



Aviation Safety

Vortex

Learn from the mistakes of others; you'll not live long enough to make them all yourself . . . **Issue 4/2000**

Like a Fine Wine, We Improve With Age

Do you need to remove your glasses to properly see and read the overhead panel? Do you start to read back a clearance and, after concentrating on all the details in the clearance, find that you need to check the instrument panel to determine what your call sign is? Do you need bright sun on the map to read most of the small details—after you've removed your glasses? Are you thinking of buying a new headset—or better still, a new helmet?—After all, there can't be anything wrong with your hearing. Are you finding you don't have the stamina you used to? Welcome to the over 50 Club.

On the softball diamond I find that older age—maturity, experience and cunning—can still best youth, fitness and exuberance (some of the time). Experience counts a lot in the flying business where it can counteract to some degree (if properly employed) the slowing down of both mind and body. Age usually brings maturity and caution, and we use them to avoid situations with the potential for added stress, which may require rapid thought and action. "Superior pilots use their superior knowledge to avoid situations that would require their superior skills."

The ageing process produces predictable physiological changes. Programmed from birth, they start to appear when we are born and progress throughout our lives. For example, from about age 20 on, our metabolic process slows down. Ageing is a

personal process, faster in some people than others, but it will affect us all in due course.

In the flying business, getting older can create some common and some unique problems. Knowing about them and understanding the effects can help us deal effectively with the process. Listed below are a few things to consider about ageing.

Affairs of the Heart

Heart disease is the largest single killer in our society today, and the risk of developing heart disease increases with age. Though age is by far the most important factor, it is not the only one. Other associated factors include family history, gender, high cholesterol, smoking, and diabetes.

Hypertension, or high blood pressure, is more prevalent the older we get, and untreated high blood pressure is related to an increased risk of strokes, with the risk doubling each decade after age 55.

Fortunately our aviation medical system keeps a close watch on problems of the heart, and medication available to Canadian-licensed pilots can, and does, control a large number of heart problems, such as hypertension.

Diabetes

Diabetes is a metabolic condition that results in uncontrolled levels of glucose in the blood. One type of diabetes is more common with increasing age, and early symptoms may go unrecognized for quite a

long time. The onset of diabetes is very often accompanied by excessive thirst, frequent urination, weight loss, fatigue, blurred vision, and recurrent skin infections, such as boils. Long-term untreated effects include damage to the kidneys, cardiovascular system, arterial system and eyes, with blindness occurring periodically.

Vision

Our eyesight deteriorates with age, that is a certainty, and almost everyone will develop a condition known as *presbyopia*, a reduction in our ability to focus on near objects. If you find that your arms aren't long enough for you to read the map, you may be developing presbyopia! Have you ever wished that the overhead CB panel was a bit further away? Have you started to notice that more light is needed to read in low-contrast conditions?

As we age, the flexible crystalline lens of the eye hardens and loses its elasticity and, at the same time, the ciliary muscle that permits the lens to change its shape weakens and loses its tone. When the lens of the eye loses its range of adjustment, the image that the eye takes in is focused behind—rather than on—the retina, and vision becomes blurred. The retina is the thin layer of tissue composed of millions of visual cells that lines the inside back two-thirds of the eye and is comparable to a film in a

camera. It receives light and sends tiny electrical impulses to the brain to give sight. Far-sighted people (trouble seeing close up) normally experience the problem before near-sighted people (trouble seeing far away). Presbyopia does not occur overnight, so the onset is not dramatic. Presbyopia progresses gradually over the years, and we tend to adapt to its gradual onset as opposed to becoming overly concerned. It becomes more noticeable as we approach 50. It is estimated that more than 140 million people in North America have varying degrees of presbyopia.

The speed of accommodation or, in other words, the ability to change focus from near to distant, decreases with age. Have you noticed that it takes what seems to be a long time to focus on the instruments after having had your eyes out of the cockpit for a while?

Cataract problems (opacities in the lens of the eye) or glaucoma (increased pressure in the eye) increases with age. Both glaucoma and cataracts can reduce a pilot's visual sensitivity in low-contrast situations, decreasing our ability, for example, to pick out other aircraft against a background sky. It's a good plan for pilots of advancing years to have a thorough eye examination done every few years.

