Guideline: Incidental CT Finding Renal Hypodensity

(see Table 1A)

Hemorrhagic **Indeterminate** Cyst **Contains Fat** +21 to +69 HU Cyst -10 to Region of interest is >/= +70 HU < -10 HU +20 HU (see table 1) Non-contrast CT CT or MRI W/WO Unlikely Non-contrast CT or MRI W/WO to be No Simple With neoplastic calcification calcifications Thin or (AML) imperceptible wall; Complex No F/U size no mural nodule, Cyst > 3 cm septa or Suspected renal (see table 2) calcification cell carcinoma Multiple Solid Solitary NO YES Bosniak I or II w/o **Enhancing** Benign simple or TSTC: growth per documented F/U* F/U* minimally **Different** density No F/U prior studies growth US, CT or MRI CT or MRI complicated than parenchyma; Yellow CTR Yellow CTR likely benign cyst No F/U Indeterminate **Homogeneous:** size Consider YES likely benign cyst > 1.0 cm referral to renal **Bosniak IIF** mass clinic. benign complex cystic mass **Yellow CTR** No F/U NO size > 1.0 cm F/U* > 4 cm MRI (preferred) or Consider No CT beginning at 6referral to renal Small renal > 4mm 12 months, then growth mass clinic. neoplasm TSTC: Similar yearly for 5 yrs density to NO YES YES parenchyma **Yellow CTR Bosniak III or IV** density No growth No F/U complex cystic or <4 mm Consider mass referral to renal mass clinic F/U* F/U* Consider US, CT F/U* **Yellow CTR** CT or MRI at referral to renal **MRI** (preferred) or MRI 6-12 months mass clinic or CT beginning **Yellow CTR** at 6-12 months, **Yellow CTR** then yearly for 5 years. If stable for 5 years, likely benign cyst. *F/U Note: Follow-up CT or MRI is always W/WO Table 1. Features that indicate heterogeneity in a renal mass Table 1A. Features to consider: 1. Size 2. Attenuation value 3. Homogeneity versus heterogeneity Legend

- 4. Enhancement
- 5. Complexity of cystic mass (Bosniak classification)
- 6. Growth and morphologic change
- 7. Role of biopsy

Feature		
Wall thickening		
One or more septa		
Mural nodule(s)		
Measurable or visible attenuation differences		
Calcification		

CTR = Critical Test Result

F/U = Follow-up

HU = Housefield Unit TSTC = Too small to characterize

Table 2. Bosniak renal cyst classification system		
Bosniak Classification	Description	
I	Benign simple cyst with a hairline thin wall without septa, calcification, or solid component. Homogeneous near-water attenuation density (—10 to 20 HU) without enhancement.	
II	Benign minimally complicated cyst that may contain a few hairline thin septa that may have "perceived" but not measurable enhancement. Fine calcification or a segment of slightly thickened calcification may be present in the wall or septa. Also, a well-marginated nonenhancing homogeneous mass < 3 cm with density above simple fluid attenuation (hyperdense cyst).	
IIF	Usually benign complicated renal cyst with multiple hairline thin septa or minimal smooth thickening of the wall or septa. Wall or septa may contain thick and nodular calcification and may have "perceived" but not measurable enhancement. Also, a well-marginated intrarenal nonenhancing mass > 3 cm with density above simple fluid.	
III	Indeterminate complicated cystic renal mass with thickened irregular walls or septa that have measurable enhancement.	
IV	Malignant cystic renal mass with enhancing soft tissue components (cystic renal cell carcinoma).	

Table 3. CT and MRI criteria for defining enhancement in a renal mass

CT Criteria: Increase in Attenuation After Contrast			
≥20 HU	Definite for enhancement		
>10 to < 20 HU	Equivocal for enhancement; consider factors related to beam hardening, intra-renal location*		
≤10 HU	No enhancement		
MRI criteria for enhancement			
≥15% increase in signal intensity after contrast	Enhancing lesion		
Alternative method	Visible signal intensity on subtraction images		
HU = Hounsfield units.			

^{*}Stricter criteria (15 HU) should be used as a cutoff for enhancement of exophytic or larger lesions not prone to these factors.