

# PRIVATE PILOT COURSE

## AEROMEDICAL FACTORS



# MEDICAL CERTIFICATE



	Age	Valid
First Class	Over 40	6 months
	Under 40	12 months
Second Class	Any Age	12 months
Third Class	Over 40	24 months
	Under 40	60 months

# BASIC MED

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## APPLICATION

1. Comply with the general BasicMed requirements (possess a U.S. driver's license, have held a medical after July 14, 2006).
2. Get a physical exam with a state-licensed physician, using the Comprehensive Medical Examination Checklist
3. Complete a BasicMed medical education course every 24 months;
4. Carry course completion certificate;
5. Go fly!

## FLIGHT RULES

1. Aircraft maximum certified takeoff weight not more than 6,000 pounds
2. Aircraft not authorized to carry more than 6 occupants (5 pax + pilot)
3. Can fly up to 19,000 MSL
4. Can fly up to 250 KIAS
5. Pilot can fly IFR, if rated and current
6. Can't fly for compensation or hire
7. Can only fly in the US, unless authorized where flight is conducted



# TYPES OF HYPOXIA

**HYPOXIC HYPOXIA**

**HYPEMIC HYPOXIA**

**STAGNANT HYPOXIA**

**HISTOTOXIC HYPOXIA**

Altitude	Time of useful consciousness
45,000 feet MSL	9 to 15 seconds
40,000 feet MSL	15 to 20 seconds
35,000 feet MSL	30 to 60 seconds
30,000 feet MSL	1 to 2 minutes
28,000 feet MSL	2½ to 3 minutes
25,000 feet MSL	3 to 5 minutes
22,000 feet MSL	5 to 10 minutes
20,000 feet MSL	30 minutes or more

