Genitourinary Neoplasms

2014/2015 FCDS Educational Webcast Series

January 15, 2015
Steven Peace, CTR

2015 Update; Background, Anatomy, Risk Factors, Screening Guidelines, MPH Rules Review
AJCC TNM 7th ed., SS2000, CSv02.05 and SSFs
Plus...NCCN 2015 Tx Guidelines

Presentation Outline

- Background, Anatomy and Risk Factors
  - Kidney – Renal Parenchyma
  - Kidney – Renal Pelvis
  - Ureters
  - Bladder
  - Prostate
- GU Cancer Screening Guidelines
- Multiple Primary and Histology Coding Rules (MPH)
- GU Cancer Staging – CSv02.05, AJCC TNM 7th ed., SS2000
- NCCN Treatment Guidelines
- Questions
Genitourinary System

Source: http://seekwellness.com/images

Genitourinary System

KIDNEY

U.S. Incidence/Mortality

Source: American Cancer Society Cancer Facts and Figures 2014
Risk Factors/Screening

Risk Factors
- Cigarette Smoking (renal pelvis cases – not RCC)
- Obesity (30% of cases)
- High Blood Pressure
- Chronic Kidney Disease
- Occupational Exposures
- Long-term use of medicines
- Family History of RCC

Screening
- None
- Incidental Finding
  - Ultrasound
  - CT Scan

Signs and Symptoms
1. Flank Pain
2. Hematuria
3. Abdominal Mass
   - Weight Loss
   - Anorexia
   - Anemia
   - Polycythemia
   - Discolored Urine
   - Leg and Ankle Swelling

Source: ePainAssist.com
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: http://training.seer.cancer.gov
Renal Cell Carcinoma and Renal Cell Carcinoma Subtypes

- 8312 Renal cell carcinoma is a “generic” term that includes all glandular or (adeno)carcinomas of the kidney
- 8255 Adenocarcinoma with mixed subtypes
- 8260 Papillary (Chromophil)
- 8310 Clear Cell
- 8316 Cyst associated, cystic
- 8317 Chromophobe
- 8318 Sarcomatoid (Spindle cell)
- 8319 Collecting duct type (Bellini duct)
- 8320 Granular cell
- 8510 Medullary carcinoma, NOS; medullary adenocarcinoma
- 8959 Malignant cystic nephroma

Source: 2007 Multiple Primary & Histology Coding Rules

Multiple Primary and Histology Coding Rules

Kidney (C64.9) - Renal Parenchyma
- Terms & Definitions
- Multiple Primary Rules
- Histology Coding Rules
What does this CT show?

Source: http://www.mayo.edu/kidney_adrenal

Kidney Equivalent Terms, Definitions, Tables and Illustrations:

C649
(Excludes lymphoma and leukemia - M9500 - 9990 and Esophageal cancer M1440)

INTRODUCTION
Renal cell carcinoma (RCC) is a group term for glandular (adrenal) carcinomas of the kidney. Approximately 85% of all malignancies of the kidney are renal cell and specific renal cell types.

Transitional cell carcinoma nearly arises in the kidney parenchyma (C649). Transitional cell carcinoma listed in the upper urinary system usually arises in the renal pelvis (C649). Only code transitional cell carcinoma to kidney in the rare instance when pathology confirms the tumor originated in the parenchyma of the kidney.

Equivalent or Equal Terms
- Multifocal and multihemispheric
- Renal cell carcinoma (RCC) and hypernephroma (obsolete term)
- Tumor, mass, lesion, and neoplasm

Definitions

Adenocarcinoma with mixed subtype (8255): A mixture of two or more of the specific renal cell carcinoma types listed in Table 1.

Carcinoma of the collecting ducts of Bellini, collecting duct carcinoma (8319) is a malignant epithelial tumor. There is controversy about the relationship between medullary carcinoma and collecting duct carcinoma, some advocate that there is a relationship, others are not convinced. Genetic studies are ongoing. We will code medullary carcinoma originating in the kidney to B510 as we code differentiation between the medullary and the collecting duct carcinoma.

Chromophobe RCC (8315) is a rare form of kidney cancer. Chromophobe is a renal carcinoma characterized by large pale cells with prominent nucleolus.

Clear cell RCC (8310) is the most common type of RCC. Clear cell is composed of clear or eosinophilic cytoplasm. Clear cell is architecturally diverse, with solid alveolar and acinar patterns the most common.
### Kidney Equivalent Terms, Definitions, Tables and Illustrations

**C640**
(Excludes lymphoma and leukemia – M9510 – 9988 and Kaposi sarcoma M9140)

**Table 1 - Renal cell carcinomas and specific renal cell types**

<table>
<thead>
<tr>
<th>Code</th>
<th>Specific Renal Cell Carcinoma Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>8120</td>
<td>Papillary (chromophobe)*</td>
</tr>
<tr>
<td>8110</td>
<td>Clear cell</td>
</tr>
<tr>
<td>8118</td>
<td>Cyst associated, cystic</td>
</tr>
<tr>
<td>8117</td>
<td>Chromophobe*</td>
</tr>
<tr>
<td>8114</td>
<td>Interstitial (spindle cell)</td>
</tr>
<tr>
<td>8119</td>
<td>Collecting duct type (Bellini duct)</td>
</tr>
<tr>
<td>8130</td>
<td>Granular cell</td>
</tr>
<tr>
<td>8110</td>
<td>Medullary carcinoma, NOS; medullary adenocarcinoma</td>
</tr>
<tr>
<td>9719</td>
<td>Multigland adenocarcinoma, multinodular metanephric cystic adenoma</td>
</tr>
</tbody>
</table>

*Note: Chromophobe and chromophobe are different histologies

### Kidney Multiple Primary Rules - Flowchart

(Excludes lymphoma and leukemia M9510 – 9988 and Kaposi sarcoma M9140)

- **Prepare one abstract.** Use the histology coding rules to assign the appropriate histology code.
- **Prepare two or more abstracts.** Use the histology coding rules to assign the appropriate histology code to each case abstracted.

**MULTIPLE TUMORS**

Multiple tumors may be a single primary or multiple primaries.

<table>
<thead>
<tr>
<th>Decision</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M3</strong></td>
<td><strong>Wilms Tumors</strong></td>
</tr>
<tr>
<td><strong>M4</strong></td>
<td><strong>Multiple Primaries</strong></td>
</tr>
<tr>
<td><strong>M5</strong></td>
<td><strong>Renal Cell Histologies</strong></td>
</tr>
</tbody>
</table>

**Wilms Includes Bilateral as 1 Primary**

**Renal Cell Histologies Do Not Include Bilateral**

January 1, 2007
Staging Kidney Cancer

Stage I (5-year survival: 96%)  Tumor ≤ 7 cm in greatest dimension and limited to kidney.

Stage II (5-year survival: 82%)  Tumor >7 cm in greatest dimension and limited to kidney.

Stage III (5-year survival: 64%)  Tumor in major veins, adrenal gland, or perinephric tissue (not beyond Gerota's fascia) and/or 1 regional lymph node involved.

Stage IV (5-year survival: 23%)  Tumor beyond Gerota's fascia, >1 regional lymph node involved, and/or ≥1 distant metastasis.

Source: http://www.aboutcancer.com
## Early Stage Kidney CA Based On Size Only - Until Tumor Extends Beyond Outer Capsule of Kidney

