

**Completing the Puzzle**  
**AJCC TNM Staging**  
**Kidney**

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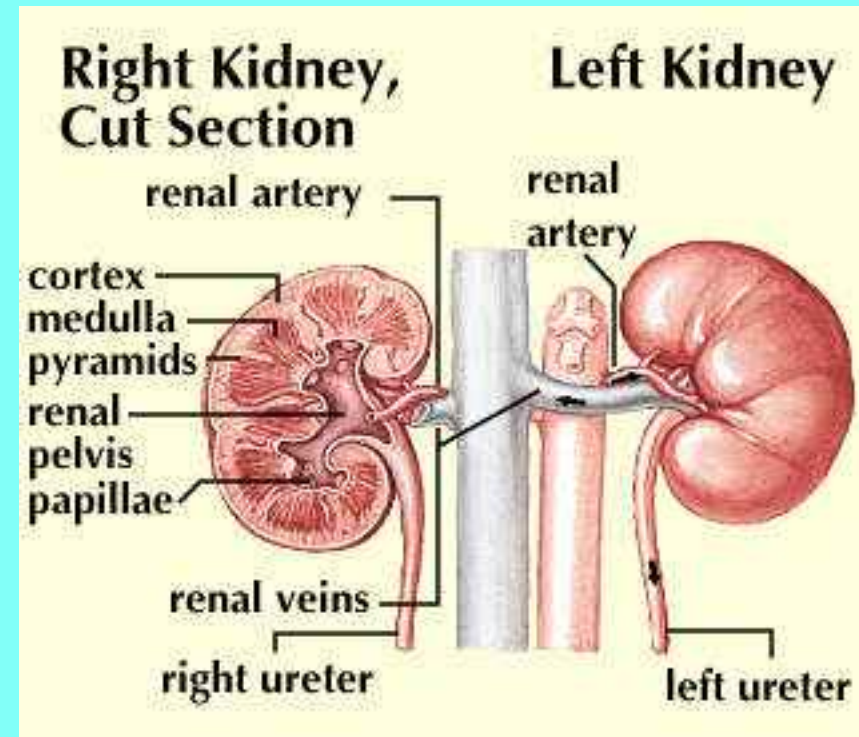
# OBJECTIVES

- Understanding of Kidney TNM staging
- Identify clinical versus pathologic information to use in staging cases
- Case eligibility for pathologic staging

