- Select approach and departure routes that avoid highways and residential areas where illumination can impair night vision.

Self-Imposed Stress

Night flight can be more fatiguing and stressful than day flight, and many self- imposed stressors can limit night vision. Pilots can control this type of stress by knowing the factors that can cause self-imposed stressors. Some of these factors are listed in the following paragraphs. *[Figure 17-20]*

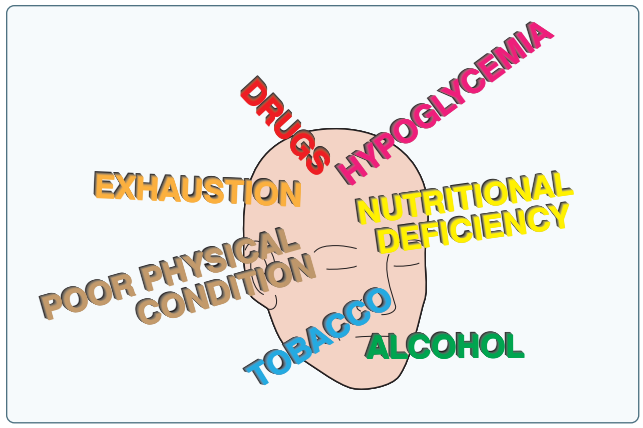

Figure 17-20. *Self-imposed stress.*

Drugs

Drugs can seriously degrade visual acuity during the day and especially at night. Pilots who become ill should consult an aviation medical examiner (AME) or flight surgeon as to which drugs are appropriate to take while flying.

Exhaustion

Pilots who become fatigued during a night flight will not be mentally alert and will respond more slowly to situations requiring immediate action. Exhausted pilots tend to concentrate on one aspect of a situation without considering the total requirement. Their performance may become a safety hazard depending on the degree of fatigue and instead of using proper scanning techniques may get fixated on the instruments or stare off rather than multitask.

Poor Physical Conditioning

To overcome poor physical conditioning, pilots should participate in regular exercise programs. People who are physically fit become less fatigued during flight and have better night scanning efficiency. However, too much exercise in a given day may leave crew members too fatigued for night flying.

Alcohol

Alcohol is a sedative and its use impairs both coordination and judgment. As a result, pilots who are impaired by alcohol fail to apply the proper techniques of night vision. They are likely to stare at objects and to neglect scanning techniques. The amount of alcohol consumed determines the degree to which night vision is affected. The effects of alcohol are long lasting and the residual effects of alcohol can also impair visual scanning efficiency.

Tobacco

Of all the self-imposed stressors, cigarette smoking most decreases visual sensitivity at night. Smoking significantly increases the amount of carbon monoxide carried by the hemoglobin in red blood cells. This reduces the blood's capacity to combine with oxygen, so less oxygen is carried in the blood. Hypoxia caused by carbon monoxide poisoning affects peripheral vision and dark adaptation. The results are the same as those for hypoxia caused by high altitude. Smoking 3 cigarettes in rapid succession or 20 to 30 cigarettes within a 24-hour period may saturate from 8 to 10 percent of the capacity of hemoglobin. Smokers lose 20 percent of their night vision capability at sea level, which is equal to a physiological altitude of 5,000 feet.

Hypoglycemia and Nutritional Deficiency

Missing or postponing meals can cause low blood sugar, which impairs night flight performance. Low blood sugar levels may result in stomach contractions, distraction, breakdown in habit pattern, and a shortened attention span. Likewise, an insufficient consumption of vitamin A may also impair night vision. Foods high in vitamin A include eggs, butter, cheese, liver, apricots, peaches, carrots, squash, spinach, peas, and most types of greens. High quantities of vitamin A do not increase night vision but a lack of vitamin A certainly impairs it.

Distance Estimation and Depth Perception

Knowledge of the mechanisms and cues affecting distance estimation and depth perception assist pilots in judging distances at night. These cues may be monocular or binocular. The monocular cues that aid in distance estimation and depth perception include motion parallax, geometric perspective, retinal image size, and aerial perspective.

Motion Parallax

Motion parallax refers to the apparent motion of stationary objects as viewed by an observer moving across the landscape. When the pilot or crewmember looks outside the aircraft perpendicular to the direction of travel, near objects appear to move backward, past, or opposite the path of motion; far objects seem to move in the direction of motion or remain fixed. The rate of apparent movement depends on the distance the observer is from the object.