2011 Estimated US Cancer Cases*

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>29%</td>
<td>30%</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Melanoma of skin</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Oral cavity</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>All Other Sites</td>
<td>19%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Source: American Cancer Society, 2011

*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.
Thyroid Cancer In The United States

- Thyroid cancer
  - Most common endocrine neoplasm
  - Diagnosed in 48,020 individuals
  - 3.2 F: 1 M ratio
  - 1,740 will die this year in US, 200,000+ worldwide

- Nearly 2 of 3 cases are found in people between the ages of 20 and 55. Mean age of dx 49 yo

- Has risen in recent years and is now more than twice what it was in 1990 due to early detection via ultrasound

- Death rate has been fairly stable for many years and remains very low compared with most other cancers.
Thyroid Cancer - Types

- Papillary thyroid cancer (85%)
  - Most common in US. Begins in follicular cells and grows slowly. If diagnosed early, most can be cured.

- Follicular thyroid cancer (15%)
  - Begins in follicular cells and grows slowly.

- Medullary thyroid cancer (3%)
  - Begins in parafollicular (C cells). Can make abnormally high levels of calcitonin. Tends to grow slowly. It can be easier to control if it's found and treated before it spreads to other parts of body.

- Anaplastic thyroid cancer (2%)
  - Begins in follicular cells. Tends to grow and spread very quickly. Very hard to control

Thyroid Cancer – Risk Factors

- Radiation
- FMHx of medullary thyroid cancer
- Family history of goiter or colon growths
- Personal history
- Female sex
- Age > 45 years
- Iodine
**Thyroid Cancer – Risk Factors**

- **Radiation**
  - High levels of radiation are much more likely than others to develop papillary or follicular thyroid cancer
  - High dose x-rays to treat kids with enlarged tonsils, acnes in 1920-50s
  - Radiation fallout containing I-131 (eg Chernobyl accident)

- **FMH of medullary thyroid cancer**
  - Runs in families, change in gene called RET can be tested
  - Can occur alone or with other cancers as MEN syndrome

- **FMH of goiters**
  - With multiple nodules at risk for papillary thyroid cancer
  - Familial polyposis are at increased risk also

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**Thyroid Cancer – Risk Factors**

- **Iodine?**
  - Too little iodine in the diet may increase the risk of follicular thyroid cancer
  - Other studies show that too much iodine in the diet may increase the risk of papillary thyroid cancer.
  - More studies are needed
Thyroid Cancer - Symptoms

• Lump in the front of the neck
• Hoarseness or voice changes
• Swollen lymph nodes in the neck
• Trouble swallowing or breathing
• Pain in the throat or neck that does not go away
• Diarrhea and episodic flushing associated with medullary thyroid cancer

Thyroid Cancer - Diagnosis

• Physical exam
• Lab test
• Ultrasound
• Thyroid scan – cold nodules may be cancer
• Biopsy
  – FNA
  – Surgical biopsy
Thyroid Cancer – Staging

- Ultrasound
- CT scan of neck and chest
- MRI of neck
- CXR
- Whole body scan
Thyroid Cancer - Treatment

- Surgery
- Thyroid hormone treatment
- Radioactive iodine therapy
  - Radioactive iodine (I-131) therapy is a treatment for papillary or follicular thyroid cancer.
- External radiation therapy
- Chemotherapy
  - Treatment for anaplastic thyroid cancer.

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Melanoma Screening Update

**Clinical Guidelines**

Screening for Skin Cancer: U.S. Preventive Services Task Force Recommendation Statement

**Annals of Internal Medicine**

**Description:** Update of the 2001 U.S. Preventive Services Task Force (USPSTF) recommendation statement on screening for skin cancer.

**Methods:** To update its recommendation, the USPSTF evaluated evidence published since 2001 on studies on screening effectiveness, the stage of detection by screening, and the accuracy of whole-body examination by primary care clinicians and self-examination by patients.

**Recommendation:** The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for skin cancer by primary care clinicians and self-examination by patients.

Ann Intern Med. 2009;150:188
Rationale For Screening For Skin Cancer

• Importance
  – Skin cancer—basal cell carcinoma, squamous cell carcinoma, and melanoma—is the most commonly diagnosed cancer.
  – Although melanoma accounts for about 5% to 6% of skin cancer diagnoses, it accounts for approximately 75% of the mortality from skin cancer.

• Detection
  – There is fair evidence that screening by clinicians is moderately accurate in detecting melanoma.
  – The evidence is insufficient to determine the extent to which screening by patient self-examination accurately detects skin cancer.