# KIDNEY TOPOGRAPHY CODES ICD-O-3

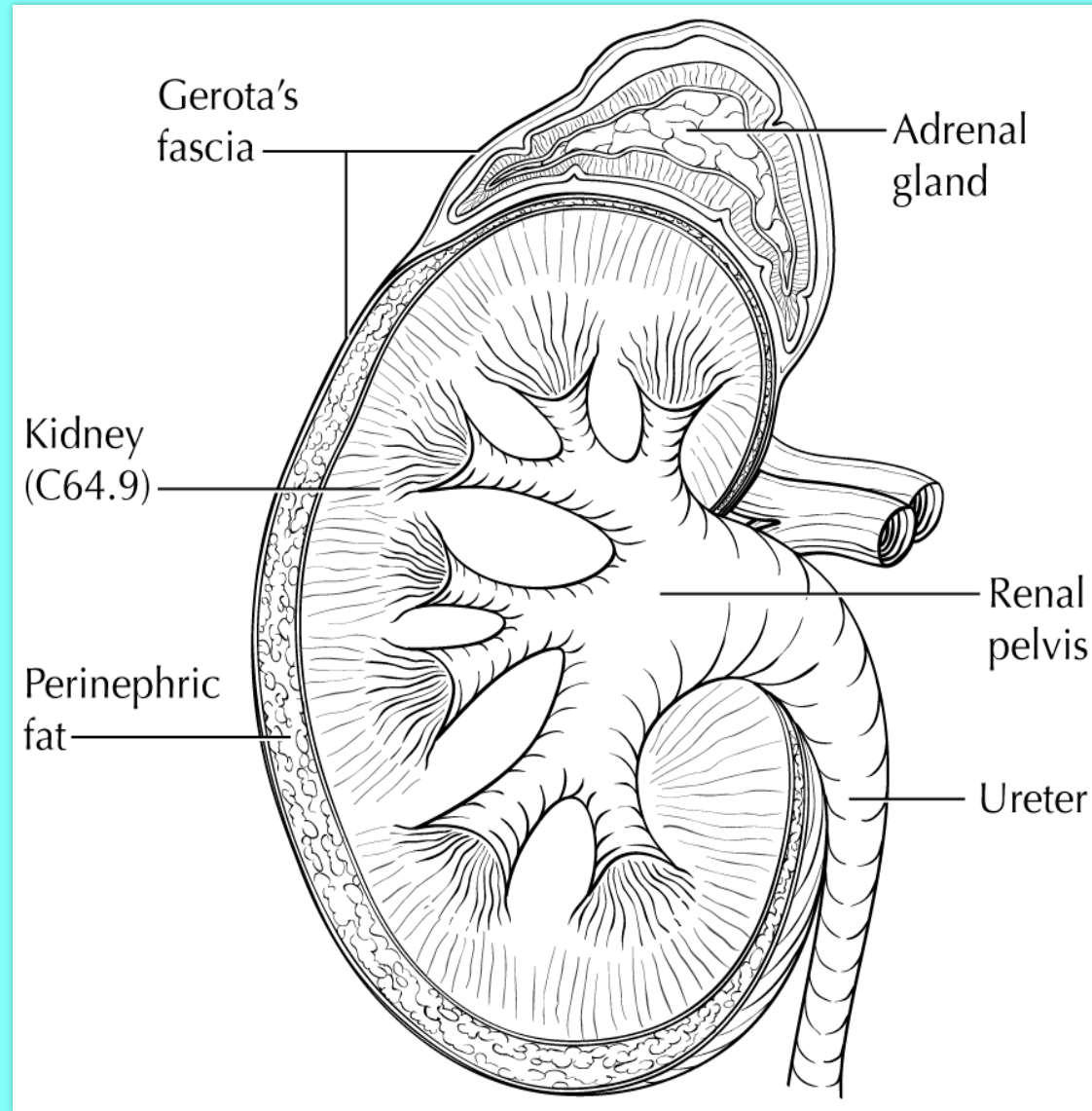
ICD-O-3  
C64.9

Term  
Kidney, NOS

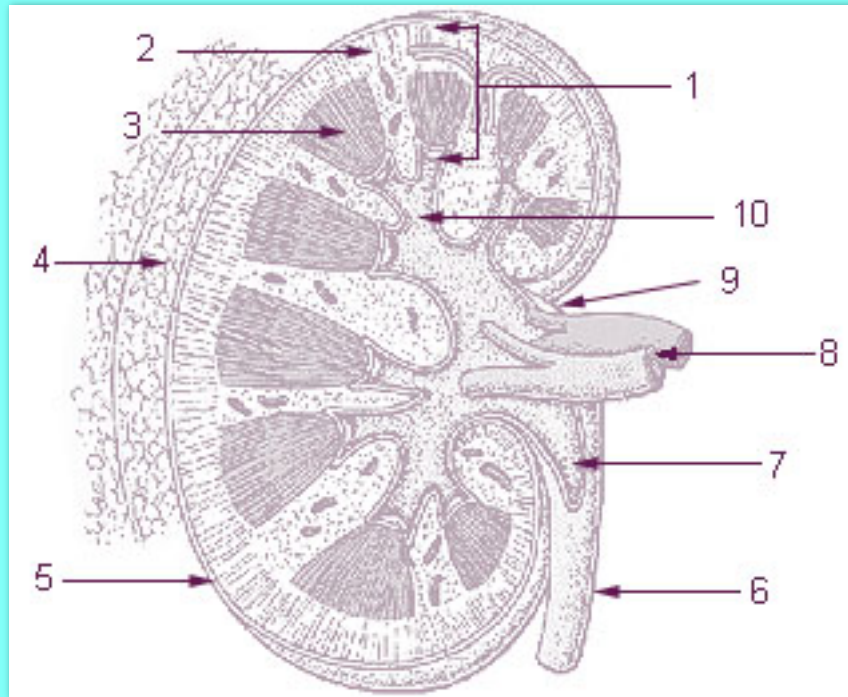


# Kidney

Anatomical site of the kidney.



# Kidney Anatomy

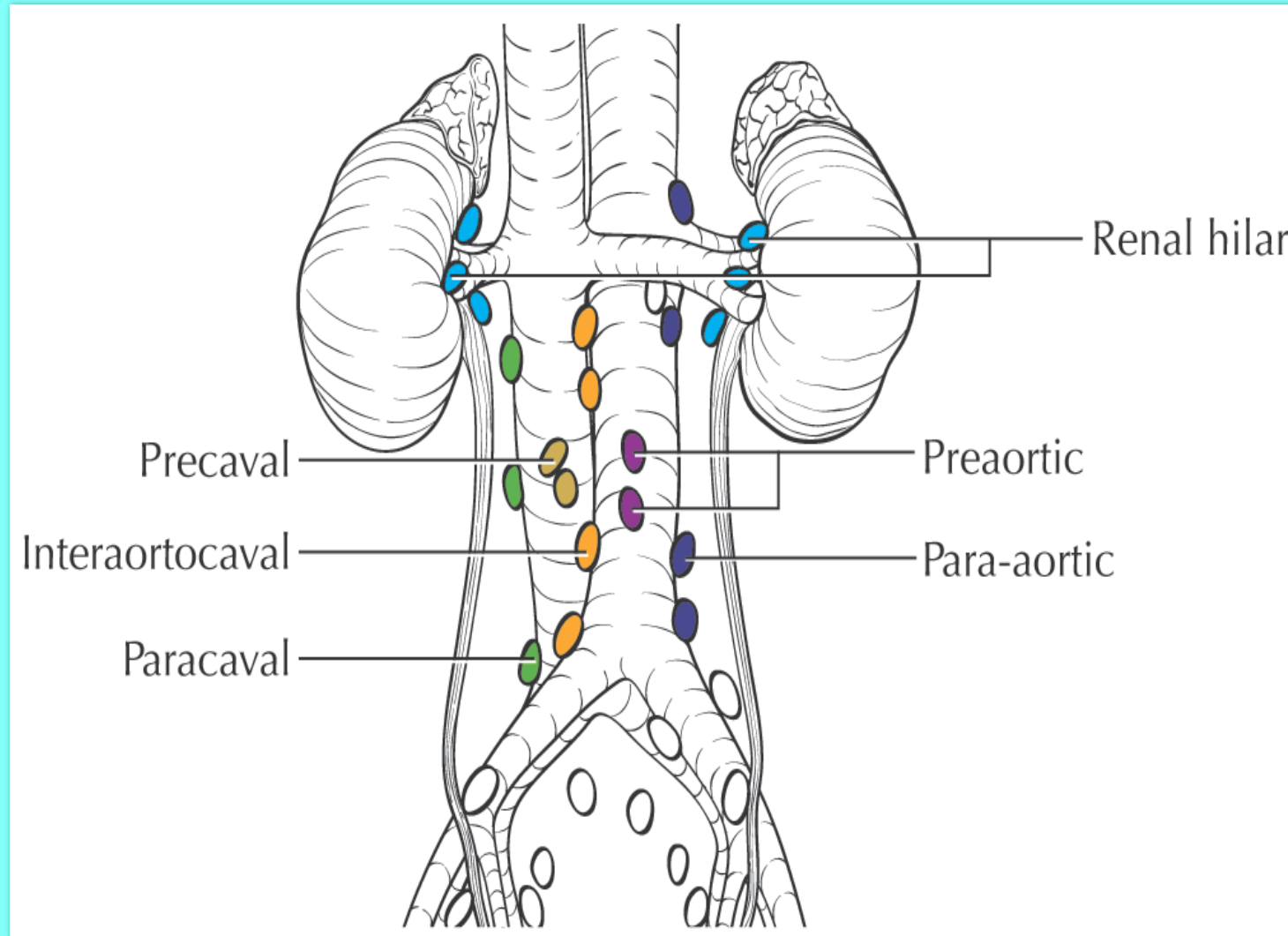


- 1.Parenchyma
- 2.Cortex
- 3.Medulla
- 4.Perirenal fat
- 5.Capsule
- 6.Ureter
- 7.Pelvis of kidney
- 8.Renal vessels
- 9.Hilum
- 10.Calyx

