INITIAL EVALUATION

Renal mass (excluding Wilms tumor)

- Chest x-ray or CT chest
- CT abdomen and optional CT pelvis
- CBC, sodium, potassium, carbon dioxide, BUN, creatinine, alkaline phosphatase, calcium, albumin

Potential metastatic lesion identified?  

Yes → See Metastatic Disease on Page 4

No → Increased alkaline phosphatase or symptoms of bone pain?

Yes → Bone scan and plain films of any symptomatic or suspicious areas

No → Lesion identified?

Yes → Further imaging as needed

No → Consider biopsy of lesion

See Metastatic Disease on Page 4

Mass in contralateral kidney (multifocal disease, ipsilateral and/or contralateral)?

Yes → See Multifocal Renal Masses on Page 3

No → Clinical suspicion of transitional cell carcinoma (TCC)?

Yes → Biopsy

No → Urine cytology

See Bladder Cancer Algorithm

Impaired renal function or morphologically abnormal contralateral kidney?

Yes → Split renal function test

No → 24 hour urine for creatinine clearance

See Page 2

Note: Consider Clinical Trials as treatment options for eligible patients.

Patients with Renal Cell Carcinoma (RCC) diagnosed before age 46, regardless of histology, should be referred for genetic counseling and consideration of hereditary RCC syndromes.
Renal Cell Carcinoma

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Note: Consider Clinical Trials as treatment options for eligible patients.

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Special anatomic considerations, e.g., inferior vena cava thrombus above hepatic vein or invasion of adjacent organs?

- Partial nephrectomy
- Radical nephrectomy
- Laparoscopic approach to radical or partial nephrectomy
- Energy ablative technique [radio-frequency ablation (RFA), cryotherapy]
- Watchful waiting or active surveillance

Pathology report consistent with high risk of relapse?

- Individualized decision regarding systemic treatment or observation
- Possible embolization

Complete resection?

- Clinical trial of adjuvant therapy if available
- Observation

Yes

No

Yes

No

Special imaging

Additional surgical consultation

Patient able to undergo resection?

Yes

No

Observation

Individualized decision regarding systemic treatment or observation

Yes

No

Observation

Individualized decision regarding systemic treatment or observation

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Approved by The Executive Committee of the Medical Staff on 06/27/2017
Multifocal renal masses

- CT chest, abdomen and pelvis
- MRI brain (if signs or symptoms are present)
- Bone scan (if signs or symptoms are present)
- CBC, sodium, potassium, chloride, carbon dioxide, BUN, creatinine, alkaline phosphatase, calcium, albumin
- Split renal function test

Clinical evidence of von Hippel-Lindau disease?¹

- Yes
  - Refer to von Hippel-Lindau clinic available at MD Anderson

- No
  - Metastasis identified?
    - Yes
      - Follow guideline for metastases on Page 4
    - No
      - Unilateral lesion
        - Nephron-sparing approaches or nephrectomy depending on anatomy
      - Bilateral lesion
        - Lesions amenable to nephron-sparing approaches?
          - Yes
            - Nephron-sparing approaches
          - No
            - Nephrology consultation
              - Individualized decision regarding bilateral nephrectomy, systemic treatment, or observation

¹ Evidence of von Hippel-Lindau disease includes:
- Retinal hemangiomas
- Cerebellar hemangioblastomas
- Spinal hemangioblastomas
- Renal cell carcinoma
- Pheochromocytoma
- Pancreatic cysts
- Pancreatic neuroendocrine tumors
- Endolymphatic sac tumors
- Round ligament cysts (females)
- Epididymal cysts (males)

Note: Consider Clinical Trials as treatment options for eligible patients.
Renal Cell Carcinoma

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Suspicions of metastatic disease

Staging:
- CT chest, abdomen, and pelvis
- CBC with differential, sodium, potassium, chloride, LDH, carbon dioxide, BUN, creatinine, alkaline phosphatase, calcium, albumin, AST
- MRI brain if clinically indicated
- Bone scan if clinically indicated

Consider local control modalities:
- Surgery
- Radiation therapy
- Energy ablation
- Embolization

Consider cytoreductive nephrectomy if primary tumor in place or neoadjuvant therapy in setting of clinical trials or biopsy if not surgical candidate

If primary in place, consider cytoreductive nephrectomy

Consider observation versus adjuvant therapy in setting of clinical trials

Consider Clinical Trials as treatment options for eligible patients.

Note: Consider Clinical Trials as treatment options for eligible patients.

**CLINICAL PRESENTATION**

**METASTASES AT PRESENTATION OR RECURRENCE**

**Suspicions of metastatic disease**

**Staging:**
- CT chest, abdomen, and pelvis
- CBC with differential, sodium, potassium, chloride, LDH, carbon dioxide, BUN, creatinine, alkaline phosphatase, calcium, albumin, AST
- MRI brain if clinically indicated
- Bone scan if clinically indicated

**Consider local control modalities:**
- Surgery
- Radiation therapy
- Energy ablation
- Embolization

**Consider cytoreductive nephrectomy if primary tumor in place or neoadjuvant therapy in setting of clinical trials or biopsy if not surgical candidate**

If primary in place, consider cytoreductive nephrectomy

Consider observation versus adjuvant therapy in setting of clinical trials

Consider Clinical Trials as treatment options for eligible patients.

