Oncology Board Facts

Skin CA

1\textsuperscript{st} most common is basal cell cancer
- originates from the lowest layer of the epidermis but least dangerous skin cancer
- raised, smooth, \textbf{pearly bump} on the \textbf{sun-exposed skin}

TX
- \textit{Surgical resection}

2\textsuperscript{nd} most common squamous cell carcinoma
- uncontrolled growth of abnormal cells in the squamous cells
- scaling, and thickened patch on \textbf{sun-exposed skin}.
- Some are firm hard nodules and dome shaped like keratoacanthomas.
- \textbf{Ulceration and bleeding may occur}

TX
- \textit{Imiquimod (Aldara)}

Actinic keratosis
- \textit{scaly or crusty growths or lesions} caused by damage from the sun’s ultraviolet (UV) rays
- also known as solar keratoses
- \textbf{precursors to squamous cell CA}

TX
- \textit{5-fluorouracil (5-FU) ointment or liquid}
- \textit{Imiquimod 5\% cream}

Malignant Melanoma
- \textbf{Less common} than other skin cancers.
- It causes the \textbf{majority (75\%) of deaths} related to skin cancer
- \textbf{Women} the most common site is the \textbf{legs}
- \textbf{Men} most common on the \textbf{back}
- ABCD
- \textbf{Wide local excision}

Kaposi sarcoma
- CA that causes patches of abnormal tissue to grow under the \textbf{skin}, in the lining of the \textbf{mouth, nose, and throat} or in other organs.
- \textbf{patches are red or purple} and are made of cancer cells and blood cells
- caused by \textbf{Human herpesvirus 8}, also known as Kaposi sarcoma-associated herpesvirus
- **Classic KS** occurs mainly in older people of Mediterranean, Eastern European, and Middle Eastern heritage
- **Endemic KS** occurs in people living in Equatorial Africa
- **AIDS-related KS** mouth is involved in about 30% of cases, and is the initial site in 15% of can also be seen in GI and respiratory tracts
- The AIDS-related KS lesions often rapidly progress to plaques and nodules affecting the upper trunk, face, and oral mucosa
- **DX:** tissue biopsy

**Lung CA**

Lung cancers are generally divided into **small cell lung cancer (SCLC)** and **non-small cell lung cancer (NSCLC)**. Non–small cell lung cancer accounts for approximately 85% of all lung cancers. Non-small cell lung cancer is divided further into adenocarcinoma, squamous cell carcinoma, and large cell carcinoma histologies in as many as 90% of patients the cause of lung cancer is tobacco smoking.

**Types of NSCLC**

1. **Adenocarcinomas** are the most commonly seen type of NSCLC in the U.S. and comprise up to 30-40% of NSCLC.
   - adenocarcinomas are associated with smoking, like other lung cancers, observed in nonsmokers who develop lung cancer.
   - Most adenocarcinomas arise in the outer, or peripheral, areas of the lungs.
   - **Bronchioloalveolar carcinoma** is a subtype of adenocarcinoma that frequently develops at multiple sites in the lungs and spreads along the preexisting alveolar walls is more common in female never-smokers, and may have different responses to treatment. This form of tumor has a better prognosis for surgical resection.

2. **Squamous cell lung carcinoma** usually starts near a central bronchus.
   - Accounting for 25-30% of lung cancers A hollow cavity and associated necrosis are commonly found at the center of the tumor.
   - Well-differentiated squamous cell lung cancers often grow more slowly than other cancer types.
   - Squamous cell carcinomas were formerly more common than adenocarcinomas; at present, they account for about 25-30% of NSCLC. Also known as epidermoid carcinomas, squamous cell cancers arise most frequently in the central chest area.
3. **Large cell cancer**
- Large cell carcinoma represents 10-20% of bronchogenic tumors.
- These tumors lack any diagnostic features to suggest their diagnosis prior to biopsy.
- They tend to grow rapidly, metastasize early, and are **strongly associated with smoking**.
- Undifferentiated large cell carcinoma shows no evidence of squamous or glandular maturation. Thus these tumors are often diagnosed by default, when all other possibilities have been excluded. Large cell carcinoma is, in effect, a "diagnosis of exclusion".