Source: SEER Training Modules, Kidney Anatomy



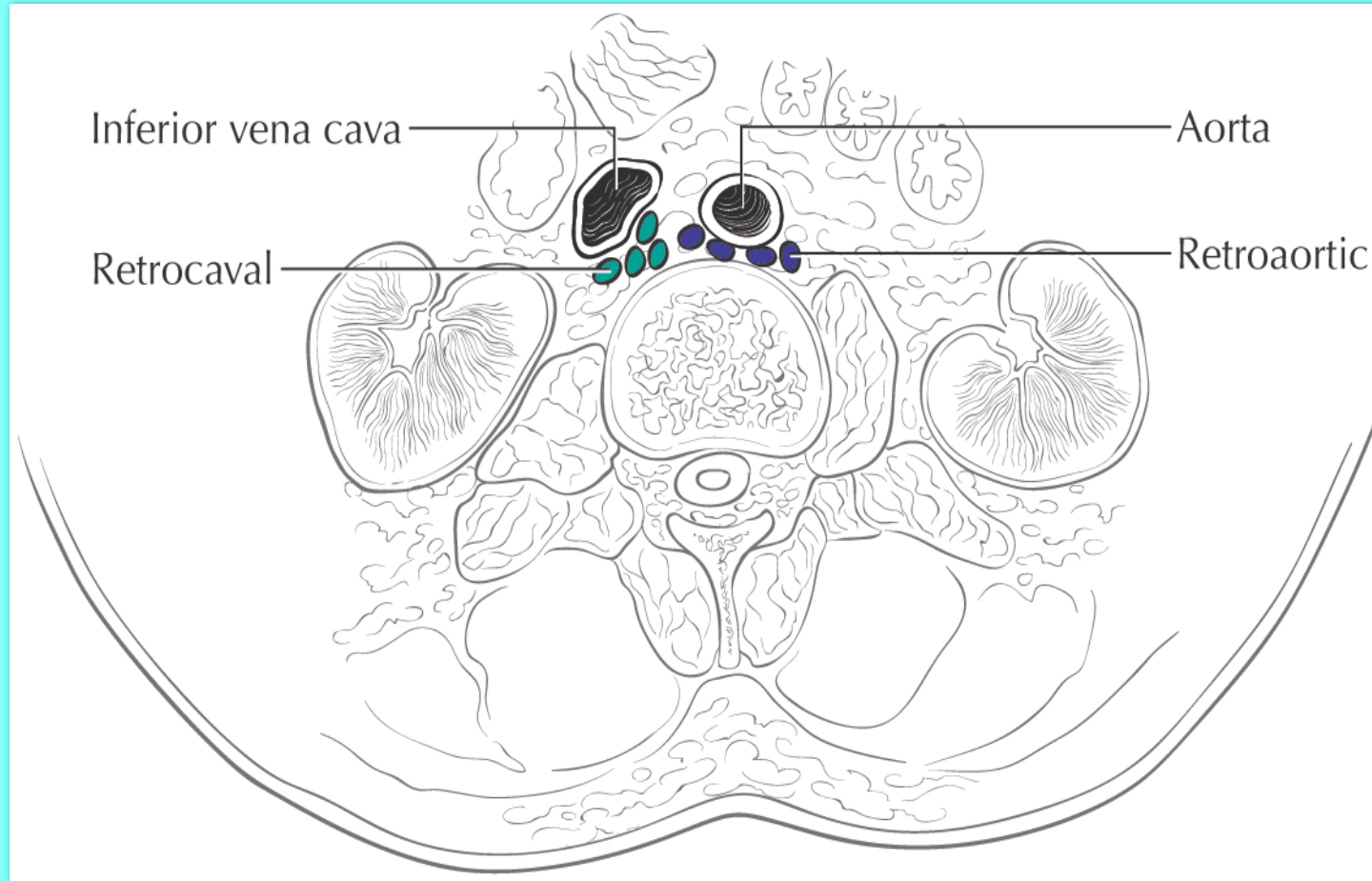
# Kidney



Regional lymph nodes of the kidney.

Compton, C.C., Byrd, D.R., et al., Editors. AJCC Cancer Staging Atlas, 2nd Edition. New York: Springer, 2012. ©American Joint Committee on Cancer

# Kidney



Regional lymph nodes of the kidney.

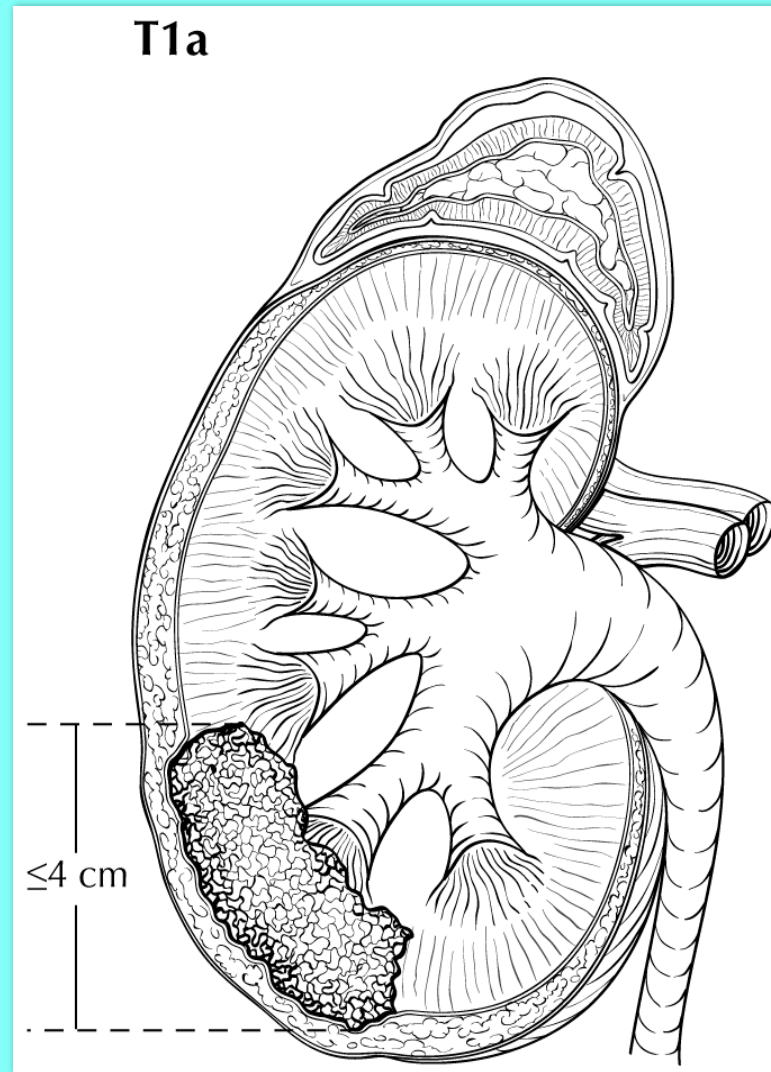
Compton, C.C., Byrd, D.R., et al., Editors. AJCC CancerStaging Atlas, 2nd Edition. New York: Springer, 2012. ©American Joint Committee on Cancer

# AJCC T classifications

- **TX** Primary tumor cannot be assessed
- **T0** No evidence of primary tumor
- **T1** Tumor 7 cm or less in greatest dimension, limited to kidney
- **T1a** Tumor 4 cm or less in greatest dimension, limited to kidney
- **T1b** Tumor more 4 cm but not more than 7 cm in greatest dimension, limited to kidney



