25TH ICRO DEHRADUN
STAGING OF GENITOURINARY MALIGNNCIES

SPEAKER
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CONSULTANT ONCOLOGIST
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HEALTH CARE PVT LTD
Introduction

• What is staging?

• Why staging is important

• Staging systems
  • TNM
STAGING OF TUMORS

STAGE OF A TUMOR IS BASED ON

• SIZE OF PRIMARY TUMOR
• EXTENT OF INVASION INTO SURROUNDING TISSUES
• THE SPREAD TO REGIONAL LYMPH NODES
• PRESENCE OR ABSENCE OF BLOOD BORNE METASTASIS
Why is staging important?

- Selecting treatment
- Research
- Guidelines
STAGING SYSTEM

AJCC/UICC STAGING SYSTEM

TNM CLASSIFICATION

WHERE

T IS TUMOR

N NODE

AND

M METASTASIS
PLAN OF TODAY’S LECTURE

- Renal Cell Carcinoma
- Bladder Carcinoma
- Testicular Carcinoma
- Prostate Carcinoma
- Renal Pelvis and Ureter
- Urethra
- Penile Carcinoma
RENAL CANCER
DIAGNOSIS

- **Physical examination:**
  - Fever
  - High blood pressure

- **Lab tests:**
  - Complete blood count
  - Urinanalysis
  - Serum calcium

- **Imaging tests:**
  - Ultrasound abdomen
  - Abdominal CT scan
  - MRI scan
  - PET scan
  - Renal angiography
  - Intravenous pyelogram
  - Chest x-ray
  - Bone scan
  - Biopsy
    - Fine needle aspiration
    - Core needle biopsy
American Joint Committee on Cancer (AJCC)
TNM Staging System for Kidney Cancer (7th ed., 2010)

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)
Regional Lymph Nodes (N)
NX  Regional lymph nodes cannot be assessed
N0  No regional lymph node metastasis
N1  Metastasis in regional lymph node(s)

Distant Metastasis (M)
M0  No distant metastasis
M1  Distant metastasis
MODIFICATIONS IN AJCC 8TH EDITION

Kidney

N2 is eliminated
<table>
<thead>
<tr>
<th>Anatomic Stage/Prognostic Groups</th>
<th>T</th>
<th>N</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>T1</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage II</td>
<td>T2</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage III</td>
<td>T1 or T2</td>
<td>N1</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>N0 or N1</td>
<td>M0</td>
</tr>
<tr>
<td>Stage IV</td>
<td>T4</td>
<td>Any N</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>Any T</td>
<td>Any N</td>
<td>M1</td>
</tr>
</tbody>
</table>
Robson staging

- Robson staging revolves around the relationship to Gerota's fascia, involvement of renal vein and regional nodes.
- **Stage I**: limited to kidney
- **Stage II**: involvement of perinephric fat but remains limited to Gerota's fascia
- **Stage III**
  - IIIa: renal vein involvement
  - IIIb: nodal involvement
  - IIIc: both IIIa and IIIb
- **Stage IV**
  - IVa: direct invasion of adjacent organs / structures
  - IVb: distant metastases
### Prognostic and surgical staging systems of IVC tumor thrombus

<table>
<thead>
<tr>
<th>Anatomic landmark</th>
<th>Staging systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TNM</td>
</tr>
<tr>
<td>RV</td>
<td>T3b</td>
</tr>
<tr>
<td>IVC &lt;2 cm above RV</td>
<td>I</td>
</tr>
<tr>
<td>IVC &gt;2 cm above RV and below hepatic veins</td>
<td>II</td>
</tr>
<tr>
<td>IVC above hepatic veins and below diaphragm</td>
<td>III</td>
</tr>
<tr>
<td>IVC above diaphragm</td>
<td>T3c</td>
</tr>
</tbody>
</table>
BLADDER CANCER
Most Common Type is Transitional Cell Carcinoma 93%

- Papillary
- Flat
- Benign
- Dyspalsia
- Malignant
- Cis
- Invasive Cancer
1 Epithelium
2 Subepithelial connective tissue
3 Muscle
4 Perivesical fat

Tumor invades local organs
Tumor invades pelvic or
American Joint Committee on Cancer (AJCC)
TNM Staging System for Bladder Cancer (7th ed., 2010)

Primary Tumor (T)

