Uterine Malignancy
New Cancer Cases By Site

<table>
<thead>
<tr>
<th>2010</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>28%</td>
</tr>
<tr>
<td>Lung</td>
<td>14%</td>
</tr>
<tr>
<td>Colo-Rectal</td>
<td>10%</td>
</tr>
<tr>
<td>Uterus</td>
<td>6%</td>
</tr>
<tr>
<td>Thyroid</td>
<td>5%</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>4%</td>
</tr>
<tr>
<td>Ovary</td>
<td>3%</td>
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</tbody>
</table>
### Cancer Deaths By Site

**2010**

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>26%</td>
</tr>
<tr>
<td>Breast</td>
<td>15%</td>
</tr>
<tr>
<td>Colo-Rectal</td>
<td>9%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>7%</td>
</tr>
<tr>
<td>Ovary</td>
<td>5%</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>4%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>3%</td>
</tr>
<tr>
<td>Uterus</td>
<td>3%</td>
</tr>
</tbody>
</table>
Gynecologic Malignancies
2010

- Uterus: 43,470 New, 7,950 Deaths
- Ovary: 21,880 New, 13,850 Deaths
- Cervix: 12,200 New, 4,210 Deaths
- Vulva: 3,900 New, 920 Deaths
Uterine Cancer

Median age at Diagnosis
60 years
Uterine Malignancy
Age Distribution

20-29: 4
30-39: 27
40-49: 60
50-59: 107
60-69: 266
70-79: 218
80-89: 92
90-95: 9

783 Pt, 2000
Uterine Cancer

- 75% Postmenopausal
- 25% Perimenopausal/Premenopausal
- 5% Aged 40 or younger
# Endometrial Cancer

<table>
<thead>
<tr>
<th>Clinical Features</th>
<th>Type I</th>
<th>Type II</th>
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</thead>
<tbody>
<tr>
<td>Risk Factors</td>
<td>Unopposed estrogen</td>
<td>Age</td>
</tr>
<tr>
<td>Race</td>
<td>White &gt; Black</td>
<td>White = Black</td>
</tr>
<tr>
<td>Differentiation</td>
<td>Well differentiated</td>
<td>Poorly differentiated</td>
</tr>
<tr>
<td>Histology</td>
<td>Endometrioid</td>
<td>Non-endometrioid</td>
</tr>
<tr>
<td>Stage</td>
<td>I/II</td>
<td>III/IV</td>
</tr>
<tr>
<td>Prognosis</td>
<td>Favorable</td>
<td>Not favorable</td>
</tr>
<tr>
<td>Ploidy</td>
<td>Diploid</td>
<td>Aneuploid</td>
</tr>
</tbody>
</table>
Uterine Cancer
Risk Factors

- Obesity
- Nulliparity
- Late menopause
- Unopposed estrogen
- Hereditary 5% associated with HPNCC
  (10% for women younger than 50)
Uterine Cancer
Etiology

- Estrogen Driven
  - Obese, postmenopausal

- Non-estrogen Driven
  - Older, not obese
Post Menopausal Vaginal Bleeding
## Postmenopausal Bleeding

### Etiology

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Exogenous estrogen</td>
<td>30</td>
</tr>
<tr>
<td>Endometritis/vaginitis</td>
<td>30</td>
</tr>
<tr>
<td>Endometrial Cancer</td>
<td>15</td>
</tr>
<tr>
<td>Polyps (endom./ cx.)</td>
<td>10</td>
</tr>
<tr>
<td>Endometrial hyperplasia</td>
<td>5</td>
</tr>
<tr>
<td>Misc.(sarcoma/ Cx ca./ trauma, caruncle)</td>
<td>10</td>
</tr>
</tbody>
</table>
Endometrial Cancer Screening

- No cost effective screening method.
- Prompt evaluation of symptomatic patients is essential.
Endometrial Cancer Precursors
Estrogen Dependent