### Kidney Parenchyma

**Kidney (Renal Parenchyma)**

<table>
<thead>
<tr>
<th>CS Tumor Size</th>
<th>CS Site-Specific Factor 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS Extension</td>
<td>Size of Metastasis in Lymph Nodes</td>
</tr>
<tr>
<td>CS Tumor Size</td>
<td>CS Site-Specific Factor 8</td>
</tr>
<tr>
<td>CS Lymph Nodes</td>
<td>Extranodal Extension of Regional Lymph Nodes</td>
</tr>
<tr>
<td>CS Lymph Nodes Eval</td>
<td>CS Site-Specific Factor 9 &lt; 988</td>
</tr>
<tr>
<td>Regional Nodes Positive</td>
<td>CS Site-Specific Factor 10 = 988</td>
</tr>
<tr>
<td>Regional Nodes Examined</td>
<td>CS Site-Specific Factor 11 - 988</td>
</tr>
<tr>
<td>CS Mets at CX</td>
<td>CS Site-Specific Factor 12 - 988</td>
</tr>
<tr>
<td>CS Mets Eval</td>
<td>CS Site-Specific Factor 13 - 988</td>
</tr>
<tr>
<td>CS Site-Specific Factor 1</td>
<td>CS Site-Specific Factor 14 - 988</td>
</tr>
<tr>
<td>Invasion Beyond Capsule</td>
<td>CS Site-Specific Factor 15 - 988</td>
</tr>
<tr>
<td>CS Site-Specific Factor 2</td>
<td>CS Site-Specific Factor 16 - 988</td>
</tr>
<tr>
<td>Vessel Involvement</td>
<td>CS Site-Specific Factor 17 - 988</td>
</tr>
<tr>
<td>CS Site-Specific Factor 3</td>
<td>CS Site-Specific Factor 18 - 988</td>
</tr>
<tr>
<td>Ipsilateral Adrenal Gland Involvement</td>
<td>CS Site-Specific Factor 19 - 988</td>
</tr>
<tr>
<td>CS Site-Specific Factor 4</td>
<td>CS Site-Specific Factor 20 - 988</td>
</tr>
<tr>
<td>Sacralized Features</td>
<td>CS Site-Specific Factor 21 - 988</td>
</tr>
<tr>
<td>CS Site-Specific Factor 5</td>
<td>CS Site-Specific Factor 22 - 988</td>
</tr>
<tr>
<td>Histologic Tumor Necrosis</td>
<td>CS Site-Specific Factor 23 - 988</td>
</tr>
<tr>
<td>CS Site-Specific Factor 6</td>
<td>CS Site-Specific Factor 24 - 988</td>
</tr>
<tr>
<td>Fullman Nuclear Grade</td>
<td>CS Site-Specific Factor 25 = 988</td>
</tr>
</tbody>
</table>

**Note:** Lateral involvement must be coded for this site.

---

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>No tumor found</td>
</tr>
<tr>
<td>001-999</td>
<td>001 - 999 millimeters (non) (Exact size to nearest mm)</td>
</tr>
<tr>
<td>999</td>
<td>999 millimeters or larger</td>
</tr>
<tr>
<td>999</td>
<td>Microscopic focus or necrotic and no size of focus given</td>
</tr>
</tbody>
</table>

---

### Kidney Parenchyma

#### CS Tumor Size

- Note 1: Code the tumor size as documented in the chart of record.
- Note 2: The assigned T (Tumor Size) and T3 categories for tumors limited to the kidney is based on the physician's statement of the T category. Use codes 994, 995-999 as appropriate to code CS Tumor Size based on a statement of T when no other size information is available.

---

**Early Stage Kidney CA Based On Size Only - Until Tumor Extends Beyond Outer Capsule of Kidney**
### CS Extension

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>TNx</th>
<th>Nxn</th>
<th>Rx</th>
</tr>
</thead>
<tbody>
<tr>
<td>610</td>
<td>Bladder</td>
<td></td>
<td>T4</td>
<td>T4</td>
</tr>
<tr>
<td>620</td>
<td>IVC above diaphragm or mediastinum</td>
<td>T4L</td>
<td>T4L</td>
<td>RE</td>
</tr>
<tr>
<td>625</td>
<td>IVC NOS</td>
<td>T4N0S</td>
<td>T4N0S</td>
<td>RE</td>
</tr>
</tbody>
</table>
| 630  | Isolated adrenal or paraaortic glands (noncontiguous bilateral adrenal gland involvement coded in CS Mabs of IM)
| 640  | Isolated adrenal gland plus blood vessels listed in code 667 and/or IVC below diaphragm |
| 645  | Isolated adrenal gland plus blood vessels listed in code 667 and/or IVC below diaphragm |
| 650  | Extension beyond Gerota's fascia to: ascenting colon from right kidney
| 660  | Retroperitoneal soft tissue                                                  | T4  | T4  | RE  |
| 665  | any of (660, 601, 610, 620, 630, 640, 645, 650)                              | T4  | T4  | RE  |

### CS Lymph Nodes

- **Vena Cava**
- **Hilar LN**
- **Para-Caval LN**
- **Para-Aortic LN**
- **Aorta**
- **Bladder**

Source: [http://www.laparoboticsurgery.com](http://www.laparoboticsurgery.com)
CS Mets at Dx

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No distant metastasis</td>
</tr>
<tr>
<td>10</td>
<td>Distant lymph node(s)</td>
</tr>
<tr>
<td>20</td>
<td>Extension to Contralateral kidney / Contralateral spleen / Liver from left kidney / Spleen from right kidney</td>
</tr>
<tr>
<td>40</td>
<td>Noncontiguous ipsilateral adrenal (supraaortal) gland metastasis / Distant metastasis except distant lymph node(s) / Carcinomatous</td>
</tr>
<tr>
<td>50</td>
<td>ORSOLETE DATA CONVERTED V1003 Sex code 55 40 + 10 Distant metastasis plus distant lymph node(s)</td>
</tr>
<tr>
<td>55</td>
<td>(40 or 20) + 10 Distant metastasis or extension coded in 20 plus distant lymph node(s)</td>
</tr>
<tr>
<td>60</td>
<td>Distant metastasis, NOS Stated as MT with no other information on distant metastasis</td>
</tr>
<tr>
<td>99</td>
<td>Unknown; distant metastasis not stated Distant metastasis cannot be assessed Not documented in patient record</td>
</tr>
</tbody>
</table>

Site-Specific Factors

SSF1: Invasion Beyond Capsule
SSF2: Vein Involvement
SSF3: Ipsilateral Adrenal Gland Involvement
SSF4: Sarcomatoid Features
SSF5: Histologic Tumor Necrosis
SSF6: Fuhrman Nuclear Grade
SSF7: Size of Metastasis in Lymph Nodes
SSF8: Extranodal Extension
AJCC TNM and SS2000

Primary Tumor (T)
TX Primary tumor cannot be assessed
T0 No evidence of primary tumor
T1 Tumor 7 cm or less in greatest dimension, limited to the kidney
T1a Tumor 4 cm or less in greatest dimension, limited to the kidney
T1b Tumor more than 4 cm but not more than 7 cm in greatest dimension, limited to the kidney
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
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
T4 Tumor invades beyond Gerota’s fascia (including contiguous extension into the ipsilateral adrenal gland)

Summary Stage
0 In situ Neoplasms, unclassified
1 Localized
- Invasive cancer confined to kidney cortex and/or medulla
- Invasion of renal capsule
- Renal pelvis or cortex involved
- Separate focus of non-muscle-invasive disease
- Localized, NOS
2 Regional, by direct extension only
- Extension to: Adrenal (ipsilateral) gland, ipsilateral
  - Avascular cilia from right kidney
  - Blood vessels (major)
  - Extensive portion of renal vein
  - Hilar blood vessels
  - Perinephral vein
  - Renal artery
  - Renal vein, NOS
  - Tumor thrombus in a renal vein, NOS
  - Vena cava
  - Descending colon from left kidney
  - Diaphragm
  - Dorsal aorta to right kidney
  - Perirenal (perinephric) tissue/lip fat
  - Pleura
  - Psoas muscle
  - Renal (Gerota’s) fascia
  - Retroperitoneal soft tissue
  - Tumor of perirenal
  - Umbil, including implant(s), ipsilateral

Kidney Cancer Treatment
Kidney Cancer

Version 3.2015

NCCN.org

Source: http://NCCN.org

Kidney – Early Stage

Initial Workup

- HBE
- CBC, comprehensive metabolic panel
- Urinalysis
- Abdominal/pelvic CT or abdominal MRI with or without contrast depending on renal insufficiency
- Chest imaging
- Bone scan, if clinically indicated
- Bone MRI, if clinically indicated
- If urothelial carcinoma suspected (e.g., central mass), consider urine cytology, ureteroscopy
- Consider needle biopsy, if clinically indicated

Stage

- Stage I (pT1a)
- Stage I (pT1b)
- Stage II, III, IV

Primary Treatment

- Partial nephrectomy (preferred)
- Radical nephrectomy (if partial not feasible or central location)
- Active surveillance in selected patients

Follow-Up

- Follow-up (see KID-1)
- If relapse, see KID-2

Source: http://NCCN.org
Ablation or Embolization

- “Ablation” is destruction of tumor by vaporization, chipping away (like chipping ice) or various other erosive processes.

- Tumor ablation is coded as surgery.