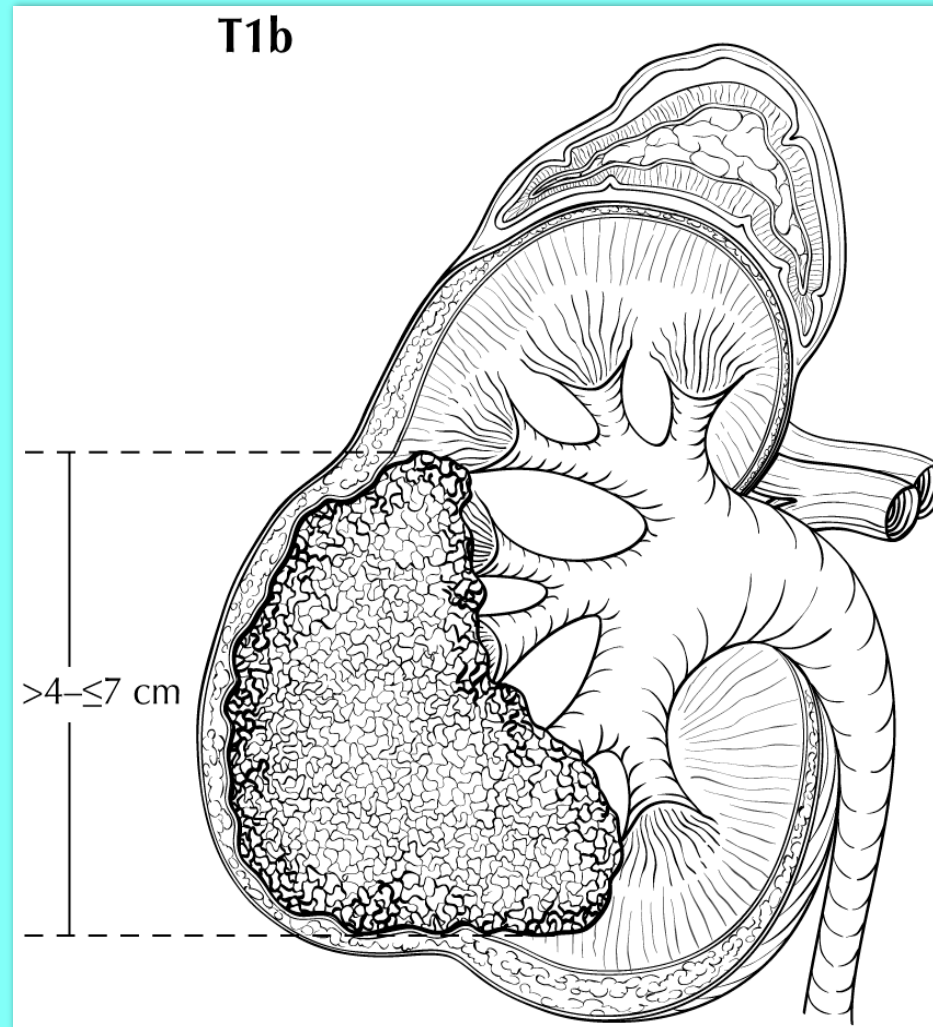
# Kidney



T1a is defined as tumor that is 4 cm or less in greatest dimension, limited to the kidney.

Compton, C.C., Byrd, D.R., et al., Editors. AJCC Cancer Staging Atlas, 2nd Edition. New York: Springer, 2012. ©American Joint Committee on Cancer

# Kidney

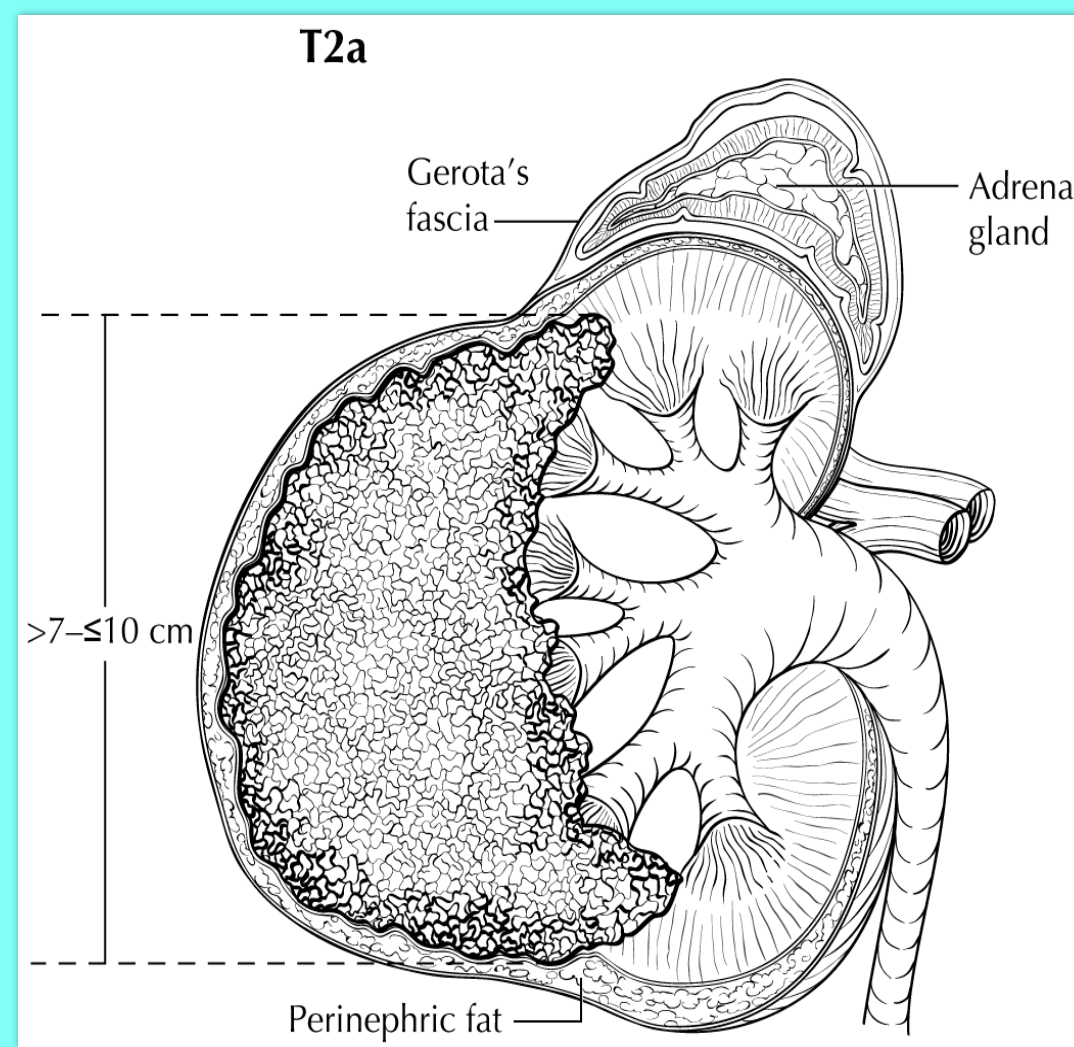


T1b is defined as tumor that is more than 4 cm but not more than 7 cm in greatest dimension, limited to the kidney.

