ANATOMIC DRAWING OF THE URINARY SYSTEM

Adrenal gland, left
Kidney, left
Ureter, left
Urinary bladder
Urethra

THE URINARY SYSTEM
The mucosa of the urinary tract consists of:

The **EPITHELIAL LAYER** contains no blood vessels or lymphatics.

The **BASEMENT MEMBRANE**, a sheet of extracellular material, functions as a filtration barrier and a boundary involved in generating and maintaining tissue structure.

The **LAMINA PROPRIA**, composed of areolar connective tissue, contains blood vessels, nerves, and, in some regions, glands. Once tumor has broken through the basement membrane into the lamina propria, it can spread by way of the lymphatics and blood vessels to other parts of the body.

The urinary sites do NOT have a **MUSCULARIS MUCOSAE**, and, therefore, the lamina propria and the submucosa are difficult to separate. These terms are used interchangeably.

The **SUBMUCOSA** is a thick layer of either dense or areolar connective tissue. It contains blood vessels, lymphatic vessels, nerves, and, in some regions, glands.

The **MUSCULARIS PROPRIA** is composed of multiple layers of muscle tissue; it constitutes the wall of the organ.

The **SEROsa**, the outermost layer covering, is a serous membrane, part of the visceral peritoneum. It covers only the superior surface of the bladder. There is no serosa on the renal pelvis or ureters. Where there is no serosa, the connective tissue of surrounding structures merges with the connective tissue of the urinary organs and is called **ADVENTITIA**.

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th>MUSCOSA</th>
<th><strong>MUSCULARIS PROPRIA</strong></th>
<th>SEROSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder (C67._)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, on superior surface</td>
</tr>
<tr>
<td>Renal pelvis (C65.9)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Ureter(s) (C66.9)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Table of Anatomic Structures**
ANATOMIC DRAWING OF THE KIDNEY AND RENAL PELVIS

CROSS SECTION OF THE KIDNEY

- Capsule
- Cortex
- Interlobar artery and vein
- Minor calyces
- Major calyx
- Hilum
- Renal artery and vein
- Pelvis of kidney
- Ureter
- Renal papilla
- Perirenal fat
- Peri/pararenal fat
- Medulla
- Medullary rays
- Pyramid
- Renal (Gerota’s) fascia
- Renal papilla
KIDNEY (Renal) PARENCHYMA
C64.9
C64.9 Kidney, NOS (Kidney parenchyma) <>
<> Laterality must be coded for this site.

SUMMARY STAGE

0  In situ: Noninvasive; intraepithelial

1 Localized only

Invasive cancer confined to kidney cortex and/or medulla
Invasion of renal capsule
Renal pelvis or calyces involved
Separate focus of tumor in renal pelvis/calyx

Localized, NOS

2 Regional by direct extension only

Extension to:
Adrenal (suprarenal) gland, ipsilateral
Ascending colon from right kidney
Blood vessel(s) (major):
  Extrarenal portion of renal vein
  Hilar blood vessel
  Perirenal vein
  Renal artery
  Renal vein, NOS
  Tumor thrombus in a renal vein, NOS
  Vena cava
Descending colon from left kidney
Diaphragm
Duodenum from right kidney
Perirenal (perinephric) tissue/fat
Peritoneum
Psoas muscle ***
Renal (Gerota’s) fascia
Retroperitoneal soft tissue
Tail of pancreas
Ureter, including implant(s), ipsilateral
3 Regional lymph node(s) involved only

REGIONAL Lymph Nodes (including contralateral and bilateral)

- Aortic, NOS###:
  - Lateral (lumbar)
  - Para-aortic
  - Periaortic
  - Paracaval###
  - Renal hilar
  - Retroperitoneal, NOS###

Regional lymph node(s), NOS

4 Regional by BOTH direct extension AND regional lymph node(s) involved

Codes (2) + (3)

5 Regional, NOS

7 Distant site(s)/lymph node(s) involved

Distant lymph node(s)

