

URINARY SYSTEM

BLADDER, RENAL PELVIS AND URETERS ANATOMIC STRUCTURES

Table of Anatomic Structures

PRIMARY SITE	MUCOSA -Epithelium -Lamina propria submucosa	MUSCULARIS PROPRIA	SEROSA
Bladder (C67_)	Yes	Yes	Yes, on superior surface
Renal pelvis (C659)	Yes	Yes	No
Ureter (C669)	Yes	Yes	No

The layers of the urinary tract include:

1. The **EPITHELIAL LAYER** contains no blood vessels or lymphatics
2. The **BASEMENT MEMBRANE**, a sheet of extracellular material, functions as a filtration barrier and a boundary involved in generating and maintaining tissue structure
3. 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
4. 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
5. 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
6. The **MUSCULARIS PROPRIA** is composed of multiple layers of muscle tissue; it constitutes the wall of the organ
7. 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.
 - a. Where there is no serosa, the connective tissue of surrounding structures merges with the connective tissue of the urinary organs and is called **ADVENTITIA**.

KIDNEY (RENAL PARENCHYMA)

8000-8700, 8720-8790, 9700-9701

C649

C649 Kidney, NOS (Renal parenchyma)

Note 1: The following sources were used in the development of this chapter

- SEER Extent of Disease 1988: Codes and Coding Instructions (3rd Edition, 1998) (<https://seer.cancer.gov/archive/manuals/EOD10Dig.3rd.pdf>)
- SEER Summary Staging Manual-2000: Codes and Coding Instructions (<https://seer.cancer.gov/tools/ssm/>)
- Collaborative Stage Data Collection System, version 02.05: <https://cancerstaging.org/cstage/Pages/default.aspx>
- Chapter 60 *Kidney*, in the AJCC Cancer Staging Manual, Eighth Edition (2017) published by Springer International Publishing. Used with permission of the American College of Surgeons, Chicago, Illinois.

Note 2: See the following chapters for the listed histologies

- 8710-8714, 8800-8934, 8940-9137, 9141-9582: *Soft Tissue*
- 8935-8936: *GIST*
- 9140: *Kaposi Sarcoma*

SUMMARY STAGE

0 In situ: noninvasive, intraepithelial

1 Localized only (localized, NOS)

- Confined (limited) to the kidney, NOS
- Invasion of renal capsule
- Invasive cancer confined to kidney cortex and/or medulla
- Pelvicalyceal system
- Renal pelvis or calyces involved
- Separate focus of tumor in renal pelvis/calyx

2 Regional by direct extension only

- Adrenal gland (ipsilateral) (contiguous metastasis)
- Ascending colon from right kidney
- Beyond Gerota's fascia, NOS
- Blood vessel(s) (major)
 - Extrarenal portion of renal vein or segmental (muscle containing branches)

- Hilar blood vessel
- Inferior vena cava
- Perirenal vein/fat
- Renal artery
- Renal vein, NOS/sinus fat
- Tumor thrombus in a renal vein, NOS
- Descending colon from left kidney
- Diaphragm
- Duodenum from right kidney
- Perinephric tissue
- Peritoneum
- Psoas muscle
- Quadratus lumborum muscle
- Retroperitoneal soft tissue
- Tail of pancreas
- Ureter (ipsilateral), including implant(s)

3 Regional lymph node(s) involved only

- Aortic, NOS
 - Lateral (lumbar)
 - Para-aortic
 - Periaortic
 - Preaortic
 - Retroaortic
- Caval, NOS
 - Interaortocaval
 - Paracaval
 - Pericaval
 - Precaval
 - Retrocaval
- Renal hilar
- Retroperitoneal, NOS
- Regional lymph node(s), NOS
 - Lymph node(s), NOS

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

- Codes (2) + (3)

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

- Distant site(s) (including further contiguous extension)
 - Adrenal gland
 - Contralateral
 - Ipsilateral, noncontiguous
 - Aorta
 - Contralateral kidney
 - Contralateral ureter
 - Liver
 - Ribs
 - Spleen
 - Stomach
- Distant lymph node(s), NOS
- Distant metastasis, NOS
 - Carcinomatosis
 - Distant metastasis WITH or WITHOUT distant lymph node(s)