Proliferative endometrium

Hyperpalsia

Hyperplasia with atypia (EIN)

Cancer
Uterine Malignancy
Diagnosis

- Endometrial biopsy
- Dilation and curettage
- Hysteroscopy
- Histologic type and grade
- Presence or absence of vaginal metastases
- Rule out primary endocervical carcinoma
Uterine Cancer

Histology

- Endometrioid
- Papillary serous
- Clear cell
- Undifferentiated
- Sarcoma
  - Mixed Mesodermal Sarcoma
  - Leiomyosarcoma
  - Stromal Sarcoma
Uterine Cancer Staging
Pre-treatment Evaluation

- May or may not alter staging of the disease
- Should impact decision making regarding therapy
F.I.G.O.
International Federation of Gynecology & Obstetrics

- Universally available
- Clinical vs. Surgical
- Once established, the stage is not changed
- Should have prognostic significance
- Aids in worldwide outcome reporting
- May assist in treatment decisions
F.I.G.O. Clinical Staging

- Physical exam
- Chest radiograph
- Intravenous pyelogram
- Barium enema
- Sigmoidoscopy/cystoscopy
Diagnostic Tests

Cannot alter staging

- Computed tomography
- Magnetic resonance imaging (MRI)
- PET scan
- Bone scan
Staging

Gynecologic Malignancies

Clinical

Cervix GTN Vagina

Surgical

Ovary Uterine Vulva
Uterine Malignancy

Surgical Staging
Endometrial Cancer Staging  
FIGO 2009

Stage I  The carcinoma is confined to the corpus uteri
IA  No or < ½ myometrial invasion
IB  Invasion ≥ ½ of the myometrium

Stage II  Tumor involves the cervical stroma, but does not extend beyond the uterus

Stage III  Local and/or regional spread of the tumor
IIIA  Tumor invades the serosa of the corpus uteri and/or adnexae
IIIB  Vaginal and/or parametrial involvement
IIIC  Metastases to the pelvic and/or para-aortic lymph nodes
   IIIC1  Positive pelvic lymph nodes
   IIIC2  Positive para-aortic lymph nodes with or without positive pelvic lymph nodes

Stage IV  Tumor invades the bladder and/or bowel mucosa
IVA  Tumor invades bladder and/or bowel mucosa
IVB  Distant metastases, including intra-abdominal metastases and/or inguinal lymph nodes

Note:  All tumors are Graded 1,2 or 3.
Endocervical gland involvement is to be considered Stage I.
Positive cytology has to be reported separately without changing stage.
FIGO 2009
Updated Endometrial Cancer Staging

- Myometrial invasion is consolidated into two groups IA and IB
- Stage IIA cervical mucosal involvement deleted
- Stage not altered by (+) cytology IIIA
- Node involvement segregated into pelvic and aortic
Uterine Cancer
Prognostic Factors

- Histologic type
- Histologic grade
- Depth of myometrial invasion
- (+) peritoneal cytology?
- Node metastases
- Extra-uterine disease
Uterine Malignancies
UKSM,W

7/82 - 7/2000

783 Patients
Uterine Malignancies

Histology

783 Pt, 2000
Uterine Malignancies
Stage Distribution

783 Pt, 2000
Uterine Malignancies
Distribution by Grade

- Grade I: 24%
- Grade II: 32%
- Grade III: 29%
- Not Spec.: 15%

783 Pt. 2000
Uterine Cancer Therapy
Uterine Malignancy

Pre-treatment Assessment

- Physical exam & pre-op evaluation
- CXR
- EKG
- CBC, comprehensive metabolic panel
- CT scan is of no benefit if surgery is planned
Uterine Malignancy
Treatment Options

- Surgical staging
- Hysterectomy, BSO, and peritoneal cytology, pelvic lymphadenectomy, aortic node sampling
- Abdominal, laparoscopic, robotic
- Postop treatment is based on pathologic risk factors
Uterine Cancer
Surgical Preparation

- Medical clearance
- Bowel prep (usually not)
- DVT prophylaxis
- Prophylactic antibiotics
Uterine Cancer
Pattern of Spread

- Direct extension
  - Myometrium
  - Parametrium
  - Peritoneal surface

- Lymphatic

- Vascular
VENA CAVA
AORTA

OVARY
FALLOPIAN TUBE
ROUND LIGAMENT

DRAINAGE FROM LOWER UTERUS & CERVIX THROUGH THE PARAMETRIUM TO THE PELVIC NODES.

