

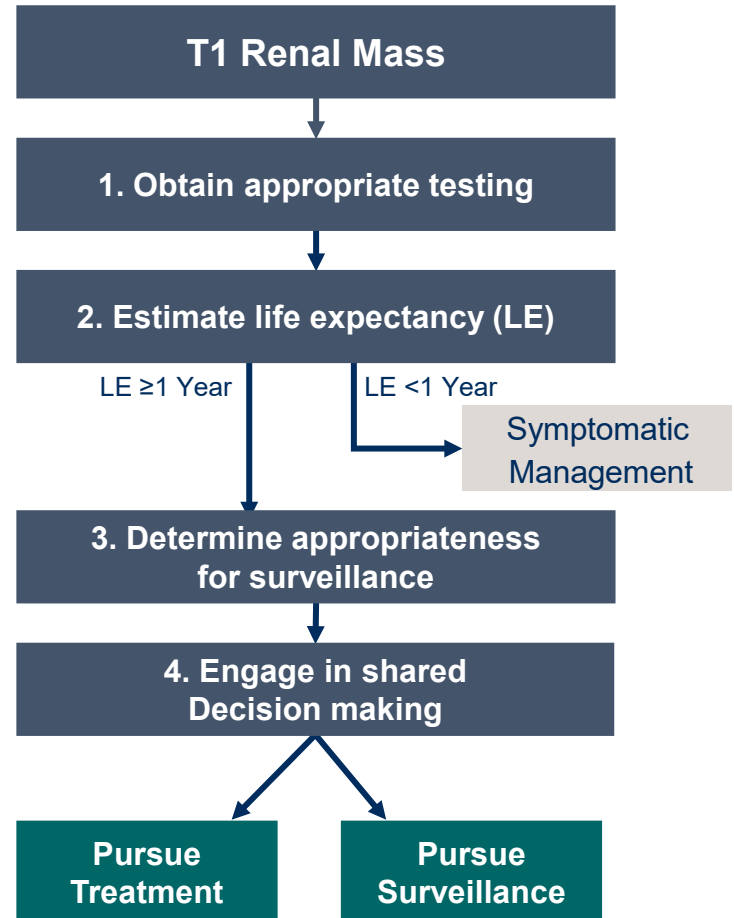
Roadmap for Management of Patients with T1 Renal Masses

Evaluation Phase

The Evaluation Phase involves four important steps to determine whether to pursue immediate treatment or initial surveillance:

- Step 1: Obtain appropriate testing
- Step 2: Estimate life expectancy (LE)
- Step 3: Determine appropriateness for surveillance based on MUSIC criteria*
- Step 4: Engage in shared-decision making regarding management

*Some patients will choose treatment at this point based on preference or uncertainty around appropriateness for surveillance.



Roadmap for Management of Patients with T1 Renal Masses

Initial Evaluation: 1) Appropriate Testing



CT with & without contrast OR Multiphase MRI

- Consider additional imaging if indeterminate after first study
- Iodinated Contrast Media: Benefits likely outweigh risks when eGFR>30
- Group II Gadolinium-based Contrast Media: Benefits likely outweigh risks for all eGFR levels
- Documentation of tumor complexity is recommended



Chest Imaging for >3cm, prefer CT thorax for >5cm



Baseline Assessment: CBC, CMP, UA (consider ACR)



Consider Renal Mass Biopsy (for solid, accessible masses)

- Strong rationale when findings will change management
- Definitive diagnosis in 80-90%, coaxial sheath prevents spread
- Low complication rate (~8% admitted, ~3% seen in ED, after biopsy)