9 Unknown if extension or metastasis

KIDNEY RENAL PELVIS

8000-8700, 8720-8790, 9700-9701

C659, C669

C659 Renal pelvis

C669 Ureter

Note 1: The following sources were used in the development of this chapter

- SEER Extent of Disease 1988: Codes and Coding Instructions (3rd Edition, 1998) (<https://seer.cancer.gov/archive/manuals/EOD10Dig.3rd.pdf>)
- SEER Summary Staging Manual-2000: Codes and Coding Instructions (<https://seer.cancer.gov/tools/ssm/>)
- Collaborative Stage Data Collection System, version 02.05: <https://cancerstaging.org/cstage/Pages/default.aspx>
- Chapter 61 *Renal Pelvis and Ureter*, in the AJCC Cancer Staging Manual, Eighth Edition (2017) published by Springer International Publishing. Used with permission of the American College of Surgeons, Chicago, Illinois.

Note 2: See the following chapters for the listed histologies

- 8710-8714, 8800-8934, 8940-9137, 9141-9582: *Soft Tissue*
- 8935-8936: *GIST*
- 9140: *Kaposi Sarcoma*

Note 3: Tumor involving both renal pelvis and ureter (unifocal or multifocal) is classified by the depth of greatest invasion in either organ.

Note 4: Direct invasion of the bladder by a ureteral tumor is classified by the depth of greatest invasion of the bladder or ureter.

SUMMARY STAGE

0 In situ, intraepithelial, noninvasive

- Flat, sessile
- Noninvasive papillary carcinoma

1 Localized only (localized, NOS)

- Confined to renal pelvis, NOS
- Confined to ureter, NOS
- Muscularis
 - Renal pelvis only

- Ureter only
- Subepithelial connective tissue (lamina propria, submucosa)
 - Renal pelvis only
 - Ureter only

2 Regional by direct extension only

- Extension to bladder from ureter
 - Muscularis of distal ureter and/or bladder
 - Subepithelial connective tissue of distal ureter and/or bladder
- Invasion beyond muscularis into
 - Peripelvic fat (renal pelvis)
 - Periureteric fat (ureter)
 - Retroperitoneal soft/connective tissue
- Renal pelvis and ureter (unifocal or multifocal)
 - Duodenum (from right renal pelvis or right ureter)
 - Ipsilateral adrenal gland (suprarenal) gland
 - Major blood vessel(s)
 - Aorta
 - Renal artery/vein
 - Vena cava (inferior)
 - Muscularis
 - Distal ureter from proximal ureter
 - Renal pelvis from ureter
 - Ureter from renal pelvis
 - Psoas muscle (ureter)
 - Subepithelial connective tissue
 - Distal ureter from proximal ureter
 - Renal pelvis from ureter
 - Ureter from renal pelvis
 - Tumor thrombus in a renal vein, NOS
- Renal pelvis only
 - Ipsilateral kidney parenchyma and kidney, NOS

3 Regional lymph node(s) involved only

- All sites
 - Lateral aortic (lumbar)
 - Paracaval
 - Renal hilar
 - Retroperitoneal, NOS
 - Regional lymph node(s), NOS
 - Lymph node(s), NOS
- Renal Pelvis

- Aortic (para-aortic, periaortic, NOS)
- Ureter
 - Iliac (common, external, NOS)
 - Internal (hypogastric) (obturator)
 - Pelvic, NOS
 - Periureteral

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

- Codes (2) + (3)

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

- Distant site(s) (including further contiguous extension)
 - Ascending colon (from right renal pelvis or right ureter)
 - Bladder (wall or mucosa) from renal pelvis
 - Colon, NOS
 - Descending colon (from right renal pelvis or right ureter)
 - Ipsilateral kidney parenchyma from ureter
 - Liver (from right renal pelvis or right ureter)
 - Pancreas
 - Perirenal (perinephric) fat (via kidney)
 - Prostate (ureter)
 - Spleen (from left renal pelvis or left ureter)
 - Uterus (ureter)
- Distant lymph node(s), NOS
- Distant metastasis, NOS
 - Carcinomatosis
 - Distant metastasis WITH or WITHOUT distant lymph node(s)