TX  Primary tumor cannot be assessed
T0  No evidence of primary tumor
Ta  Noninvasive papillary carcinoma
Tis Carcinoma in situ: “flat tumor”
T1  Tumor invades subepithelial connective tissue
T2  Tumor invades muscularis propria
pT2a Tumor invades superficial muscularis propria (inner half)
pT2b Tumor invades deep muscularis propria (outer half)
T3  Tumor invades perivesical tissue
pT3a Microscopically
pT3b Macroscopically (extravesical mass)
T4  Tumor invades any of the following: prostatic stroma, seminal vesicles, uterus, vagina, pelvic wall, abdominal wall
T4a Tumor invades prostatic stroma, uterus, vagina
T4b Tumor invades pelvic wall, abdominal wall
**Regional Lymph Nodes (N)**
Regional lymph nodes include both primary and secondary drainage regions. All other nodes above the aortic bifurcation are considered distant lymph nodes.

- **NX**  
  Lymph nodes cannot be assessed
- **N0**  
  No lymph node metastasis
- **N1**  
  Single regional lymph node metastasis in the true pelvis (hypogastric, obturator, external iliac, or presacral lymph node)
- **N2**  
  Multiple regional lymph node metastasis in the true pelvis (hypogastric, obturator, external iliac, or presacral lymph node metastasis)
- **N3**  
  Lymph node metastasis to the common iliac lymph nodes

**Distant Metastasis (M)**

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

- **LG**  low grade
- **HG**  high grade (WHO/ISUP)

**IF NOT SPECIFIED**

- **GX**  can not be assessed
- **G1**  well differentiated
- **G2**  moderately differentiated
- **G3**  poorly differentiated
- **G4**  undifferentiated
<table>
<thead>
<tr>
<th>ANATOMIC STAGE/PROGNOSTIC GROUPS</th>
<th>Ta</th>
<th>N0</th>
<th>M0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 0a</td>
<td>Tis</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage 0is</td>
<td>T1</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage I</td>
<td>T2a</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage II</td>
<td>T2b</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage III</td>
<td>T3a</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage IV</td>
<td>T4a</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage IV</td>
<td>T4b</td>
<td>N0</td>
<td>M0</td>
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<td></td>
<td>Any T</td>
<td>N1-3</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>Any T</td>
<td>Any N</td>
<td>M1</td>
</tr>
</tbody>
</table>
MODIFICATIONS IN AJCC 8TH EDITION

Urinary bladder
The M category is subdivided
M1a Non regional lymph nodes
M1b Other distant metastasis
Minor changes to Stage
Jewett-Marshall Staging (Clinical)

**Stage A:** Submucosal invasion but no muscle invasion

**Stage B** Bladder wall or muscle invasion
   - B1 Superficial
   - B2 Deep

**Stage C** Extension through serosa into perivesical fat

**Stage D** Lymph nodes and other distant metastasis
   - D1 regional nodes
   - D2 distant nodes and other distant mets

**AJCC** T1 TO T4 = **JEWETT** A TO D
N AND M PART OF **STAGE D**
## Approximate Probability of Recurrence 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>50%</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>
RENAL PELVIS AND URETER
American Joint Committee on Cancer (AJCC)
TNM Staging System for Renal Pelvis and Ureter Cancer (7th ed., 2010)

**Primary Tumor (T)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>Primary tumor cannot be assessed</td>
</tr>
<tr>
<td>T0</td>
<td>No evidence of primary tumor</td>
</tr>
<tr>
<td>Ta</td>
<td>Papillary noninvasive carcinoma</td>
</tr>
<tr>
<td>Tis</td>
<td>Carcinoma in situ</td>
</tr>
<tr>
<td>T1</td>
<td>Tumor invades subepithelial connective tissue</td>
</tr>
<tr>
<td>T2</td>
<td>Tumor invades the muscularis</td>
</tr>
<tr>
<td>T3</td>
<td>(For renal pelvis only) Tumor invades beyond muscularis into peripelvic fat or the renal parenchyma. (For ureter only) Tumor invades beyond muscularis into periureteric fat</td>
</tr>
<tr>
<td>T4</td>
<td>Tumor invades adjacent organs, or through the kidney into the perinephric fat.</td>
</tr>
</tbody>
</table>
Regional Lymph Nodes (N)*
NX    Regional lymph nodes cannot be assessed
N0    No regional lymph node metastasis
N1    Metastasis in a single lymph node, 2 cm or less in greatest dimension
N2    Metastasis in a single lymph node, more than 2 cm but not more than 5 cm in greatest dimension; or multiple lymph nodes, none more than 5 cm in greatest dimension
N3    Metastasis in a lymph node, more than 5 cm in greatest dimension
* Note: Laterality does not affect the N classification.