INGUINAL NODES
Postoperative Treatment

- Observation
- Pelvic radiation
- Combination chemotherapy & radiation
- Systemic chemotherapy
- Hormone therapy
Uterine Cancer
Post-operative Pelvic Radiation Therapy

- Grade III lesions with any invasion
- Deeply invasive Grade II ?
- Cervical stromal invasion
- Serosal involvement ?
- Positive pelvic nodes
Uterine Cancer
Post-operative Systemic or Combination Therapy

- Positive peritoneal cytology?
- Gross peritoneal disease / omentum
- Adnexal involvement
- Distant metastases
Uterine Malignancies

Status Last Seen

Alive, NED: 71
Alive w/Dis: 10
Dead w/Dis: 14
Dead wo/Dis: 1
Lost to FU: 4

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Uterine Malignancy Survival

783 Pt, 2000 % NED
Uterine Malignancy
Survival By Grade

% NED

I: 86%
II: 80%
III: 51%
Not Spec.: 55%

783 Pt, 2000
Uterine Cancer
Post-treatment Surveillance

- Pelvic exam and Pap q 3 mos. for 1 yr.
- Pelvic exam and Pap q 4 mos. for 1 yr.
- Exams q 6 mos. For final 3 years.
- 50% of vaginal/pelvic recurrences are curable with radiation therapy
- Expensive radiographic f/u is of little benefit
Uterine Sarcomas
Uterine Sarcomas

- **Mesenchymal Tumors**
  - Endometrial Stromal and related tumors
    - Endometrial stromal Sarcoma
  - Smooth muscle tumors
    - Leiomyosarcoma

- **Mixed Epithelial & Mesenchymal Tumors**
  - Carcinosarcoma
    - Malignant mixed tumors
  - Adenosarcoma
The End
Uterine Cancer
<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>25%</td>
</tr>
<tr>
<td>Breast</td>
<td>15%</td>
</tr>
<tr>
<td>Colo-Rectal</td>
<td>11%</td>
</tr>
<tr>
<td>Ovary</td>
<td>5%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>5%</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>4%</td>
</tr>
</tbody>
</table>
Prognostic Factors

- Histology
- Lesion size
- Histologic grade
- Stage / Extent of disease
- Node status
- Age & physical condition of patient
**Endometrial Carcinoma- 1988 FIGO Staging**

Stage IA G123  Tumor limited to endometrium  
Stage IB G123  Invasion to less than one-half the myometrium  
Stage IC G123  Invasion to more than one-half the myometrium  

Stage IIA G123  Endocervical glandular involvement only  
Stage IIB G123  Cervical stromal invasion  

Stage IIIA G123  Tumor invades serosa and/or adnexa, and/or (+) peritoneal cytology  
Stage IIIB G123  Vaginal metastases  
Stage IIIC G123  Metastases to pelvic and/or paraaortic nodes  

Stage IVA G123  Tumor invasion of bladder or bowel mucosa  
Stage IVB G123  Distant metastases including intra-abdominal and/or inguinal nodes  

**Histopathology- Tumor Grading**  
G1  5% or less of a nonsquamous or nonmorular solid growth pattern  
G2  6%-50% of a nonsquamous or nonmorular solid growth pattern  
G3  More than 50% of a nonsquamous or nonmorular solid growth pattern  

Nuclear atypia, inappropriate for the architectural grade, raises the degree of grade 1 or grade 2 tumors by one grade.  