Roadmap for Management of Patients with T1 Renal Masses

Initial Evaluation: 2) Estimate Life Expectancy

Step 1. Calculate the CVI score (range: 0-6) by assigning points as follows

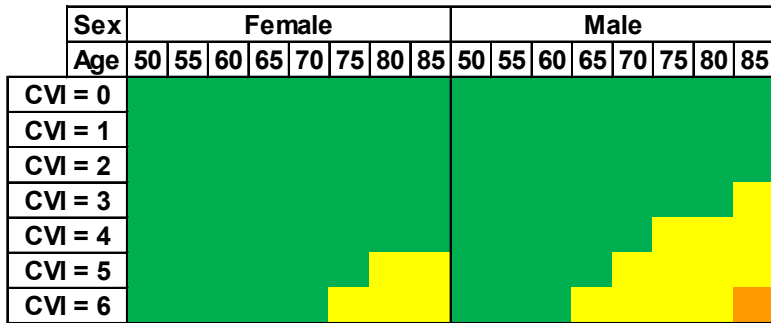
Points	Condition
2	Congestive heart failure
1	Chronic kidney disease Chronic obstructive pulmonary disease Cerebrovascular disease Peripheral vascular disease

Step 2. Use the tables on the next page to categorize each T1 renal mass patient (stage I) as having an estimated life expectancy that is >10 years, between 6 and 10 years, between 1 and 5 years, or less than 1 year (symptomatic management is recommended).

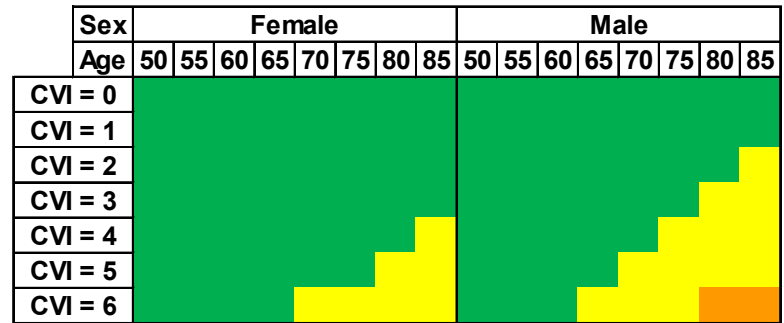
For more detailed information or for patients with a T2+ renal mass (stage II-IV), scan the QR below