Distant Metastasis (M)
M0    No distant metastasis
M1    Distant metastasis
<table>
<thead>
<tr>
<th>ANATOMIC STAGE/PROGNOSTIC GROUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 0a</td>
</tr>
<tr>
<td>Stage 0is</td>
</tr>
<tr>
<td>Stage I</td>
</tr>
<tr>
<td>Stage II</td>
</tr>
<tr>
<td>Stage III</td>
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<tr>
<td>Stage IV</td>
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<td></td>
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<tr>
<td>5 YEAR DISEASE UPPER URINARY</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>STAGE</td>
</tr>
<tr>
<td>pT1</td>
</tr>
<tr>
<td>pT2</td>
</tr>
<tr>
<td>pT3</td>
</tr>
<tr>
<td>pT4</td>
</tr>
</tbody>
</table>
American Joint Committee on Cancer (AJCC)
TNM Staging System for Urethral Carcinoma (7th ed., 2010)

**Primary Tumor (T) (Male and Female)**

- **TX**: Primary tumor cannot be assessed
- **T0**: No evidence of primary tumor
- **Ta**: Noninvasive papillary, polypoid, or verrucous carcinoma
- **Tis**: Carcinoma in situ
- **T1**: Tumor invades subepithelial connective tissue
- **T2**: Tumor invades any of the following: corpus spongiosum, prostate, periurethral muscle
- **T3**: Tumor invades any of the following: corpus cavernosum, beyond prostatic capsule, anterior vagina, bladder neck
- **T4**: Tumor invades other adjacent organs
**Regional Lymph Nodes (N)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX</td>
<td>Regional lymph nodes cannot be assessed</td>
</tr>
<tr>
<td>N0</td>
<td>No regional lymph node metastasis</td>
</tr>
<tr>
<td>N1</td>
<td>Metastasis in a single lymph node 2 cm or less in greatest dimension</td>
</tr>
<tr>
<td>N2</td>
<td>Metastasis in a single node more than 2 cm in greatest dimension, or in multiple nodes</td>
</tr>
</tbody>
</table>

**Distant Metastasis (M)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M0</td>
<td>No distant metastasis</td>
</tr>
<tr>
<td>M1</td>
<td>Distant metastasis</td>
</tr>
</tbody>
</table>
Urothelial (Transitional Cell) Carcinoma of the Prostate

Tis pu  Carcinoma in situ, involvement of the prostatic urethra
Tis pd  Carcinoma in situ, involvement of the prostatic ducts
T1     Tumor invades urethral subepithelial connective tissue
T2     Tumor invades any of the following: prostatic stroma, corpus spongiosum, periurethral muscle
T3     Tumor invades any of the following: corpus cavernosum, beyond prostatic capsule, bladder neck (extraprostatic extension)
T4     Tumor invades other adjacent organs (invasion of the bladder)
<table>
<thead>
<tr>
<th>Stage</th>
<th>T</th>
<th>N</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 0a</td>
<td>Ta</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage 0is</td>
<td>Tis</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>Tis pu</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>Tis pd</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage I</td>
<td>T1</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage II</td>
<td>T2</td>
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<tr>
<td>Stage III</td>
<td>T1</td>
<td>N1</td>
<td>M0</td>
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<tr>
<td></td>
<td>T2</td>
<td>N1</td>
<td>M0</td>
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<tr>
<td></td>
<td>T3</td>
<td>N0</td>
<td>M0</td>
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<tr>
<td></td>
<td>T3</td>
<td>N1</td>
<td>M0</td>
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<tr>
<td>Stage IV</td>
<td>T4</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>N1</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>Any T</td>
<td>N2</td>
<td>M0</td>
</tr>
<tr>
<td></td>
<td>Any T</td>
<td>Any N</td>
<td>M1</td>
</tr>
</tbody>
</table>
MODIFICATIONS IN AJCC 8TH EDITION

Urethra
Changes to N category
N1 Metastasis in a single lymph node
N2 Metastasis in multiple lymph nodes
PROSTATE CANCER