# ALTITUDE CHAMBER DEMO

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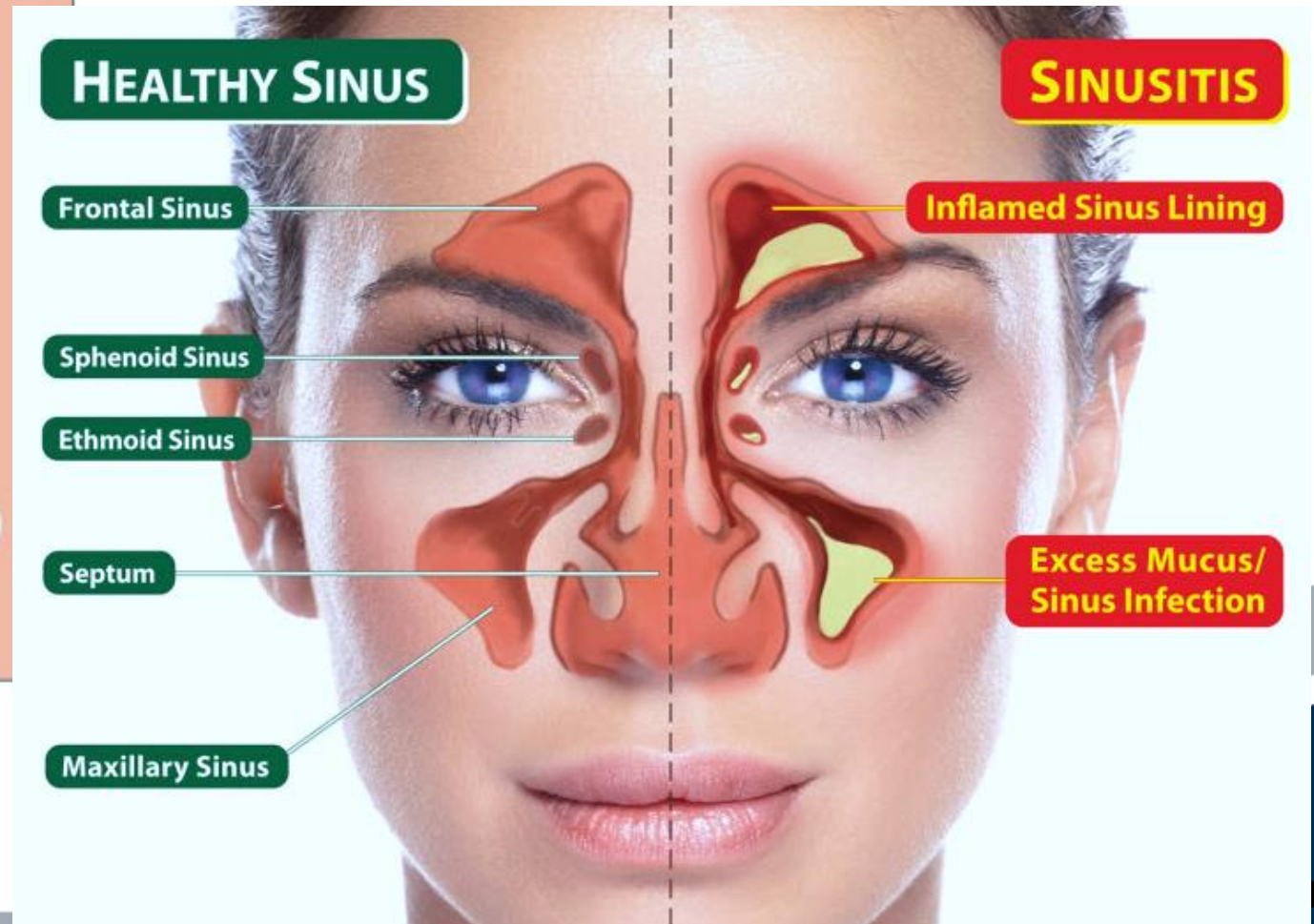
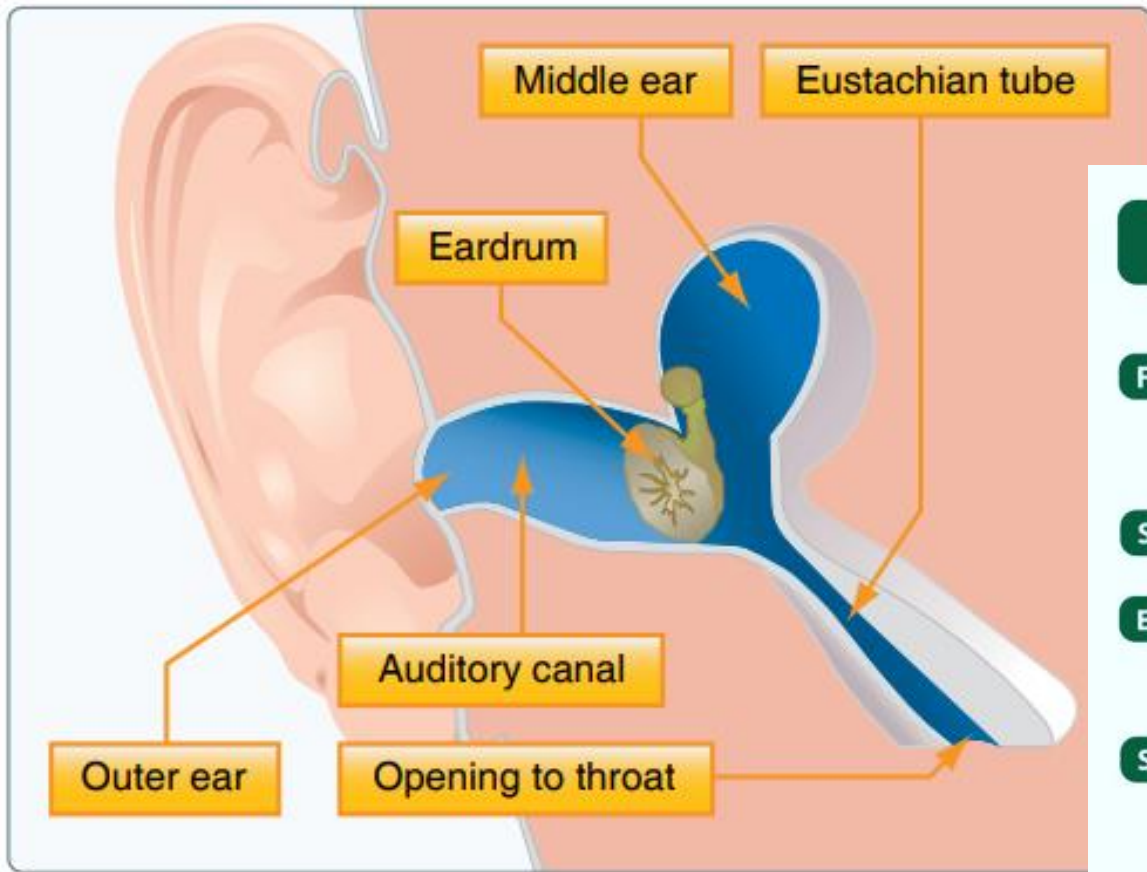




# HYPERVENTILATION



# MIDDLE EAR AND SINUS PROBLEMS





# SPATIAL DISORIENTATION

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VESTIBULAR  
SOMATOSENSORY  
VISUAL