- Types of Ablation Include:
  - Cryo-Ablation – Uses Cold
  - Laser-Ablation – Uses Light
  - Microwave-Ablation – Uses Heat
  - PDT – photodynamic therapy is a type of laser ablation
  - High-Intensity Ultrasound – Uses Sound Waves to create heat

Ablation or Embolization

- “Embolization” is a procedure performed to create an embolus, a blocked or hardened blood vessel, and is used to shut down blood flow and blood supply to the primary tumor or to metastasis.

- Embolization can include injection of a chemical like alcohol or a chemo agent to sclerose or harden key blood vessel(s) and may even trap chemo behind the embolus; or can be performed by injecting a foreign material or substance like coils or radioactive beads to block the artery and prevent any blood flow to the tumor.

- Types of Embolization Include:
  - Chemo-Embolization – Uses Chemotherapy Agent(s) - TACE
  - Alcohol-Embolization – Uses Alcohol
  - Radioactive Beads/Spheres – Combines Radioisotopes / Mechanical Block
  - Artificial Embolus – plastic or metal coils, foam, other plugs to Block

- Treatment Code Will Depend on Type of Embolization
Kidney – Late Stage

### Primary Treatment

- Stage IV:
  - Potentially surgically resectable primary with solitary metastatic site
  - Nephrectomy + surgical metastectomy
  - Relapse: See First-line Therapy (R0-D)

- Potentially surgically resectable primary with multiple metastatic sites
  - Neoadjuvant nephrectomy
  - See First-line Therapy (R0-D)

- Surgically unresectable
  - See First-line Therapy (R0-D)

Source: [http://NCCN.org](http://NCCN.org)

---

### First-line Therapy

- Predominant clear cell histology
  - Clinical trial
  - Sunitinib (category 1)
  - Temsirolimus (category 1) for poor-prognosis patients
  - Bevacizumab + IFN (category 1)
  - Pazopanib (category 1)
  - High-dose IL-2 for selected patients
  - Axitinib
  - Sorafenib for selected patients
  - Best supportive care

- Non-clear cell histology
  - See Sysyemic Therapy (R0-D)

Source: [http://NCCN.org](http://NCCN.org)

---

### Subsequent Therapy

- Follow-up (See R0-D)
  - Clinical trial or targeted therapy:
    - After tyrosine kinase inhibitor therapy
    - Everolimus (category 1)
    - Axitinib (category 1)
    - Sorafenib
    - Bevacizumab
    - Pazopanib
    - Temsirolimus (category 2B)
    - Bevacizumab (category 2B)
    - After cytokine therapy
    - Axitinib (category 1)
    - Sorafenib (category 1)
    - Ramucirumab (category 1)
    - Pazopanib (category 1)
    - Tannrolimus
    - Bevacizumab
    - Cytokine therapy:
      - High-dose IL-2 for selected patients
      - Best supportive care

Source: [http://NCCN.org](http://NCCN.org)
Kidney – What’s New?

- Next Generation Gene Sequencing Technology can now identify specific tumor suppressor genes on the same or different chromosomes and track their interaction with other genes to classify kidney cancers beyond histologic characteristics.

- The VHL gene seems to be the initiating gene for most renal cell carcinomas, clear cell type. VHL mutation is only 1st mutation.

- Recent studies are showing how BAP1 and VHL genes interact to transform a normal kidney cell into a cancer cell…and that additional mutations occur later in PBRM1 and other genes.

- The first mutation in VHL (deletion) actually causes 4 additional tumor suppressor genes to mutate downstream – not just one. So clear cell RCC can now be subtyped into 4 subtypes of clear cell.
**Urothelium**

The layer of transitional epithelium that lines the wall of the renal pelvis, ureters, the bladder, and parts of the urethra

The lining is made up of transitional epithelial cells that stop urine from entering the body.

Urine consists of water and waste products.

---

**Field Effect Theory**

The field effect theory suggests that the urothelium has undergone a widespread change, perhaps in response to a carcinogen, making it more sensitive to malignant transformations.

As a result, multiple tumors arise more easily.
Implantation Theory

The implantation theory suggests that tumor cells in one location lose their attachments and float in the urine until they attach (implant) on another site.

Urothelial tumors commonly spread in a head-to-toe direction, for example from the renal pelvis to the ureter(s) to the bladder.

U.S. Incidence/Mortality

Source: American Cancer Society Cancer Facts and Figures 2014
Risk Factors/Screening

Risk Factors
- Cigarette Smoking
- Chemical Exposures: dyes, solvents, paints, rubber, benzene, etc.
- Cyclophosphamide
- Chronic Inflammation
- Parasite Schistosoma

Screening
- None
- Blood in Urine
- Incidental Finding
- Ultrasound
- Cystoscopy
Anatomy

- **Mucosa**
  - Urothelium
  - Epithelium
  - Mucosal Surface
  - Transitional Mucosa
  - Tunica Mucosa
  - Vesicae Urinariae

- **Submucosa**
  - Lamina Propria
  - Muscularis Mucosa
  - Subepithelial Tissue
  - Suburothelial Connective Tissue
  - Stroma

- **Muscle / Muscularis**
  - Muscularis Propria
  - Muscularis Externa
  - Smooth Muscle

Histology

- Urothelial Carcinoma = Transitional Cell Carcinoma
- TCC Papillary or Flat is NOT a Histologic Sub Type
- Squamous Cell Carcinoma
- Adenocarcinoma
- Small Cell Carcinoma
- Small Cell Neuroendocrine

Source: http://iws.collin.edu/mweis/A&P

Histology

- Papillary
  - Non-invasive
  - Invasive
- Flat (sessile)
  - In situ
  - Invasive

Source Multiple Primary & Histology Coding Rules - Table 1 – Urothelial Tumors
Histology

Table 1 – Urothelial Tumors
Note: Excludes pure squamous carcinoma, glandular (adenoc) carcinoma, or other bladder tumor histologies.

<table>
<thead>
<tr>
<th>Urothelial/Transitional Cell Tumors</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>With squamous differentiation</td>
<td>8120</td>
</tr>
<tr>
<td>With glandular differentiation</td>
<td></td>
</tr>
<tr>
<td>With trophoblastic differentiation</td>
<td></td>
</tr>
<tr>
<td>Nested</td>
<td></td>
</tr>
<tr>
<td>Microcystic</td>
<td></td>
</tr>
<tr>
<td>Transitional cell, NOS</td>
<td></td>
</tr>
<tr>
<td>Papillary carcinoma</td>
<td>8130</td>
</tr>
<tr>
<td>Papillary transitional cell</td>
<td></td>
</tr>
<tr>
<td>Micropapillary</td>
<td>8131</td>
</tr>
<tr>
<td>Lymphoepithelioma-like</td>
<td>8082</td>
</tr>
<tr>
<td>Plasmacytoid</td>
<td></td>
</tr>
<tr>
<td>Sarcomatoid</td>
<td>8122</td>
</tr>
<tr>
<td>Giant cell</td>
<td>8031</td>
</tr>
<tr>
<td>Undifferentiated</td>
<td>8020</td>
</tr>
</tbody>
</table>

Source: http://pathguy.com/lectures/bladder.htm

Tumor Grade

Urothelial Neoplasia

- **Grade 0/1**
  - Urothelium
  - Normal

- **Grade II**
  - “Atypical Hyperplasia”
  - Probably means nothing

- **Grade III**
  - Carcinoma in situ
  - Many invasive bladder cancers arise in flat CIS

- Papilloma / Papillary CA Grade I
- Papillary CA Grade II
  - “Low Grade”
- Papillary CA Grade III
  - “High Grade”

Source:  http://pathguy.com/lectures/bladder.htm
Tumor Grade

Table 1. Principles of Pathology Management: Malignancy Grading of Bladder Carcinoma: Old and New Systems

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Papilloma grade 0</td>
<td>Papilloma</td>
<td>Papilloma</td>
</tr>
<tr>
<td>Papilloma with atypia grade 1</td>
<td>TCC grade 1</td>
<td>Papillary urothelial neoplasm of low malignant potential</td>
</tr>
<tr>
<td>Urothelial carcinoma grade 2A</td>
<td>TCC grade 1</td>
<td>Urothelial carcinoma, low-grade</td>
</tr>
<tr>
<td>Urothelial carcinoma grade 2B</td>
<td>TCC grade 2</td>
<td>Urothelial carcinoma, low-grade or high-grade</td>
</tr>
<tr>
<td>Urothelial carcinoma grade 3</td>
<td>TCC grade 3</td>
<td>Urothelial carcinoma, high-grade</td>
</tr>
</tbody>
</table>

Source: nccn.org

Tumor Grade

Source: http://sciencedirect.com
Urothelial MPH Rules

Includes:

✓ C65.9 - Renal Pelvis
✓ C66.9 - Ureter
✓ C67.0-C67.9 - Bladder
✓ C68.0-C68.9 - Urinary Other

Source: http://www.medicinenet.com

Terms and Definitions

Equivalent or Equivalent Terms
- Flat transitional cell, flat urothelial
- In situ transitional cell carcinoma, in situ urothelial carcinoma
- Tumor, mass, lesion, neoplasm
- Urothelial and transitional
- Urothelium and transitional epithelium
- Intramural and in situ
- Papillary transitional cell carcinoma, papillary urothelial carcinoma
Urinary Terms and Definitions

Renal Pelvis, Ureter, Bladder, and Other Urinary Equivalent Terms, Definitions, Tables and Illustrations
C659, C669, C670-C679, C889-C899
(Excludes lymphoma and leukemia M1559-M1929 and Kaposi sarcoma M1940)

Flat Tumor: The tumor occupies the confines of the bladder wall without infiltrating the muscular layer. May be solid or cystic and may recur.