Progression
Staging work up

- Baseline work up
  Haemogram/LFT/KFT/CXR

- Essential work up
  PSA/Biopsy/Gleason scoring

- Complimentary work up
  CT/MRI (becomes essential in higher clinical stage)
  PET CT
  Bone Scan (essential if bone mets suspected)
  Molecular testing
TNM Staging System For Prostate Cancer

Primary Tumor (T)

**Clinical**

TX Primary tumor cannot be assessed

T0 No evidence of primary tumor

T1 Clinically inapparent tumor neither palpable nor visible by imaging

T1a Tumor incidental histologic finding in 5% or less of tissue resected

T1b Tumor incidental histologic finding in more than 5% of tissue resected

T1c Tumor identified by needle biopsy (e.g., because of elevated PSA)

T2 Tumor confined within prostate*

T2a Tumor involves one-half of one lobe or less

T2b Tumor involves more than one-half of one lobe but not both lobes

T2c Tumor involves both lobes

T3 Tumor extends through the prostatic capsule**

T3a Extracapsular extension (unilateral or bilateral)

T3b Tumor invades the seminal vesicle(s)

T4 Tumor is fixed or invades adjacent structures other than seminal vesicles: bladder, levator muscles, and/or pelvic wall.

*Note: Tumor found in one or both lobes by needle biopsy, but not palpable or reliably visible by imaging, is classified as T1c.

**Note: Invasion into the prostatic apex or into (but not beyond) the prostatic capsule is not classified as T3, but as T2.
**Pathologic (pT)**

- **pT2**
  - pT2a Unilateral, involving one-half of one side or less
  - pT2b Unilateral, involving more than one-half of one side but not both sides
  - pT2c Bilateral disease

- **pT3**
  - Extraprostatic extension
  - pT3a Extraprostatic extension or microscopic invasion of the bladder neck**
  - pT3b Seminal vesicle invasion

- **pT4**
  - Invasion of bladder, rectum

*Note: There is no pathologic T1 classification.*

**Note: Positive surgical margin should be indicated by an R1 descriptor (residual microscopic disease).**

**Regional Lymph Nodes (N)**

- **Clinical**
  - NX Regional lymph nodes were not assessed
  - N0 No regional lymph node metastasis
  - N1 Metastasis in regional lymph node(s)

- **Pathologic**
  - PNX Regional nodes not sampled
  - pN0 No positive regional nodes
  - pN1 Metastases 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

*Note: When more than one site of metastasis is present, the most advanced category is used. pM1c is most advanced.*
<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>≤6</td>
</tr>
<tr>
<td></td>
<td>T2a</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;10</td>
<td>≤6</td>
</tr>
<tr>
<td></td>
<td>T1-2a</td>
<td>N0</td>
<td>M0</td>
<td>PSA ≥10 &lt;20</td>
<td>≤6</td>
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<tr>
<td>IIA</td>
<td>T1a-c</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;20</td>
<td>7</td>
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<tr>
<td></td>
<td>T2a</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;20</td>
<td>≤7</td>
</tr>
<tr>
<td></td>
<td>T2b</td>
<td>N0</td>
<td>M0</td>
<td>PSA &lt;20</td>
<td>≤7</td>
</tr>
<tr>
<td></td>
<td>T2b</td>
<td>N0</td>
<td>M0</td>
<td>PSA ≥10 &lt;20</td>
<td>≤6</td>
</tr>
<tr>
<td>IIB</td>
<td>T2c</td>
<td>N0</td>
<td>M0</td>
<td>Any PSA</td>
<td>Any Gleason</td>
</tr>
<tr>
<td></td>
<td>T1-2</td>
<td>N0</td>
<td>M0</td>
<td>PSA ≥20</td>
<td>Any Gleason</td>
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<td>T1-2</td>
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<td>M0</td>
<td>Any PSA</td>
<td>≥8</td>
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<td>III</td>
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<td>M0</td>
<td>Any PSA</td>
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<td>N1</td>
<td>M0</td>
<td>Any PSA</td>
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<td>Any T</td>
<td>Any N</td>
<td>M1</td>
<td>Any PSA</td>
<td>Any Gleason</td>
</tr>
</tbody>
</table>

*Note: When either PSA or Gleason is not available, grouping should be determined by T stage and/or either PSA or Gleason as available.
MODIFICATIONS IN AJCC 8TH EDITION