# RECENT NEWS



NEWS

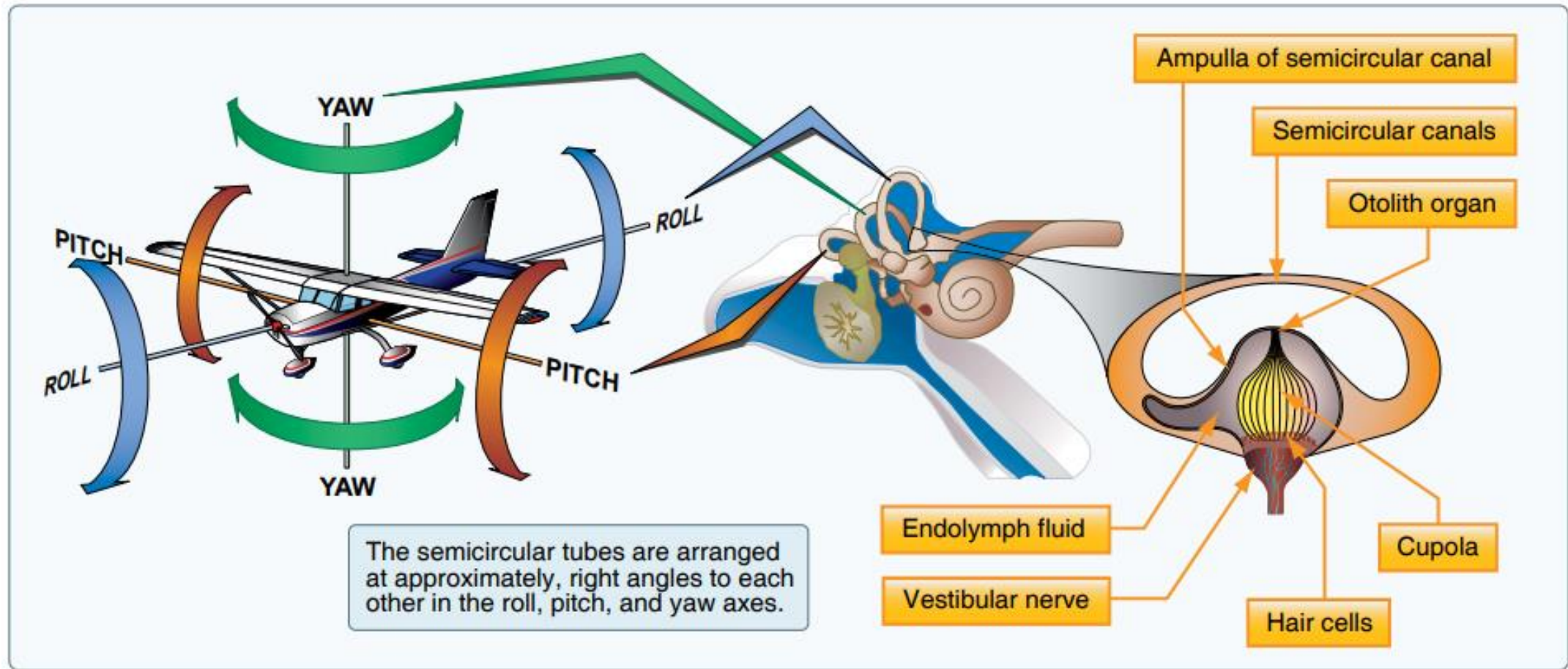
## Atlas Air Pilot Likely Reacted to Somatogravic Illusion

Captain was cited for failing to supervise flight.

