REAL WORLD APPLICATIONS

Radiation and Medicine

Radiation has a variety of important applications in medicine. The most common use of radiation in medicine is in the taking of X-rays. X-ray procedures are useful for examining body parts of very high or very low density, such as bones or lungs. X-rays are used mainly to diagnose diseases and injuries rather than to cure them.

Nuclear Medicine is Used Inside the Body

Specialists in the field of nuclear medicine use radiation in a different way. In nuclear medicine, small amounts of radioactive substances are introduced into the body. The radioactive substance is designed to target a specific organ or area of the body. Special devices track the substance inside the body, and computers use the resulting information to make highly accurate three-dimensional images of the area. These images are much more detailed than conventional X-ray images.

Interventional Radiology

In another radiation treatment, called interventional radiology, doctors use radiation imaging for guidance as they insert very small tubes directly into the veins, arteries, or organs of patients. This method is much less expensive and less dangerous than conventional surgery. It can be used to diagnose and treat diseases and to open blocked passageways in the body.

Radiotherapy

Radiotherapy is another common medical procedure, used in treating cancer. In radiotherapy, radiation is targeted directly at cancerous cells in the body. The cancerous cells, which are usually more susceptible to radiation than other cells, are destroyed. The other cells suffer fairly little damage.

Your Turn to Think

In each of the following exercises, suppose you are a physician who is trying to decide which treatment option is best for each patient.

1. What radiation treatment could be used to help a patient with a blocked artery?
2. You suspect that a patient’s arm is broken. What type of radiation might help you find out?
3. You have a patient with cancer. What type of radiation treatment might destroy the tumor without doing too much harm to the healthy cells?