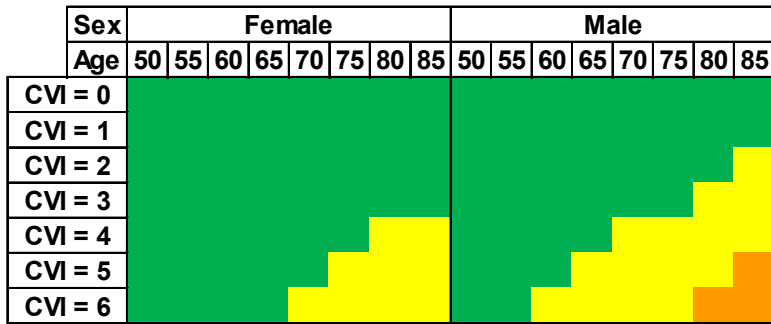
2cm Renal Mass



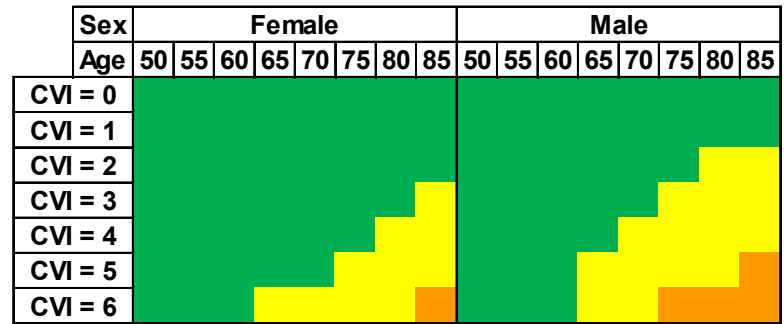
3cm Renal Mass



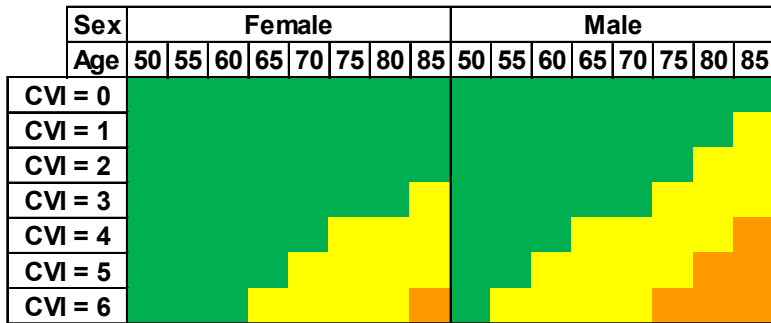
4cm Renal Mass



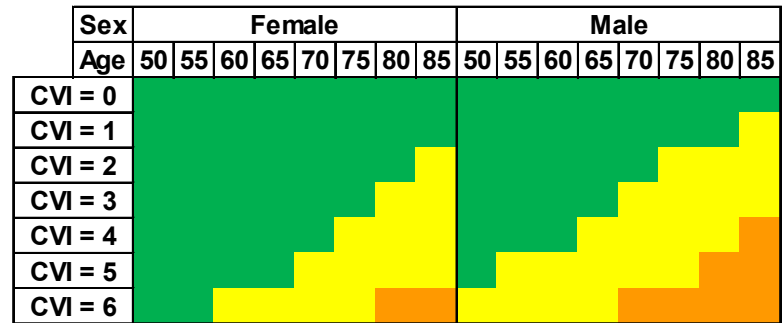
5cm Renal Mass



6cm Renal Mass



7cm Renal Mass



Green = Life Expectancy >10 years

Yellow = Life Expectancy 6-10 years


Orange = Life Expectancy 1-5 years


Roadmap for Management of Patients with T1 Renal Masses


Initial Evaluation: 3) Determine Appropriateness for Surveillance

Using initial imaging and life expectancy results, evaluate a patient's appropriateness for Surveillance as established by the MUSIC Consensus Panel.

	<3 cm	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
<1 year	Appropriate for Surveillance	Appropriate for Surveillance	Appropriate for Surveillance	Appropriate for Surveillance	Appropriate for Surveillance	Appropriate for Surveillance
1-5 years	Appropriate for Surveillance	Appropriate for Surveillance	Appropriate for Surveillance	Appropriate for Surveillance	Uncertain	Uncertain
6-10 years	Appropriate for Surveillance	Appropriate for Surveillance	Uncertain	Uncertain	Inappropriate for Surveillance	Inappropriate for Surveillance
>10 years	Appropriate for Surveillance	Uncertain	Inappropriate for Surveillance	Inappropriate for Surveillance	Inappropriate for Surveillance	Inappropriate for Surveillance

 = Appropriate for Surveillance

 = Uncertain

 = Inappropriate for Surveillance

Surveillance Exclusion Criteria

- Radiologic suspicion of T3 disease or infiltrative features
- Renal mass biopsy showing grade 4 renal cell carcinoma (RCC)
- Renal mass biopsy showing the following histotypes:
 - Collecting duct carcinoma
 - Renal medullary carcinoma
 - Rhabdoid variant of RCC
 - Sarcoma
 - Sarcomatoid RCC

Otherwise healthy, **Low** Complexity

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Grey	Grey	Grey	Red
6-10 years	Grey	Grey	Red	Red	Red
>10 years	Grey	Red	Red	Red	Red

Otherwise healthy, **Intermediate** Complexity

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Grey	Red	Red
6-10 years	Grey	Grey	Red	Red	Red
>10 years	Grey	Red	Red	Red	Red

Otherwise healthy, **High** Complexity

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Grey	Grey	Grey
6-10 years	Green	Grey	Red	Red	Red
>10 years	Grey	Red	Red	Red	Red

Elevated Perioperative Risk, **Low** Complexity

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Grey	Grey	Grey
6-10 years	Green	Grey	Grey	Red	Red
>10 years	Grey	Grey	Red	Red	Red