4. **Small cell lung carcinoma (SCLC)**
- Less common (20% of cases). It was formerly referred to as **"oat cell"** carcinoma.
- Most cases arise in the larger airways (primary and secondary bronchi) and grow rapidly.
- The small cells contain dense neurosecretory granules (vesicles containing **neuroendocrine hormones**), which give this tumor an **endocrine/paraneoplastic syndrome association**.
- **Metastatic at presentation**, and ultimately carries a **worse prognosis**.
- This type of lung cancer is **strongly associated with smoking**.
- **Widespread metastases occur early in the course of the disease**.
- The most common paraneoplastic syndromes are the syndrome of inappropriate secretion of antidiuretic hormone (**SIADH**) and the syndrome of ectopic adrenocorticotropic hormone (**ACTH**) production.

**SC**= Squamous and **small cell** originate in the **central area** (cough, obstruction, hemoptysis)
**LAP**= Large cell and **adenocarcinoma** originate **peripherally** (Pleural effusion)

<table>
<thead>
<tr>
<th>Squamous Cell Carcinoma - non-smoker:</th>
<th>1.0%</th>
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<tbody>
<tr>
<td><strong>3rd Squamous Cell Carcinoma - smoker:</strong></td>
<td><strong>15.7%</strong></td>
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<tr>
<td>Small Cell Carcinoma - non-smoker:</td>
<td>0.3%</td>
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<tr>
<td><strong>2nd Small Cell Carcinoma - smoker:</strong></td>
<td><strong>24.0%</strong></td>
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<tr>
<td>Adenocarcinoma - non-smoker:</td>
<td>11.6%</td>
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<td><strong>1st Adenocarcinoma - smoker:</strong></td>
<td><strong>38.9%</strong></td>
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<td>Large Cell Carcinoma - non-smoker:</td>
<td>1.5%</td>
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<tr>
<td>Large Cell Carcinoma - smoker:</td>
<td>6.7%</td>
</tr>
<tr>
<td>Other or unspecified:</td>
<td>0.4%</td>
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</tbody>
</table>
Mesothelioma

- most predominantly caused by **inhaled asbestos fibers**
- **swallowing asbestos** fibers could contribute to peritoneal Mesothelioma
- construction workers, railroad workers, naval mechanics, bakers, explosive workers, and automobile mechanics.
- Malignant Mesothelioma more common in men 3:1.
- Pleural mesothelioma is a cancer that originates in the pleura or lining of the lung.
- Lung cancer originates inside the lung itself

The pattern of **nodal metastasis** is different from that of lung cancer.
The mechanism of spread of the disease to the hilar nodes may be through lung invasion

**SXS:**
- Chest discomfort, pleuritic pain, easy fatigability,
- fever, sweats
- weight loss

There are three histological types of malignant Mesothelioma:
1. **Epithelioid; 50-60% of the cases Most Common**
2. Sarcomatoid
4. Papillary Mesothelioma

- **carcinoembryonic antigen (CEA)** is elevated for people with adenocarcinoma but normal for people with mesothelioma

Electron microscopy reveals that cells have **long microvilli**, in contrast to adenocarcinomas, which have **short microvilli**

Unlike lung cancer, there is no association between mesothelioma and smoking

Despite treatment with chemotherapy, radiation therapy or sometimes surgery, the disease carries **a poor prognosis**
**Thyroid Cancer:**

**Causes:**
High-dose radiation to the head and neck (tx during Hodgkin disease)
5% of nodules are found to be malignant
**DX:** fine needle aspiration cytology test

Cell types

- **Papillary thyroid CA is the most common**
- 75% to 85% of case often in young females – excellent prognosis
- Follicular thyroid cancer/Hürthle cell (10% to 20% of cases)
- Medullary thyroid cancer (5% to 8% of cases) parafollicular cells, often part of MEN-2 syndrome.
- Poorly differentiated thyroid cancer
- Anaplastic thyroid cancer (Less than 5% and it’s not responsive to treatment and can cause pressure symptoms
- **Scintigraphy using iodine-131** used to detect and metastases

**TX:** thyroidectomy followed by radioactive iodine

**Oral CA**

**Squamous cell CA**
75% related to tobacco use and excessive alcohol and poor oral hygiene
**HPV 16**
Other common premalignant lesions include **oral lichen planus**

**DX:** BX

**GU Neoplastic Diseases**

**Bladder Cancer**

- The most common type of bladder cancer in the United States
- **urothelial carcinoma, formerly known as transitional cell carcinoma**
- associated with bladder infection by **Schistosoma haematobium**.
- **SXS:** Painless hematuria
- **Smoking history**
- Age >65
- **DX:** Cystoscopy
**Prostate Cancer**
- Prostate cancer is the most common non cutaneous cancer among males
- PSA testing at age 50
- African-American start at age 40
- Prostate cancer remain significantly higher in African American> white
- Cell type adenocarcinoma
- Most common site for metastasis is bone
- A high-fat diet may lead to increased risks, while a diet rich in soy may be protective.
- PSA glycoprotein produced by prostate cells, either benign or malignant
- Not about the level but change in level