So you think that your night vision is starting to go but your day vision is

still satisfactory? Well, there's a very good explanation for this condition. Night vision is often worse than daytime vision, and this is why your eye doctor checks your vision in a dark room. To accommodate the reduced amount of light in a darkened room, your pupils dilate to allow more of the available light in. The larger pupil forces the lens of the eye to work harder in order to focus an image on the retina. Thus, vision is worse at night in part because the eye has to work harder to do its job, and any impairment in your vision becomes more obvious. In addition, certain cataracts are apparent only when the eye is dilated, and this may be another source of night impairment.

“The older we get the more sensitive we are to inadequate amounts of sleep. We tire more easily and rapidly and take much longer to recover . . .”

Hearing

Hearing loss resulting from unprotected exposure to high levels of noise will cause the majority of our loss, but there is a gradual change related solely to ageing. The natural loss (*presbycusis* is defined as age-related hearing loss), which is genetically determined for each individual, is added to environmental loss, so protect what you have. We can take steps to protect our hearing by wearing suitable hearing



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protection, such as earplugs and/or a good quality headset or hearing defenders. Any time you are in or around helicopters without some form of hearing protection, you are causing damage to what may already be a damaged hearing system. Remember, noise-induced hearing loss will probably be permanent and typically occurs gradually over a period of time. If you need to raise your voice to be heard or are constantly asking people to repeat themselves, then you quite likely have suffered some permanent hearing loss, but the news is not all bad—you can still protect what you have left.

Mind

Sorry, but as we grow older we become slower at mentally processing information, that is a given. It becomes more difficult to absorb new knowledge, particularly that of a technical nature, and we quite often become less receptive to new concepts. We age, and so does our memory. Unfortunately, one of the first things to depart is the part we quite often like best. The *episodic memory*, the part that tells us what we did last night or where we parked the car, goes early, while the *procedural memory*, used for automatic actions/reactions, remains minimally affected for a long time. You are far more likely to forget where you put the car keys than how to drive your beloved

Acura. The downhill slide begins in our 30s, but the difference in performance between the youngsters and the mature pilots is not attributable to a failing memory alone. It's a given that when people are asked to perform multiple tasks at the same time, performance on one task, and quite often all tasks, shows a marked decline. Older people have, through testing and research, shown an increased performance degradation over test groups of younger people of similar skills in multi-task situations. The age-related gap can, however, be reduced with practice and repetition.

Concentrating, remaining attentive, being interested in what one is reading or hearing, and finding ways to recall a fact or a person's name through *word association*—thanks Syd for the bit on roses—are methods of recharging a failing memory. Stress is another contributor to a failing memory and ironically, as we age, we also often take on more responsibilities and are placed under more stress. As a group, pilots are normally keen to learn new ideas and take on new challenges, and it is this attribute that aids us in keeping our minds young as the body ages.

There are no magic bullets for slowing or preventing memory loss, but some researchers have written about mental callisthenics or *neurobics* as a possible

aid. Everything from changing your daily commute to work to brushing your teeth with the non-dominant hand may boost the production of brain chemicals called *neurotrophins*, which may help keep the brain sharp. Neurobics has not been studied in depth, but experts say there is little risk in trying them. The theory—that a more active brain is a healthier brain—has been documented in studies on animals.

As well, physical fitness appears to aid mental fitness. An ageing study on rats found that regular exercise boosted the production of cell-protecting neurotrophins in the brain. It has been reported that older people with poor cardiovascular health were three times more likely than healthy people to have loss of cognitive function. It would seem that what is required is a fit body along with a fit and active mind.

From Sleep to Altitude

As we age, our reflexes and reaction times slow down. As discouraging as this may seem, it's not all bad and can, to a large degree, be compensated for. What we lose in reflexes, strength and reaction time, we make up for with experience, caution and preparation. There's an old adage that goes "there are old pilots and bold pilots, but there are no old bold

pilots." While this is not entirely true, it is definitely true in that there is no substitute for experience.

The older we get the more sensitive we are to inadequate amounts of sleep. We tire more easily and rapidly and take much longer to recover from sleep debt than those who are 20 or 30 years our junior.

We require fewer calories to maintain our ideal weight. If that wasn't bad enough, our appetite for the tastier but far less-nutritious foods increases—you'll be happy to know that there is a scientific reason for that.

Our tolerance to alcohol in any form diminishes with age, and it requires less intake to feel the onset of the effects. There is also much more discomfort the next morning, which is quite likely a good thing.