Elevated Perioperative Risk, **Intermediate** Complexity

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Green	Grey	Grey
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Elevated Perioperative Risk, **High** Complexity

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Green	Grey	Grey
6-10 years	Green	Grey	Grey	Red	Red
>10 years	Green	Grey	Grey	Red	Red

Nephron-Sparing Candidate, eGFR = 15-29

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Grey	Grey	Red
6-10 years	Green	Grey	Grey	Red	Red
>10 years	Grey	Grey	Red	Red	Red

Nephron-Sparing Candidate, eGFR = 30-44

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Grey	Grey	Grey
6-10 years	Green	Grey	Grey	Red	Red
>10 years	Green	Grey	Red	Red	Red

Nephron-Sparing Candidate, eGFR = 45-60

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Grey	Red	Red
6-10 years	Green	Grey	Red	Red	Red
>10 years	Grey	Red	Red	Red	Red

Not Nephron-Sparing Candidate, eGFR = 15-29

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Green	Green	Grey
6-10 years	Green	Green	Grey	Grey	Red
>10 years	Green	Grey	Grey	Red	Red

Not Nephron-Sparing Candidate, eGFR = 30-44

	3-3.9 cm	4-4.9 cm	5-5.9 cm	6-6.9 cm	7+ cm
1-5 years	Green	Green	Green	Grey	Grey
6-10 years	Green	Green	Grey	Red	Red
>10 years	Green	Grey	Red	Red	Red

Not Nephron-Sparing Candidate, eGFR = 45-60

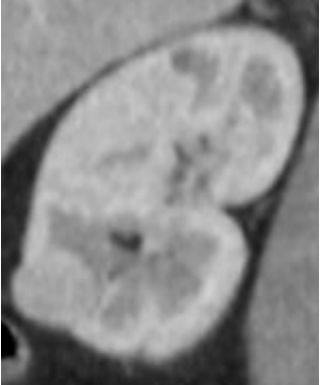

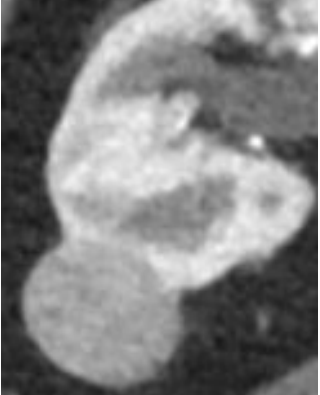


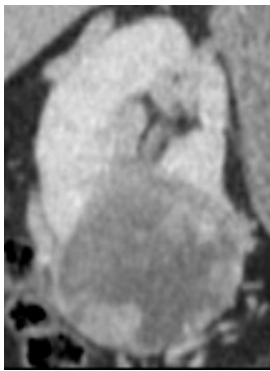
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>10 years	Grey	Grey	Red	Red	Red



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Initial Evaluation: 4) Engage in Shared Decision Making

	Surveillance	Ablation	Robotic Partial Nephrectomy (RPN)	Open Partial Nephrectomy (OPN)	Minimally Invasive Radical Nephrectomy (MIRN)
Cancer Control	Fair	Good	Better	Better	Best
Renal Function	Best	Better	Better	Better	Fair
Morbidity	Best	Better	Good	Fair	Good