**Renal Cell Cancer**
- Most common type of renal malignancy
- The tissue of origin for renal cell carcinoma is the proximal renal tubular epithelium
- Approximately 30% of patients with renal carcinoma present with metastatic disease
- The greatest increase in incidence currently is observed in African Americans.
- SXS: Hematuria, flank pain, weight loss
- normochromic/normocytic anemia
- Palpable mass in the flank or abdomen
- HTN Hypercalcemia

**Risk Factors**
HTN, cigarette smoking, obesity, polycystic kidney disease

**Testicular Cancer**
Germ cell tumors
Men aged 20-34 years
Risk factors: cryptorchidism, orchitis
SXS: painless, swollen, hard testis
**DX:** Serum human chorionic gonadotrophin (HCG), alpha-fetoprotein (AFP), and lactate dehydrogenase (LDH) are the most important tumor markers
UTZ, CT Scan, CXR to r/o mets

**Wilms Tumor**
Wilms tumor is the 5th most common pediatric malignancy and the most common renal tumor in children.
The mean age at diagnosis is 3.5 years
The most common feature at presentation is an abdominal mass
Abdominal pain and abdominal mass occurs in 30-40% of cases.
SXS: HTN secondary to elevated renin levels fever from tumor necrosis, hematuria, and anemia. **CXR to r/o mets**
Leukemias

ALL:
most common in children
The overall cure rate for childhood ALL is now approximately 75-80%
Causes: viral, chemical, Down’s, Twins
Most cases occur in children between ages 3 and 7
- Generalized weakness and fatigue
- Anemia
- Weight loss and/or loss of appetite (Anorexia)
- Excessive bruising or bleeding from wounds, nosebleeds
- Bone pain, joint pains (caused by the spread of "blast" cells to the surface of the bone or into the joint from the marrow cavity)
- Bone marrow biopsy is the definitive diagnostic test.

CLL
- Chronic lymphocytic leukemia (CLL)
- the most common leukemia in adults in the Western World
- Hairy cell leukemia is a sub-type of CLL TX=Rituximab
- Males 55-84
- More than half of people diagnosed with CLL are older than 70, and cases rarely occur in individuals younger than 40.
- Most benign
- analysis of chromosomal aberrations using the fluorescence in situ hybridization (FISH) technique
- The protooncogene bcl2 is known to be present
- The majority of patients live 5-10 years, with an initial course that is relatively benign but followed by a terminal progressive and resistant phase lasting 1-2 years
- Bone marrow biopsy is the definitive diagnostic test

AML:
- AML is the 2nd most common in adults
- The average age of a person with AML is 65 years
- Auer Rods seen in the peripheral smear
- The most common symptom is fatigue. Patients often retrospectively note a decreased energy level over past weeks.
- Other symptoms of anemia include dyspnea upon exertion, dizziness
- Patients with splenomegaly note fullness in the left upper quadrant and early satiety.
- Patients with **gum infiltration** often present to their dentist first. Gingivitis due to neutropenia can cause swollen gums, and thrombocytopenia can cause the **gums to bleed**.
- **Bone marrow biopsy is the definitive diagnostic test.**

**CML**  
90% have the Philadelphia chromosome (Ph 1)  
**Bcr-Abl** is the key cause and driver of  

**Philadelphia chromosome-positive (Ph+) chronic myeloid leukemia (CML)**  
Most patients with AML have an elevated **lactic dehydrogenase level** and, frequently, an **elevated uric acid level**.  
- **Bone marrow biopsy is the definitive diagnostic test**

**Hodgkin’s Disease**  
- Thomas Hodgkin first described Hodgkin disease in 1832  
- **Infectious agents, particularly the Epstein-Barr virus (EBV), may be involved in the pathogenesis of Hodgkin disease.**
- **Painless enlarged lymph nodes**  
- **BX is the diagnostic test of choice**  
- **Most common cervical and supraclavicular**  
- **Males 15-38yo**  
- F/C, weight loss, night sweats, pruritus  
- In classic Hodgkin disease, the neoplastic cell is the **Reed-Sternberg giant cell**
- **Good recovery with chemo/rad tx**