Prostate
T4N0M0 is now stage III
WHO Grade should be used to record tumour grade

Stage
Stage I T1, T2a N0 M0
Stage II T2b-2c N0 M0
Stage III T3, T4 N0 M0
Stage IV Any T N1 M0
   Any T Any N M1
Whitmore-Jewett staging

• **A: Tumor is present, but not detectable clinically; found incidentally**
  – A1: tissue resembles normal cells; found in a few chips from one lobe
  – A2: more extensive involvement

• **B: Tumor can be felt on physical examination but has not spread outside the prostatic capsule**
  – BIN: the tumor can be felt, it does not occupy a whole lobe, and is surrounded by normal tissue
  – B1: the tumor can be felt and it does not occupy a whole lobe
  – B2: the tumor can be felt and it occupies a whole lobe or both lobes

• **C: Tumor has extended through the capsule**
  – C1: the tumor has extended through the capsule but does not involve the seminal vesicles
  – C2: the tumor involves the seminal vesicles

• **D: Tumor has spread to other organs**
Gleason Grade

- Histological grading of prostate cancer 1-5

*However*

- Prostate cancer not uniform
- To aid calculations of prognosis, the sum of the *two most prevalent islands* of prostate cancer are used
- Therefore, gleason grade ranges 2-10

<table>
<thead>
<tr>
<th>Gleason X</th>
<th>Gleason score cannot be processed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gleason ≤6</td>
<td>Well differentiated (slight anaplasia)</td>
</tr>
<tr>
<td>Gleason 7</td>
<td>Moderately differentiated (moderate anaplasia)</td>
</tr>
<tr>
<td>Gleason 8-10</td>
<td>Poorly differentiated/undifferentiated (marked anaplasia)</td>
</tr>
</tbody>
</table>
GLEASON PATTERN

1. SMALL UNIFORM GLANDS

2. MORE STROMA BETWEEN GLANDS

3. DISTINCTLY INFILTERATIVE MARGINS

4. IRREGULAR MASSES OF NEOPLASTIC GLANDS

5. ONLY OCCASIONAL GLAND FORMATION
GLEASON GRADE GROUP DEFINITIONS

Gleason grade group 1: Gleason score ≤6
Only individual discrete well-formed glands

Gleason grade group 2: Gleason score 3+4=7
Predominantly well-formed glands with lesser component of poorly-formed/fused/cribriform glands

Gleason grade group 3: Gleason score 4+3=7
Predominantly poorly-formed/fused/cribriform glands with lesser component of well-formed glands* 

Gleason grade group 4: Gleason score 4+4=8; 3+5=8; 5+3=8
• Only poorly-formed/fused/cribriform glands or
• Predominantly well-formed glands and lesser component lacking glands¹ or
• Predominantly lacking glands and lesser component of well-formed glands¹

Gleason grade group 5: Gleason score 9-10
Lack gland formation (or with necrosis) with or without poorly formed/fused/cribriform glands²
Gleason score = Gleason grade + Gleason grade
RISK STRATIFICATION

D'Amico Risk Stratification

• First one to give concept
• Predicts about chances of recurrence after treatment
• Low risk- T1-T2a and GS ≤6 and PSA ≤10
• Intermediate risk- T2b and/or GS =7 and/or PSA >10–20
• High risk- ≥T2c or PSA >20 or GS 8–10
• Does not take into account other parameters
PARTIN TABLES

PSA: >10
Gleason Score: 4+3
Clinical Stage: T2a

Find Results

<table>
<thead>
<tr>
<th>OC: organ confined (22)</th>
<th>EPE: extraprostatic extension (22)</th>
<th>SV+: seminal vesicle involvement (10)</th>
<th>LN+: lymph node involvement (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25(20-31)</td>
<td>44(36-53)</td>
<td>20(12-29)</td>
<td>10(4-18)</td>
</tr>
</tbody>
</table>

Numbers represent percentage of patients with the specified PSA, clinical stage, and biopsy Gleason score who would have organ-confined disease (OC), extra-prostatic extension (EPE), cancer invading into the seminal vesicles (SV+), or cancer invading regional lymph nodes (LN+). Numbers in parentheses represent 95% confidence intervals.

- Uses Gleason score, serum PSA, and clinical stage – to predict whether the tumor will be confined to the prostate
The UCSF-CAPRA score

- UCSF developed the Cancer of the Prostate Risk Assessment score
- 0-2 low risk
- 3-5 intermediate risk
- 6-10 high risk
NCCN Risk categories

5.1 Very low risk
Includes men with a T1c tumor, PSA level less than 10 ng/mL, PSA density less than 0.15 ng/mL/g, Gleason score 6 or less, and cancer in fewer than three biopsy cores and in half or less of any core.

