AU InforMed

Key Inforbits

- Cancer statistics
- Review of cancer pathophysiology
- 7 warning signs of cancer
- How coffee may decrease risk of cancer

- New treatment: Keytruda®
- Cancer screening recommendations
- New evidence for Xeloda®
- Top ways to help prevent cancer

National Cancer Survivor's Day
was on Sunday, June 4, 2017

Image from: https://en.wikipedia.org/wiki/File:National_Cancer_Survivors_Day_Logo.png

Fast Facts on Cancer

- As of 2013, the most common cancer site was female breast, followed by prostate, lung and bronchus, then colon and rectum.[1]
- 5-year survival rates for cancer of any kind have increased from 49% in 1975 to 69.3% in 2009[2] (see chart below).
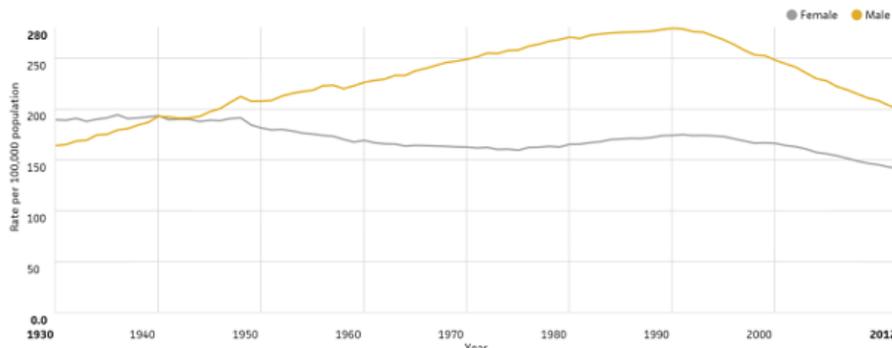- Nearly 40% of both men and women will be diagnosed with cancer at some point in their life.[3]

Image from: https://www.cancer.org/latest-news/4-essential-cancer-charts-for-2016.html

Review of Cancer Pathophysiology

Cancer is a genetic disease caused by changes to genes that control the way cells function. These genetic changes can be inherited from parents or can arise due to errors that occur as cells divide. With healthy cells, each has a specific size, structure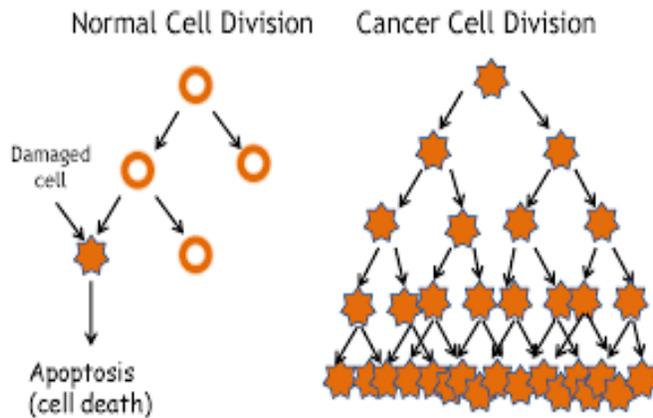 and function to serve the needs of the tissues in the body. Cancer cells differ in the size, structure and function from normal healthy cells. These cells lack normal growth rates and therefore can grow uncontrollably. Cancer cells also ignore normal signals from the body that tells the cells to stop dividing or program cell death, which is the process the body uses to get rid of unneeded cells.[4] The term cancer includes a variety of diseases from different types of tissues. A tumor can arise from any of 4 major tissue types, including: epithelial tissue, connective tissue, lymphoid tissue, and nerve tissue. Connective tissue tumors include muscle, bone and cartilage. Cancer cells typically contain traits to identify their tissue type, and are then classified by their tissue of origin. Tumors can then be classified as benign or malignant. Benign tumors include noncancerous growths that are localized and rarely spread to other tissues. Whereas, malignant tumors are unstable, and results in atypical cells that lose their normal function. These tumors can destroy the tissues surrounding them, and often spread to distant tissues or sites in the body.[5]

Image from: http://www.newhealthadvisor.com/Cancer-Cells-vs-Normal-Cells.html

There are two major types of genes involved in cancer formation. Proto-oncogenes are involved in normal cell growth and division, and when altered or more active than normal, these genes can develop into cancer causing genes, also known as oncogenes. They then allow cells to grow and survive when they should not.[4] The other major type of gene is tumor suppressor genes, which regulate and inhibit inappropriate cellular growth. If this gene undergoes mutation or is lost it can then lead to loss of control over normal cell growth.[5] DNA repair genes also play an important role in fixing damaged DNA. If mutations occur in these genes, it leads to mutations developing in other genes which may cause cells to become cancerous.[4]