• USPSTF Statement
  – The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for skin cancer by primary care clinicians or by patient skin self-examination (I statement).
  – If this service is used, patients should be made aware of the uncertainty about the balance of benefits and harms.
Rationale For Screening For Skin Cancer

• Clinical considerations
  – This recommendation applies to the adult general population without a history of premalignant or malignant lesions
  – USPSTF did not examine the outcomes related to surveillance of patients at extremely high risk, such as those with familial syndromes (for example, the familial atypical mole and melanoma syndrome)
  – Clinicians should remain alert for skin lesions with malignant features noted in the context of physical examinations performed for other purposes.

Cancer Cases | Where the disease is being found, 2011 estimates

<table>
<thead>
<tr>
<th>MEN</th>
<th>NEW CASES</th>
<th>PCT. OF ALL NEW CASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>240,690</td>
<td>29%</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>113,040</td>
<td>14</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>71,050</td>
<td>9</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>52,020</td>
<td>6</td>
</tr>
<tr>
<td>Melanoma</td>
<td>40,010</td>
<td>5</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>37,120</td>
<td>5</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>36,060</td>
<td>4</td>
</tr>
<tr>
<td>Oral cavity &amp; pharynx</td>
<td>27,710</td>
<td>3</td>
</tr>
<tr>
<td>Leukemia</td>
<td>25,320</td>
<td>3</td>
</tr>
<tr>
<td>Pancreas</td>
<td>22,050</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WOMEN</th>
<th>NEW CASES</th>
<th>PCT. OF ALL NEW CASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>230,480</td>
<td>30%</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>109,070</td>
<td>14</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>69,360</td>
<td>9</td>
</tr>
<tr>
<td>Uterine corpus</td>
<td>46,470</td>
<td>6</td>
</tr>
<tr>
<td>Thyroid</td>
<td>36,550</td>
<td>5</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>30,300</td>
<td>4</td>
</tr>
<tr>
<td>Melanoma</td>
<td>30,220</td>
<td>4</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>23,800</td>
<td>3</td>
</tr>
<tr>
<td>Ovary</td>
<td>21,990</td>
<td>3</td>
</tr>
<tr>
<td>Pancreas</td>
<td>21,980</td>
<td>3</td>
</tr>
</tbody>
</table>

* Excludes basal and squamous cell skin cancers and in situ carcinoma except urinary bladder.

Source: American Cancer Society

US melanoma stats: 70,230 adults will be diagnosed. 8,790 will die.
Epidemiology

• Lifetime risk
  – 1 in 1,500 (born in 1935) vs 1 in 39 for Caucasian men and 1 in 58 for Caucasian women (2010)

• Overall trend toward increased diagnosis of earlier stage melanomas with increasing incidence of thicker melanomas for men over age 65

• Increase incidence attributed to
  – Increase in rates of screening with detection of thinner more indolent lesions
  – Increase in the number of skin biopsies
  – Changes in the histologic interpretation of early evolving lesions

Epidemiology

• Incidence rates in central Europe were similar to those in the United States between 1970 and 2000

• In Australia and New Zealand, where incidence rates are the highest in the world (40 to 60 cases/100,000), melanoma incidence has nearly doubled every 10 years since 1970
Epidemiology

• Overall mortality from melanoma has remained stable or continues to rise.

• Mortality rate among men over age 65, who comprise 36% of all deaths and 20% of all cases, rose by 157% during 1969-1999.

• Five-year survival rates for people with melanoma depend upon the stage of the disease at the time of diagnosis.
  – Almost one-half (46%) of all US melanoma deaths occur in men ages 50.

Risk Factors

• Both environmental and genetic.

• Sun exposure
  – UVB more closely associated with melanoma
  – Higher altitudes, increased exposure during midday hours
  – Intermittent exposure and sunburn in adolescence or childhood

• Artificial tanning (especially use less than 35 yo).

• Fair skin, high-density freckling, blond/red hair, and light eye color (green, hazel, blue).

• Moles
  – Atypical nevi have an associated 3-20 fold increased risk of developing malignant melanoma
  – High nevus count (> 25).
Risk Factors

• FMHx
  – 10% of pts with melanoma have FMHx
  – Changes in two genes identified (CDKN2A and CDK4).
    – However, only a small number of families with melanoma have these changes in their genes

• Race
  – Whites 10x higher than Blacks
  – Melanoma in Hispanics are rising

• Personal Hx of skin cancer
  – Prior h/o melanoma
  – Prior h/o basal and squamous cell skin cancer

Prevention

• Reduce exposure to UV radiation
  – Avoid sunburn using SPF of 15 or higher

• Regular skin examination

• Avoid sun lamps, tanning beds, or tanning salons
Clinical Features Of Melanoma

- **A**symmetry
- **B**order irregularities
- **C**olor variegation (ie, different colors within same region)
- **D**iameter greater than 6 mm
- **E**nlargement or evolution of color change, shape, or symptoms
Superficial spreading melanoma

Asymmetry and color variation are characteristic of superficial spreading melanomas.
Courtesy of James C Shaw, MD.