The onset and effects of *hypoxia* are more noticeable as we advance in years. Hypoxia is defined as a state of oxygen deficiency in the body sufficient to cause an impairment of function. Hypoxia is caused by the reduction in partial pressure of oxygen, inadequate oxygen transport, or the inability of the tissues to use oxygen. There are four sub-classifications of hypoxia, and the one that affects aviation the most is *hypoxic hypoxia*, which is a reduction in the amount of oxygen passing into the blood. It is caused by a reduction

in oxygen pressure in the lungs, by a reduced gas exchange area, by exposure to high altitude, or by lung disease. Although the *Canadian Aviation Regulations* (CARs) stipulate that you may fly between sea level and 10,000 ft above mean sea level without supplemental oxygen, this does not mean that you will not suffer the effects of hypoxia at, say, 8000 ft. The greatest change in atmospheric pressure takes place in the first 8000 ft. Some of the other items that will affect the onset of hypoxia include smoking, blood donations, haemorrhaging, anaemia, certain drugs, chemicals, carbon monoxide, high g forces, prolonged sitting in one position, cold temperatures, positive pressure breathing, narcotics, chewing tobacco, and alcohol.

Can We Do Anything?


It would be nice, but we can't stop the clock. Cheer up, all is not lost. Studies say that exercise is the key to coping with many problems associated with ageing. Exercise, in addition to increasing our tolerance to the abuse we sometimes deal to our bodies, also helps us control hypertension, heart disease and diabetes. Three hours in the gym daily is not required—walking regularly, say four to five hours a week, is one of the best forms of exercise.

Good eating and drinking habits will also contribute to a longer life and more time in the air.

“Superior pilots use their superior knowledge to avoid situations that would require their superior skills.”

Give your medical examiner a comprehensive briefing on how your health has been since your last flight

medical, and don't leave anything out. Many of us have reason to be grateful when medical conditions we were unaware of surfaced and were treated before significant problems developed. Although time marches on and we can't stop it, there are steps we can take to slow down the rate. Being prepared for the coming changes we can

expect and compensating for them is half the battle. Using those years and years of experience to make an honest assessment of our fitness and listening to what others are trying to tell us is also a step in the right direction. Remember, a healthy diet and regular exercise will help us say “I am fit to fly” for a few more years. 

Occurrence Synopses

The following information may change as investigations progress.

03 Mar. 2000

TSB Report A00W0063

Evansburg, Alta.

5 mi. E

R44

C-GJAG

The R44 with a pilot and two passengers on board was on a low-level photography flight when it hit a single-strand power line. The line broke but not before causing considerable damage to the main rotor. The pilot landed immediately without further problems. There were no injuries.

06 Mar. 2000

CADORS 2000C0199

Norman Wells, N.W.T.

20 mi. N

F28C-2

C-FBFN

The pilot called Norman Wells Flight Service Station (FSS), reporting that he was 15 min out. When he failed to arrive, a communications search was initiated. When that produced no results, a search was started and a C-130 Hercules was launched from CFB Winnipeg, Manitoba, Rescue 342. The C-130 located the missing helicopter on nearby Kelly Lake. The helicopter landed prior to running out of fuel, but no mention had been made of a fuel problem when contact had been made with the FSS. Cost to the Canadian tax payers for the unnecessary SAR alert (UN SAR) was in excess of \$40,000.00 all because a pilot failed to transmit his fuel situation and his intentions when he had the chance.

19 Mar. 2000

TSB Report A00P0041

Port McNeill, B.C.

30 mi. SE

AS-350B2

C-FWCN

While unloading equipment at the helipad, one of the tree fallers threw an axe away from the area of the baggage compartment. The pilot heard a loud bang and shut down immediately. Inspection revealed that the axe had contacted the main rotor about 2 in. from the tip. Company maintenance determined that the damage was not sufficient to ground the helicopter, and it was placed back in service.

19 Mar. 2000

TSB Report A00P0043

Klua Lake, B.C.

Bell 205A-1

C-GAYB

The 205 was landing in a confined area when the main blade was damaged, requiring inspection and repair by company maintenance personnel.

23 Mar. 2000 **Innisfail, Alta.** **Rotorway Exec 90 C-FZXE**

TSB Report A00W0072

No flight plan had been filed and the pilot did not make his intentions known to anyone. The pilot's family found his car at the airport and noticed that the helicopter was gone. He was then reported missing and a full-scale search was initiated. The wreckage containing the body of the pilot was discovered two days later just outside the airport boundary. The ELT had been removed for servicing.