In situ: A term describing a lesion that is limited to the surface of the affected organ.

Invasive: A term describing a lesion that has spread beyond the confines of the affected organ.

Muscle: The muscle layer of the bladder wall, consisting of smooth muscle fibers.

Bilharziasis: A disease caused by parasitic flukes, often found in the urinary system.

Hypertrophy: An increase in the size of an organ or tissue due to an increase in cell size.

Hemorrhage: The escape of blood from a blood vessel into the surrounding tissue or into the blood stream.

Cystitis: Inflammation of the bladder lining.

Necrosis: The death of tissue due to a lack of blood supply or other factors.

Squamous cell carcinoma: A type of cancer that arises from squamous epithelial cells, such as those found in the skin and lining of the mouth.

Adenocarcinoma: A type of cancer that arises from glandular tissue.

Bladder: The muscular organ that stores urine before it is expelled.

Adenomyosis: A condition in which the tissue of the uterus, including the muscle layers, invades the endometrial lining.

Prostate: A gland in the male reproductive system located below the bladder.

Ovary: One of the female reproductive organs, located in the pelvis.

Penis: The external male reproductive organ.

Urothelium: The lining of the urinary tract, consisting of flat, non-keratinizing epithelial cells.

Histology: The study of the microscopic structure of tissues and organs.

Tumor: An abnormal growth of cells that can cause harm to the body.

Tumors may be classified as benign or malignant.

Benign tumors are not typically treated surgically, unless they cause discomfort or obstruction.

Malignant tumors are cancerous and can spread to other parts of the body.

Urinary Tract: The system responsible for producing, transporting, and eliminating waste products from the body.

Urinary Symptoms: Signs or symptoms that may indicate a problem in the urinary system.

Urinary System: The system responsible for producing, transporting, and eliminating waste products from the body.

Urinary Tract Infections: Infections of the urinary system, such as urinary tract infections and bladder infections.

Urinary Bladder: The muscular organ that stores urine before it is expelled.

Urinary with stones: A condition in which small, hard particles called stones form in the urine and can cause pain.

Urinary with hemorrhage: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with obstruction: A condition in which the flow of urine is blocked, often caused by a tumor or other obstruction.

Urinary with infection: A condition in which an infection is present in the urinary system, often caused by bacteria.

Urinary with bleeding: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with tissue destruction: A condition in which tissue is damaged or destroyed, often caused by infection or injury.

Urinary with inflammation: A condition in which the urinary system is inflamed, often caused by infection or injury.

Urinary with pain: A condition in which pain is present in the urinary system, often caused by infection or injury.

Urinary with bleeding: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with tissue destruction: A condition in which tissue is damaged or destroyed, often caused by infection or injury.

Urinary with inflammation: A condition in which the urinary system is inflamed, often caused by infection or injury.

Urinary with pain: A condition in which pain is present in the urinary system, often caused by infection or injury.

Urinary with bleeding: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with tissue destruction: A condition in which tissue is damaged or destroyed, often caused by infection or injury.

Urinary with inflammation: A condition in which the urinary system is inflamed, often caused by infection or injury.

Urinary with pain: A condition in which pain is present in the urinary system, often caused by infection or injury.

Urinary with bleeding: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with tissue destruction: A condition in which tissue is damaged or destroyed, often caused by infection or injury.

Urinary with inflammation: A condition in which the urinary system is inflamed, often caused by infection or injury.

Urinary with pain: A condition in which pain is present in the urinary system, often caused by infection or injury.

Urinary with bleeding: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with tissue destruction: A condition in which tissue is damaged or destroyed, often caused by infection or injury.

Urinary with inflammation: A condition in which the urinary system is inflamed, often caused by infection or injury.

Urinary with pain: A condition in which pain is present in the urinary system, often caused by infection or injury.

Urinary with bleeding: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with tissue destruction: A condition in which tissue is damaged or destroyed, often caused by infection or injury.

Urinary with inflammation: A condition in which the urinary system is inflamed, often caused by infection or injury.

Urinary with pain: A condition in which pain is present in the urinary system, often caused by infection or injury.

Urinary with bleeding: A condition in which blood is present in the urine, often caused by injury or disease.

Urinary with tissue destruction: A condition in which tissue is damaged or destroyed, often caused by infection or injury.

Urinary with inflammation: A condition in which the urinary system is inflamed, often caused by infection or injury.

Urinary with pain: A condition in which pain is present in the urinary system, often caused by infection or injury.
Prognosis Depends on Level of Invasion (T) and Grade (G)

Source: [http://NCCN.org](http://NCCN.org)

Source: [http://cancerresearchuk.org](http://cancerresearchuk.org)

Source: [http://onlinehealthcareservices.com](http://onlinehealthcareservices.com)
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>Papillary Papillary transitional cell carcinoma, staged to be non-invasive</td>
</tr>
<tr>
<td></td>
<td>- Papillary non-infiltrating (See Note 24)</td>
</tr>
<tr>
<td></td>
<td>- Staged as T1a with no other information on extension (See Notes 1 and 2)</td>
</tr>
<tr>
<td>T1a</td>
<td>T1a</td>
</tr>
<tr>
<td></td>
<td>IS</td>
</tr>
<tr>
<td></td>
<td>IS</td>
</tr>
<tr>
<td>030</td>
<td>Papillary Papillary transitional cell carcinoma, with inferred description of invasion (See Note 26)</td>
</tr>
<tr>
<td>T1a</td>
<td>T1a</td>
</tr>
<tr>
<td></td>
<td>IS</td>
</tr>
<tr>
<td></td>
<td>IS</td>
</tr>
<tr>
<td>060</td>
<td>Non-papillary</td>
</tr>
<tr>
<td></td>
<td>Carcinoma in situ, NOS</td>
</tr>
<tr>
<td></td>
<td>Transitional cell carcinoma in situ</td>
</tr>
<tr>
<td></td>
<td>Staged as Tis with no other information on extension</td>
</tr>
<tr>
<td>Tis</td>
<td>Tis</td>
</tr>
<tr>
<td></td>
<td>IS</td>
</tr>
<tr>
<td></td>
<td>IS</td>
</tr>
<tr>
<td>100</td>
<td>Confined to mucosa, NOS (See Note 3)</td>
</tr>
<tr>
<td></td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>215</td>
<td>Extension to distal ureter:</td>
</tr>
<tr>
<td></td>
<td>Superficial muscle of bladder and/or distal ureter</td>
</tr>
<tr>
<td></td>
<td>(See Note 7)</td>
</tr>
<tr>
<td>T2a</td>
<td>T2a</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>220</td>
<td>Muscle (mesorectum proprium) of bladder only</td>
</tr>
<tr>
<td></td>
<td>Deep muscularis-propria half</td>
</tr>
<tr>
<td></td>
<td>Staged as T2b with no other information on extension</td>
</tr>
<tr>
<td>T2b</td>
<td>T2b</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td>230</td>
<td>Extension through full thickness of bladder wall</td>
</tr>
<tr>
<td></td>
<td>BUT still confined within bladder wall (See Note 5)</td>
</tr>
<tr>
<td>T2b</td>
<td>T2b</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td>245</td>
<td>Extension to distal ureter:</td>
</tr>
<tr>
<td></td>
<td>Deep muscularis or extension through wall of bladder and/or distal ureter</td>
</tr>
<tr>
<td></td>
<td>(See Note 7)</td>
</tr>
<tr>
<td>T2b</td>
<td>T2b</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>249</td>
<td>Muscle (mesorectum proprium) invaded, NOS of bladder only</td>
</tr>
<tr>
<td></td>
<td>Staged as T2b (NOS) with no other information on extension</td>
</tr>
<tr>
<td>T2b</td>
<td>T2b</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td>250</td>
<td>Extension to distal ureter:</td>
</tr>
<tr>
<td></td>
<td>Muscle (mesorectum proprium) invaded, NOS of bladder and/or distal ureter (See Note 7)</td>
</tr>
<tr>
<td>T2b</td>
<td>T2b</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>300</td>
<td>Localized, NOS</td>
</tr>
<tr>
<td></td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>630</td>
<td>Prostatic stroma</td>
</tr>
<tr>
<td></td>
<td>Prostate, NOS</td>
</tr>
<tr>
<td></td>
<td>Urethra (excluding distal urethra)</td>
</tr>
<tr>
<td></td>
<td>Urethra, including prostatic urethra (excluding subepithelial connective tissue, see code 720)</td>
</tr>
<tr>
<td>T4a</td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>650</td>
<td>Prostate, NOS</td>
</tr>
<tr>
<td></td>
<td>Prostate, NOS</td>
</tr>
<tr>
<td></td>
<td>Urethra (excluding distal urethra)</td>
</tr>
<tr>
<td></td>
<td>Urethra, including prostatic urethra (excluding subepithelial connective tissue, see code 720)</td>
</tr>
<tr>
<td>T4a</td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>670</td>
<td>Urethra</td>
</tr>
<tr>
<td></td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>673</td>
<td>Rectum, male</td>
</tr>
<tr>
<td></td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>677</td>
<td>Large intestine including rectum, female (excluding rectum, male)</td>
</tr>
<tr>
<td></td>
<td>Small intestine</td>
</tr>
<tr>
<td></td>
<td>Staged as T4a with no other information on extension</td>
</tr>
<tr>
<td>T4a</td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>D</td>
</tr>
<tr>
<td>680</td>
<td>Staged as T4a with no other information on extension</td>
</tr>
<tr>
<td>T4a</td>
<td>T4a</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>700</td>
<td>Bladder or &quot;urothelium&quot;</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>710</td>
<td>Pelvic bone</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td>715</td>
<td>(710 or 760) or 677</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>RE</td>
</tr>
<tr>
<td></td>
<td>D</td>
</tr>
<tr>
<td>750</td>
<td>Abdominal wall</td>
</tr>
<tr>
<td></td>
<td>Pelvic wall</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td></td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>D</td>
</tr>
</tbody>
</table>
AJCC TNM and SS2000