In serous adenocarcinomas, clear cell adenocarcinomas, and squamous cell carcinomas, nuclear grading takes precedent.
Uterine Malignancies
Grade Distribution

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2010 Estimated US Cancer Deaths*

Men 299,200
- Lung & bronchus: 29%
- Prostate: 11%
- Colon & rectum: 9%
- Pancreas: 6%
- Liver & intrahepatic bile duct: 4%
- Leukemia: 4%
- Esophagus: 4%
- Non-Hodgkin lymphoma: 4%
- Urinary bladder: 3%
- Kidney & renal pelvis: 3%
- All other sites: 23%

Source: American Cancer Society, 2010.

Women 270,290
- Lung & bronchus: 26%
- Breast: 15%
- Colon & rectum: 9%
- Pancreas: 7%
- Ovary: 5%
- Non-Hodgkin lymphoma: 4%
- Leukemia: 3%
- Uterine corpus: 3%
- Liver & intrahepatic bile duct: 2%
- Brain/Other nervous system: 2%
- All other sites: 24%

Source: American Cancer Society, 2010.
2010 Estimated US Cancer Cases*

**Men**

- Prostate: 28%
- Lung & bronchus: 15%
- Colon & rectum: 9%
- Urinary bladder: 7%
- Melanoma of skin: 5%
- Non-Hodgkin lymphoma: 4%
- Kidney & renal pelvis: 4%
- Oral cavity: 3%
- Leukemia: 3%
- Pancreas: 3%
- All Other Sites: 19%

**Women**

- Breast: 28%
- Lung & bronchus: 14%
- Colon & rectum: 10%
- Uterine corpus: 6%
- Thyroid: 5%
- Non-Hodgkin lymphoma: 4%
- Melanoma of skin: 4%
- Kidney & renal pelvis: 3%
- Ovary: 3%
- Pancreas: 3%
- All Other Sites: 20%

Source: American Cancer Society, 2010.

*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.
## Lifetime Probability of Developing Cancer, Women, US, 2004-2006*

<table>
<thead>
<tr>
<th>Site</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>All sites†</td>
<td>1 in 3</td>
</tr>
<tr>
<td>Breast</td>
<td>1 in 8</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>1 in 16</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>1 in 20</td>
</tr>
<tr>
<td>Uterine corpus</td>
<td>1 in 40</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>1 in 52</td>
</tr>
<tr>
<td>Urinary bladder‡</td>
<td>1 in 84</td>
</tr>
<tr>
<td>Melanoma§</td>
<td>1 in 56</td>
</tr>
<tr>
<td>Ovary</td>
<td>1 in 71</td>
</tr>
<tr>
<td>Pancreas</td>
<td>1 in 72</td>
</tr>
<tr>
<td>Uterine cervix</td>
<td>1 in 145</td>
</tr>
</tbody>
</table>

* For those free of cancer at beginning of age interval.
† All Sites exclude basal and squamous cell skin cancers and in situ cancers except urinary bladder.
‡ Includes invasive and in situ cancer cases
§ Statistic for white women.
Endometrial Cancer Staging
FIGO 2009

Stage I  The carcinoma is confined to the corpus uteri
IA  No or < ½ myometrial invasion
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Stage II  Tumor involves the cervical stroma, but does not extend beyond the uterus

Stage III  Local and/or regional spread of the tumor
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IVA  Tumor invades bladder and/or bowel mucosa
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Note:  All tumors are Graded 1,2 or 3.
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Uterine Sarcoma Staging
FIGO 2009

- Leiomyosarcomas and Endometrial Stromal Sarcomas (ESS)
- Adenosarcomas
- Carcinosarcomas (formerly malignant mixed mullerian tumors, MMMT)
Leiomyosarcomas and Endometrial Stromal Sarcomas (ESS)  
FIGO Staging 2009