**Non-Hodgkin’s Disease**  
Non-Hodgkin lymphoma is a heterogenous group of lymphoproliferative malignancies with differing patterns of behavior and responses to treatment

- Plasmacytoma/plasma cell myeloma  
- Diffuse large B-cell lymphoma  
- **Burkitt lymphoma (subtype B Cell lymphoma)**  
  - associated with over 90% of AIDS cases  
  - **Children** with the disease often had chronic **malaria**  
  - Lymphadenopathy (enlarged tonsil, adenoids, cervical, supraclavicular)  
  - Symptoms can include fevers, night sweats, weight loss, and fatigue.  
  - **Epstein-Barr virus in Burkitt lymphoma**  
- **BX is the diagnostic test of choice**  
- Tx=Rituxan  
- **Poor recovery especially with relapses**
OB-GYN Cancers

Endometrial cancer
- Any type of dysfunctional uterine bleeding in a post menopausal female is endometrial cancer until proven otherwise. Dx by endometrial bx
- Commonly presents as irregular bleeding in post menopausal females
- Most patients are aged 50-59 years
- H/o of hydatiform mole is also seen
- Will see thickened endometrium on utz
- Next step in management endometrial bx

Ovarian CA
- epithelial ovarian carcinoma (70% ovarian CA most common)
- Fifth most frequent cause of cancer death in women,
- Germ-cell tumors, sex-cord stromal tumors, and other more rare types. Metastases to the ovaries are relatively frequent, with the most common being from the endometrium, breast, colon, stomach, and cervix.
- The mean age is 56 years
- 50% of the cases occur >65 years
- OCPs use is associated with a decreased risk of developing ovarian CA
- Mutation in the BRCA1 or BRCA2 gene is present
- Alpha-fetoprotein (AFP) and lactate dehydrogenase (LDH) are seen in malignant germ cell tumor.
- CA125 is a glycoprotein antigen detected by using mouse monoclonal antibody OC125 raised from an ovarian cancer cell line.
- CA125 is elevated in other benign and malignant conditions, including menstruation; endometriosis; pelvic inflammation; liver, renal, and lung disease; and cancer of the endometrium, breast, colon, pancreas, lung, stomach, and liver.
- Spreads initially within the peritoneal cavity
- Ascites the most common presentation

Cervix Cancer
- Cervical cancer is the 2nd most common malignancy in women
- Clinically, the first symptom is abnormal vaginal bleeding, usually postcoital
- HPV 16 and 18 most common cause for cervical CA
- Major risk factors observed include sex at a young age, multiple sexual partners, promiscuous male partners, and history of STDs
- HPV viral DNA has been detected in more than 90% of squamous intraepithelial lesions (SILs)
TX: colposcopy, direct biopsies, and endocervical curettage

Papillomavirus vaccine (Gardasil®) -- Quadrivalent HPV recombinant vaccine. 3 doses 1st dose/ 2nd dose 2 months later/ 3rd dose 6 months after 1st dose
First vaccine indicated to prevent cervical cancer, genital warts (condyloma acuminata) HPV 6 and 11
Cervarix® same dosing frequency

PAP Smears Guidelines
Age of 1st Pap = 21 then every 2 years until 30 then every 3 years
Age of final Pap= 65 if at least 3 normal results in the preceding 10 years

Dysplasia
- PAP smear must be done as well as a culture for HPV
- Stage I repeat pap smear
- Stage II dysplasia (atypical squamous, low-grade squamous, high grade squamous intraepithelial lesion or atypical glandular cells)= colposcopy
- HPV 16 and 18 most common cause for cervical CA

Vaginal CA
- Rare form of cancer most common squamous CA seen in females >50
- Adenocarcinoma is another from usually seen in females <30
- A specific subtype of adenocarcinoma ("Clear Cell") occurs in a small percent of women (term "DES-Daughters")
- born between 1938 and 1973
- diethylstilbestrol (DES)
- DES was prescribed to prevent possible miscarriages and premature birth

Breast CA
- most common is ductal located upper outer quadrant
- Ductal most common
- Lobular rare and aggressive
- Risk factors: obesity, lack of exercise, hormonal replacement tx, smoking, ETOH, family hx (lumps following trauma or infection??)
- SXS: breast inflammation, itching, pain, swelling, nipple inversion, warmth and redness hard non-tender mass=20% of lumps are cancer
- Paget’s disease redness and mild flaking of the nipple skin (eczematoid)
- orange-peel texture to the skin referred to as peau d’orange
- Mutation in the BRCA1 or BRCA2 gene is present
- Raloxifene (Evista) and Tamoxifen commonly used in treatment
- Mammograms begin at age 40 and every 1 to 2 years sooner for patients with high risk factors (Family hx, BRCA1 and BRCA2 gene)
Gastric CA

- **Adenocarcinoma**
  - most frequently in men over 40 years old.
  
