1. Chapter Eight Cancer and Human Health

    a. Main message
        i. Cancer cells divide without restraint and invade other tissues treatment must focus on inhibiting cancer cells without harming normal cells
    b. Key concepts
        i. When normal restraints on cell division fail, a cell starts dividing rapidly and produces a benign tumor
        ii. Tumor cells that gain the ability to invade surrounding tissue and cancer cells cancer cells can spread too other organs and cause further damage
        iii. Gene mutations are the root cause of all cancers
        iv. Proto-oncogenes are normal genes that stimulate cell division when mutations make them hyperactive they trigger cancerous change and are then called oncogenes
        v. Tumor suppressor genes repair DEOXYRIBONUCLEIC ACID and block cell division and cell migration the risk of cancer rises when mutations make the genes nonfunctional
        vi. The great majority of human cancers are non-hereditary instead they are caused by the accumulation of many somatic mutations over the course of life
        vii. Standard cancer therapies attempt to kill rapidly dividing cells most commonly with toxic chemicals and radiation the treatments produce serious side effects because they also kill healthy cells
        viii. New cancer therapy's aim to kill cancer cells selectively most commonly by destroying them with targeted antibodies
        ix. Infectious agents such as viruses can trigger cancerous change viruses are implicated in about 15 percent of human cancers
        x. Environment and lifestyle factors play a large role in human cancers and are the focus in cancer prevention.
    c. Summary of chapter
        i. 8.1 the basics of cancer
            1. Over a lifetime an American male has nearly one in two chances and an American woman one in three chance of developing cancer there are more than 200 different types of cancer but four of them lung prostate breast and colon cancer account for more than half of all cancers combined
            2. Cancer develops when cells lose normal restraints on cell division and migration
            3. The cells mass formed by the inappropriate proliferation of cells is known as a tumor tumors grow large when they recruit blood vessels through angiogenesis
            4. Precancerous cells become cancerous (malignant) when they invade other tissues invasive cells detach themselves from their surroundings and lose anchorage dependence cancer cells can spread from a primary tumor too establish secondary tumors in other organs in the process known as metastasis
            5. Growth regulates stimulate cell division negative growth regulators restrain it. Runaway cell proliferation is the consequence if the cell cycle is excessively stimulated through the pathways controlled by