Health & Wellness

The following information was taken from Aeronautical Information Manual (Transport Canada) and From the Ground Up for pilots in training. Most of what follows apply to crews also and is basically Common Sense

Health

We as members of C ASARA are required to be physically fit and healthy so that we are alert and able to carry out our tasks. We all sign a medical declaration each year to say that we are medically fit and able to participate in CASARA activities, pilots also as part of their license have a periodic medical examination by a civil aviation medical examiner the frequency of which depends on their age.

There is no precise regulation which tells airmen whether they are fit to fly and there is no pre-flight inspection to ensure fitness. The individual, therefore, must have no condition which impairs alertness, reaction time or decision making ability. Persons with conditions which could result in sudden or subtle incapacitation, such as epilepsy, heart disease, uncontrolled diabetes mellitus, or diabetes requiring insulin or oral hypoglycemic agents, cannot be medically certified according to CAR Canadian Aviation Regulations 424. Conditions such as anemia, acute infection or peptic ulcers are temporarily disqualifying.

To be healthy we need to eat a good balanced diet, get plenty of sleep and make sure we do a reasonable amount of exercise. Many of us these days sit in front of a computer for 8 hours a day, we need to compensate for this. I know I find that if I sit around a lot and don't exercise I become quite lethargic and everything is an effort, can't be bothered. You don't have to go out and run marathons, etc. a good brisk 30 minute walk several times a week works wonders. If we just remember moderation in everything we do, eating, drinking, exercising, etc, we will be OK. It is also advisable to have a yearly medical checkup with your GP to make sure everything is in good working order and if it isn't to get it fixed before it becomes more serious.

We all get sick at some time or other and need medication of some sort, this is when we have to think carefully about flying. Self medication or taking medicine in any form immediately before or while flying can be hazardous. Simple remedies such as antihistamines, cough and cold mixture, laxatives, tranquilizers and appetite suppressants, may seriously impair our judgment and co-ordination. The condition for which the medicine is required may itself reduce ones efficiency to a dangerous level, even though the symptoms are masked by medicine.

Certain drugs have been associated with aircraft accidents in the recent past. The most common of these are antihistamines, (widely prescribed for hayfever and other allergies, and contained in many cold and cough remedies), tranquilizers (prescribed for nervous conditions, hypertension and other conditions) and appetite reducing drugs such as amphetamines. Barbiturates, nerve tonics or pills prescribed for digestive and other disorders may produce a marked depression of mental alertness.

Don't fly with a cold. A cold that is a mere discomfort on the ground can become a serious menace to pilots and passengers in the air. Tiredness, irritability, drowsiness and pain are all symptoms of a cold and work together to make a pilot unsafe in the air. More insidious, however, is the effect a cold may have on the sinuses and on the middle and inner ear. Swollen lymph tissue and mucous membranes may block the sinuses causing disabling pain and pressure vertigo during descent from altitude. Infection of the inner ear, that is a common symptom of a cold, can also produce severe vertigo. The tissue around the nasal end of the Eustachian tube will quite likely be swollen and middle ear problems associated under normal conditions with descent from altitude will be severely aggravated. A perforated eardrum is a possible result. Although a perforated eardrum usually heals quickly in some cases there is permanent hearing impairment or prolonged infection of the middle ear.

Any general discomfort, whether due to colds, indigestion, nausea, worry, lack of sleep or any other bodily weakness, is not conducive to safe flying.

Fatigue

Excessive fatigue is perhaps the most insidious of these conditions, resulting in inattentiveness, slow reactions and confused mental processes. The biggest danger of fatigue is that an individual may not recognize its effects.

The onset of fatigue is accompanied by numerous symptoms: deterioration in timing of movements, irritability and lack of patience, a tendency to lock the attention on individual instruments rather than to see the instrument panel as a whole, a tendency to become forgetful and ignorant of relevant cues, a tendency to over control the airplane, an awareness of physical discomforts, a loss of "seat of the pants" flying ability, a tendency to accept a wider margin of error than normal.

Fatigue is caused by many things: lack of sleep, poor nutrition, stress, prolonged and repeated flights, aircraft noise, eye strain, vibration, wide variations in temperature and humidity, heavy workload and uncomfortable working conditions, boredom, monotony, night flights, frustrations from work and family.

Excessive fatigue should be considered a reason for cancelling or postponing a flight.

Stress

Flying fitness is not just a physical condition. It has a definite meaning in the psychological sense as well. It involves the ability of the pilot to perceive, think and act to the best of his ability without the hindering effects of anger, worry and anxiety.

Studies have shown that emotional factors, mental upset and psychological maladjustments are repeatedly present in airplane accidents. The ability to think clearly and act decisively is greatly influenced by the feelings and emotions. In fact, every individual will panic earlier than normal if he is suffering from fatigue, illness, worry or anger. But, even well away from the panic threshold, good judgment is seriously impaired under stress.

There are many factors that contribute to stress in the cockpit. They are generally classed into three categories:

Physical which includes extreme temperature and humidity, noise, vibration, lack of oxygen.