5.2 Low risk
Includes men with a T1a, T1b, T1c, or T2a tumor, PSA level less than 10 ng/mL, and Gleason score 6 or less.

5.3 Intermediate risk
Includes men with a T2b or T2c tumor, PSA level between 10 and 20 ng/mL, or Gleason score 7. If you meet two or all three conditions, your risk is high.

5.4 High risk
Includes men with a T3a tumor, a PSA level greater than 20 ng/mL, or a Gleason score between 8 and 10. If you meet two or all three conditions, your risk is very high.

5.5 Very high risk
Includes men with a T3b or T4 tumor, primary Gleason grade 5, or more than 4 biopsy cores with Gleason scores between 8 and 10.

5.6 Metastatic disease
Includes men with N1 or M1 disease.
TESTICULAR CANCER
American Joint Committee on Cancer (AJCC)
TNM Staging System for Testis Cancer (7th ed., 2010)

Primary Tumor (T)*

The extent of primary tumor is usually classified after radical orchiectomy, and for this reason, a pathologic stage is assigned.

- pTX: Primary tumor cannot be assessed
- pT0: No evidence of primary tumor (e.g. histologic scar in testis)
- pTis: Intratubular germ cell neoplasia (carcinoma in situ)
- pT1: Tumor limited to the testis and epididymis without vascular/lymphatic invasion; tumor may invade into the tunica albuginea but not the tunica vaginalis
- pT2: Tumor limited to the testis and epididymis with vascular/lymphatic invasion, or tumor extending through the tunica albuginea with involvement of the tunica vaginalis
- pT3: Tumor invades the spermatic cord with or without vascular/lymphatic invasion
- pT4: Tumor invades the scrotum with or without vascular/lymphatic invasion
Regional Lymph Nodes (N)

Clinical
NX  Regional lymph nodes cannot be assessed
N0  No regional lymph node metastasis
N1  Metastasis with a lymph node mass 2 cm or less in greatest dimension; or multiple lymph nodes, none more than 2 cm in greatest dimension
N2  Metastasis with a lymph node mass, more than 2 cm but not more than 5 cm in greatest dimension; or multiple lymph nodes, any one mass greater than 2 cm but not more than 5 cm in greatest dimension
N3  Metastasis with a lymph node mass more than 5 cm in greatest dimension

Pathologic (pN)
pNX Regional lymph nodes cannot be assessed
pN0 No regional lymph node metastasis
pN1 Metastasis with a lymph node mass 2 cm or less in greatest dimension and less than or equal to five nodes positive, none more than 2 cm in greatest dimension
pN2 Metastasis with a lymph node mass more than 2 cm but not more than 5 cm in greatest dimension; or more than five nodes positive, none more than 5 cm; or evidence of extranodal extension of tumor
pN3 Metastasis with a lymph node mass more than 5 cm in greatest dimension

Distant Metastasis (M)
M0  No distant metastasis
M1  Distant metastasis
M1a Nonregional nodal or pulmonary metastasis
M1b Distant metastasis other than to nonregional lymph nodes and lung
Serum Tumor Markers (S)

SX  Marker studies not available or not performed
SO  Marker study levels within normal limits
S1  LDH < 1.5 x N* and
    hCG (mlu/mL) < 5,000 and
    AFP (ng/ml) < 1,000
S2  LDH 1.5-10 x N or
    hCG (mlu/mL) 5,000-50,000 or
    AFP (ng/ml) 1,000-10,000
S3  LDH > 10 x N or
    hCG (mlu/mL) > 50,000 or
    AFP (ng/ml) > 10,000