Further contiguous extension:
- Aorta
- Contralateral:
  - Adrenal (suprarenal) gland
  - Kidney
  - Ureter
- Liver
- Ribs##
- Spleen
- Stomach

Other direct extension

Metastasis

9 Unknown if extension or metastasis

Note: The parenchyma of the kidney includes the following structures: cortex (outer layer of kidney) and renal columns; medulla, medullary rays, renal pyramids, and renal papillae; nephrons (renal corpuscle, loops of Henle, proximal and distal tubules, collecting duct), glomerulus, and Bowman’s capsule. The most common site for renal parenchymal cancer to develop is in the proximal convoluted tubule. Tumor extension from one of these structures into another would be coded to localized unless there were further signs of involvement.

### Considered regional in Historic Stage
#### Considered distant in Historic Stage
##### Considered distant in 1977 Summary Staging Guide
RENAL PELVIS AND URETER
C65.9, C66.9
C65.9 Renal pelvis <>
C66.9 Ureter <>
<> Laterality must be coded for this site.

SUMMARY STAGE

0 In situ: Noninvasive; intraepithelial

Carcinoma in situ, NOS

Papillary noninvasive carcinoma

1 Localized only

Muscularis invaded
Subepithelial connective tissue (lamina propria, submucosa) invaded

Localized, NOS

2 Regional by direct extension only

Extension to:
Adjacent tissue(s), NOS:
  Connective tissue
  Peripelvic/periureteric tissue
  Retroperitoneal soft/connective tissue
Adrenal (suprarenal) gland from renal pelvis###
Bladder from ureter
Blood vessel(s) (major):###
  Aorta
  Renal artery/vein
  Tumor thrombus in a renal vein, NOS
  Vena cava (inferior)
Duodenum from right renal pelvis or right ureter###
Implants in ureter
Ipsilateral kidney parenchyma and kidney, NOS from renal pelvis
Psoas muscle from ureter
Ureter from renal pelvis
3 Regional lymph node(s) involved only

REGIONAL Lymph Nodes (including contralateral and bilateral)

Renal Pelvis:
Aortic, NOS###:
  Lateral (lumbar)
  Para-aortic
  Periaortic
Paracaval
Renal hilar
Retroperitoneal, NOS

Regional lymph node(s), NOS

Ureter:
Iliac, NOS:
  Common
  External
  Internal (hypogastric), NOS:
    Obturator

Lateral aortic (lumbar)
Paracaval
Pelvic, NOS
Periureteral
Renal hilar
Retroperitoneal, NOS

Regional lymph node(s), NOS

4 Regional by BOTH direct extension AND regional lymph node(s) involved

Codes (2) + (3)

5 Regional, NOS
RENAL PELVIS AND URETER
C65.9, C66.9

7 Distant site(s)/lymph node(s) involved

Distant lymph node(s)

Extension to##:

Ascending colon
Bladder (wall or mucosa) from renal pelvis
Colon, NOS
Descending colon
Ipsilateral kidney parenchyma from ureter
Liver
Pancreas
Perirenal (perinephric) fat via kidney
Spleen

Further contiguous extension

Ureter:

Prostate
Uterus

Other direct extension

Metastasis

9 Unknown if extension or metastasis

Note: Ascending colon from right ureter and descending colon from left ureter considered Regional in 1977 Summary Stage.

## Considered regional in Historic Stage
### Considered distant in Historic Stage
The trigone of the urinary bladder is an area of mucous membrane that is bounded by the internal orifice of the urethra and the postero-lateral orifices (right and left) of the ureters.
DISTINGUISHING NONINVASIVE AND INVASIVE BLADDER CANCER

The two main types of bladder cancer are the flat (sessile) variety and the papillary type. Only the flat (sessile) variety is called in situ when tumor has not penetrated the basement membrane. Papillary tumor that has not penetrated the basement membrane is called noninvasive, and pathologists use many different descriptive terms for noninvasive papillary transitional cell carcinoma. Frequently, the pathology report does not contain a definite statement of noninvasion; however, noninvasion can be inferred from the microscopic description. The more commonly used descriptions for noninvasion are listed below.