By Rob Mark  
8 hours ago



# VESTIBULAR ILLUSIONS



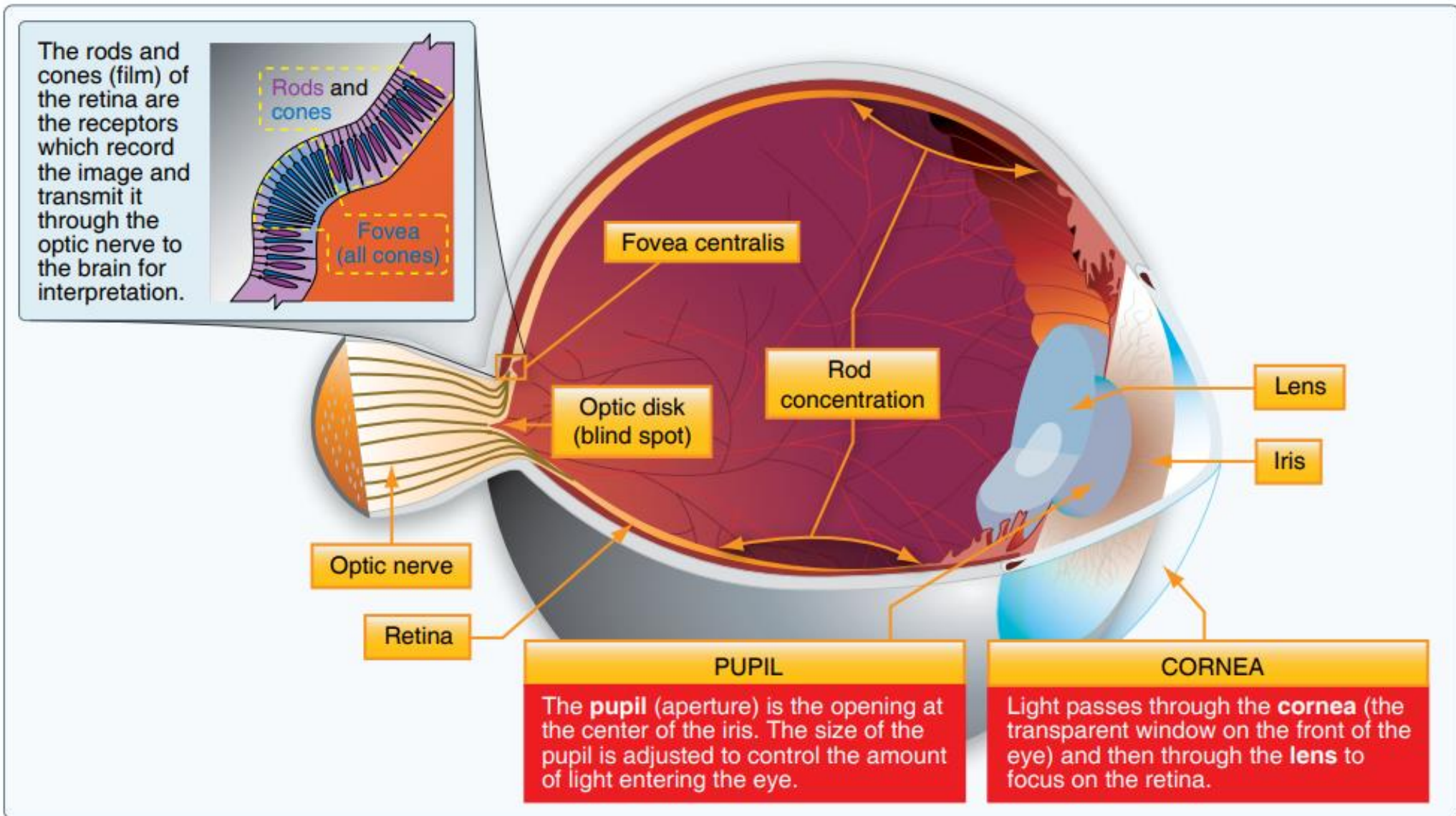
THE LEANS  
CORIOLIS ILLUSION

GRAVEYARD SPIRAL  
SOMATOGRAVIC ILLUSION

INVERSION ILLUSION  
ELEVATOR ILLUSION

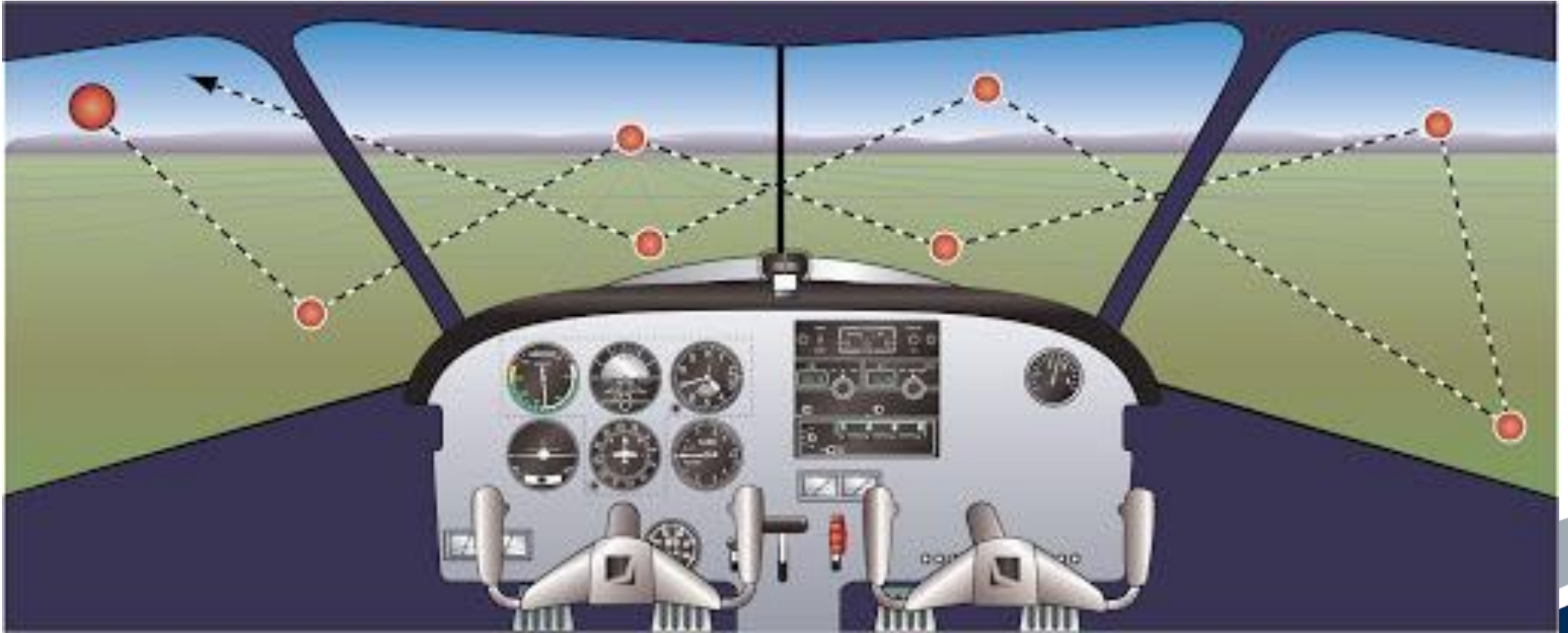


# COMPONENTS OF EYE

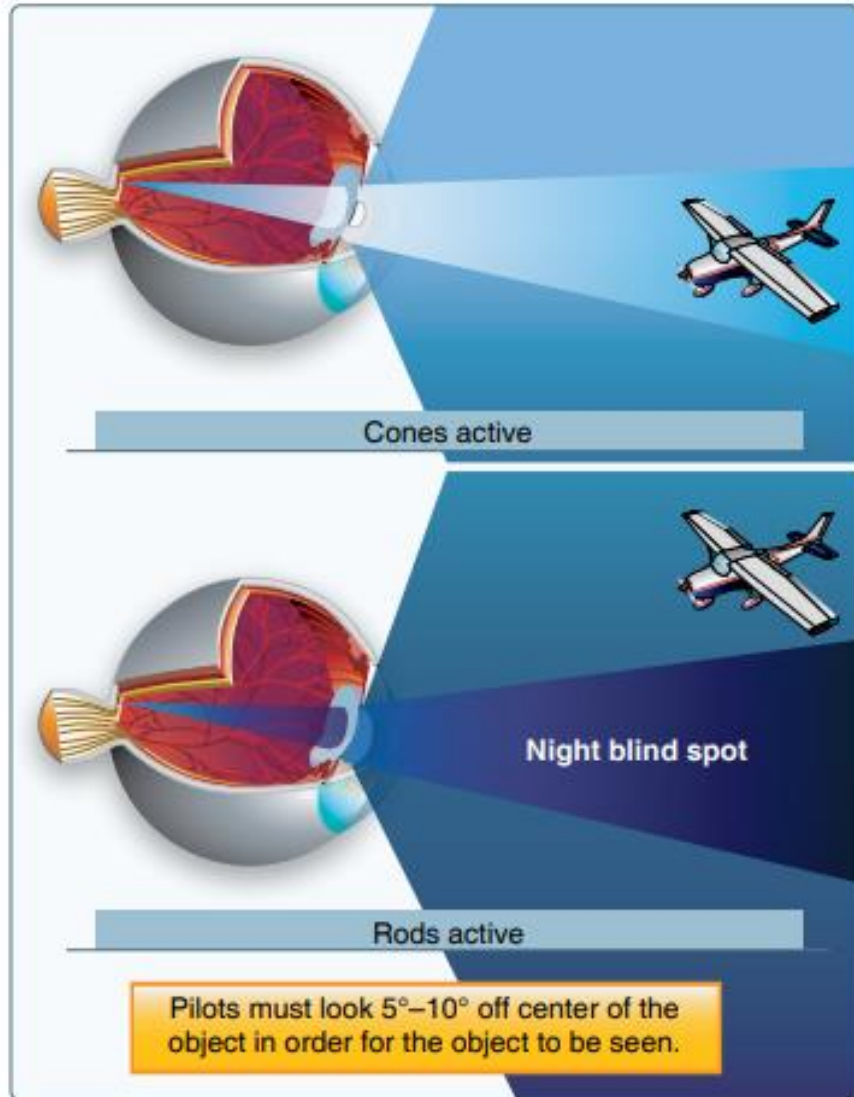