	Low Complexity	High Complexity	Malignant/Metastatic Potential												
Small	 <p>1.9 cm RENL = 4</p>	 <p>1.6 cm RENL = 10</p>	<table border="1"> <thead> <tr> <th>Renal Mass Size (cm)</th> <th>Likelihood Of Cancer</th> <th>Likelihood of Metastasis</th> </tr> </thead> <tbody> <tr> <td>0.1 – 1.0</td> <td>50-68%</td> <td>0%</td> </tr> <tr> <td>1.1 – 2.0</td> <td>75-81%</td> <td>0%</td> </tr> <tr> <td>2.1 – 3.0</td> <td>79-89%</td> <td>3%</td> </tr> </tbody> </table>	Renal Mass Size (cm)	Likelihood Of Cancer	Likelihood of Metastasis	0.1 – 1.0	50-68%	0%	1.1 – 2.0	75-81%	0%	2.1 – 3.0	79-89%	3%
			Renal Mass Size (cm)	Likelihood Of Cancer	Likelihood of Metastasis										
0.1 – 1.0	50-68%	0%													
1.1 – 2.0	75-81%	0%													
2.1 – 3.0	79-89%	3%													
Medium	 <p>3.1 cm RENL = 5</p>	 <p>4.2 cm RENL = 10</p>	<table border="1"> <thead> <tr> <th>Renal Mass Size (cm)</th> <th>Likelihood Of Cancer</th> <th>Likelihood of Metastasis</th> </tr> </thead> <tbody> <tr> <td>3.1 – 4.0</td> <td>81-89%</td> <td>3%</td> </tr> <tr> <td>4.1 – 5.0</td> <td>88%</td> <td>13%</td> </tr> </tbody> </table>	Renal Mass Size (cm)	Likelihood Of Cancer	Likelihood of Metastasis	3.1 – 4.0	81-89%	3%	4.1 – 5.0	88%	13%			
			Renal Mass Size (cm)	Likelihood Of Cancer	Likelihood of Metastasis										
3.1 – 4.0	81-89%	3%													
4.1 – 5.0	88%	13%													
Large	 <p>5.0 cm RENL = 6</p>	 <p>6.9 cm RENL = 10</p>	<table border="1"> <thead> <tr> <th>Renal Mass Size (cm)</th> <th>Likelihood Of Cancer</th> <th>Likelihood of Metastasis</th> </tr> </thead> <tbody> <tr> <td>5.1 – 6.0</td> <td>87-91%</td> <td>18%</td> </tr> <tr> <td>6.1 – 7.0</td> <td>92-93%</td> <td>24%</td> </tr> </tbody> </table>	Renal Mass Size (cm)	Likelihood Of Cancer	Likelihood of Metastasis	5.1 – 6.0	87-91%	18%	6.1 – 7.0	92-93%	24%			
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5.1 – 6.0	87-91%	18%													
6.1 – 7.0	92-93%	24%													



Roadmap for Management of Patients with T1 Renal Masses

Surveillance Phase: 1) How to Perform Surveillance

High Intensity Surveillance Plan

Tumor Size	1 st Surveillance Imaging	2 nd Surveillance Imaging	3 rd Surveillance Imaging
0 - 4 cm	3 months after diagnosis	9 months after dx (6mo after previous imaging)	21 mo after dx (12mo after previous)
4 - 6 cm			15 mo after dx (6mo after previous)
> 6 cm		6 months after dx (3mo after previous)	12 mo after dx (6mo after previous)

Low Intensity Surveillance Plan

Tumor Size	1 st Surveillance Imaging	2 nd Surveillance Imaging	3 rd Surveillance Imaging
0 - 4 cm	6 months after diagnosis	18 months after dx (12mo after previous imaging)	30 mo after dx (12mo after previous imaging)
4 - 6 cm			
> 6 cm		12 months after dx (6mo after previous)	24 mo after dx (12mo after previous)



Roadmap for Management of Patients with T1 Renal Masses

Surveillance Phase: 2) When to Perform Additional Tests

Scenarios That Should Prompt Further Investigation	Recommended Response
Changes in patient life expectancy and/or tumor size/stage	Re-evaluate appropriateness for continued surveillance vs. transition to treatment (see pages 10-11)
Renal Masses > 5cm	Follow-up chest imaging along with repeated abdominal imaging and renal function assessments
Rapid Tumor Growth	Likely transition to treatment; if still considering surveillance, offer renal mass biopsy
Clinical Suspicion for Local Progression or Metastatic Disease	Imaging of appropriate areas
Patient Preference	Modify intensity of surveillance or transition to treatment for sustained changes in patient preferences