24 Mar. 2000 **Buckingham River, B.C.** **Bell 212** **C-GOKW**

TSB Report A00P0045

The helicopter, with a long line attached, was returning at 4500 ft ASL to pick up a load when the No. 2 engine lost power. The pilot released the line and landed without further problems. Maintenance attempted, unsuccessfully, to start the engine in both automatic and manual FCU modes. The fuel/oil heater, manual FCU, automatic FCU and engine-driven fuel pump were changed and the helicopter was returned to service.

27 Mar. 2000 **Coppermine, N.W.T.** **AS 350D** **C-GANA**

TSB Report A00W0076 **64 mi. S**

The AStar pilot called his company dispatch on his satellite telephone to report that he had crashed near Echo Bay, N.W.T. He was uninjured and had ample winter survival equipment, so the decision was made that he would spend the night at the accident site and be picked up the next morning.

The 350 had been dispatched to retrieve passengers and the pilot from a MD 500D that had damaged its tail rotor in an accident (A00W0077) earlier the same day. After recovering three passengers, the pilot of the 350 returned to the 500 to recover the pilot and remaining passenger. En route to the damaged 500, the pilot encountered reduced visibility in heavy snow and, when he attempted to land, the helicopter rolled onto its left side.

27 Mar. 2000 **Coppermine, N.W.T.** **MD 500D** **C-FRZP**

TSB Report A00W0077 **60 mi. S**

The pilot released the sling load, moved ahead to clear the load and then landed on the snow surface. He did a seating check to determine how firm the snow base was and then, when satisfied that the area was suitable, he fully lowered the collective and reduced power to ground idle. The bear paws broke through the snow, and the tail rotor was damaged on contact with the ground. The pilot contacted an overflying aircraft, and the information was passed on to the company. An AStar was sent from another company, and it arrived five hours later. Three workers were then removed and, on the return trip, the AStar crashed (A00W0076). All involved in the two accidents were recovered, uninjured, the next day.

06 Apr. 2000 **Hagensborg, B.C.** **AS350 B-2** **C-FWCN**

TSB Report A00P0052 **4 mi. N**

Inbound to a mountain repeater site at 5800 ft ASL to pick up a radio technician, the 350 encountered icing conditions and crashed, coming to rest on the side of the mountain at the 5200 ft level. The pilot conducted a reconnaissance of the area and then approached to a spot 2000 ft laterally away from and 200 ft below the pickup site. He hovered there, in falling snow, for about 8 min, waiting for the visibility to clear at the landing site. The radio technician later reported that clouds accompanied by snow showers had been moving in and out. The air temperature was about -6°Celsius and the snow appeared dry. As he waited in the hover, he noticed that the pedal input requirement had increased significantly and that the torque indicated 103%. The

helicopter began to settle and, because he had no more available power, the pilot tried to fly away from the mountain with a turn to the left to maintain visual references. This manoeuvre put the helicopter in a downwind, descending condition from which there was no recovery. The main blades hit the side of the mountain, and the helicopter came to rest on its side. The pilot escaped with minor injuries. He confirmed that the ELT was transmitting, turned off the fuel and electrics and radioed for help with a portable radio. Once he was assured that help was on the way, he turned off the ELT and climbed to the repeater site to await rescue.

08 Apr. 2000 **Creston, B.C.** **Hiller UH-12C** **C-GCWN**
TSB Report A00P0054

Two pilots were practising confined area work when the main rotor struck an overhanging wooden beam. Control was maintained, and the helicopter landed without further damage. On departure the pilot allowed the machine to drift too close to the side of a grain elevator and, as they climbed, they hit the beam. There were no injuries.

25 Apr. 2000 **Grimshaw, Alta.** **Bell 206B** **C-GMXU**
TSB Report A00W0085

On the fourth autorotation, the student flared high and pulled collective too soon, resulting in a very hard landing. Initial contact was made in a nose-high attitude, and the helicopter pitched forward; the bear paws dug into the soft ground and the machine came to an abrupt halt, still upright. Examination revealed damage to the transmission cowling and wrinkling of the tail boom. Neither pilot was injured.