Seven Warning Signs of Cancer[6]

1. Change in bowel or bladder habits
2. A sore that does not heal
3. Unusual bleeding or discharge
4. Thickening or lump of the breast or elsewhere
5. Indigestion or difficulty swallowing
6. Obvious change in warts or mole
7. Nagging cough or hoarseness

New Treatment: Keytruda®

On May 23, 2017, the Federal Drug Administration (FDA) announced that they have granted accelerated approval to Keytruda® (pembrolizumab) for a new and unique cancer use. The drug's new indication is based on a common biomarker rather than a location in the body where the tumor originated. Keytruda® is the first cancer agent with a specific genetic feature for a target. It is manufactured by Merck & Co.[7]
Keytruda® is indicated for the treatment of melanoma, non-small cell lung cancer, head and neck squamous cell cancer, classical Hodgkin

Image from:
http://www.clipartlord.com/wp-content/uploads/2014/03/key.png

lymphoma, urothelial carcinoma, and microsatellite instability-high cancer.[7-9] It is available as an injection only and may be used in both adults and children. The usual adult dose is 200 mg administered every 3 weeks. The average wholesale price (AWP) is about $5,400 for a 100 mg/4mL solution.[9]
Keytruda® has been studied in numerous clinical trials. The drug was shown to be twice as effective as

Erbitux® for the treatment of head and neck cancer.[10] It was also demonstrated significantly longer progression-free and overall survival with fewer side effects compared with platinum-based chemotherapy for patients with non-small cell lung cancer.[11] Similar results were also seen for the treatment of urothelial carcinoma in comparison to platinum-based chemotherapy regimens.[12] Common adverse reactions (occurring in more than 20% of patients) include fatigue, pruritus, diarrhea, decreased appetite, cough, dyspnea, and nausea.[7,8] One safety issue surrounding the use of Keytruda® is the potential for Steven's-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN). Several cases of these events have been reported in patients taking Keytruda® in Canada as of March 2017.[9]
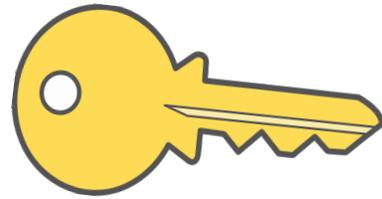
Image from: https://pharmphorum.com/wp-content/uploads/2016/05/Keytruda.jpg

New Evidence for Xeloda®

A randomized clinical trial published in the *New England Journal of Medicine* on June 1, 2017 reported that Xeloda® (capecitabine) is a safe and effective adjuvant therapy to help prolong both disease-free and overall survival among patients with HER2-negative breast cancer who had residual invasive disease on pathological testing. The trial included 910 patients with HER2-negative residual invasive breast cancer after chemotherapy with anthracycline, taxane, or both.[14]
Disease-free survival at five years was greater in the Xeloda® group (74.1% alive and free from recurrence)

compared with the placebo group (67.6%), with a p-value of 0.01. Overall survival at 5 years was also greater in the treatment arm, including women with triple-negative disease. In fact, the trial demonstrated the benefits of Xeloda® so clearly that the trial had to be stopped early. It is also of note however that hand-foot syndrome, a common side effect of capecitabine, was reported by 73.4% of patients in the treatment group of this study.[14]
Xeloda® was first approved in 1998 for metastatic breast cancer. Since then, it has also gained FDA-approval for metastatic colorectal cancer and has been used off-label for esophageal, gastric, pancreatic, and ovarian cancers, among others.[15] A major advantage of Xeloda®, compared with traditional chemotherapy, is that it is available as an oral tablet, rather than an injectable. An oral solution may also be made from the tablets for those who have trouble swallowing pills or tablets.[15]

Image from:
http://www.cvs.com/webcontent/images/drug/DrugItem_14276.JPG

Cancer Screening Recommendations[13]
Breast Cancer (women only) 40 to 44 years old → option to start annual breast cancer screenings with mammograms 45 to 54 years old → should get mammograms yearly 55 years and older → may continue yearly mammograms or switch to every 2 years instead *Note: Screenings should continue if a woman is in good health and is expected to live for 10+ years*

Colon and Rectal Cancer and Polyps (men and women)
Starting at age 50, follow one of these testing plans:
  • Tests that find polyps and cancer (preferred)
    1. Flexible sigmoidoscopy every 5 years, or
    2. Double-contrast barium enema every 5 years, or
    3. CT colonography (virtual colonoscopy) every 5 years, or
    4. Colonoscopy, every 10 years
  • Tests that mostly find cancer
    1. Guaiac-based fecal occult blood test (gFOBT) every year, or
    2. Fecal immunochemical test (FIT) every year, or
    3. Stool DNA test (sDNA) every 3 years
Note: If any non-colonoscopy test is positive, a colonoscopy should be done to confirm diagnosis