SITE–SPECIFIC FACTORS

- SSF1: WHO/ISUP Grade
- SSF2: Size of Metastasis in Lymph Node
- SSF3: Extranodal Extension
Urothelial Cancers
Treatment

NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®)
Bladder Cancer
Version 2.2014
NCCN.org

Source: http://NCCN.org
PRINCIPLES OF SURGICAL MANAGEMENT

Transurethral Resection for Papillary Appearing Tumor (likely non-muscle invasive)
- Adequate resection with muscle in specimen
- Early repeat TURBT (within six weeks) if
  > Incomplete initial resection
  > No muscle in original specimen for high-grade disease
  > Large or multi-focal lesions
  > Any T1 lesion

Transurethral Resection for Suspected or Known Carcinoma in Situ
- Multiple selective and/or random biopsies
- Additional biopsy adjacent to papillary tumor
- Consider prostate urethral biopsy

Transurethral Resection for Sessile or Invasive Appearing Tumor (likely muscle invasive)
- Perform EUA
- Repeat TURBT if
  > No muscle in specimen for high-grade disease
  > Any T1 lesion
  > First resection does not allow adequate staging/attribution of risk for treatment selection
  > Incomplete resection and considering tri-modality bladder preservation therapy

Segmental (Partial) Cystectomy
- Reserved for solitary lesion in location amenable to segmental resection with adequate margins
- No carcinoma in situ as determined by random biopsies
- Bilateral pelvic lymphadenectomy should be performed and include at a minimum common, internal iliac, external iliac, and obturator nodes.

Radical Cystectomy
- Bilateral pelvic lymphadenectomy should be performed and include at a minimum common, internal iliac, external iliac, and obturator nodes.

Source: http://NCCN.org

PRINCIPLES OF INTRAVESICAL TREATMENT

Indications: Based on probability of recurrence and progression to muscle invasive disease, such as size, number, and grade.

Immediate Intravesical Chemotherapy
- Initiated within 24 hrs after resection
- Use after TUR lowers recurrence rate in T2 low-grade tumors
- Treatment should not be given if extensive TURBT or if suspected bladder perforation

Induction Intravesical Chemotherapy
- Initiated 2-6 wks after resection
- Maximum of 2 inductions without complete response
- Maintenance therapy is optional

Induction Intravesical Immunotherapy
- Initiated 2-6 wks after resection
- Withhold if traumatic catheterization, bacteriuria, persistent gross hematuria, persistent severe local symptoms, or systemic symptoms
- Maximum of 2 inductions without complete response
- Some data suggest benefit of maintenance therapy
- Dose reduction is encouraged if there are substantial local symptoms during maintenance therapy

APPENDIX PROBABILITY OF RECURRENT AND PROGRESSION

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Approximate Probability of Recurrence in 5 years</th>
<th>Approximate Probability of Progression to Muscle Invasion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ta, low grade</td>
<td>50%</td>
<td>Minimal</td>
</tr>
<tr>
<td>Ta, high grade</td>
<td>60%</td>
<td>Moderate</td>
</tr>
<tr>
<td>T1, low grade (rare)</td>
<td>90%</td>
<td>Moderate</td>
</tr>
<tr>
<td>T1, high grade</td>
<td>50%-70%</td>
<td>Moderate-High</td>
</tr>
<tr>
<td>Tis</td>
<td>50%-90%</td>
<td>High</td>
</tr>
</tbody>
</table>
Chemotherapy Regimens

Table 2. Combination Chemotherapy Regimens

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gemcitabine/</td>
<td>Gemcitabine&lt;sup&gt;□□□□□□&lt;sub&gt;□□□□&lt;/sub&gt; 1000 mg/m² on days 1, 8, 15 of</td>
</tr>
<tr>
<td>Cisplatin&lt;sup&gt;□□□□□□&lt;sub&gt;□□□□&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or 1000 mcg/m² on days 1, 8 of a 21-day cycle</td>
</tr>
<tr>
<td>Cisplatin</td>
<td>70 mg/m² on day 2</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>30 mg/m² on day 1 or day 2</td>
</tr>
<tr>
<td>Vinblastine</td>
<td>3 mg/m² on day 1 or day 2</td>
</tr>
<tr>
<td>Doxorubicin</td>
<td>30 mg/m² on day 1 or day 2</td>
</tr>
<tr>
<td>Cisplatin</td>
<td>70 mg/m² on day 1</td>
</tr>
<tr>
<td>CMV&lt;sup&gt;□&lt;/sup&gt;</td>
<td>Methotrexate 30 mg/m² on days 1, 8 of a 21-day cycle</td>
</tr>
<tr>
<td></td>
<td>Vinblastine 4 mg/m² on days 1, 8</td>
</tr>
<tr>
<td></td>
<td>Cisplatin 100 mg/m² on day 2 before hydration</td>
</tr>
<tr>
<td></td>
<td>Folic acid 15 mg every 6 hours on days 2, 9 after hydration</td>
</tr>
</tbody>
</table>

*This dose should not be combined with radiation.

Source: http://NCCN.org

What’s New in Urothelial CA

- Greater focus on getting urologists to work with medical oncology to administer adjuvant chemo perioperatively for muscle-invasive and non-invasive urothelial cancers.

- Everolimus-based therapy, an mTOR inhibitor targeted therapy, has been recently proven very effective and tumors showing to be very sensitive to this targeted therapy when specific mTOR mutations, E2419K and E2014K, are present.