27 Apr. 2000 **Near Beloeil, Que.** **Bell 206B** **C-GFSE**
TSB Report A00Q0046

The 206 was on a local test flight after maintenance was carried out on a number of critical components. Shortly after takeoff a catastrophic failure took place in the rotor system and the helicopter crashed, minus the main rotor, killing the pilot and passenger.

28 Apr. 2000 **Campbell River, B.C.** **MD 500D** **C-FLGK**
TSB Report A00P0062

A hard landing experienced during a simulated tail rotor failure resulted in structural and component damage but no injuries to the two pilots. The training pilot had initiated the failure in a 200 ft hover, and initial ground impact on the tail rotor sheared the tail rotor drive shaft.

28 Apr. 2000 **St-Charles de Bellechasse, Que.** **Bell 206B** **C-GUMO**
TSB Report A00Q0047

The helicopter with four on board was conducting a duck counting operation when it flew into high-voltage wires, cutting two strands of wire and badly damaging the 206. All eyes were counting ducks and nobody was watching for obstacles. When the pilot spotted the wires it was too late to avoid them. The pilot did manage to successfully land the badly damaged helicopter in a nearby field. There were no injuries.

04 May 2000 **McCracken Mesa, Utah** **AS 350D** **C-GPTT**
TSB Report A00F0022 **17 mi. SE of Blanding**

The Canadian-owned AStar was working for a geophysical company doing a seismograph job when it crashed, killing the Canadian pilot and two of his passengers, critically injuring two other passengers and seriously injuring a fifth. Witnesses reported that the helicopter was spinning as it hit the ground and that it caught fire on

impact. Oil field workers in the area rescued the survivors from the burning aircraft. The National Transportation Safety Board is investigating with assistance from the Transportation Safety Board of Canada (TSB).

06 May 2000 (missing between Ottawa Bell 206B C-GGUB
TSB Report A00O0082 and North Bay)

The 206 departed Ottawa International Airport at 03:00 Eastern Daylight Time (EDT) on the second leg (200 mi.) of a visual flight rules (VFR) trip from Montreal to North Bay. No flight plan had been filed, but the company reported the helicopter missing at 17:00 EDT when the helicopter failed to arrive in North Bay. A search was started immediately. The missing aircraft was last seen on radar 49 mi. west of the Ottawa airport. Weather was marginal for VFR flight, and it was still dark when the 206 left Ottawa. The helicopter is still missing.

10 May 2000 Abbotsford, B.C. Bell 47G-2 C-FKNQ
TSB Report A00P0077

The helicopter crashed into the infield area of the Abbotsford airport shortly after departing on a local training flight. Witnesses reported seeing the helicopter take off and start a left climbing turn to downwind. It then began to descend and spin to the right. The G-2 crashed on the airport infield in an extreme nose-low attitude and burst into flames, killing the instructor and student.

15 May 2000 Cabot Island, Nfld. Bell 212 C-GCHG
TSB Report A00A0076

The pilot had just released a load of water barrels at the Cabot Island lighthouse and was returning to Cape Freels with a sling load of empty barrels when it crashed in the water, 1/4 mi. west of the island, killing the pilot and destroying the helicopter. The TSB is investigating.

17 May 2000 Fort Nelson, B.C. Bell 206B C-GK GK
TSB Report A00W0100

Control was lost during a stuck pedal training sequence and, on impact with the ground, the helicopter rolled onto its right side, causing considerable damage to the main and tail rotor systems. There were no injuries.

21 May 2000 Resolute, Nunavut Bell 206L C-GJOL
TSB Report A00C0099 40 mi. SW

The Bell departed a fuel cache 60 mi. southwest of Resolute at midnight and was returning to Resolute when it crashed on the frozen surface of Parry Channel, 20 mi. northeast of the fuel cache, killing the two passengers and seriously injuring the pilot. The 206 broke apart when it hit the ice, spreading wreckage over a large area. The pilot and passengers had been doing a polar bear survey.

Despite very painful and debilitating injuries, the pilot was able to crawl to his passengers to check their condition, then crawl to the ELT to make sure it was transmitting. There was damage to the ELT, but it did transmit enough to be picked up by the SARSAT system. The pilot managed to gather enough survival equipment to keep himself alive in sub-zero Celsius temperatures till help could get to him. Fourteen hours after the crash, rescuers were finally able to get to him through very bad weather. The pilot was wearing a helmet but the passengers were not.