Careful attention must be given to the use of the term “confined to mucosa” for bladder. Historically, carcinomas described as “confined to mucosa” were coded as localized. However, pathologists use this designation for noninvasion as well. In order to rule out the possibility of coding noninvasive tumors in this category, abstractors should determine:

1) If the tumor is confined to the epithelium, then it is noninvasive.

2) If the tumor has penetrated the basement membrane to invade the lamina propria, then it is invasive. The terms lamina propria, submucosa, stroma, and subepithelial connective tissue are used interchangeably.

3) Only if this distinction cannot be made should the tumor be coded to “confined to mucosa.”

<table>
<thead>
<tr>
<th>For Bladder Cases Only</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Definite Statements of Noninvasion</strong></td>
<td><strong>Inferred Description of Noninvasion</strong></td>
</tr>
<tr>
<td>Non-infiltrating; noninvasive</td>
<td>No involvement of muscularis propria and no mention of subepithelium/submucosa</td>
</tr>
<tr>
<td>No evidence of invasion</td>
<td>No statement of invasion (microscopic description present)</td>
</tr>
<tr>
<td>No extension into lamina propria</td>
<td>(Underlying) Tissue insufficient to judge depth of invasion</td>
</tr>
<tr>
<td>No stromal invasion</td>
<td>No invasion of bladder wall; no involvement of muscularis propria</td>
</tr>
<tr>
<td>No extension into underlying supporting tissue</td>
<td>Benign deeper tissue</td>
</tr>
<tr>
<td>Negative lamina propria and superficial muscle</td>
<td>Microscopic description problematic for pathologist</td>
</tr>
<tr>
<td>Negative muscle and (subepithelial) connective tissue</td>
<td>(noninvasion versus superficial invasion)</td>
</tr>
<tr>
<td>No infiltrative behavior/component</td>
<td>Frond surfaced by transitional cells</td>
</tr>
<tr>
<td></td>
<td>No mural infiltration</td>
</tr>
<tr>
<td></td>
<td>No evidence of invasion (no sampled stroma)</td>
</tr>
</tbody>
</table>
BLADDER
C67.0-C67.9
C67.0 Trigone of bladder
C67.1 Dome of bladder
C67.2 Lateral wall of bladder
C67.3 Anterior wall of bladder
C67.4 Posterior wall of bladder
C67.5 Bladder neck
C67.6 Ureteric orifice
C67.7 Urachus
C67.8 Overlapping lesion of bladder
C67.9 Bladder, NOS

SUMMARY STAGE

0 In situ: Noninvasive; intraepithelial

Carcinoma in situ, NOS

Noninvasive papillary (transitional) cell carcinoma
Papillary non-infiltrating
Papillary transitional cell carcinoma, stated to be noninvasive
Papillary transitional cell carcinoma, with inferred description of noninvasion

Sessile (flat) (solid) carcinoma in situ
Transitional cell carcinoma in situ

Jewett-Strong-Marshall Stage 0
TNM/AJCC Ta

Jewett-Strong-Marshall CIS
TNM/AJCC Tis

1 Localized only

Invasive tumor confined to:
   Mucosa, NOS
Muscle (muscularis)##:
   Deep muscle—outer half
   Extension through full thickness of bladder wall
   Superficial muscle—inner half
   NOS
Submucosa:
   Lamina propria
   Stroma
   Subepithelial connective tissue
   Tunica propria
Subserosa
Jewett-Strong-Marshall Stage A
TNM/AJCC T1, T2

Localized, NOS
2 Regional by direct extension only

Bladder FIXED

Extension to:
Adventitia
Extravesical mass
Parametrium
Periprostatic tissue
Peritoneum
Periureteral fat/tissue
Perivesical fat/tissue
Prostate
Rectovesical/Denonvilliers’ fascia
Seminal vesicle
Serosa (mesothelium) (to/through)
Tunica serosa (to/through)
Ureter
Urethra (including prostatic urethra)
Uterus
Vagina
Vas deferens