The incidence extremely high in Japan, Chile, and Iceland.
  - Indigestion
  - Nausea or vomiting
  - Dysphagia
  - Postprandial fullness
  - Loss of appetite
  - Melena or pallor from anemia
  - Tumor markers such as **CEA and CA 19-9**
  
  **DX:** *Esophagogastroduodenoscopy (EGD)*
- fruits and vegetables rich in vitamin C may have a protective effect

**Risk factors**
  - family history of gastric cancer
  - gastric ulcers
  - *Helicobacter pylori* infection
  - blood type A
  - **personal history of pernicious anemia**
  - history of chronic atrophic gastritis, a condition of decreased gastric acid, and a prior history of adenomatous gastric polyp.

Pancreatic Cancer

- **Adenocarcinoma**
  - 4th most common cause of cancer-related deaths
- **Weight loss (anorexia)**
- **Painful jaundice**
  - Jaundice, abdominal pain, back pain, loose stools, obstructing bile ducts
- **Diabetes**= new onset diabetes in **elderly r/o pancreatic CA**
- **Risk Factors:**
  - The risk of developing pancreatic cancer **increases with age**
  - Smoking, red meats, **soft drink sweetener fructose**, diabetes, chronic pancreatitis, family h/o pancreatic CA, **ETOH (???)**
  - CA in **body or tail** usually present with pain and **weight loss**
  - CA in the **head of the gland** present with **steatorrhea, weight loss, and jaundice**.
- **DX:** CT Scan and BX, MRI, ERCP
- **TX:** Whipple procedure, chemotherapy, and radiation therapy
Liver Cancer

- 3rd most common cancer in the world
- majority of patients will die within one year
- The most frequent is hepatocellular carcinoma

Risk factors
- Hepatitis C and chronic hepatitis B
- Cirrhosis (ETOH abuse)
- Obesity???
- Alpha-feta protein levels

Biliary Cancer
Cholangiocarcinoma which is an adenocarcinoma

risk factors
- primary sclerosing cholangitis
- congenital liver malformations
- infection with the parasitic liver flukes

Colon Cancer

- Most common site recto-sigmoid area
- Adenocarcinoma (95%)
- APC Gene
- CEA, CA-19-9

SXS:
- Abdominal pain
- Change in bowel habits
- Hematochezia or melena
- Weakness
- Anemia without other GI symptoms microcytic/hypochromic
- Weight loss

Risk Factors:
- Gardner’s syndrome
- Familial adenomatous polyps
- Crohn’s disease
- Ulcerative colitis
- Red meats??
Screening has the potential to reduce colorectal cancer deaths by 60%.

**Colonoscopy Guidelines**

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Age to begin screening</th>
<th>Recommendations</th>
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<tbody>
<tr>
<td>Average Risk</td>
<td>&lt; Age 50</td>
<td>No screening needed</td>
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<td>No risk factors</td>
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<tr>
<td>No symptoms</td>
<td>&gt; Age 50</td>
<td>Colonoscopy q 10 years</td>
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<td>Flexible sigmoidoscopy q 5 years</td>
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<td></td>
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<td>Double Contrast Barium Enema q 5 years</td>
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<td></td>
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<td>Circulating tumor cells q 5 years</td>
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<table>
<thead>
<tr>
<th>Increased risk factors</th>
<th>Age 40 or 10 years younger earliest diagnosis in the family</th>
<th>Colonoscopy</th>
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<tbody>
<tr>
<td>adenomatous polyps or colon cancer in a 1st degree relative</td>
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<table>
<thead>
<tr>
<th>Highest risk</th>
<th>Any Age</th>
<th>Colonoscopy</th>
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<tbody>
<tr>
<td>h/o Crohn’s disease or Ulcerative colitis &gt; 8 years</td>
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<tr>
<td>Genetics</td>
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</tr>
<tr>
<td>1. Hereditary Non-polyposis Colorectal CA</td>
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<tr>
<td>2. Familial adenomatous polyps</td>
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