# SCANNING TECHNIQUES



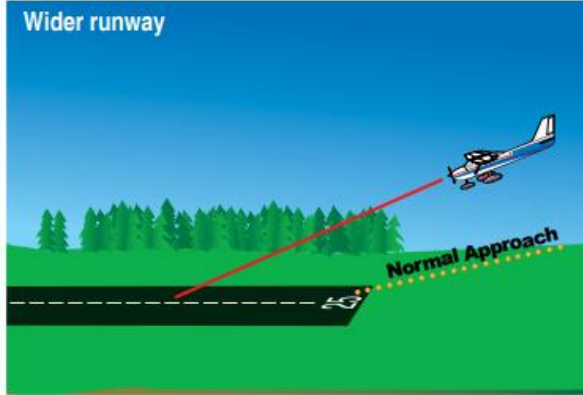
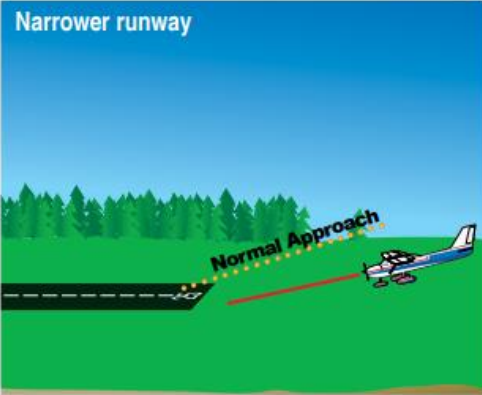
# NIGHT ILLUSIONS



**Blind Spot**  
**Autokinesis**  
**False Horizon**

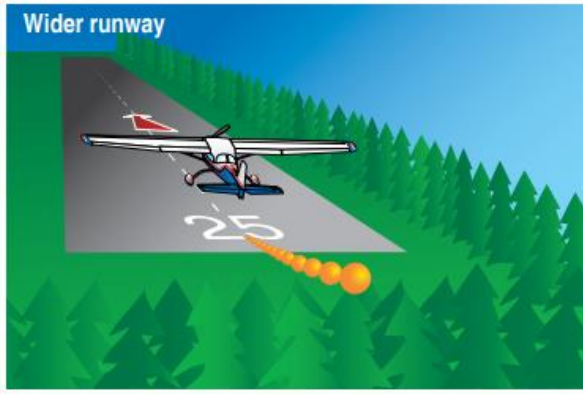


# VISUAL AND OPTICAL ILLUSIONS



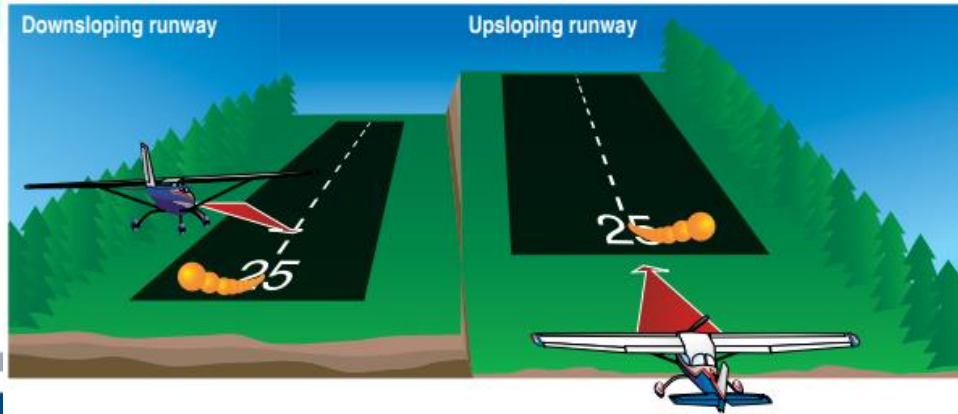
## Runway width illusion

- A narrower-than-usual runway can create an illusion that the aircraft is higher than it actually is, leading to a lower approach.
- A wider-than-usual runway can create an illusion that the aircraft is lower than it actually is, leading to a higher approach.



