

## MEDICAL MATTERS

**H**E WAS AN experienced pilot, but on a fine September day in 1989, he lost control of his Super Air Tourer and arced down 700ft into the Clarence River at 180kt. Witnesses reported that nothing fell off the aircraft, and no part of it was flapping during the descent. No changes to engine power were heard.

The investigation revealed that the pilot had died of a massive heart attack.

If he had told his designated aviation medical examiner (DAME) about the heart problems he'd suffered some years before, he might still be alive. By failing to report his heart condition, he missed out on tests which may have indicated the danger he faced.

In November of the same year, the pilot of a Winton Sapphire died of sudden heart failure 200ft beyond the end of the strip in Manton, Queensland. If he had seen his DAME about the chest pains he was experiencing, he too might still be flying.

Although it is difficult to prove that an accident is due to heart disease, over the past 10 years there have been no less than 8 accidents and 13 deaths in Australia, where the pilot-in-command suffered from heart disease.

**Largest killer:** Coronary heart disease is the largest single killer of men and women, causing more than 1 death every 20 minutes, according to the Australian Heart Founda-



# TIME FLIES

A rundown on how ageing can affect your ability to fly safely.

RUSSELL SWEENEY

& SOPHIA KALOGEROPOULOS

tion. Your chances of suffering from heart disease increase dramatically with age.

A common form of heart disease that increases as you age is ischaemic heart disease. Ischaemia (derived from the Greek word *ischein* "to restrict" and *aemia* "of the blood") means a restriction of the blood supply to the

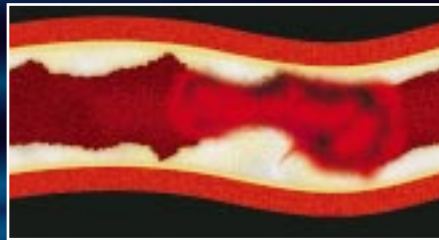
heart musculature. The vessels of the vascular system in the heart "harden" and become narrow due to the build up of plaque, increasing resistance to blood flow.

Often, this shows up as angina, which is frequently felt as a shortness of breath accompanied by a crushing pain in the chest, with the pain sensation spreading behind the

## Cardiovascular diseases



Coronary artery with plaque formation.



Plaque rupture with coronary artery blockage (clot about the ruptured plaque), causing infarction of heart muscle.

## Diabetes



Insulin levels must be maintained artificially.



Graphic: P. Markmann

breast bone, often up into the neck and down the arms.

The pain or discomfort may be dull or expansive. If this happens, you should immediately seek medical advice.

Ischaemic heart disease may progress to a heart attack, in which case the symptoms are much more severe. Chest pain is excruciating, with pain radiating into the abdomen and up into the neck and down the arms. This can be accompanied by shortness of breath, and a feeling of crushing tightness within the chest.

Ischaemic heart disease can even cause sudden death without symptoms.

Heart disease may have been a factor in the

an October 1995 accident, in which an experienced 54-year-old pilot-in-command and 2 passengers died. The pilot suffered from in-flight incapacitation, spiralling down 500ft to crash near the runway. The coroner and the Bureau of Air Safety Investigation (BASI) found that the presence of ischaemic heart disease in the pilot-in-command was a contributing factor to the accident (see story page 8).

**Arrhythmia:** Another condition that can be experienced in an individual with ischaemic heart disease is a disruption of the regular heart rhythm, known as arrhythmia. An arrhythmia may be experienced as an unpleasant event or may be fatal.

The onset of any of these heart conditions while in flight may be very dangerous.

What can be done to prevent ischaemic heart disease or to slow its progression? Ensure you exercise regularly. It is recommended that 20 minutes of exercise be taken 3 times a week. The exercise should cause your heart rate to increase, and should be sufficiently vigorous to make you sweat a little. The amount of saturated fat in your diet needs to be minimised.

Your blood pressure should be regularly checked and controlled. Weight should be kept under control. If you smoke, you should cease. Even smoking a few cigarettes a day can contribute to heart disease.

If you require surgery for coronary artery disease, your medical certificate will be suspended for 6 months. If, after that period, you fully satisfy CASA's protocols for reassessment, your certificate will be returned without conditions.

However you will be followed up more frequently: 6 monthly, if you have a class 1 certificate, and 12 monthly if you have a class 2 certificate. The follow-up will include cardiology reports in addition to stress electrocardiograms, thallium scans and angiograms, depending on the level of licence you have.

**“Controllable” risk factors for heart disease.**

These are factors that an individual can change through a committed effort.

**Heart attack risk is decreased by:**

1. Not smoking, or stopping once you've started.
2. Eating a diet low in saturated fat and cholesterol.
3. Maintaining a weight that is close to the recommended weight for an individual of your age, gender and height.
4. Controlling or preventing high blood pressure.
5. Controlling diabetes, if you have it.
6. Managing stress.
7. Exercising aerobically on a regular basis.

