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 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