**Note:** Consider Clinical Trials as treatment options for eligible patients.
Renal Cell Carcinoma

PATHOLOGY

SYSTEMIC TREATMENT

- Clinical trial
- Frontline agents – good/intermediate risk:
  - Pazopanib
  - Sunitinib
  - Bevacizumab plus interferon alpha-2b
  - Interleukin-2
- Frontline agent – poor risk:
  - Temsirolimus
- Second-line agents:
  - Nivolumab
  - Cabozantinib
  - Lenvatinib plus everolimus
  - Axitinib
  - Everolimus
  - Sorafenib
  - Previously unused frontline agent
  - Chemotherapy: gemcitabine and fluorouracil, gemcitabine and capecitabine

- Consider surgical consolidation or
- Observation or
- Change therapy

- Prolonged period of stabilization and/or regression of lesions?
- Yes
- Continue treatment to maximum response
- No
- Change therapy

- Response?
- Yes
- No
- Change therapy

Note: Consider Clinical Trials as treatment options for eligible patients.

1 See Appendix A for dosing

Department of Clinical Effectiveness V9
Approved by The Executive Committee of the Medical Staff on 06/27/2017
Renal Cell Carcinoma

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Note: Consider Clinical Trials as treatment options for eligible patients.

### EVALUATION

#### SUMMARY BY STAGE

**Clinical Stage I**
- T1a T1b
- Less than or equal to 7 cm

- Good surgical candidate?
  - Yes: Consider biopsy if atypical radiographic findings
    - Partial nephrectomy (if anatomically feasible)
    - Radial nephrectomy
  - No: Consider biopsy
    - Energy ablation
    - Active surveillance

- Clinical Stage II
- Greater than 7 cm

- Good surgical candidate?
  - Yes: Consider biopsy if atypical radiographic findings
    - Partial nephrectomy (if anatomically feasible)
    - Radial nephrectomy
  - No: Consider biopsy
    - Active surveillance
    - Embolization

- Clinical Stage III
- T3a/T3b/N+

- Good surgical candidate?
  - Yes: Consider biopsy if atypical radiographic findings
    - Partial nephrectomy
    - Radial nephrectomy
    - Clinical trial for adjuvant treatment
  - No: Consider biopsy
    - Active surveillance
    - Embolization

- Clinical Stage IV
- M+

- Good surgical candidate?
  - Yes: Medical oncology consult
    - Cytoreductive nephrectomy (resection of single metastasis if possible)
      - Systemic therapy\(^1\) or Clinical trial
  - No: Consider embolization to control primary if symptomatic
    - Systemic therapy\(^1\)

---

\(^1\) Systemic therapy:
- Antiangiogenic agents: sunitinib, bevacizumab plus interferon alpha-2b, axitinib, sorafenib, pazopanib
- mTOR inhibitors: temsirolimus, everolimus
- Chemotherapy: gemcitabine and fluorouracil, gemcitabine and capecitabine
- Immunotherapy: interleukin-2
### SURVEILLANCE

#### Stage I:

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#### Stage IV:

- History and physical exam, CT of abdomen, CXR, blood tests¹ every 3 months for years 1 and 2; every 4 months for years 3 and 4; every 6 months for year 5; then yearly.

CXR = chest x-ray

¹Blood tests include CBC, calcium, liver function tests, and alkaline phosphatase
### APPENDIX A: Suggested Guide for Dosing Options

<table>
<thead>
<tr>
<th>Drug</th>
<th>Line of Therapy</th>
<th>Dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pazopanib</td>
<td>1st</td>
<td>800 mg PO daily</td>
</tr>
<tr>
<td>Sunitinib</td>
<td>1st</td>
<td>50 mg PO, 4 weeks on/2 weeks off or 2 weeks on/1 week off</td>
</tr>
<tr>
<td>Bevacizumab plus interferon alpha-2b</td>
<td>1st</td>
<td>Bevacizumab 10 mg/kg IV every 2 weeks, interferon 9 million units subcutaneously 3 times a week</td>
</tr>
<tr>
<td>Interleukin-2</td>
<td>1st</td>
<td>720,000 international units/kg IV every 8 hours (maximum 14 doses)</td>
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<tr>
<td>Temsirolimus</td>
<td>1st</td>
<td>25 mg IV weekly</td>
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<tr>
<td>Nivolumab</td>
<td>2nd</td>
<td>240 mg IV every 2 weeks</td>
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<tr>
<td>Cabozantinib*</td>
<td>2nd</td>
<td>60 mg PO daily (Cabometyx™ tablet formulation)</td>
</tr>
<tr>
<td>Lenvatinib* plus everolimus</td>
<td>2nd</td>
<td>Lenvatinib 18 mg PO daily, everolimus 5 mg PO daily</td>
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<tr>
<td>Axitinib</td>
<td>2nd</td>
<td>5 mg PO twice a day</td>
</tr>
<tr>
<td>Everolimus</td>
<td>2nd</td>
<td>10 mg PO daily</td>
</tr>
<tr>
<td>Sorafenib</td>
<td>2nd</td>
<td>400 mg PO twice a day</td>
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</tbody>
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*Non-formulary

1 For clear cell renal cell carcinoma
SUGGESTED READINGS


Renal Cell Carcinoma

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DEVELOPMENT CREDITS

This practice algorithm is based on majority expert opinion of the Genitourinary Center Faculty at the University of Texas, MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following medical, radiation, and urologic oncologists:

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