# AJCC T classifications

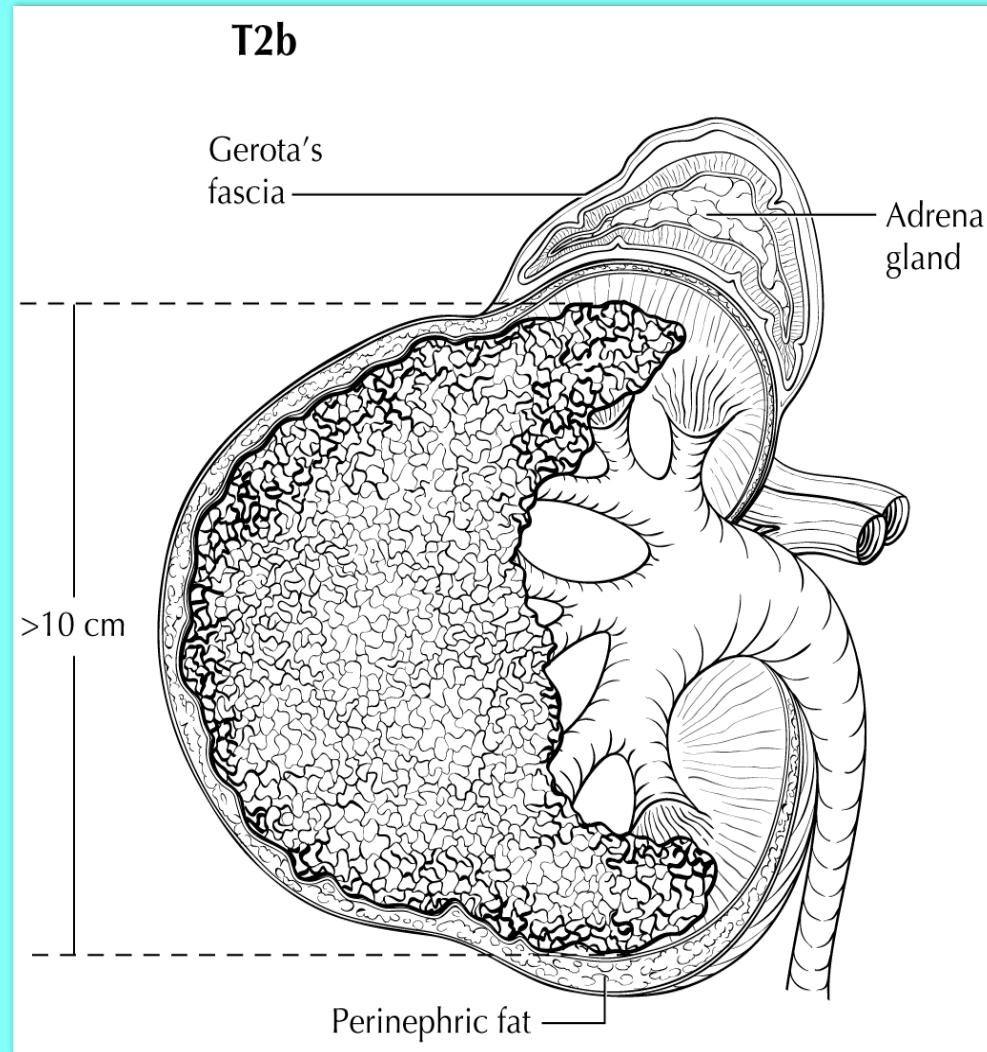
- **T2** Tumor more than 7 cm in greatest dimension, limited to the kidney
- **T2a** Tumor more than 7 cm but less than or equal to 10 cm in greatest dimension, limited to the kidney
- **T2b** Tumor more than 10 cm, limited to the kidney

# Kidney



T2a is defined as tumor that is more than 7 cm but less than or equal to 10 cm in greatest dimension, limited to the kidney.

# Kidney



T2b is defined as tumor that is more than 10 cm in greatest dimension, limited to the kidney.

Compton, C.C., Byrd, D.R., et al., Editors. AJCC CancerStaging Atlas, 2nd Edition. New York: Springer, 2012. ©American Joint Committee on Cancer

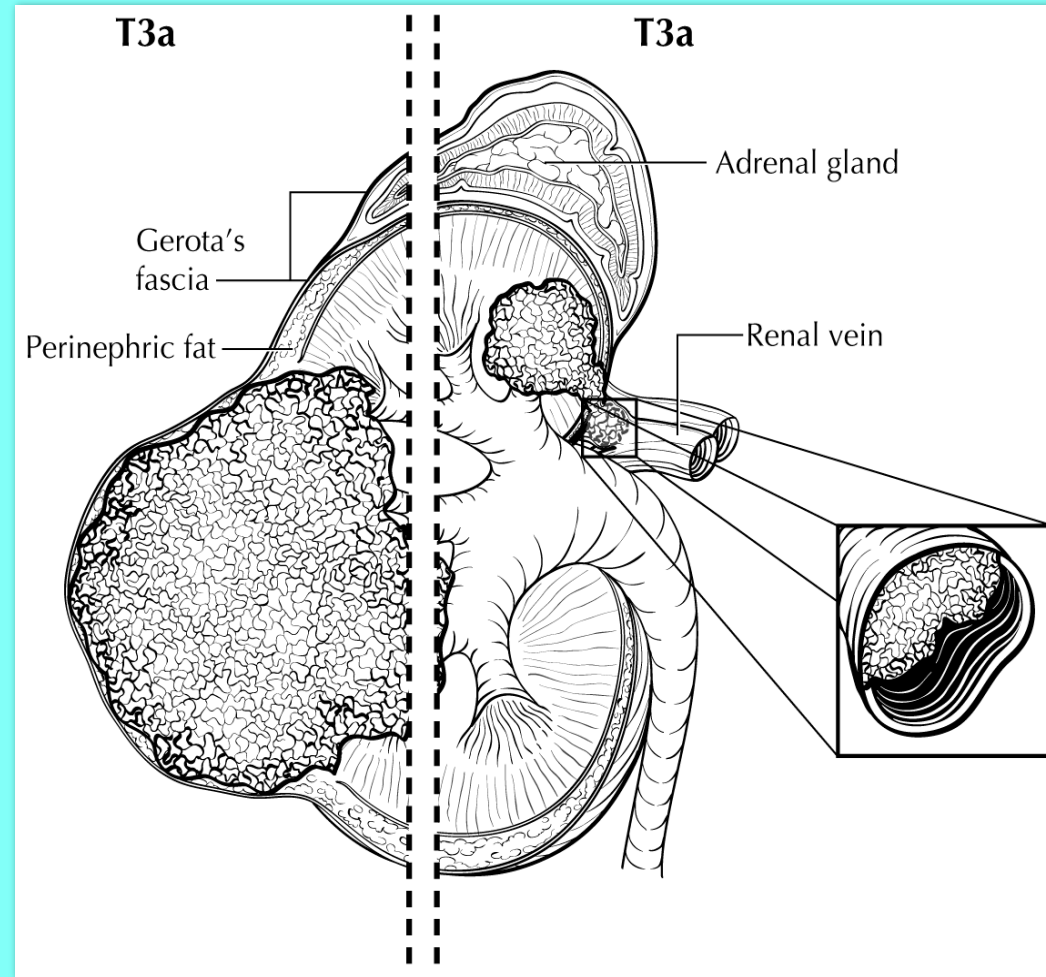


# AJCC T classifications

- **T3** Tumor extends into major veins or perinephric tissues but not into the ipsilateral adrenal gland and not beyond Gerota's fascia
- **T3a** Tumor grossly extends into the renal vein or its segmental (muscle containing) branches, or tumor invades perirenal and/or renal sinus fat but not beyond Gerota's fascia
- **T3b** Tumor grossly extends into the vena cava below the diaphragm
- **T3c** Tumor grossly extends into the vena cava above the diaphragm or invades the wall of the vena cava