3 Regional lymph node(s) involved only

REGIONAL Lymph Nodes (including contralateral and bilateral)

Iliac, NOS:
   External
   Internal (hypogastric), NOS:
      Obturator
Pelvic, NOS
Perivesical
Sacral, NOS##:
   Lateral (lateral sacral)
   Middle (promontorial) (Gerota’s node)
   Presacral

Regional lymph node(s), NOS

4 Regional by BOTH direct extension AND regional lymph node(s) involved

Codes (2) + (3)

5 Regional, NOS
BLADDER
C67.0-C67.9

7 Distant site(s)/lymph node(s) involved

Distant lymph node(s):
  Common iliac
  Other distant lymph node(s)

Extension to:
  Abdominal wall
  Bone
  Colon
  Pelvic wall
  Rectum

Further contiguous extension

Metastasis

9 Unknown if extension or metastasis

Note 1: The lamina propria and submucosa tend to merge when there is no muscularis mucosae, so these terms may be used interchangeably.

Note 2: The meaning of the terms “invasion of mucosa, grade 1” and “invasion of mucosa, grade 2” varies with the pathologist, who must be queried to determine whether the carcinoma is “noninvasive” or “invasive.”

Note 3: Statements Meaning Confined to Mucosa, NOS
  Confined to mucosal surface
  Limited to mucosa, no invasion of submucosa and muscularis
  No infiltration/invasion of fibromuscular and muscular stroma
  Superficial, NOS

Note 4: Pubic bone and rectum for males are considered regional by direct extension in the 1977 Summary Staging Guide. For males, non-prostatic urethra considered to be distant in 1977 Summary Staging Guide.

## Considered regional in Historic Stage
### Considered distant in Historic Stage
** Considered regional in 1977 Summary Staging Guide
*** Considered distant in 1977 Summary Staging Guide
URETHRA, PARAURETHRAL GLAND, AND UNSPECIFIED URINARY ORGANS
C68.0-C68.1, C68.8-C68.9
C68.0 Urethra (including transitional cell carcinoma of prostatic urethra {M8120-8130})
C68.1 Paraurethral gland
C68.8 Overlapping lesion of urinary organs
C68.9 Urinary system, NOS

SUMMARY STAGE

0 In situ: Noninvasive; intraepithelial
   Carcinoma in situ, NOS
   Noninvasive papillary, polypoid, or verrucous carcinoma

1 Localized only
   Muscularis invaded
   Subepithelial connective tissue (lamina propria, submucosa) invaded
   Localized, NOS

2 Regional by direct extension only
   Extension beyond the prostatic capsule
   Extension to:
      Bladder neck
      Corpus cavernosum
      Corpus spongiosum
      Periurethral muscle (sphincter)
      Prostate
      Vagina, anterior or NOS

3 Regional lymph node(s) involved only
   REGIONAL Lymph Nodes (including contralateral and bilateral)
      Iliac, NOS:
         Common
         External
         Internal (hypogastric), NOS:
            Obturator
      Inguinal, NOS:
         Deep, NOS:
            Node of Cloquet or Rosenmuller (highest deep inguinal)
            Superficial (femoral)
      Pelvic, NOS
      Presacral
      Sacral, NOS
      Regional lymph node(s), NOS
URETHRA, PARAURETHRAL GLAND, AND UNSPECIFIED URINARY ORGANS
C68.0-C68.1, C68.8-C68.9

4 Regional by BOTH direct extension AND regional lymph node(s) involved

Codes (2) + (3)

5 Regional, NOS

7 Distant site(s)/lymph node(s) involved

Distant lymph node(s)

Extension to:
   Bladder (excluding bladder neck)##
   Seminal vesicle(s)##
   Other adjacent organs##

Further contiguous extension

Metastasis

9 Unknown if extension or metastasis

Note: Transitional cell carcinoma (M-8120-8130) of the prostatic ducts and prostatic urethra are to be coded to urethra (C68.0) and Summary Stage assigned according to this scheme.

## Considered regional in Historic Stage