Nodular melanoma

Nodular melanomas present a discrete nodule, usually with dark pigmentation, although they may be amelanotic, as depicted above.
Courtesy of James C Shaw, MD.
Lentigo maligna melanoma

Lentigo maligna melanoma usually arises in areas of sun-damaged skin, particularly on the head and neck. It begins as a freckle-like, tan-brown macule and gradually enlarges and develops darker or lighter asymmetric foci and raised areas, which signify dermal invasion.

Photo courtesy of Susan Swetter, MD.

Acral lentiginous melanoma

An acral lentiginous melanoma shows the asymmetry and color variegation of typical melanomas. They are distinguished clinically by their location on the palms, soles, or nails.

Courtesy of James C Shaw, MD.
Clinical Features Of Melanoma

• Seven point checklist in England

• Major features
  – Change in size
  – Change in color
  – Change in shape

• Minor features
  – Inflammation
  – Bleeding or crusting
  – Sensory change
  – Lesion diameter greater than 6 mm

www.cancer.gov/melanomarisktool/
www.cancer.gov/melanomarisktool

- Does the patient live in Northern, Central, or Southern United States?
- What is the patient's gender?
- What is the patient's race?
- What is the patient's age?
- Has the patient ever had a blistering sunburn?
- Is the patient's complexion light, medium, or dark?
- How many moles less than or equal to 5 mm in diameter are on patient's back?
- How extensive is the freckling on the patient's back and shoulders?
- For females only
  - After repeated and prolonged exposure to sunlight, at the age the patient is now, how tan would the patient's skin become?
- For males only
  - How many moles larger than 5mm in diameter are on the patient's back?
  - Does the patient have severe solar damage on the shoulders?

www.cancer.gov/melanomarisktool

- The risks are estimated only for non-Hispanic whites
  - Data on other ethnicities were too limited to accurately estimate risk
- Will estimate an individual's risk of developing melanoma during the next 5-year period and up to age 70 based on the risk factor information provided
- If I was a non-Hispanic white, my 5-yr absolute risk of melanoma is 0.04%
- For every 1,000 men living in this region with these characteristics, on average 0.4 will develop melanoma in the next 5 years
MelaFind

The MelaFind hand-held imager, used to capture lesion images, is made up of:

- An illuminator that shines light of 10 different specific wavelengths, including near infrared bands
- A lens system composed of 9 elements that creates images of the light scattered back from the lesions
- A photon (light) sensor
**MelaFind**

- Tool for the evaluation of clinically **atypical cutaneous pigmented** lesions when a **dermatologist** chooses to gather additional data before making a final decision to biopsy to rule out melanoma
- **Not a screening device** and **is not indicated for non-pigmented lesions**, lesions that are clinically confirmed as melanomas, or lesions on special anatomical sites, such as acral, mucosal, or subungual
- Device’s handheld attachment **compares images to a database of 10,000 archived images** and recommends whether a biopsy should be done
- Hope is to find more melanomas sooner

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**Cancer Screening Guidelines**

- **USPSTF**
  - Found insufficient evidence to recommend for or against either routine screening of the general population for skin cancer by primary care providers or counseling patients to perform periodic skin self-examinations (I statement)
- **Clinical considerations**
  - Clinicians should be aware that:
    - Fair-skinned men and women older than 65 years
    - Patients with atypical moles, and those with more than 50 moles constitute known groups at substantially increased risk for melanoma.
    - Other risk factors for skin cancer include family history and a considerable past history of sun exposure and sunburns.
    - Benefits from screening are uncertain, even in high-risk patients.
# Cancer screening guidelines

- **American Cancer Society:**
  - Recommends skin examination as part of the broader cancer-related checkup
  - *Every 3 yrs age 20-40*, then *yearly after age 40*

- **The Institute of Medicine:**
  - Concludes that clinicians and patients should continue to be alert to the common signs of skin cancer with a particular emphasis on older white males and on melanoma

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**Thank you!**

Cleveland Clinic

*Every life deserves world class care.*