Cervical cancer (women only) 21 to 29 years old → Pap test every 3 years 30 to 65 years old → Pap test + HPV test every 5 years (preferred) or Pap test every 3 years 65 years and older → stop testing if negative cervical cancer test results for last 10 years
Lung cancer (men and women) Annual screenings should be done in those who are 55-74 years old, in good health, and have at least a 30 pack-year smoking history who are still smoking or have quit in the last 15 years. *Pack year = number of cigarette packs smoked per day multiplied by number of years smoked*
Prostate cancer (men only) Starting at age 50, talk to a physician about the risks and benefits of testing. *Note: African Americans or those with family history of prostate cancer before age 65, start at 45.*

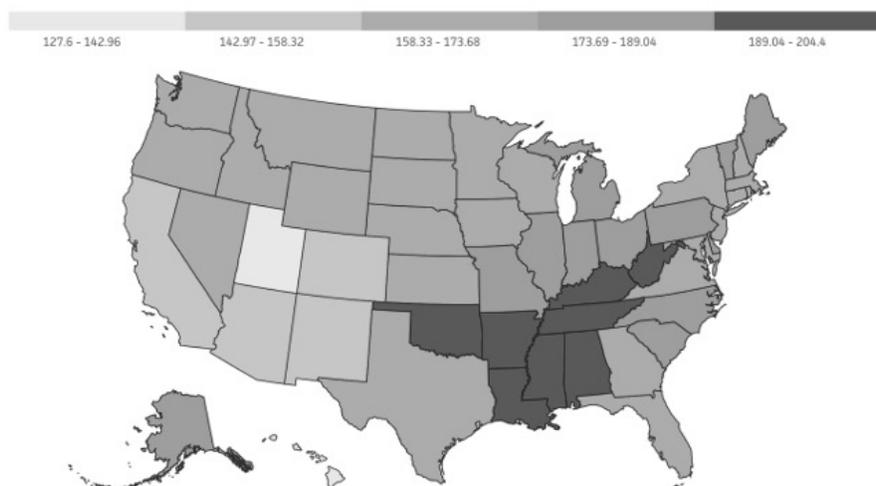## Deaths from lifestyle-related cancers highest in the south

Image from: https://www.cancer.org/latest-news/4-essential-cancer-charts-for-2016.html

Top Ways to Help Prevent Cancer[6,16]

- Get immunized
  - The hepatitis B vaccine can help prevent liver cancer
  - The HPV vaccine can help prevent cervical and other genital cancers
- Avoid tobacco use
  - Both cigarettes and smokeless tobacco are associated with cancer[17]
  - Ask your doctor or pharmacist if you need help quitting!
- Eat a healthy diet
  - Eat lots of fruits and vegetables
  - Limit alcohol intake to 2 drinks per day or less
  - Avoid processed meats
- Get physical activity: At least 150 minutes of moderate activity or 75 minutes of vigorous activity each week
- Protect yourself from the sun
  - Avoid sun exposure between 10 am and 4 pm
  - Stay in the shade when possible
  - Use plenty of sunscreen!
- Get regular checkups with your physician

Image from:
http://www.playbuzz.com/vzzwhw10/are-you-a-healthy-person

How Coffee May Decrease Risk of Liver Cancer

Image from:
http://www.chattahoocheecoffee.com/sites/default/files/slide3.jpg

A recent study published in *BMJ Open* in May 2017 has shown that coffee can help decrease the risk of developing hepatocellular carcinoma (HCC), a common form of liver cancer.[18] This finding is particularly important because the prevalence of HCC has been increasing globally. Liver cancer accounts for more than 600,000 deaths per year.[19]

The study concluded that just one coffee per day was associated with a 20% lower risk of developing HCC. An extra 2 cups increased that number to 35%.[18] The study was lacking randomized controlled trial data and there was no clear definition of coffee in many of the studies the authors evaluated, so the quality of evidence backing this study is not ideal.

Coffee has antioxidant, anti-inflammatory, and anti-carcinogenic compounds that may help lower your risk of developing liver cancer. Studies believe that the link is more strongly associated with caffeine content though, as decaffeinated coffee had a weaker association with lowering the risk.[20] Previous studies have also shown a link between coffee consumption and a decreased risk of melanoma, endometrial cancer, and type 2 diabetes.[21]

Summary

Cancer remains a leading cause of death but survival rates are improving. New treatments and drug indications have been rising, including Keytruda for cancer with a specific biomarker and Xeloda for HER2-negative breast cancer. Prevention strategies including screenings, immunizations, general wellness activities, and perhaps even coffee may help decrease the risk of cancer.

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The last "dose" …

"Cancer is a word, not a sentence."
-- John Diamon, British journalist and broadcaster

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