## Runway slope illusion

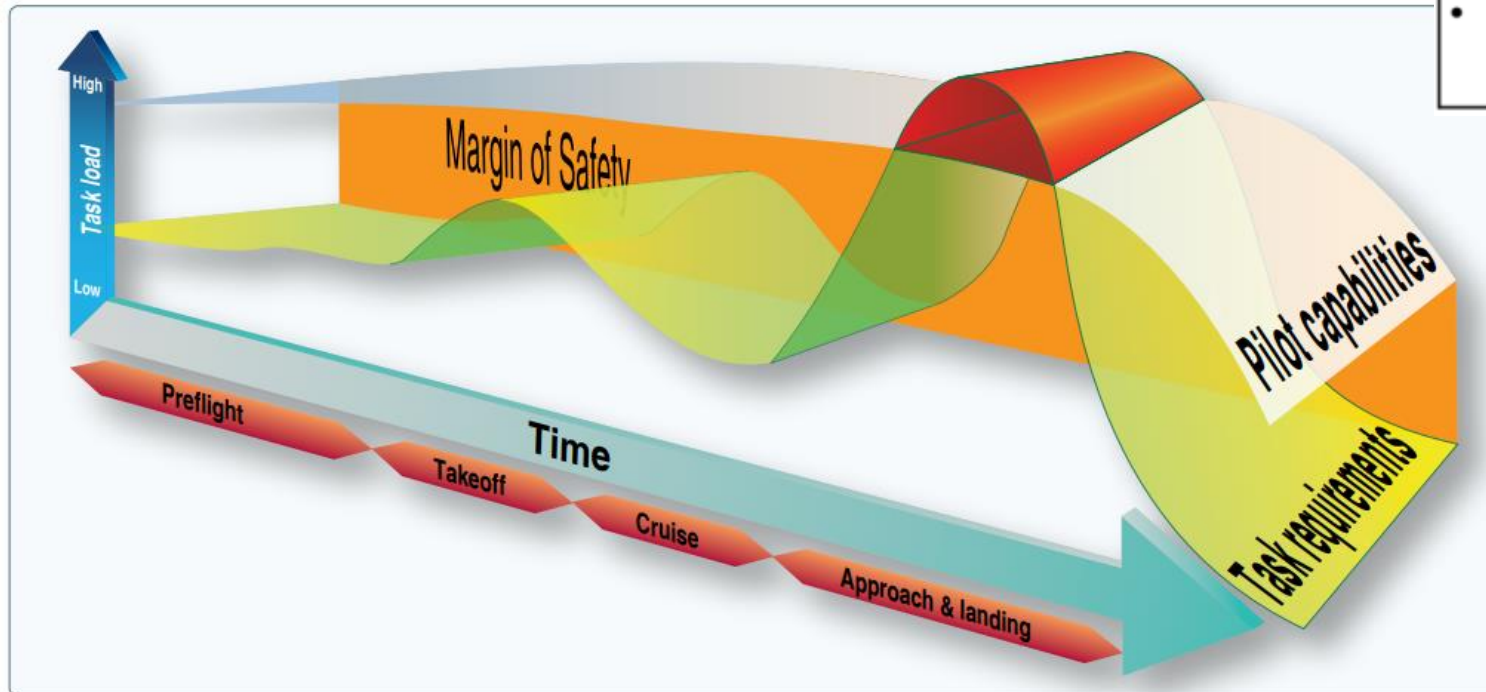
- A downsloping runway can create the illusion that the aircraft is lower than it actually is, leading to a higher approach.
- An upsloping runway can create the illusion that the aircraft is higher than it actually is, leading to a lower approach.



..... Normal approach  
◀ Approach due to illusion



# FATIGUE MANAGEMENT



Physical Signs	Mental Signs	Emotional Signs
<ul style="list-style-type: none"><li>• Yawning repeatedly</li><li>• Heavy eyelids or microsleeps</li><li>• Eye-rubbing</li><li>• Nodding off or head drooping</li><li>• Headaches, nausea, or upset stomach</li><li>• Slowed reaction time</li><li>• Lack of energy, weakness, or light headedness</li></ul>	<ul style="list-style-type: none"><li>• Difficulty concentrating on tasks</li><li>• Lapses in attention</li><li>• Failure to communicate important information</li><li>• Failure to anticipate events or actions</li><li>• Making mistakes even on well-practiced tasks</li><li>• Forgetfulness</li><li>• Difficulty thinking clearly</li><li>• Poor decision making</li></ul>	<ul style="list-style-type: none"><li>• More quiet or withdrawn than normal</li><li>• Lack of motivation to do the task well</li><li>• Irritable or grumpy with colleagues, family, or friends</li><li>• Low morale</li><li>• Heightened emotional sensitivity</li></ul>