**Risk factors for heart disease that an individual cannot change, include:**

1. Gender (males are more susceptible).
2. Age.
3. A family history of heart disease.

**Vision**



**Normal vision**



**Cataracts**  
Increasing opacity of the lens. Symptoms include hazy or double vision.



**Glaucoma**  
Reduction in visual depth of field. Symptoms include blurred vision, rings around lights.

# What's your risk of heart disease?

## A Understand your risk factors

Some risks are unavoidable, and some you can change. Use the risk factor assessment table to understand your risk profile. If you answer yes to any of the modifiable risk factors, you should be considering how to change your lifestyle or take medication in order to reduce your risk.

Risk factors		Yes	No
<b>Unavoidable risk factors</b>			
<b>Advancing age</b>	The older you are the more likely it is that plaque has built up. If you are a woman over 44 or a man over 38, tick "yes".	<input type="checkbox"/>	<input type="checkbox"/>
<b>Male gender</b>	Men are prone to heart disease at an earlier age. Tick "yes" if you are male.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Post menopausal female</b>	After menopause, women's rate of heart disease "catches up". If you are a postmenopausal female, tick "yes".	<input type="checkbox"/>	<input type="checkbox"/>
<b>Heredity</b>	Do you have family members (father, mother, grandparents, aunts, uncles, children) with heart disease or stroke?	<input type="checkbox"/>	<input type="checkbox"/>
<b>Modifiable risk factors</b>			
<b>High cholesterol</b>	If your total cholesterol level is above 5.2 mmol/l, tick "yes".	<input type="checkbox"/>	<input type="checkbox"/>
<b>Low HDL</b>	High density lipoproteins protect against heart disease. Is your HDL count less than 0.9 mmol/l?	<input type="checkbox"/>	<input type="checkbox"/>
<b>High blood pressure</b>	Tick "yes" if your blood pressure is above 139/89. If your blood pressure is 130/85 or higher, it is on the high end of normal and you are advised to keep a close watch on it.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Cigarette smoking</b>	The nicotine in cigarette smoke causes your coronary arteries to constrict. Cigarettes also cause the blood to clot and the carbon monoxide decreases the amount of oxygen the blood can carry. Tick "yes" if you smoke.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Obesity*</b>	Obesity causes an additional strain on the heart and is linked with high cholesterol, high blood pressure, and an increased heart size. Tick "yes" if you are 20 per cent or more over your ideal body weight.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Lack of exercise*</b>	Lack of exercise increases the risk of cardiovascular disease. Exercise can reduce your blood pressure and make your heart and other muscles work more effectively. Tick "yes" if you don't exercise regularly.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Stress*</b>	Stress increases your blood pressure and heart rate, and the workload placed on your heart. Over time, chronic stress can, for some people, contribute to the development of coronary artery disease. Tick "yes" if you often feel stressed.	<input type="checkbox"/>	<input type="checkbox"/>
<b>Diabetes</b>	The increased blood sugar levels in a diabetic cause an increase in triglycerides and LDL and a decrease in HDL. A diabetic who controls his or her blood sugar level will minimise adverse changes in the lipid (HDL and LDL) profile.	<input type="checkbox"/>	<input type="checkbox"/>

## B Score your risk of a heart event

Add the points for major risk factors to give you a total score.

\* The study from which this scoring system was devised did not take into account these risk factors.

Female	
Age	30 31 32 33 34 35 36 37 38 39 40 41 42-43 44 45-46 47-48 49-50 51-52 53-55 56-60 61-67 68-74 <b>Total:</b>
Points	-12 -11 -9 -8 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 <input type="text"/>
Male	
Age	30 31 32-33 34 35-36 37-38 39 40-41 42-43 44-45 46-47 48-49 50-51 52-54 55-56 57-59 60-61 62-64 65-67 68-70 71-73 74 <b>Total:</b>
Points	-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 <input type="text"/>
HDL - Cholesterol levels	
HDL-C	0.64-0.68 0.69-0.76 0.77-0.83 0.84-0.91 0.92-0.99 1.00-1.09 1.10-1.20 1.21-1.31 1.32-1.43 1.44-1.56 1.57-1.72 1.73-1.90 1.91-2.08 2.09-2.26 2.27-2.50 <b>Total:</b>
Points	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6 -7 <input type="text"/>
Cholesterol levels	
Total-C	3.59-3.92 3.93-4.31 4.32-4.72 4.73-5.17 5.18-5.68 5.69-6.20 6.21-6.80 6.81-7.47 7.48-8.17 8.18-8.56 <b>Total:</b>
Points	-3 -2 -1 0 1 2 3 4 5 6 <input type="text"/>
Systolic blood pressure	
SBP	98-104 105-112 113-120 121-129 130-139 140-149 150-160 161-172 173-185 <b>Total:</b>
Points	-2 -1 0 1 2 3 4 5 6 <input type="text"/>
Other	
Risk	Points
Smoking	4
Diabetic (male)	3
Diabetic (female)	6
ECG-LVH	9
<b>Total:</b>	<input type="text"/>