9 Unknown if extension or metastasis

DISTINGUISHING NONINVASIVE AND INVASIVE BLADDER CANCER

1. The two main types of bladder cancer are the flat (sessile) variety and the papillary type.
 - a. Only the flat (sessile) variety is called in situ when tumor has not penetrated the basement membrane
 - b. 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.
 - c. Frequently, the pathology report does not contain a definite statement of noninvasion; however, noninvasion can be inferred from the microscopic description.
 - d. The more commonly used descriptions for noninvasion are listed below.
2. 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. To rule out the possibility of assigning noninvasive tumors in this category, abstractors should determine:
 - a. If the tumor is confined to the epithelium, then it is noninvasive.
 - b. If the tumor has penetrated the basement membrane to invade the lamina propria, then it is invasive
3. The terms lamina propria, submucosa, stroma, and subepithelial connective tissue are used interchangeably.

Note: Only if the distinction cannot be made should the tumor be assigned 1 (localized) for “confined to mucosa.”

Definite statements of noninvasion for papillary transitional cell carcinomas include

Noninfiltrating
Noninvasive
No evidence of invasion
No extension into lamina propria
No stromal invasion
No extension into underlying supporting tissue
Negative lamina propria & superficial muscle
Negative muscle and (subepithelial) connective tissue
No infiltrative behavior/component

Inferred descriptions of noninvasion for papillary transitional cell carcinomas include

No involvement of muscularis propria and no mention of subepithelium/submucosa
No statement of invasion (microscopic description present)
(Underlying) Tissue insufficient to judge depth of invasion
No invasion of bladder wall
No involvement of muscularis propria
Benign deeper tissue
Microscopic description problematic (noninvasion versus superficial invasion)
Frond surfaced by transitional cell
No mural infiltration
No evidence of invasion (no sampled stroma)
Confined to mucosa

BLADDER

8000-8700, 8720-8790, 9700-9701

C670-C679

C670 Trigone of bladder

C671 Dome of bladder

C672 Lateral wall of bladder

C673 Anterior wall of bladder

C674 Posterior wall of bladder

C675 Bladder neck

C676 Ureteric orifice

C677 Urachus

C678 Overlapping lesion of bladder

C679 Bladder, NOS

Note 1: The following sources were used in the development of this chapter

- SEER Extent of Disease 1988: Codes and Coding Instructions (3rd Edition, 1998) (<https://seer.cancer.gov/archive/manuals/EOD10Dig.3rd.pdf>)
- SEER Summary Staging Manual-2000: Codes and Coding Instructions (<https://seer.cancer.gov/tools/ssm/>)
- Collaborative Stage Data Collection System, version 02.05: <https://cancerstaging.org/cstage/Pages/default.aspx>
- Chapter 62 *Urinary Bladder*, in the AJCC Cancer Staging Manual, Eighth Edition (2017) published by Springer International Publishing. Used with permission of the American College of Surgeons, Chicago, Illinois.

Note 2: See the following chapters for the listed histologies

- 8710-8714, 8800-8934, 8940-9137, 9141-9582: *Soft Tissue*
- 8935-8936: *GIST*
- 9140: *Kaposi Sarcoma*

Note 3: The two main types of bladder cancer are the flat (sessile) variety and the papillary type. 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.

Note 4: Noninvasive papillary transitional carcinoma: Pathologists use many different descriptive terms for noninvasive papillary transitional cell carcinoma. Frequently, the pathology report does not contain a definite statement of non-invasion; however, non-invasion can be inferred from the microscopic description.