Physiological which includes fatigue, poor physical condition, hunger and disease

Psychological which relates to emotional factors such as a death or illness in the family, business worries, poor interpersonal relationships with family or boss, financial worries etc.

Man is essentially a terrestrial creature. His body is equipped to operate at greatest efficiency within relatively narrow limits of atmospheric pressure and through years of habit, has adapted itself to movement on the ground.

Affects of flying on Human Body

In his quest for adventure and his desire for progress, man has ventured into a foreign environment, the air high above the ground. But these lofty heights are not natural to man. As altitude increases, the body becomes less and less efficient to a point, at sufficient altitude, of incapacitation and unconsciousness,. Completely deprived of oxygen, the body dies in 8 minutes. Without ground reference, the senses can play tricks, sometimes fatal tricks.

Airplane accidents are an occurrence that every conscientious pilot is concerned with preventing. Most aircraft accidents are highly preventable. Many of them have one factor in common. They are precipitated by some human failing rather than by a mechanical malfunction. In fact statistics indicate that human factors are involved in 85% of aircraft accidents. Many of these have been the result of disorientation, physical incapacitation and even the death of the pilot during the flight. Others are the result of poor management of cockpit resources.

Hypoxia

Because hypoxia comes on without warning of any kind, supplementary oxygen must be available in any aircraft that will be flown above 10.000ft. the general rule of oxygen above 10,00ft ASL by day and above 5.000ft ASL by night is one the wise pilot will practice to avoid the hazard of this debilitating condition. Hypoxia can be defined as a lack of sufficient oxygen in the body cells or tissues.

The greatest concentration of air molecules is near the earth's surface. There is progressively less air and therefore less oxygen (per unit volume) as you ascend to higher altitudes. Therefore each breath of air that you breathe at, for example, 15,000ft ASL has about half the amount of oxygen of a breath taken at sea level.

But the most important fact to remember about hypoxia is that the individual is unaware that he is exhibiting symptoms of this condition. The brain centre that would warn him of decreasing efficiency is the first to be affected and the pilot enjoys a misguided sense of well-being. Neither is there any pain nor any other warning signs that tell him that his alertness is deteriorating. The effects of hypoxia progress from euphoria (feeling of well-being) to reduced vision, confusion, inability to concentrate, impaired judgment and slowed reflexes to eventual loss of consciousness.

The retina of the eye is more sensitive to hypoxia than any part of the body: one of the first symptoms of which is a decrease in night vision.

There are many other factors which affect vision. Hypoxia, carbon monoxide poisoning, alcohol, drugs, fatigue and smoking are only a few of these. After time spent in bright sunlight the eye is slow to adapt to darkness and this may reduce night vision. To improve dark adaption pilots should use sunglasses during the day to avoid eye fatigue. At night cockpit light should be kept low and flashlights should be equipped with red filters to maintain the dark adaption needed to see clearly outside the cockpit.

Carbon Monoxide

Oxygen is transported throughout the body by combining with the haemoglobin in the blood. However, this vital transportation agent, haemoglobin, has 210 times the affinity for carbon monoxide that it has for oxygen. Therefore, even the smallest amounts of carbon monoxide can seriously interfere with the distribution of oxygen and produce a type of hypoxia, known as anaemic hypoxia.

Carbon monoxide is colourless, odourless and tasteless. It is a product of fuel combustion and is found in varying amounts in the exhaust from airplane engines. A defect, crack or hole in the cabin heating system may allow this gas to enter the cockpit of the airplane.

Susceptibility to carbon monoxide increases with altitude. At higher altitudes, the body has difficulty getting enough oxygen because of decreased pressure. The additional problem of carbon monoxide could make the situation critical.

Early symptoms of CO poisoning are feelings of sluggishness and warmness. Intense headache, throbbing in the temples, ringing in the ears, dizziness and dimming of vision follow as exposure increases. Eventually vomiting, convulsions, coma and death result.

Although CO poisoning is a type of hypoxia, it is unlike altitude hypoxia in that it is not immediately remedied by the use of oxygen or by descent to lower altitudes.

If you notice exhaust fumes or experience any of the symptoms associated with CO poisoning, you should shut off the cabin heater, open a fresh air source immediately, avoid smoking, use `100% oxygen if it is available and land at the first opportunity and ensure that all effects of CO are gone before continuing the flight. It may take several days to rid the body of carbon monoxide. In some cases, it may be wise to consult a doctor.

Many small aircraft have a small CO detector glued to the instrument panel. The detector will turn dark brown to grey/black when exposed to carbon monoxide and that, even a slight darkening, may indicate a dangerous level of carbon monoxide. When the air freshens, the detector will return to its original colour.

Decompression sickness

Because of the change in barometric pressure during ascent and descent, gases trapped in certain body cavities expand or contract.

The inability to pass this gas may cause abdominal pain, toothache or pain in ears or sinus cavities. In some cases, the pain may be so severe as to lead to incapacitation.