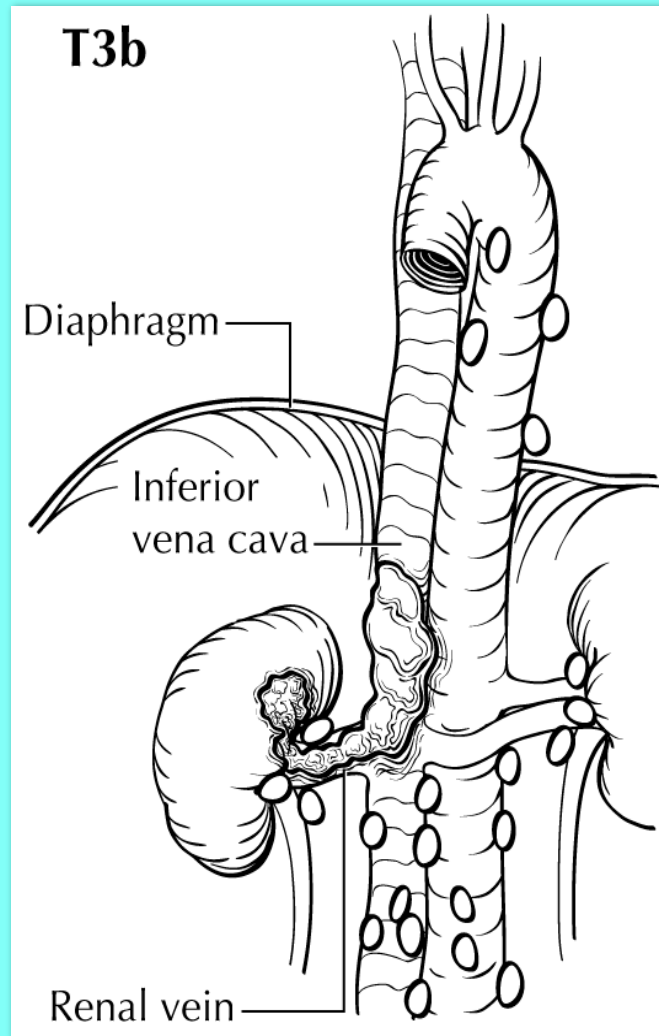


# Kidney



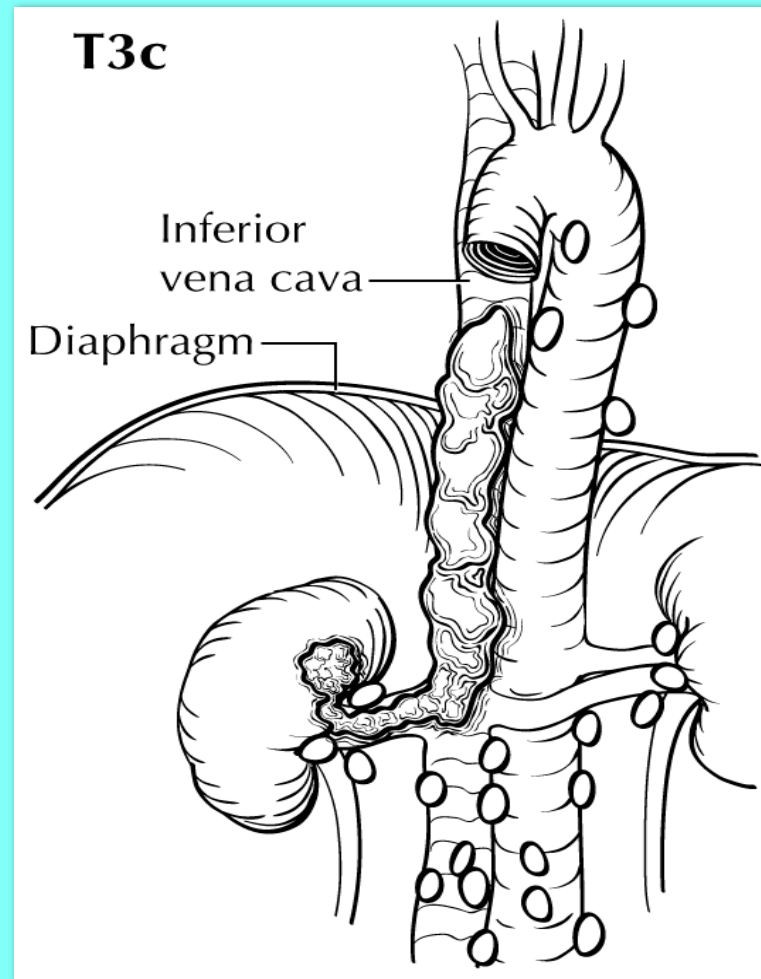
T3a is defined as tumor that extends into perinephric tissues but not into the ipsilateral adrenal gland or beyond Gerota's fascia (illustrated on the left) or T3a is tumor that grossly extends into the renal vein (illustrated on the right).

# Kidney



T3b is defined as tumor that grossly extends into the vena cava below the diaphragm.

# Kidney

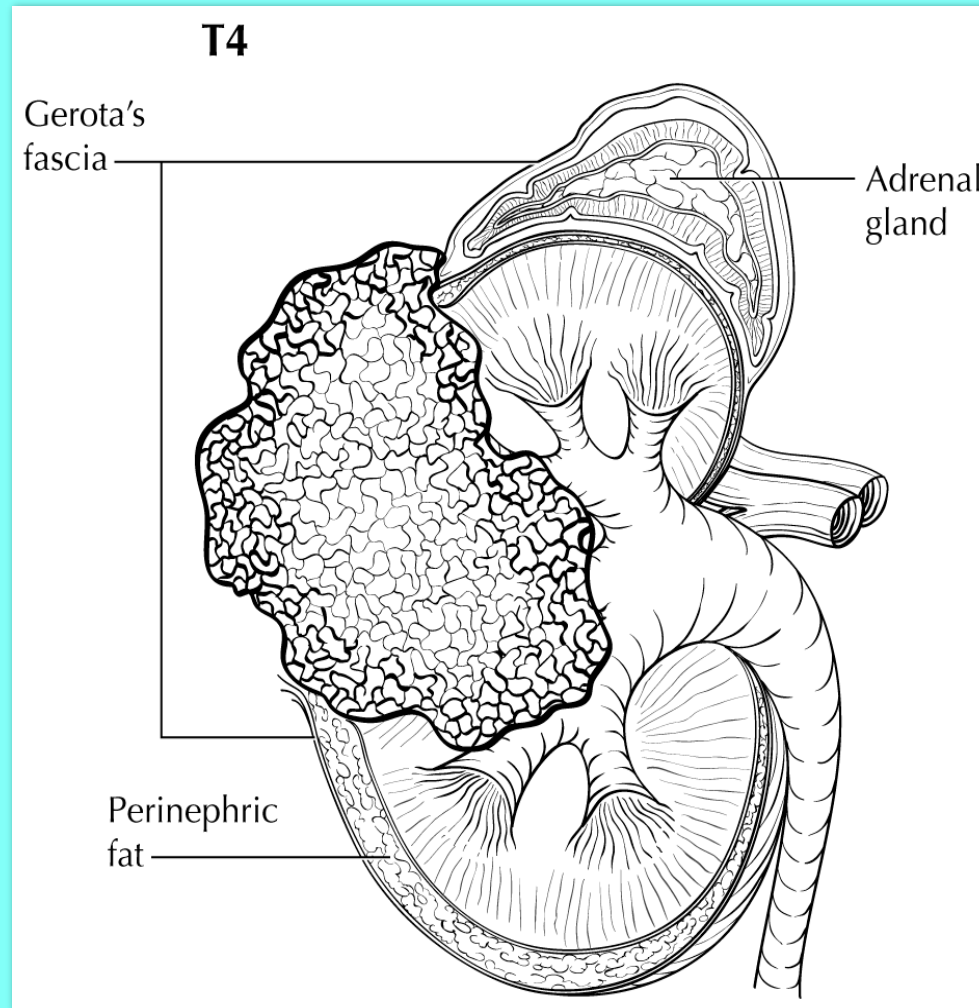


T3c is defined as tumor that grossly extends into vena cava above diaphragm or invades the wall of the vena cava.