Definite statements of non-invasion for papillary transitional cell carcinomas (Ta) include

- Noninfiltrating

- Noninvasive
- No evidence of invasion
- No extension into lamina propria
- No stromal invasion
- No extension into underlying supporting tissue
- Negative lamina propria and superficial muscle
- Negative muscle and (subepithelial) connective tissue
- No infiltrative behavior/component

Inferred descriptions of non-invasion for papillary transitional cell carcinomas include

- No involvement of muscularis propria and no mention of subepithelium/submucosa
- No statement of invasion (microscopic description present)
- (Underlying) Tissue insufficient to judge depth of invasion
- No invasion of bladder wall
- No involvement of muscularis propria
- Benign deeper tissue
- Microscopic description problematic (non-invasion versus superficial invasion)
- Frond surfaced by transitional cell
- No mural infiltration
- No evidence of invasion (no sampled stroma)
- Confined to mucosa

Note 5: Noninvasive (in situ) flat transitional cell carcinoma: Careful attention must be given to the use of the term "confined to mucosa" for flat bladder carcinomas. Historically, carcinomas described as "confined to mucosa" were coded as localized. However, pathologists use this designation for non-invasion as well. Pathologists also vary in their use of the terms "invasion of mucosa, grade 1" and "invasion of mucosa, grade 2" to distinguish between noninvasive and invasive carcinomas. In order to accurately code tumors described as "confined to mucosa", abstractors should determine

- If the tumor is confined to the epithelium: then it is noninvasive (IS).
- If the tumor has penetrated the basement membrane to invade the lamina propria: then it is invasive and coded to 1 for localized. The lamina propria and submucosa tend to merge when there is no muscularis mucosa, so these terms may be used interchangeably, along with stroma and subepithelial connective tissue.
- If the distinction between involvement of the epithelium and lamina propria cannot be made, then the tumor should be coded as "confined to mucosa, NOS" (L).
- Statements meaning confined to mucosa, NOS for flat transitional cell carcinomas include
 - Confined to mucosal surface
 - Limited to mucosa, no invasion of submucosa and muscularis
 - No infiltration/invasion of fibromuscular and muscular stroma
 - Superficial, NOS

Note 6: Code 2 for regional if the only description of extension is through full thickness of bladder wall, and there is no clear statement as to whether or not the cancer has extended into fat.

SUMMARY STAGE

0 In situ: noninvasive, intraepithelial

- Nonpapillary
 - Carcinoma in situ, NOS
 - Sessile (flat) (solid) carcinoma in situ
 - Transitional cell carcinoma in situ
- Papillary
 - Non-infiltrating
 - Transitional cell carcinoma, stated to be non-invasive
 - Transitional cell carcinoma, with inferred description of non-invasion

1 Localized only (localized, NOS)

- Mucosa, NOS
- Muscle (muscularis propria)
 - Deep muscle-outer half
 - Extension through full thickness of bladder wall
 - Superficial muscle-inner half
- Submucosa
 - Lamina propria
 - Stroma
 - Subepithelial connective tissue
 - Tunica propria
- Subserosa

2 Regional by direct extension only

- Adventitia
- Bladder is “fixed”
- Extravesical tumor, NOS
- 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

- Iliac, NOS
 - External
 - Internal (hypogastric)
- Obturator
- Pelvic, NOS
- Perivesical pelvic, NOS
- Sacral, NOS
 - Lateral (laterosacral)
 - Presacral
 - Sacral promontory (Gerota's)
- Regional lymph node(s), NOS
 - Lymph node(s), NOS

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

- Codes (2) + (3)

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

- Distant site(s) (including further contiguous extension)
 - Abdominal wall
 - Bone
 - Colon
 - Large intestine including rectum
 - Pelvic wall
 - Pubic bone
 - Small intestine
- Distant lymph node(s), NOS
 - Common iliac
- Distant metastasis, NOS
 - Carcinomatosis
 - Distant metastasis WITH or WITHOUT distant lymph node(s)

9 Unknown if extension or metastasis

URETHRA

8000-8700, 8720-8790, 9700-9701

C680

C680 Urethra

C680 Prostatic Urethra

Note 1: The following sources were used in the development of this chapter

- SEER Extent of Disease 1988: Codes and Coding Instructions (3rd Edition, 1998) (<https://seer.cancer.gov/archive/manuals/EOD10Dig.3rd.pdf>)
- SEER Summary Staging Manual-2000: Codes and Coding Instructions (<https://seer.cancer.gov/tools/ssm/>)
- Collaborative Stage Data Collection System, version 02.05: <https://cancerstaging.org/cstage/Pages/default.aspx>
- Chapter 63 *Urethra*, in the AJCC Cancer Staging Manual, Eighth Edition (2017) published by Springer International Publishing. Used with permission of the American College of Surgeons, Chicago, Illinois.