*N indicates the upper limit of normal for the LDH assay.
### ANATOMIC STAGE/PROGNOSTIC GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>T</th>
<th>N</th>
<th>M</th>
<th>S (Serum Tumor Markers)</th>
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</thead>
<tbody>
<tr>
<td>Stage 0</td>
<td>pTis</td>
<td>N0</td>
<td>M0</td>
<td>S0</td>
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<td>pT1-4</td>
<td>N0</td>
<td>M0</td>
<td>SX</td>
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<td>Stage IA</td>
<td>pT1</td>
<td>N0</td>
<td>M0</td>
<td>S0</td>
</tr>
<tr>
<td>Stage IB</td>
<td>pT2</td>
<td>N0</td>
<td>M0</td>
<td>S0</td>
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<tr>
<td></td>
<td>PT3</td>
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<td>M0</td>
<td>S0</td>
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<td></td>
<td>PT4</td>
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<td>S0</td>
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<tr>
<td>Stage IS</td>
<td>Any pT/TX</td>
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<td>M0</td>
<td>S1-3</td>
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<tr>
<td>Stage II</td>
<td>Any pT/Tx</td>
<td>N1-3</td>
<td>M0</td>
<td>SX</td>
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<tr>
<td>Stage IIA</td>
<td>Any pT/TX</td>
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<td>M0</td>
<td>S0</td>
</tr>
<tr>
<td></td>
<td>Any pT/TX</td>
<td>N1</td>
<td>M0</td>
<td>S1</td>
</tr>
<tr>
<td>Stage IIB</td>
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<td>M0</td>
<td>S0</td>
</tr>
<tr>
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<td>Any pT/TX</td>
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<td>M0</td>
<td>S1</td>
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<tr>
<td>Stage IIC</td>
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<td>M0</td>
<td>S0</td>
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<td>M0</td>
<td>S1</td>
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<td>Stage III</td>
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<td>M1</td>
<td>SX</td>
</tr>
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<td>Stage IIIA</td>
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<td>M1a</td>
<td>S0</td>
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<td>Any N</td>
<td>M1a</td>
<td>S1</td>
</tr>
<tr>
<td>Stage IIIB</td>
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<td>N1-3</td>
<td>M0</td>
<td>S2</td>
</tr>
<tr>
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<td>S2</td>
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<tr>
<td>Stage IIIC</td>
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<td>Any pT/TX</td>
<td>Any N</td>
<td>M1a</td>
<td>S3</td>
</tr>
<tr>
<td></td>
<td>Any pT/Tx</td>
<td>Any N</td>
<td>M1b</td>
<td>Any S</td>
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**Staging and Classification**

<table>
<thead>
<tr>
<th>Test</th>
<th>Recommendation</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum tumour markers</td>
<td>Alpha-fetoprotein</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>hCG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LDH</td>
<td></td>
</tr>
<tr>
<td>Abdominopelvic CT</td>
<td>All patients</td>
<td>A</td>
</tr>
<tr>
<td>Chest CT</td>
<td>All patients</td>
<td>A</td>
</tr>
<tr>
<td>Testis ultrasound (bilateral)</td>
<td>All patients</td>
<td>A</td>
</tr>
<tr>
<td>Bone scan or MRI columna</td>
<td>In case of symptoms</td>
<td>A</td>
</tr>
<tr>
<td>Brain scan (CT/MRI)</td>
<td>In case of symptoms and patients with metastatic</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>disease with multiple lung metastases and/or high</td>
<td></td>
</tr>
<tr>
<td></td>
<td>beta-hCG values.</td>
<td></td>
</tr>
</tbody>
</table>

**Further investigations**

- **Fertility investigations:**
  - Total testosterone
  - LH
  - FSH
  - Semen analysis
  - Sperm banking

- **Recommendation:** Should be offered

- **GR:** A

- The mean serum half-life of **AFP 5-7 days** and **hCG is 2-3 days**
# Staging and Classification

<table>
<thead>
<tr>
<th>Good-prognosis group</th>
<th>Non-semioma (56% of cases)</th>
<th>All of the following criteria:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5-year PFS 89%</td>
<td>• Testis/retroperitoneal primary</td>
</tr>
<tr>
<td></td>
<td>5-year survival 92%</td>
<td>• No non-pulmonary visceral metastases</td>
</tr>
<tr>
<td>Seminoma (90% of cases)</td>
<td>5-year PFS 82%</td>
<td>• AFP &lt; 1,000 ng/mL</td>
</tr>
<tr>
<td></td>
<td>5-year survival 86%</td>
<td>• hCG &lt; 5,000 IU/L (1,000 ng/mL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LDH &lt; 1.5 x ULN</td>
</tr>
</tbody>
</table>

All of the following criteria:

- Any primary site
- No non-pulmonary visceral metastases
- Normal AFP
- Any hCG
- Any LDH
## Staging and Classification