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>Tumor limited to the uterus</td>
</tr>
<tr>
<td>IA</td>
<td>( \leq 5 \text{ cm} )</td>
</tr>
<tr>
<td>IB</td>
<td>( &gt; 5 \text{ cm.} )</td>
</tr>
<tr>
<td>Stage II</td>
<td>Tumor extends beyond the uterus, within the pelvis</td>
</tr>
<tr>
<td>IIA</td>
<td>Adnexal involvement</td>
</tr>
<tr>
<td>IIB</td>
<td>Involvement of other pelvic tissue</td>
</tr>
<tr>
<td>Stage III</td>
<td>Tumor invades abdominal tissues (not just protruding into the abdomen)</td>
</tr>
<tr>
<td>IIIA</td>
<td>One site</td>
</tr>
<tr>
<td>IIIB</td>
<td>( &gt; \text{ one site} )</td>
</tr>
<tr>
<td>IIIC</td>
<td>Metastases to pelvic or para-aortic lymph nodes</td>
</tr>
<tr>
<td>Stage IV</td>
<td>Tumor with</td>
</tr>
<tr>
<td>IVA</td>
<td>Bladder and/or rectum invasion</td>
</tr>
<tr>
<td>IVB</td>
<td>Distant metastases</td>
</tr>
</tbody>
</table>
Uterine Adenosarcoma
FIGO 2009 Staging

Stage I  Tumor limited to uterus
   IA  Tumor limited to endometrium/endocervix with no myometrial invasion
   IB  $\leq \frac{1}{2}$ myometrial invasion
   IC  $> \frac{1}{2}$ myometrial invasion

Stage II  Tumor extends beyond the uterus, within the pelvis
   IIA  Adnexal involvement
   IIB  Involvement of other pelvic tissues

Stage III  Tumor invades abdominal tissues (not just protruding into the abdomen)
   IIIA  One site
   IIIB  > one site
   IIIC  Metastasis to pelvic and/or para-aortic lymph nodes

Stage IV  Tumor with
   IVA  Bladder and/or rectum invasion
   IVB  Distant metastasis
Carcinosarcomas

Should be staged as carcinomas of the endometrium
Uterine Cancer
Prognostic Factors

- Histologic type
- Histologic grade
- Depth of myometrial invasion
- (+) peritoneal cytology?
- Node metastases
- Extra-uterine disease
Uterine Cancer Staging
F.I.G.O.

■ Stage I
  ◆ A - Limited to endometrium
  ◆ B - Invades ≤1/2 myometrium
  ◆ C - Invades > 1/2 myometrium

■ Stage II
  ◆ A - Endocervical gland involvement
  ◆ B - Cervical stromal invasion
Uterine Cancer Staging
F.I.G.O.

- **Stage III**
  - A - Involves serosa, adnexa, or (+) cytology
  - B - Vaginal Metastases
  - C - (+) pelvic or para-aortic nodes

- **Stage IV**
  - A - Invades bladder or bowel mucosa
  - B - Distant metastases, abdomen, or inguinal nodes
Uterine Malignancies
Depth Of Myometrial Invasion

783 Pt, 2000
Uterine Malignancies
Peritoneal Cytology

783 Pt. 2000
**Uterine Cancer**

Surgical Therapy and Staging

- Midline incision
- Peritoneal cytology
  - Right and left paracolic gutters and pelvis
- Explore upper abdomen
- para-aortic +/- pre-caval node sampling
- Pelvic node dissection
- TAH/BSO
Uterine Malignancies
Post-operative Therapy

783 Pt, 2000
Uterine Malignancy
Survival By Depth of Myometrial Invasion

783 Pt, 2000
Uterine Malignancy
Survival By (+) Peritoneal Cytology

783 Pt, 2000
Uterine Malignancy
Survival By Post-Operative Therapy

783 Pt, 2000

% NED
Uterine Cancer

Post-op hormone therapy??