

## Learning Series - #26



### Understanding General Aviation

General aviation (GA) represents all civilian flying except scheduled passenger airline service and over 90% of all civil aircrafts belong to this category. Personal and recreational aviation is of particular interest to life insurance underwriters as it accounts for about 50% of all flying but 75% of fatal accidents. Since up to 75% of accidents are due to pilot error, weather being a major factor, having a basic understanding of aviation and the contributing human factors when considering risks associated with private flying is key.

#### Licensing requirements and training

##### According to the Canadian Aviation Regulations (CARs), requirements for aeroplanes:

- **Recreational permit** (Canada only, max 1 passenger and 4 seats): class 4 medical, minimum 25 hours flight training including 5 hours solo
- **Private permit** (International, no airplane or seats limit): class 3 medical, minimum 45 hours flight training including 12 hours solo, 40 hours ground school



Students are also required to pass written exams which provide knowledge of the following subject areas: air law, navigation, meteorology, and aeronautics. Pilots with at least a private permit can also obtain an instrument flight rating (IFR) which allows them to fly in poor meteorological conditions (low cloud ceilings and/or poor visibility) relying only on instruments rather than by outside visual references under visual flight rules (VFR). Since loss of control in flight and unintended flight into instrument meteorological conditions (IMC) are two of the most frequent causes of fatal GA accidents, an IFR is a true benefit for the pilot and should be assessed favourably.

**Class 3 medical:** valid for 5 years under age 40 or 2 years over age 40, done by an approved Medical Aviation Examiner. Pilots over age 40 also require an EKG every 5 years.

**Class 4 medical:** same validity as class 3 but completed by a regular physician. Pilots over age 50 require an EKG every 4 years.

Requirements for all license types (ultralight, glider, gyroplane, free balloon, commercial, etc.) can be found on Transport Canada and the FAA's website for the United States. American certifications are similar except an additional Sport Pilot Certificate which allows to fly a light sport aircraft with less requirements than a Recreational Certificate.

In Canada, in addition to self-reporting, the law makes it compulsory for doctors and optometrists who are aware that their patient is a pilot to report to Transport Canada any medical condition that could constitute a hazard to aviation safety. In the United States, however, the onus is only on the pilot to voluntarily report an adverse change in health so the FA may not be aware of an adverse change until a certificate needs to be updated which could take years. Pilots who have their own plane and fly from private airfields could also possibly continue to fly with an expired medical certificate by ignoring the renewal requirement.

#### Types of aircrafts

The most common categories of GA aircrafts are:

##### Fixed wing (single or multi-engine)



Homebuilt (including light-sport aircrafts which are light airplanes, gliders, powered parachutes, ultralight trikes, balloons or airships)



##### Rotary wing (helicopter)





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## Understanding General Aviation (cont'd)

The vast majority of active GA aircrafts are small single-engine fixed wing (i.e. Cessna 152/172/182 and Piper PA-28) so they naturally account for the highest crash totals. However, larger and more complex aircrafts are far more fatal in the case of an accident. The percentage of accidents that result in a fatality (lethality index) is between 10-15% for single-engine and 30-40% for multi-engine aircrafts.

Homebuilt, including experimental and light-sport/ultralight aircrafts, account for a small proportion of GA aircrafts but tend to have higher rates of crashes and fatality. Their popularity is increasing since they are

more accessible due to lower cost and less training requirements, but lack of proper maintenance/assembly and minimal pilot flight time can contribute to more accidents.

Some newer GA aircrafts such as the single engine Cirrus SR22T or the Diamond DA50 offer advanced technologies and safety features such as an integrated parachute system, real-time terrain maps with satellite weather, autopilot, de-icing systems, stall-resistant wing, collision avoidance systems, etc. However, despite what some manufacturers claim, it remains unclear if there is any significant correlation between aircraft models and GA accident statistics.

Top of the line aircrafts can provide a false sense of extra confidence and make private pilots fly into adverse meteorological conditions or take additional risks that would have normally been avoided. Pilot error and poor judgement remain the main causes of accidents and GA aircrafts with all the latest whistles and bells can also tend to attract pilots who are fairly new and inexperienced to aviation.

Did you know? Despite most accidents occurring at landing, most fatal accidents happen en route or at takeoff.

### Flight hours

The more total flight hours a pilot has, the more experience is gained. A pilot with less than 500 hours of flight time is considered a novice but a first job as a pilot can be obtained with 200 hours of experience. An airline pilot requires minimum 1,500 hours.