The middle ear and the nasal sinuses are essentially closed cavities with a narrow drainage, pressure-equalizing tube (The Eustachion tube). As the aircraft climbs, air in the body cavities expands as the barometric pressure decreases. Normally air will escape from the middle ear and the sinuses and you will only notice the ears “popping”. The outlet of these tubes, however is narrow and, if you have a head cold or a throat infection, local swelling may reduce it. On ascent air may still be able to escape but on descent, particularly at high rates, the outlet may close like a flap preventing air from re-entering the middle ear cavity. The increasing atmospheric pressure will then force the eardrum inward, This can lead to severe pain and to an injury known as barotraumas (pressure injury).

Pressure in the ears can be equalized by swallowing, yawning, or be Valsalva manoeuvre.

At ground level the body tissues are saturated with nitrogen the inert gas which makes up 80% of our atmosphere. As the aircraft climbs atmospheric presssure is reduced, and by 18,000ft ASL atmospheric pressure is halved. Pilots flying aircraft with unpressurised cabins at altitudes greater than 25,00ft ASL may be subject to the “bends”

This condition is caused by bubbles of nitrogen forming in the tissues because the atmospheric pressure is less than the pressure at ground level. As we do not fly at these altitudes I wont go any further with this, but it is a good time to mention Scuba diving.

A person that flies in an airplane immediately after engaging in the sport of scuba diving risks severe decompression sickness at much lower altitude than would

normally be expected from this problem. The breather tanks used by a scuba diver to deliver compressed air that supersaturates the body tissues with nitrogen even in a shallow dive. At a depth of 30 ft, the body absorbs twice as much nitrogen as it would on the ground. Ascending to 8,000ft ASL could bring on incapacitating bends.

After non-decompression dives, flights up to 8,000ft ASL should be avoided for 12 hours. Where decompression stops have been required during the ascent to the surface, the interval should be 24 hours. For actual flights above 8,000ft ASL the interval is 24 hours, regardless of the type of dive, as even pressurized aircraft may lose cabin pressurization. A good rule, if you have dived to a depth below 30 ft, is not to fly for 24 hours to permit the nitrogen content of the body to return to normal.

Vision

Good vision is of primary importance in flying, in judgment of distance, depth perception, reading of charts and instruments. It should be scrupulously protected.

Pilots are exposed to higher light levels than is the average person. Very high light levels prevail at altitude because the atmosphere is less dense. In addition, light is reflected back at the pilot by cloud tops. This light contains more of the damaging blue and ultra-violet wavelengths than are encountered on the surface of the earth. Prolonged exposure can cause damage to the eye and especially to the lens. Sunglasses should therefore, be worn to provide protection against these dangers and to prevent eyestrain.

Atmospheric obscuring phenomena such as haze, smoke and fog have an effect on the distance the normal eye can see. The ability of the eye to maintain distance focus is weakened. Distant objects are not outlined sharply against the horizon and, after a short lapse of time, the eye, having no distance point to fix on, has difficulty maintaining focus at a distance of more than a mile or two (a condition known as empty field myopia) As a result scanning for other aircraft becomes difficult and requires special effort on the part of the pilot.

At night the pilot's vision is greatly impaired. The cones that are concentrated in the centre of the eye need a lot of light to function properly. As a result, there is a blind spot in the centre of the eye at night. This blind spot is sufficiently large to block out the view of another airplane some distance away if the pilot is looking directly at it.

At night it is necessary to develop the technique of using peripheral vision. One sees at night by means of the rods that are concentrated on the edges of the eye and are responsible for peripheral vision. It takes the rods about 30 minutes to adjust fully to darkness. Even a small amount of white light will destroy the dark adaptation. Therefore, as I mentioned before, cockpit lights should be kept low and flashlights should be equipped with red filters to maintain the dark adaption needed to see clearly outside the cockpit.

Disorientation

Pilots sometimes refer to disorientation as "vertigo", by which they mean not knowing which way is up. On the ground spatial orientation is sensed by the combination of vision, muscle sense (seat of the pants), and specialized organs in the inner ear which sense linear and angular accelerations. Vision is the strongest of the orientating senses, but, in a whiteout or flying in cloud, it is sometimes impossible to orient oneself by reference to the horizon. Under these conditions the pilot is completely dependent on the instruments and learned flying skills for control of the aircraft. Under no circumstances should the pilot rely upon the 'seat of the pants' sensations! Although the organs of the inner ear give useful information with regards to acceleration or turning, they can also give rise to dangerously false information. RELY UPON YOUR FLIGHT INSTRUMENTS!

Pilots without instrument flight training must maintain a visual horizon at all times and should never flight plan VFR into areas where bad weather or low visibility may be encountered. An instrument rating does not prevent disorientation but the training required to obtain the rating provides the pilot with the ability to overcome it.

WHEN TO SAY NO

Before we set out on a flight we need to ask ourselves some questions.

Do I feel well and rested?

Am I on any medication ?

When did I last drink alcohol?

Am I stressed?

Have I had enough to eat?

Am I hydrated?

Am I under any pressure to get to my destination?

Do I have VFR weather for this entire flight?

Am I current on this aircraft?

Did I carry out a complete walkaround?

Do I have enough fuel?

Am I letting the adrenaline of the tasking affect my decision?

These are some of the questions we could ask ourselves and if you can tick of everything as good then you're ready to fly!!

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