- Tumors (-) for ECCRI, a DNA repair protein that is negative in about 75% of patients, would benefit from chemotherapy (and in turn save the other 25% from getting chemo that would not work and would make the patient very sick and even harming patients that don’t need the added chemo that will not work and delays cystectomy by 3 months).
PROSTATE

Incidence / Mortality

![Graph showing incidence and mortality rates for prostate cancer from 1975 to 2008.](image)

Prostate Cancer 1975-2008
Risk Factors/Screening

- Most common cancer in men (27% of all cancers)
- 2nd leading cause of cancer death in U.S. men
- African-American men 2.5 x higher death rate others
- Estimated new cases: 233,000; deaths: 29,480
- Risk Factors:
  - Increasing Age
  - Race/Ethnicity
  - Family History
  - Genetics
  - Obesity / Diet
  - Trichomonas Vaginalis
- Screening
  - DRE + PSA (not PSA alone)

Screening Recommendations

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
<th>Suggestions for Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The USPSTF recommends the service. There is high certainty that the net benefit is substantial.</td>
<td>Offer or provide this service.</td>
</tr>
<tr>
<td>B</td>
<td>The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.</td>
<td>Offer or provide this service.</td>
</tr>
<tr>
<td>C</td>
<td>The USPSTF recommends selectively offering or providing the service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.</td>
<td>Offer or provide this service for selected patients depending on individual circumstances.</td>
</tr>
<tr>
<td>D</td>
<td>The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.</td>
<td>Discontinue the use of this service.</td>
</tr>
<tr>
<td>I</td>
<td>The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.</td>
<td>Read the clinical considerations section of USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.</td>
</tr>
</tbody>
</table>

Source: U.S. Preventive Services Task Force
The prostate is a gland found ONLY in men. It is located in front of the rectum and under the bladder. The size of a healthy prostate gland is about the size of a walnut.

Source: [http://www.abbottdiagnostics.com](http://www.abbottdiagnostics.com), U.S. National Cancer Institute

---

Vas Deferens (vasa deferens)
Seminal Vesicle (surface view)
Prostatic urethra

Anatomy

- Lateral lobes
- Prostate capsule
- Urethra
- Anterior lobe
- Median lobe
- Posterior lobe
- Ejaculatory ducts


Histology

- 99% Adenocarcinoma
  - Code acinar as adenoca
- 1% Other
  - Neuroendocrine carcinoma
  - Small cell carcinoma
  - Lymphoma
  - Sarcoma
- PIN III
  - Do NOT abstract
  - 30% men develop invasive CA
  - Follow-up for 2 years
Multiple Primary and Histology Coding Rules

Prostate (C61.9)
- Terms & Definitions
- Multiple Primary Rule
- Histology Coding Rule

Prostate – MPH Rules

- **Only ONE** Prostate Cancer DX *per patient lifetime*

- Acinar Carcinoma, Code to 8140 (Adenocarcinoma)
Prostate Cancer Staging

CLINICAL EXTENSION
- CS Ext – Clinical Stage
- Prior to Prostatectomy
- Clinical Only !!!!!!!!!!!!!
  - Bx for Elevated PSA
  - Clinically Inapparent
  - Clinically Apparent
- Used to Develop a Treatment Plan

PATHOLOGIC EXTENSION
- SSF3 – Pathologic Stage
- Do not just copy CS Ext
- PROSTATECTOMY !!!!!
- Pathologic Evaluation
  - Surgical Findings
  - Prostatectomy Specimen
- Code 970 when No Prostatectomy Done
Clinical: Why Important?

- **Clinical T1a and T1b**
  - Incidentally detected during a TURP

- **Clinical T1c and T2**
  - PSA test positive – detects earlier stage

- **Clinical T3**
  - DRE detects palpable disease sufficient to indicate the tumor has penetrated thru the prostate capsule

Clinical Stage Illustrations

- **T1c**
- **T2 (a,b,c)**
- **T3 (a,b,c)**
- **T4 (a,b)**
Clinical: Why Important?

- **Clinical T4**
  - Indicates local invasion of a structure adjacent to the prostate other than the seminal vesicle(s).
    - T4a indicates a DRE exam with tumor invading the bladder neck, external sphincter or rectum.
    - T4b indicates clinical findings of invasion into the levator muscle or a tumor that is fixed to the pelvis.

Digital Rectal Exam – DRE

Material provided by Prostate Cancer Research Institute (PCRI)
Patterns for Needle Biopsy

Pathologic Stage Criteria

Prostate
CS Site-Specific Factor 3
CS Extension - Pathologic Extension

- Note 1: Include information from prostatectomy and autopsy in this field and not in CS Extension - Clinical Extension. Only use histologic information from prostatectomy, including simple prostatectomy with negative margins, and autopsy in this field. Information from biopsy of extraprostatic sites is coded in CS Extension - Clinical Extension. Information from needle core biopsy of prostate is coded in CS Site-Specific Factor 14.
- Note 2: Code 970 if there is no prostatectomy performed within the first course of treatment.
- Note 3: Limit information in this field to first course of treatment in the absence of disease progression.
- Note 4: AJCC considers "in situ carcinoma of prostate gland" an impossible diagnosis. Any case so coded is mapped to TX for AJCC stage and is situ Summary Stage.
- Note 5: When prostate cancer is an incidental finding during a prostatectomy for other reasons (for example, a cystoprostatectomy for bladder cancer), use the appropriate code for the extent of disease found (for example, involvement in one lobe, both lobes, or more).
- Note 6: When the apical margin, distal urethral margin, bladder base margin, or bladder neck margin is involved and there is no extracapsular extension, use code 400.
- Note 7: Involvement of the prostatic urethra does not alter the extension code.
- Note 8: "Prostatic urethra" is a clinical term which means tumor extends to pelvic sidewall(s). In the absence of a more detailed statement of involvement, assign this to code 600.
- Note 9: For information regarding stage calculations, refer to CS Extension - Clinical Extension Note 6 and the special calculation extra tables.
When NO PROSTATECTOMY SSF 3 MUST = 970
Prostatectomy Procedures

When PROSTATECTOMY IS DONE
SSF 3 MUST NOT = 970

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Error</th>
<th>Error</th>
<th>Error</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>021</td>
<td>OBSOLETE DATA CONVERTED V2060</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td>See code 210</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Involves one half of one lobe or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>022</td>
<td>OBSOLETE DATA CONVERTED V2060</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td>See code 220</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Involves more than one half of one lobe, but not both lobes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>023</td>
<td>OBSOLETE DATA CONVERTED V2060</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td>See code 230</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Involves both lobes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>030</td>
<td>OBSOLETE DATA CONVERTED V2060</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td>See code 300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Localized, NOS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confined to prostate, NOS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intraprostatic involvement only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stage I, NOS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>031</td>
<td>OBSOLETE DATA REVIEWED AND CHANGED V9102</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td>Into prostatic apex, NOS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(See Site-Specific Factor 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>032</td>
<td>OBSOLETE DATA CONVERTED V2060</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td>See code 220</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Invasion into but not beyond prostatic capsule</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>033</td>
<td>OBSOLETE DATA REVIEWED AND CHANGED V9102</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
<td>ERROR</td>
</tr>
<tr>
<td></td>
<td>Arising in prostatic apex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(See Site-Specific Factor 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pathologic Extension – SSF 3

415 Extension to periurethral tissue
420 Unilateral extracapsular extension
430 Bilateral extracapsular extension
490 Extracapsular extension and specific margins involved (see Note 6)
492 Microscopic bladder neck involvement
493 Stated as pT3a with no other information on pathologic extension
495 Extension to seminal vesicel(s)
496 Stated as pT3b with no other information on pathologic extension
498 Extension to seminal vesicle(s) plus microscopic bladder neck involvement
499 Extension to seminal vesicle(s) plus microscopic bladder neck involvement

500 Extension to or fixation to adjacent structures other than seminal vesicles
510 Extraperitoneal urethra
520 Urethral muscle
580 Extensive muscle, NOS

600 Extension to or fixation to pelvic wall or pelvic bone

AJCC TNM and SS2000

Table 1. Soft-Tissue System for Prostate Cancer

<table>
<thead>
<tr>
<th>Primary Tumor (T)</th>
<th>Clinical</th>
<th>Pathologic (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>No evidence of primary tumor</td>
<td>pT2a Organ confined</td>
</tr>
<tr>
<td>T0</td>
<td>Tumor cannot be assessed</td>
<td>pT2b Unilateral, involving one-half of one side</td>
</tr>
<tr>
<td>T1</td>
<td>Tumor is palpable or visible by imaging</td>
<td>pT2c Unilateral, involving more than one-half of one side</td>
</tr>
<tr>
<td>T1a</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT3 Bilateral disease</td>
</tr>
<tr>
<td>T1b</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT3a Bilateral extracapsular extension</td>
</tr>
<tr>
<td>T1c</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT3b Extraperitoneal spread</td>
</tr>
<tr>
<td>T2</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT3c Extrapelvic extension</td>
</tr>
<tr>
<td>T3</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT3d Extrapelvic extension or microscopic invasion of the bladder neck</td>
</tr>
<tr>
<td>T3a</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT3e Extrapelvic extension or microscopic invasion of the bladder neck</td>
</tr>
<tr>
<td>T3b</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT3f Extrapelvic extension or microscopic invasion of the bladder neck</td>
</tr>
<tr>
<td>T4</td>
<td>Tumour metastatic to bone; bladder, levator muscles, and/or pelvic wall</td>
<td>pT4 Involvement of bladder, rectum</td>
</tr>
<tr>
<td>Note: Tumors found in one or both bone sites by needle biopsy, but not palpable or reliably visible by imaging, are classified as T1c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> Location into the prostate caps is or into but not beyond the pelvic capsule is not classified as T3a, not as T3c</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regional Lymph Nodes (N)