# AJCC T classifications

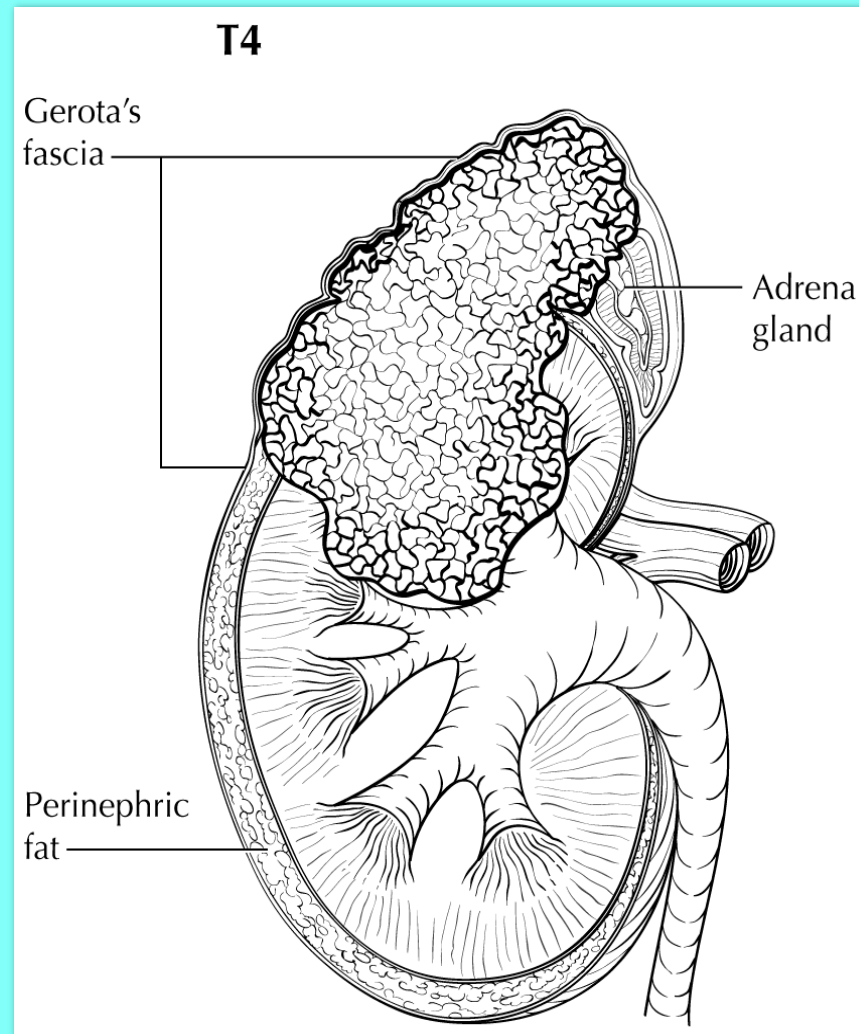
- **T4** Tumor invades beyond Gerota's fascia (including contiguous extension into the ipsilateral adrenal gland)

# Kidney



T4 is defined as tumor that invades beyond Gerota's fascia.

# Kidney



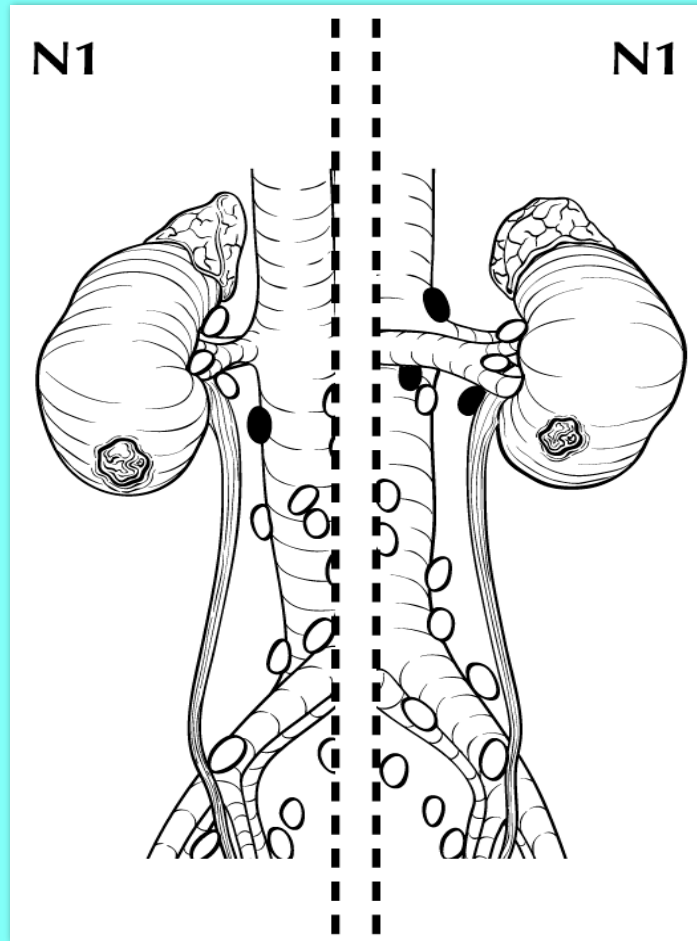
T4 is defined as tumor that extends contiguously into the ipsilateral adrenal gland.



# AJCC N classifications

- **NX** Regional Lymph nodes cannot be assessed
- **N0** No regional lymph node metastases
- **N1** Metastasis in regional lymph node(s)

# Kidney



Two views of N1, defined as metastasis in regional lymph node(s): N1, on the left, is metastasis in a single regional lymph node. N1, on the right, is metastasis in more than one regional lymph node (here showing three involved regional lymph nodes).

# AJCC M classifications

- **M0** No distant metastasis
- **M1** Distant metastasis

## KIDNEY ANATOMIC STAGE/PROGNOSTIC GROUPS

|           |          |          |    |
|-----------|----------|----------|----|
| Stage I   | T1       | N0       | M0 |
| Stage II  | T2       | N0       | M0 |
| Stage III | T1 or T2 | N1       | M0 |
|           | T3       | N0 or N1 | M0 |
| Stage IV  | T4       | Any N    | M0 |
|           | Any T    | Any N    | M1 |

# AJCC Staging for Kidney Cases

- For clinical staging to apply, there must be a suspicion of cancer.
- For pathologic staging to apply you must meet one of the following criteria:
  1. Surgical resection per AJCC Kidney chapter including partial nephrectomy, total nephrectomy, radical nephrectomy
  2. Biopsy of highest T category PLUS biopsy of highest N category. (T4/N1 proven).
  3. Positive histologic confirmation of a metastatic site. (M1 proven).