In aviation insurance, a usually better measure of competency than total flight time is pilot experience in a specific aircraft make and model. For example, a 1,500 hours pilot with 500 hours in the aircraft being insured could be assessed more favourably than a 10,000 hours pilot with no experience in the same aircraft because the risk of being involved in an incident is considered to be lower. Life insurance has a different scope, however, it can be good to keep in mind that total flight time may not always be the sole measure of competency especially when assessing a pilot with a diverse aviation background



who may be more experienced in certain types of aviation than others.

While novice pilots generate the highest proportion of crash totals, highly experienced pilots surprisingly generate a notable percentage of accidents. Safety comes with good habits and recurrent training, and as pilots become experienced, they can easily fall into the trap of complacency and distraction.

While increased flight time experience is usually associated with decreased accident rates, risk obviously increases with the number of annual flight hours. Fortunately, many private pilots, especially older individuals, fly a minimal number of hours annually which reduces the probability of an accident or an acute medical condition (i.e. heart attack) in the air.

### The pilot

The most crucial factor when assessing an aviation risk lies in the individual. How well the applicant is known is much more important than what is known about the aircraft flown.

- Is the pilot experienced (licenses/certifications, instrument flight rating, continuous flying to stay proficient)?
- How many hours are flown (> 200 hours/year presents an increased risk)?

- How and where will the applicant fly (mountainous areas have gusty and turbulent winds, any remote areas with extreme weather and limited support, any higher-risk types of flying)?
- Is there a pattern of carelessness or thrill-seeking behaviour (adverse driving record, alcohol or drug use, prior DUI, prior aviation accident, hazardous sports participation, lifestyle concerns)?



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## Understanding General Aviation (cont'd)

While it is impossible to calculate an applicant’s propensity to fly in bad weather, some of the risk factors that are more prevalent in fatal accidents are visible during underwriting.

Medically, certain conditions can affect the ability to safely fly an aircraft and should be reviewed closely by underwriters. Some of these conditions are:

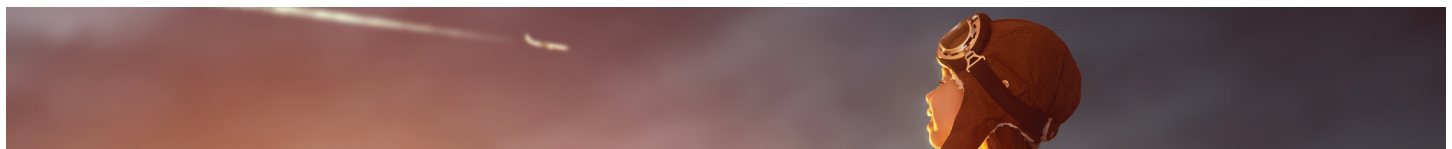
- Diabetes
- Asthma
- Cardiovascular disease (ischemic-valvular-congenital heart disease, arrhythmias, vascular disorders)
- Psychiatric conditions (depression, anxiety, PTSD)
- Neurological conditions (tumors, multiple sclerosis, stroke, migraines, seizures, head injury)
- Substance use

Transport Canada’s website has a useful Handbook for Civil Aviation Medical Examiners with guidelines and recommendations on how to assess some medical conditions. In aviation, the main concern is usually the risk of sudden and/or subtle incapacitation during flight. For example, according to their handbook:

Condition	Medical Guidelines	Recommendations/Actions
Diabetes	- HbA1c < 8.5% for at least 3 months - No neurological or renal complications - No significant diabetic retinopathy - Annual cardiovascular assessment required	Medical certificate valid for maximum 1 year
Asthma	- Severe: FEV1 < 60% - Moderate: FEV1 60-80%	- Severe: disqualification from all medical certificates - Moderate: referred to Aviation Medical Review Board, “restricted” category may be considered
Psychiatric	Concerns: - Anxiety disorder requiring tranquilizers - Ongoing depression - Change in mental health (relapse, changing dosage)	These are all disqualifying conditions which will require a complete assessment or reassessment.

### Additional Underwriting Considerations

- An aviation questionnaire must be obtained when assessing aviation risks as it provides valuable information. MVR, inspection reports or additional questionnaires (alcohol and drugs, hazardous sports) may also be pertinent depending on the applicant’s history.
- Special attention should be given to any type of flying other than personal/recreational, the most common category. Certain types of flying such as acrobatics/stunts, bush flying, aerial application (crop dusting), instructional flying or air taxi are usually considered higher risk and must be evaluated more carefully.
- Aviation is sometimes considered a “special risk”, therefore available retention and capacity limits may be reduced.



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