Nx Regional lymph nodes were not assessed
N0 No regional lymph node metastasis
N1 Metastasis in regional lymph nodes (s)

Pathologic (N)

pNx Regional nodes not sampled
pN0 No positive regional nodes
pN1 Metastasis in regional nodes (s)

Distant Metastasis (M)

M0 No distant metastasis
M1 Distant metastasis
M1a Non-regional lymph node(s)
M1b Bone(s)
M1c Other site(s) with or without bone disease
## Site Specific Factors

<table>
<thead>
<tr>
<th>SSF #</th>
<th>SSF Name</th>
<th>FCDS Required</th>
<th>CoC Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSF1</td>
<td>PSA Lab Value</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>SSF2</td>
<td>PSA Interpretation</td>
<td>-</td>
<td>YES</td>
</tr>
<tr>
<td>SSF3</td>
<td>CS Extension – Pathologic Ext</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>SSF7</td>
<td>Gleason Pattern – biopsy/TURP</td>
<td>-</td>
<td>YES</td>
</tr>
<tr>
<td>SSF8</td>
<td>Gleason Score – biopsy/TURP</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>SSF9</td>
<td>Gleason Pattern – prostatectomy/autopsy</td>
<td>-</td>
<td>YES</td>
</tr>
<tr>
<td>SSF10</td>
<td>Gleason Score – prostatectomy/autopsy</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>SSF11</td>
<td>Gleason Tertiary – prostatectomy/autopsy</td>
<td>-</td>
<td>YES</td>
</tr>
<tr>
<td>SSF12</td>
<td>Number of Cores Positive</td>
<td>-</td>
<td>YES</td>
</tr>
<tr>
<td>SSF13</td>
<td>Number of Cores Examined</td>
<td>-</td>
<td>YES</td>
</tr>
</tbody>
</table>

**ANATOMIC STAGE/PROGNOSTIC GROUPS**

<table>
<thead>
<tr>
<th>Group</th>
<th>T</th>
<th>N</th>
<th>M</th>
<th>PSA</th>
<th>Gleason</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>T1a-c</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>Gleason 3</td>
</tr>
<tr>
<td>I</td>
<td>T1b-c</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>Gleason 3</td>
</tr>
<tr>
<td>I</td>
<td>T2</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>Gleason 3</td>
</tr>
<tr>
<td>II</td>
<td>T1a-c</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>Gleason 3</td>
</tr>
<tr>
<td>II</td>
<td>T1b-c</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>Gleason 3</td>
</tr>
<tr>
<td>II</td>
<td>T2a-b</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>Gleason 3</td>
</tr>
<tr>
<td>II</td>
<td>T2a-b</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>Gleason 3</td>
</tr>
</tbody>
</table>

**SUMMARY STAGE**

- **In situ**: Noninvasive, intraepithelial.
- **1 Localized only**
  - Extension beyond prostate
    - Bladder neck (T4a)
    - Bladder, NO (T4b)
    - Extrectroprostatic extension beyond prostate capsule, NO (T4c)
  - Extension and involvement of one or more of: 
    - Lateral muscles (T4d)
    - Periprostatic tissue (Stage C2, NO)
    - Prostate capsule/base (Stage C3, T4e)
  - Extension to seminal vesicles (Stage C3, T4f)
  - Limited, NO (T4g)
  - Bilateral, NO (T4h)
- **Arising in prostate**: 
  - Extension to prostate (Stage C4, T4i)
  - Limited (Stage C4, T4j)
  - Bilateral (Stage C4, T4k)

**Intercapsular invasion**

- **Regional**: 
  - Bilateral, NO (Stage C4, T4m)
  - Limited/limited (Stage C4, T4n)
  - Bilateral (Stage C4, T4o)

**Invasive into (but not into)**

- **Periprostatic**: 
  - Bilateral, NO (Stage C4, T4p)
  - Limited (Stage C4, T4q)
  - Bilateral (Stage C4, T4r)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4s)
  - Limited (Stage C4, T4t)
  - Bilateral (Stage C4, T4u)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4v)
  - Limited (Stage C4, T4w)
  - Bilateral (Stage C4, T4x)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4y)
  - Limited (Stage C4, T4z)
  - Bilateral (Stage C4, T4{)}

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4|)
  - Limited (Stage C4, T4}\)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4\)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Regional**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)

**Invasive into**

- **Periprostatic**
  - Bilateral, NO (Stage C4, T4~)
  - Limited (Stage C4, T4~)
  - Bilateral (Stage C4, T4~)
PSA Lab Value – SSF 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>009</td>
<td>ABSOLUTE DATA CONVERTED VS2000</td>
</tr>
<tr>
<td></td>
<td>See code 99</td>
</tr>
<tr>
<td></td>
<td>Test not done (test was not ordered and was not performed)</td>
</tr>
<tr>
<td>011</td>
<td>0.2 or less (no change in prostate size)</td>
</tr>
<tr>
<td></td>
<td>(Exact value is rounded to nearest tenth of ng/ml)</td>
</tr>
<tr>
<td>025-079</td>
<td>0.2 – 07 ng/ml</td>
</tr>
<tr>
<td></td>
<td>(Exact value is rounded to nearest tenth of ng/ml)</td>
</tr>
<tr>
<td>080</td>
<td>98.0 ng/ml or greater</td>
</tr>
<tr>
<td>961-997</td>
<td>ABSOLUTE DATA CONVERTED VS2000</td>
</tr>
<tr>
<td></td>
<td>See code 960</td>
</tr>
<tr>
<td></td>
<td>98.1 – 98.7 ng/ml</td>
</tr>
<tr>
<td>080</td>
<td>Test indicated. Information not collected for this case</td>
</tr>
<tr>
<td></td>
<td>If this item is required by your standard letter, use code 960 or result in an edit error.</td>
</tr>
<tr>
<td></td>
<td>Causes with code 980 in CPT converted to code 992</td>
</tr>
<tr>
<td>090</td>
<td>ABSOLUTE DATA CONVERTED VS2000</td>
</tr>
<tr>
<td></td>
<td>See code 960</td>
</tr>
<tr>
<td></td>
<td>98.2 ng/ml</td>
</tr>
<tr>
<td>090</td>
<td>ABSOLUTE DATA CONVERTED VS2000</td>
</tr>
<tr>
<td></td>
<td>Data converted to code 990</td>
</tr>
<tr>
<td></td>
<td>98.3 ng/ml or greater</td>
</tr>
<tr>
<td>097</td>
<td>Test ordered, results unknown</td>
</tr>
<tr>
<td>998</td>
<td>Test not done (test not ordered and not performed)</td>
</tr>
<tr>
<td>999</td>
<td>Unknown or no information</td>
</tr>
<tr>
<td></td>
<td>Test documented in patient chart</td>
</tr>
</tbody>
</table>

Gleason Pattern and Score

http://www.stjohnprovidence.org
Gleason to Grade Conversion

<table>
<thead>
<tr>
<th>Gleason Score</th>
<th>Differentiation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gleason 2-6</td>
<td>Well Differentiated</td>
<td>1</td>
</tr>
<tr>
<td>Gleason 7</td>
<td>Moderately Differentiated</td>
<td>2</td>
</tr>
<tr>
<td>Gleason 8-10</td>
<td>Poorly Differentiated</td>
<td>3</td>
</tr>
</tbody>
</table>

Prostate Cancer Treatment
Prostate Cancer

Version 1.2015
NCCN.org

NCCN Guidelines for Patients® available at www.nccn.org/patients

Treatment Options

- Observation
- Beam RT
- Experimental
- Hormone
- Seed RT
- Surgery
Active Surveillance