# Clinical Staging for Kidney cases

- Imaging (CXR, CT chest/Abdomen/Pelvis, MRI, PET)
- FNA/CT guided BX (regional LNs without resection of primary tumor)



# KIDNEY CASE example

- 70 year old WF presents with abdominal and back pain. CT Abdomen/Pelvis revealed a suspicious **5 cm right kidney mass. No involvement of renal vein or adrenal gland. No LAD. No distant METS.** Patient taken to surgery for a right total nephrectomy. Path report: ***4.9 cm tumor size confined to kidney. No LNs received*** with specimen.

# KIDNEY CASE example

○ Does our case meet eligibility for clinical staging ?

**YES**

*There is a suspicion of cancer so clinical staging must be completed.*

# KIDNEY CASE example

What information can be used for clinical staging ?

- ✓ Imaging (CT Abdomen/Pelvis)
- ✓ Physical Exam

# KIDNEY CASE example

○ What is our clinical T classification?

**cT1b**

What is this based on ?

Imaging showing 5.0 cm tumor confined to kidney.

# KIDNEY CASE example

○ What is our clinical N classification?

**cN0**

What is this based on ?

Imaging stated no LAD present.

# KIDNEY CASE example

○ What is our clinical M classification?

**cM0**

What is this based on ?

Imaging showing no evidence of METS, also based on H&P with no signs or symptoms of METS present.

# KIDNEY CASE example

○ What is our clinical staging?

**cT1b**

**cN0**

**cM0**

**cStage I**



# KIDNEY CASE example

○ Does our case meet eligibility for pathologic staging ?

**YES**

*There has been surgical resection of the primary tumor.*

# KIDNEY CASE example

○ What is our pathologic T classification?

**pT1b**

What is this based on ?

Pathology report showing a 4.9 cm tumor confined to the kidney.

# KIDNEY CASE example

○ What is our pathologic N classification?

**pNx**

What is this based on ?

No LNs were removed for evaluation.

# KIDNEY CASE example

○ What is our pathologic M classification?

**cM0**

What is this based on ?

Imaging showed no METS.

# KIDNEY CASE example

○ What is our pathologic staging?



**pT1b**

**pNx**

**cM0**

**pStage 99 Unk (w/ pNx)**

# Interactive Kidney TNM staging

- It's time to put you to work...
- One side is Yellow = which indicates either "No" or "Disagree" = 
- One side is Pink = which indicates "YES" or "Agree" = 



# Interactive Kidney TNM staging

- 58 yo Asian female presents with complaints of back pain and chest pain. A CT chest identified a suspicious kidney mass. CT A/P revealed a **10 cm left kidney mass involving the renal vein. No distant METS.** A radical **left nephrectomy** performed. Pathology report: **9.8 cm** Left kidney mass, **involving the renal vein. No LNs received** with specimen. Margins negative. No further treatment recommended.

# Interactive Kidney TNM staging

○ Does our case meet eligibility for clinical staging ?



**YES** Cancer has been diagnosed so clinical staging must be completed

# Interactive Kidney TNM staging

Based on the information given what is the clinical T classification ?

Answer ?

**cT3a** Involves renal vein per CT

Do you agree ?



# Interactive Kidney TNM staging

Based on the information given what is the clinical N classification ?

Answer ?

cNx (per imaging)

Do you agree ?

**X** Imaging performed and no mention of LAD.

# Interactive Kidney TNM staging

Based on the information given what is the clinical M classification ?

Answer ?

cM0 (per imaging)

Do you agree ?



# Interactive Kidney TNM staging

Based on the information what would the clinical staging be ?

Answer

cT3a

cN0

cM0

cStage III





# Interactive Kidney TNM staging

Based on the information given does the case meet criteria to be pathologically staged ?

Answer ?



(Nephrectomy performed,  
surgical resection of  
primary tumor).

# Interactive Kidney TNM Staging

Based on the information given what is the pathologic T classification ?

Answer ? **pT3a** Involves renal vein.

Do you agree ?



# Interactive Kidney TNM Staging

Based on the information given what is the pathologic N classification ?

Answer ? **pN0**

Do you agree ?



You can only bring down a cN0 in certain specific situations. In this case a nephrectomy was performed in which a surgeon could have removed LNs for exam. This would be a pNx.

# Interactive Kidney TNM Staging

Based on the information given what is the clinical M classification ?

Answer ?

cM0

Do you agree ?



# Interactive Kidney TNM Staging

Based on the information what would the pathologic staging be ?

Answer

pT3a

pNx

cM0

pStage III





## KIDNEY ANATOMIC STAGE/PROGNOSTIC GROUPS

|                         |                  |                        |                  |
|-------------------------|------------------|------------------------|------------------|
| Stage I                 | T1               | N0                     | M0               |
| Stage II                | T2               | N0                     | M0               |
| <b><u>Stage III</u></b> | T1 or T2         | N1                     | M0               |
|                         | <b><u>T3</u></b> | <b><u>N0 or N1</u></b> | <b><u>M0</u></b> |
| Stage IV                | T4               | Any N                  | M0               |
|                         | Any T            | Any N                  | M1               |




# Kidney Example #1

- A 64 year old white male presents to ER with increasing abdominal pain & discomfort. A CT abd/pelvis revealed a 8 cm right kidney mass suspicious for cancer. It appeared to be directly invading the ipsilateral adrenal gland. A CT chest performed showed diffuse lung nodules consistent with lung METS. PT had CT guided BX of the largest left lung nodule with Path showing metastatic RCC.
- Does clinical staging apply ? 
- What info can be used ? Imaging (CT chest, abdomen/pelvis, additional imaging, Biopsies)
- Does pathologic staging apply ? 
- Why ? There is positive confirmation of a metastatic site (Lung BX +)

# Kidney Example #1

- cStaging: cT4 (invasion of ipsilateral adrenal gland per imaging)  
cN0 (per imaging)  
pM1 (Lung METS per Positive BX confirmation)  
cStage IV
- pStaging: pT blank  
pN blank  
pM1 (Positive confirmation of Lung METS per BX path)  
pStage IV

# Kidney Example #2

- 79 yo black male with presents with back pain. Imaging performed revealed a large right para-aortic mass thought to represent LAD. Right kidney was abnormal but no info available on specifics. A CT guided BX was performed of the para-aortic mass with path showing Metastatic RCC in LN tissue. PT opted for Hospice.
- Does Clinical Staging Apply ? 
- Does Pathologic Staging Apply ?

X

# Kidney Example #2

○ What is Clinical Staging ?

cTx

cN1

cM0

cStage 99 Unk (w/ Tx)

# Kidney Example #3

- 40 year old female had an incidental 1.9 cm left lower pole kidney mass found during surveillance CT for her history of colon cancer. No LAD or distant METS were seen. A left partial nephrectomy was performed. Path report: 1.8 cm RCC confined to kidney. No LNs identified in the specimen.
- Clinical Staging ?
- cT1a cN0 cM0 cStage I
- Pathologic Staging ?
- pT1a pNx cM0 pStage 99 Unk (w/ pNx)



# Contact Information

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THANK  
YOU