperative hemorrhage, with laparoscopic PN rates the highest (table 2). The Panel interpreted this finding as valid because PN procedures tended to be applied to younger patients and for smaller tumors—patients who would be less likely to have such complications unless the complications were associated with procedural characteristics. The panel also relied on an important study from three centers of excellence that examined urologic morbidity after laparoscopic PN vs open PN and found that LPN had shorter operative times and less blood loss than OPN, but higher rates of urologic complica-