Note 2: See the following chapters for the listed histologies

- 8710-8714, 8800-8934, 8940-9137, 9141-9582: *Soft Tissue*
- 8935-8936: *GIST*
- 9140: *Kaposi Sarcoma*

SUMMARY STAGE

0 In situ, intraepithelial, noninvasive

- Urethra
 - Non-invasive papillary carcinoma
 - Carcinoma in situ
- Prostatic Urethra
 - Non-invasive papillary carcinoma
 - Carcinoma in situ involving (WITHOUT stromal invasion)
 - Periurethral or prostatic ducts
 - Prostatic urethra

1 Localized only (localized, NOS)

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

2 Regional by direct extension only

- All sites
 - Bladder neck
- Urethra
 - Corpus cavernosum
 - Corpus spongiosum
 - Periurethral muscle (sphincter muscle)
 - Vagina (anterior, NOS)
- Prostatic urethra
 - Periprostatic fat (beyond prostate capsule)
 - Prostate (prostatic stroma)
 - Prostatic ducts

3 Regional lymph node(s) involved only

- Iliac (common, external, internal [hypogastric] [obturator], NOS)
- Inguinal (superficial [femoral], NOS)
- Inguinal, deep (Node of Cloquet or Rosenmuller [highest deep inguinal], NOS)
- Pelvic, NOS (including true pelvis)
- Perivesical
- Presacral
- Sacral, NOS
- Regional lymph node(s), NOS
 - Lymph node(s), NOS

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

- Codes (2) + (3)

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

- Distant site(s) (including further contiguous extension)
 - All sites
 - Adjacent organ(s), NOS
 - Bladder wall
 - Prostatic urethra
 - Rectal wall
- Distant lymph node(s), NOS
- Distant metastasis, NOS
 - Carcinomatosis
 - Distant metastasis WITH or WITHOUT distant lymph node(s)

9 Unknown if extension or metastasis

URINARY OTHER

8000-8700, 8720-8790, 9700-9701

C681, C688-C689

C681 Paraurethral gland

C688 Overlapping lesion of urinary organs

C689 Urinary system, NOS

Note 1: The following sources were used in the development of this chapter

- SEER Extent of Disease 1988: Codes and Coding Instructions (3rd Edition, 1998) (<https://seer.cancer.gov/archive/manuals/EOD10Dig.3rd.pdf>)
- SEER Summary Staging Manual-2000: Codes and Coding Instructions (<https://seer.cancer.gov/tools/ssm/>)
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- 8935-8936: *GIST*
- 9140: *Kaposi Sarcoma*

Note 3: Summary Stage is the only applicable staging system for this site/histology/schema.

SUMMARY STAGE

0 In situ, intraepithelial, noninvasive (flat, sessile)

- Noninvasive papillary, polypoid or verrucous carcinoma

1 Localized only (localized, NOS)

- Lamina propria
- Muscularis
- Subepithelial connective
- Submucosa

2 Regional by direct extension only

- Beyond prostate capsule
- Bladder neck
- Corpus cavernosum

- Corpus spongiosum
- Periurethral muscle (sphincter)
- Prostate
- Vagina, anterior or NOS

3 Regional lymph node(s) involved only

- Iliac, NOS
 - Common
 - External
 - Internal (hypogastric), NOS
 - Obturator
- Inguinal, NOS
 - Deep inguinal, NOS
 - Node of Cloquet or Rosenmuller (highest deep inguinal)
 - Superficial (femoral)
- Pelvic, NOS
- Sacral, NOS
 - Presacral
- Regional lymph node(s), NOS
 - Lymph node(s), NOS

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

- Codes (2) + (3)

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

- Distant sites (including further contiguous extension)
 - Other adjacent organs, including
 - Bladder (excluding bladder neck)
 - Seminal vesicle(s)
- Distant lymph node(s), NOS
- Distant metastasis, NOS
 - Carcinomatosis
 - Distant metastasis WITH or WITHOUT distant lymph node(s)

9 Unknown if extension or metastasis