# ALCOHOL



Type Beverage	Typical Serving (oz)	Pure Alcohol Content (oz)
Table Wine	4.0	.48
Light Beer	12.0	.48
Aperitif Liquor	1.5	.38
Champagne	4.0	.48
Vodka	1.0	.50
Whiskey	1.25	.50
0.01–0.05 (10–50 mg%)	average individual appears normal	
0.03–0.12* (30–120 mg%)	mild euphoria, talkativeness, decreased inhibitions, decreased attention, impaired judgment, increased reaction time	
0.09–0.25 (90–250 mg%)	emotional instability, loss of critical judgment, impairment of memory and comprehension, decreased sensory response, mild muscular incoordination	
0.18–0.30 (180–300 mg%)	confusion, dizziness, exaggerated emotions (anger, fear, grief) impaired visual perception, decreased pain sensation, impaired balance, staggering gait, slurred speech, moderate muscular incoordination	
0.27–0.40 (270–400 mg%)	apathy, impaired consciousness, stupor, significantly decreased response to stimulation, severe muscular incoordination, inability to stand or walk, vomiting, incontinence of urine and feces	
0.35–0.50 (350–500 mg%)	unconsciousness, depressed or abolished reflexes, abnormal body temperature, coma; possible death from respiratory paralysis (450 mg% or above)	

\* Legal limit for motor vehicle operation in most states is 0.08 or 0.10% (80–100 mg of alcohol per dL of blood).

**8 Hours 'Bottle to Throttle'  
Under the Influence  
Adversely Affect Safety**

# DRUGS

	Psychoactive Drugs	Range of Effects		Development of Tolerance	Prolonged Use of Large Amounts	Withdrawal Symptoms After Prolonged Use
		From	To			
Alcohol	Beer Wine Hard Liquor	Relaxation, lowered inhibitions, reduced intensity of physical sensations, digestive upsets, body heat loss, reduced muscular coordination.	Loss of body control, passing out (also causing physical injuries), susceptibility to pneumonia, cessation of breathing	Moderate	Liver damage, ulcers, chronic diarrhea, amnesia, vomiting, brain damage, internal bleeding, debilitation	Convulsions, shakes, hallucinations, loss of memory, uncontrolled muscular spasms, psychosis
Sedative Hypnotics	<b>Barbiturates:</b> - Nembutal - Phenobarbital - Seconal  <b>Tranquilizers:</b> - Valium - Librium - Quaaludes	Relaxation, lowered inhibitions, reduced intensity of physical sensations, digestive upsets, body heat loss, reduced muscular coordination	Passing out, loss of body control, stupor, severe depression of respiration, possible death (Effects are exaggerated when used in combination with alcohol— synergistic effect.)	Moderate	Amnesia, confusion, drowsiness, personality changes	
Opiates	Opium Morphine Heroin Codeine Dilaudid Percodan Darvon Methadone	Suppression of pain, lowered blood pressure and respiratory rate, constipation, disruption of menstrual cycle, hallucinations, sleep	Clammy skin, convulsions, coma, respiratory depression, possible death	High	Depressed sexual drive, lethargy, general physical debilitation, infections, hepatitis	Watery eyes, runny nose, severe back pains, stomach cramps, sleeplessness, nausea, diarrhea, sweating, muscle spasms



# DRUGS

Psychoactive Drugs	Range of Effects		Development of Tolerance	Prolonged Use of Large Amounts	Withdrawal Symptoms After Prolonged Use
	From	To			
<b>Stimulants</b> Dexedrine Methamphetamine Diet Pills Ritalin Cocaine Caffeine	Increased blood pressure and pulse rate, appetite loss, increased alertness, dilated and dried out bronchi, restlessness, insomnia	Paranoid reaction, temporary psychosis, irritability, convulsions, palpitations (not generally true for caffeine)	High	Psychosis, insomnia, paranoia, nervous system damage (not generally true for caffeine)	Severe depression, both physical and mental (not true for caffeine)
<b>Psychedelics</b> LSD Mescaline Psilocybin PCP	Distorted perceptions, hallucinations, confusion, vomiting	Psychosis, hallucinations, vomiting, anxiety, panic, stupor. With PCP: Aggressive behavior, catatonia, convulsions, coma, high blood pressure	High	Psychosis, continued hallucinations, mental disruption	Occasional flashback phenomena, depression
<b>THC</b> Marijuana Hashish	Sedation, euphoria, increased appetite, altered mental processes	Distorted perception, anxiety, panic	Moderate	Amotivation (loss of drive)	No true withdrawal symptoms except possible depression

# SCUBA DIVING

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# IMSAFE

## ✓ I'M SAFE CHECKLIST

**I**llness—Do I have any symptoms?

**M**edication—Have I been taking prescription or over-the-counter drugs?

**S**tress—Am I under psychological pressure from the job? Worried about financial matters, health problems, or family discord?

**A**lcohol—Have I been drinking within 8 hours?  
Within 24 hours?

**F**atigue—Am I tired and not adequately rested?

**E**motion—Am I emotionally upset?

