

inside a home or building, levels can be even higher. Radon testing kits are readily available to determine if radon levels found inside are elevated. When increased radon levels and exposure to cigarette smoke are combined, there is an even greater risk for developing lung cancer, so detection of elevated levels is important. If radon levels are found to be elevated, increased ventilation and other corrective measures should be taken to reduce exposure.<sup>173</sup>

## UV Radiation

**Ultraviolet radiation (UV light)** released from the sun can penetrate into the skin, leading to the tanning of the skin—caused by increased melanin pigment levels—or, even worse, a sunburn, caused by inflammation. UV light is made up of UVA, UVB, and UVC rays. It is these rays that cause breaks in the DNA and changes in nitrogenous bases and lead to covalent bonds forming between neighboring nitrogenous bases. These attached nitrogenous bases are called dimers and can lead to errors in DNA replication and transcription.

Another effect of UV damage is the formation of reactive oxygen species that can also induce mutations. Mutations and cell cycle changes that occur as a result of UV exposure promote the formation of cancerous cells. Skin cancer is the most

common cancer, and malignant melanoma is the deadliest form of skin cancer. Those with fair skin are most at risk because their lighter-colored form of melanin pigment does not protect very well from UV rays. To reduce the risk of developing skin cancer, a person should wear sunscreen at all times, stay out of the sun as much as possible, wear protective clothing, take note of any changes on the skin, and see a dermatologist annually for a skin evaluation.<sup>174</sup>

FIGURE 2-11 shows an individual with squamous cell carcinoma on the nose. Squamous cells are flat epithelial cells. The name “carcinoma” tells us that the cancer is derived from epithelial tissue. Would you have thought that this was cancer? This cancer was caused by UV sun exposure.<sup>175</sup>

There are various risk factors associated with cancer development and progression. Remember the flow chart that we looked at earlier in FIGURE 2-4? This chart demonstrates the influencing factors that are involved in cancer development and can help you to conceptualize how all the factors work together to lead to the progression of cancer. As we have learned, some of these risks include genetics and age, which are outside of our control. Others, such as tobacco smoking, consumption of alcohol, and weight, are based on lifestyle and can be controlled. Still others may or may not be controllable. For example, we can reduce our exposure to certain viruses by getting vaccinated against them. We can reduce breathing in carcinogens by choosing to live in an area where air pollution is not a factor and living in a home that does not contain asbestos and does not have elevated radon levels. Since cancer often is related to an accumulation of changes caused by multiple sources of damaging agents rather than a single agent, it is important to tackle risk in a similar manner. While we cannot control all aspects of our life related to cancer risk, we can make changes in the areas that we can control.

## SECTION II SUMMARY

- Cancer risk factors can be used to predict a person’s probability of getting cancer, but do not mean that a person will get cancer.
- Whereas mutations in germline cells (egg and sperm) are inherited, mutations in

**FIGURE 2-11**<sup>176</sup>



*Squamous Cell Carcinoma on the Nose: This photograph shows a cancer derived from epithelial tissue (carcinoma). Squamous cells are flat epithelial cells.*