**C Assess your score**

1. Coronary heart disease - sum points for all risk factors.

Age+	HDL-C+	Total-C+	SBP+
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoker+	Diabetes+	ECG-LVH	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
= Total:			
<input type="checkbox"/>			

2. Look up risk corresponding to point total.

Points	Probability		Pts	Probability	
	5 Yr.	10 Yr.		5 Yr.	10 Yr.
1 or less	<1%	<2	17	6%	13%
2	1%	2%	18	7%	14%
3	1%	2%	19	8%	16%
4	1%	2%	20	8%	18%
5	1%	3%	21	9%	19%
6	1%	3%	22	11%	22%
7	1%	4%	23	12%	23%
8	2%	4%	24	13%	25%
9	2%	5%	25	14%	27%
10	2%	6%	26	16%	29%
11	3%	6%	27	17%	31%
12	3%	7%	28	19%	33%
13	3%	8%	29	20%	36%
14	4%	9%	30	22%	38%
15	5%	10%	31	24%	40%
16	5%	12%	32	25%	42%

3. Compare to average 10 year risk

Age	Probability	
	Women	Men
30-34	less than 1%	3%
35-39	less than 1%	5%
40-44	2%	6%
45-49	5%	10%
50-54	8%	14%
55-59	12%	16%
60-64	13%	21%
65-69	9%	30%
70-74	12%	24%

**Strokes:** As you age, your chance of suffering a stroke or cerebrovascular accident increases. The effect on the survivors of strokes varies widely. Some individuals escape with minimal disability, while others have severe impairments. The strategy to prevent strokes is the same as that given for ischaemic heart disease.

**Mental functioning:** Your mental functioning can also be affected with age. The rate of onset and severity of impairment varies considerably.

Some elderly individuals can suffer a pronounced decrease in their mental functioning, known as dementia. Its onset is subtle. Apart from the impairment of decision making ability, there is a loss of short-term memory and the ability to reach judgements based on experience. The ability to handle complicated data is also affected. There is a

decrease in attention span, other intellectual skills, and possibly the ability to handle fatigue.

It is difficult for a person suffering the onset of dementia to recognise or accept their loss of short-term memory and slowness in reaching judgements. If you are concerned that your mental functioning is deteriorating, you should immediately cease flying and seek advice from your DAME.

**Vision:** Your eyes' ability to receive and focus light can deteriorate as you age. Degenerative changes occur most often in people over 40 years of age.

Some people are affected by presbyopia as they age, when their ability to focus on near objects decreases. This is often recognised when reading material has to be put further away to read, or more light is needed to read in low contrast conditions. Older pilots should have their vision assessed by an optometrist or ophthalmologist, and wear prescription glasses during flight, if necessary.

As you age, there is an increasing chance that the lenses of your eyes will become cloudy due to cataracts. Cataracts can be congenital, and can also be caused by long-term exposure to ultraviolet light. The opacity of the lens impedes vision; symptoms include hazy or double vision, spots and increased sensitivity to glare.

If you suffer any of these problems, you

should consult an ophthalmologist for an assessment of your vision and surgical correction of the problem, if required.

The incidence of glaucoma also increases with age. Glaucoma is due to increasing fluid pressure in the eyeball. The result can be chronic damage to the retina, which will reduce your field of vision.

The acute form of glaucoma is easy to recognise. You will have blurred vision and a painful red eye. To avoid loss of vision through glaucoma you should have regular checks of your intraocular pressures.

Both glaucoma and cataracts can reduce a pilot's visual sensitivity when in low contrast situations. Your ability to pick out other aircraft against the background sky can be compromised. Sometimes recognising a country airfield from a



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distance can be difficult.

**Hearing:** There is a degree of hearing loss – presbycusis – which occurs as part of the ageing process. Hearing loss can result from chronic exposure to noise. Severe hearing loss can adversely affect your ability to understand air traffic communications. Damage to hearing from aircraft noise can be reduced by using a headset.

**Diabetes:** Diabetes could effect 900,000 people in Australia by 2000, according to the International Diabetes Institute. It's a complex metabolic condition involving a persistent increase in the level of glucose in the blood. The onset of diabetes may be accompanied by symptoms of excessive thirst, frequent urination, weight loss, fatigue, blurred vision and infections. Long-term effects include damage to the kidneys, cardiovascular system, arterial system and the eyes.

These complications are serious and may mean loss of a medical certificate. Diabetes needs to be diagnosed early, and fully treated.

Many aspects of ageing can affect your flying. The maintenance of a healthy diet – along with a regular program of exercise – will go a long way towards ensuring your flying career continues into old age.

*Russell Sweeney is a medical officer for CASA.*

*Sophia Kalogeropoulos is a researcher for Flight Safety Australia.*