### Intermediate prognosis group

| Non-seminoma (28% of cases) | Testis/retroperitoneal primary
| 5-year PFS 75% | No non-pulmonary visceral metastases
| 5-year survival 80% | AFP 1,000 - 10,000 ng/mL or
| | hCG 5,000 - 50,000 IU/L or
| | LDH 1.5 - 10 x ULN

| Seminoma (10% of cases) | All of the following criteria:
| 5-year PFS 67% | Any primary site
| 5-year survival 72% | Non-pulmonary visceral metastases
| | Normal AFP
| | Any hCG
| | Any LDH

### Poor prognosis group

| Non-seminoma (16% of cases) | Any of the following criteria:
| 5-year PFS 41% | Mediastinal primary
| 5-year survival 48% | Non-pulmonary visceral metastases
| | AFP > 10,000 ng/mL or
| | hCG > 50,000 IU/L (10,000 ng/mL) or
| | LDH > 10 x ULN

| Seminoma | No patients classified as poor prognosis
<table>
<thead>
<tr>
<th></th>
<th>Seminoma</th>
<th></th>
<th>Non-seminoma</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>good</td>
<td>intermediate</td>
<td>Good</td>
<td>Intermediate</td>
</tr>
<tr>
<td>5 yr PFS</td>
<td>82%</td>
<td>67%</td>
<td>89%</td>
<td>75%</td>
</tr>
<tr>
<td>5 yr survival</td>
<td>86%</td>
<td>72%</td>
<td>92%</td>
<td>80%</td>
</tr>
</tbody>
</table>
PENILE CANCER

Natural History

COMMON SITE OF PRIMARY TUMOR

- within the preputial area
- in the glans
- coronal sulcus
- prepuce
- Lesions arising in the skin of the shaft are rare
- slow loco regional progression
American Joint Committee on Cancer (AJCC)
TNM Staging System for Penile Cancer (7th ed., 2010)

Primary Tumor (T)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>Primary tumor cannot be assessed</td>
</tr>
<tr>
<td>T0</td>
<td>No evidence of primary tumor</td>
</tr>
<tr>
<td>Ta</td>
<td>Noninvasive verrucous carcinoma*</td>
</tr>
<tr>
<td>Tis</td>
<td>Carcinoma in situ</td>
</tr>
<tr>
<td>T1a</td>
<td>Tumor invades subepithelial connective tissue without lymph vascular invasion and is not poorly differentiated (i.e., grade 3-4)</td>
</tr>
<tr>
<td>T1b</td>
<td>Tumor invades subepithelial connective tissue with lymph vascular invasion or is poorly differentiated</td>
</tr>
<tr>
<td>T2</td>
<td>Tumor invades corpus spongiosum or cavernosum</td>
</tr>
<tr>
<td>T3</td>
<td>Tumor invades urethra</td>
</tr>
<tr>
<td>T4</td>
<td>Tumor invades other adjacent structures</td>
</tr>
</tbody>
</table>

*Note: Broad pushing penetration (invasion) is permitted; destructive invasion is against the diagnosis
Regional Lymph Nodes (N)

Clinical Stage Definition*
cNX  Regional lymph nodes cannot be assessed
cN0  No lymph node metastasis
cN1  Palpable mobile unilateral inguinal lymph node
cN2  Palpable mobile multiple or bilateral inguinal lymph nodes
cN3  Palpable fixed inguinal nodal mass or pelvic lymphadenopathy unilateral or bilateral

Pathologic Stage Definition*
pNX  Regional lymph nodes cannot be assessed
pN0  No regional lymph node metastasis
pN1  Metastasis in a single inguinal node
pN2  Metastasis in multiple or bilateral inguinal lymph nodes
pN3  Extranodal extension of lymph node metastasis or pelvic lymph node(s) unilateral or bilateral

*Note: Pathologic stage definition based on biopsy or surgical excision.

Distant Metastasis (M)
M0     No distant metastasis
M1     Distant metastasis
<table>
<thead>
<tr>
<th>Stage</th>
<th>T</th>
<th>N</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<tr>
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<td>T1a</td>
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<td>II</td>
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</tr>
<tr>
<td></td>
<td>Any T</td>
<td>Any N</td>
<td>M1</td>
</tr>
</tbody>
</table>
MODIFICATIONS IN AJCC 8TH EDITION

Penis

Changes in T category and pathological N category
THANKS

STUDENTS ARE THE REAL TORCH BEARERS