PRINCIPLES OF ACTIVE SURVEILLANCE AND OBSERVATION

- Advantages of active surveillance:
  - Avoidance of possible side effects of definitive therapy that may be unnecessary
  - Quality of life/norma activities potentially less affected
  - Risk of unnecessary treatment of small, indolent cancers reduced

- Advantages of observation:
  - Avoidance of possible side effects of unnecessary definitive therapy and early initiation and/or continuous ADT

- Disadvantages of active surveillance:
  - Chance of missed opportunity for cure
  - Risk of progression and/or metastases
  - Subsequent treatment may be more complex with increased side effects
  - Nerve sparing may be more difficult, which may reduce chance of potency preservation after surgery
  - Increased anxiety
  - Requires frequent medical exams and periodic biopsies, which are not without complications
  - Uncertain long-term natural history of prostate cancer

- Disadvantages of observation:
  - Risk of urinary retention or pathologic fracture without prior symptoms or concerning PSA level
Surgery

PRINCIPLES OF SURGERY
Pelvic Lymph Node Dissection
• An extended PLND will discover metastases approximately twice as often as a limited PLND. Extended PLND provides more complete staging and may cure some men with micrometastatic disease; therefore, an extended PLND is preferred when PLND is performed.
• An extended PLND includes removal of all node-bearing tissue from an area bounded by the external iliac vessels anteriorly, the pelvic sidewall posteriorly, the bladder wall medially, the floor of the pelvic posteriorly, Cooper’s ligament distally, and the internal iliac artery proximally.
• A PLND can be excluded in patients with <2% predicted probability of nodal metastases by nomograms, although some patients with lymph node metastases will be missed.
• PLND can be performed using open, laparoscopic, or robotic techniques.

Radical Prostatectomy:
• RP is an appropriate therapy for any patient with clinically localized prostate cancer that can be completely excised surgically, who has a life expectancy of 12 years, and who has no serious comorbid conditions that would preclude an elective operation.
• High-volume surgeons in high-volume centers generally provide better outcomes.
• Laparoscopic and robotic-assisted RP are used commonly. In experienced hands, the results of these approaches appear comparable to open surgical approaches.
• Blood loss can be substantial with RP, but can be reduced by careful control of the dorsal vein complex and periurethral vessels.
• Urinary incontinence can be reduced by preservation of urethral length beyond the apex of the prostate and avoiding damage to the distal sphincter mechanism. Bladder neck preservation may decrease the risk of incontinence. Anatomic strictures increase the risk of long-term incontinence.
• Recovery of erectile function is directly related to age at RP, preoperative erectile function, and the degree of preservation of the cavernous nerves. Replacement of resected nerves with nerve grafts has not been shown to be beneficial. Early restoration of erections may improve late recovery.
• Salvage RP is an option for highly selected patients with local recurrence after EBRT, brachytherapy, or cryoablation in the absence of metastases, but the morbidity (e.g., incontinence, loss of erection, anatomic strictures) is high and the operation should be performed by surgeons who are experienced with salvage RP.

Radiation Therapy

PRINCIPLES OF RADIATION THERAPY
Primary External Beam Radiation Therapy
• Highly conformal RT techniques should be used to treat prostate cancer.
• Doses of 75.6 to 78.2 Gy in conventional fractions to the prostate (12 seminal vesicles for part of the therapy) are appropriate for patients with low-risk cancer. For patients with intermediate- or high-risk disease, doses up to 81.3 Gy provide improved PSA-associated disease control. The dose can be determined by the percent of patients who achieve a PSA nadir within 3 months of completion of therapy and are free of biochemical failure within 5 years.
• Patients who achieve a PSA nadir between 3 and 12 months after completion of therapy and are free of biochemical failure within 5 years may achieve equal disease control with a lower dose of radiation, usually 75.6 to 78.2 Gy.
• Extensive hypofractionated image-guided IMRT/EBRT regimens (4.6 Gy per fraction or greater) are an emerging treatment modality with single institutional and pooled reports of similar efficacy and toxicity to conventionally fractionated regimens. They can be considered as a cautious alternative to conventionally fractionated regimens at centers with appropriate technology, physics, and clinical expertise.
• Patients with high-risk cancers are candidates for pelvic lymph node irradiation and the addition of neoadjuvant or concurrent/adjuvant ADT for a total of 2 to 3 years (category I).
• Patients with intermediate-risk cancer may be considered for pelvic lymph node irradiation and 4 to 6 mos neoadjuvant/concurrent/adjuvant ADT.
• Patients with low-risk cancer should not receive pelvic lymph node irradiation or ADT.
• The accuracy of treatment should be improved by attention to daily prostate localization, with techniques of IMRT using CT, ultrasound, implanted fiducial, electromagnetic targeting/tracking, or an endorectal balloon to improve oncologic cure rates and reduce side effects.

Primary/Salvage Brachytherapy
• Low-dose rate (LDR) brachytherapy as monotherapy is indicated for patients with low-risk cancers and selected patients with low-volume intermediate-risk cancers. Intermediate-risk cancers may be treated by combining LDR brachytherapy with EBRT (46–50 Gy) and 1.4 to 4.6 mos neoadjuvant/concurrent/adjuvant ADT. Patients with high-risk cancers may be treated with a combination of EBRT (46–50 Gy) and LDR brachytherapy 2 to 3 yrs neoadjuvant/concurrent/adjuvant ADT.
• Patients with a very large prostate or very small prostate, symptoms of bladder outlet obstruction (high IPSS), or a previous transurethral resection of the prostate are more difficult to implant and may suffer increased risk of side effects. Neoadjuvant ADT may be used to shrink the prostate to facilitate implantation and to decrease the risk of severe radiation-induced prostatitis.
• Post-implant dosimetry must be performed to document the quality of the implant.
• The recommended prescribed doses for LDR monotherapy are 150 Gy for v15-25% doses to 125 Gy for v15-25% for Palleli–180. The corresponding boost doses are 40 to 60 Gy for EBRT and 110 Gy and 90 to 100 Gy, respectively.
• High-dose rate (HDR) brachytherapy can be used alone or in combination with EBRT (46–50 Gy) instead of LDR. Usually used boost regimens include 5.4 to 11.5 Gy x 2 fractions, 5.4 to 7.8 Gy x 3 fractions, and 4.5 to 6 Gy x 4 fractions. A commonly used regimen for HDR treatment alone includes 13.5 Gy x 2 fractions.
• Permanent LDR or temporary HDR brachytherapy can be used as treatment for a local recurrence following EBRT or primary brachytherapy. Radiation dose depends on the original primary external beam dose and ranges from 50 to 115 Gy for LDR and 50 to 145 Gy x 2 fractions for HDR.
Next-Generation Gene Sequencing - Estrogen Receptors play role in signaling pathways signaling cancer cells to grow. How? Estrogen Receptors hijack the androgen-signaling pathway which causes androgen deprivation therapies to fail. NEAT1 is over-expressed in both early stage prostate and in androgen-resistant tumors and may be a biomarker and/or prognostic marker in urine.

Chronic Inflammation Increases Prostate Cancer Risk as part of a SWOG trial that examined inflammation levels among participants based on prevalence of immune cells in the men’s prostate tissue samples. Nearly 90% had signs of high inflammation – nearly twice that of others.

Weill Cornell Medical College, NY and Cancer Epidemiology, Biomarkers & Prevention April 2014
What’s New in Prostate CA

Widespread adoption of robot-assisted prostatectomy effects treatment and costs with a huge increase in robot-assisted radical prostatectomies in just 5 years; growing from less than 1% to more than 40% annually. Men are more likely to be offered RARP in urban hospitals and from high-volume surgeons with up to a 40% increase in surgical expenditures over traditional prostatectomy.

BJU International (2014; doi:10.1111/bju.12850)

What’s New in Prostate CA

- Over Detection of Recurrence after Primary Treatment for Prostate Cancer based on rising PSA poses concerns. PSA recurrence can occur years before clinical metastasis and untreated PSA-R would not progress to clinical metastasis within patient’s lifetime – 30% over-detection.

- Key Prostate Site-Specific Factor Data found to be internally inconsistent with high levels of invalid or incorrect codes and up to 50% unknown, missing, or otherwise not coded values.
  - Pathologic Stage
  - PSA Lab Value at Dx
  - Gleason Primary and Secondary Pattern on Core Bx or TURP
  - Count of Number of Cores Positive/Examined

Questions

THE QUESTION MARK!