Aviation Medicine

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Faculty/Presenter Disclosure

- Faculty: Dr. Heather Langille
- Relationships with commercial interests:
  - Grants/Research Support: None
  - Speakers Bureau/Honoraria: None
  - Consulting Fees: None
  - Other: None

Disclosure of Commercial Support

- This program has received financial support from Transport Canada in the form of funding.

- Potential for conflict(s) of interest:
  - Dr. Heather Langille has received payment from Transport Canada in the form of a salary.

Mitigating Potential Bias

- Dr. Langille will be presenting Transport Canada policy which is based on current medical evidence.
- If a policy that is not in agreement with current medical evidence is presented, this will be disclosed and discussed.

Overview

- The important role of the Family Physician in aviation safety
- Duty to report medical conditions under Aeronautics Act
- What to think about when prescribing to Pilots and Air Traffic Controllers
- What to do when you have a question (We answer the phone!)
- Careers in Aviation Medicine

Aviation Medicine

- The study of the unique demands of the aerospace environment on human physiology and its effect on human performance in military and civilian aviation
- Assess risk of ***sudden*** or ***subtle*** incapacitation
- Based on engineering principles
- 2% per year risk of failure tolerated

Case 1

- You are a family doctor in a rural community
- Your patient has been admitted to your service with an IWMI and is making a good recovery
- He is 71 years old and his favourite hobby is flying his float plane
- He asks when he can resume flying

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Case 1 – You advise him:

- He can resume flying right after hospital discharge
- He can fly 2 weeks after discharge
- He should have a stress test 6 weeks after discharge and he can fly if it is okay
- You don't know but you will call Air Canada because someone there probably does
- You must report his condition to Transport Canada and they will advise him

International Civil Aviation Organisation (ICAO)

- Created in 1947
- Specialised agency of the UN
- Promote safe international civil aviation
- Located in Montréal
- 192 Member States (countries)
- All Member States must have a medical department that regulates medical standards for commercial and private pilots and ATCs
- All aviation licences have associated Medical Certificate

Transport Canada

- Transport Canada Civil Aviation Medicine advises Minister of Transport on medical fitness
  - Supposed to be 10 physicians, we are 7
  - Process about 60 000 Medical Examination Reports/yr
  - Done by about 550 designated Civil Aviation Medical Examiners (CAMEs) in Canada, 130 overseas
  - CAMEs appointed based on need in certain geographic areas
  - What is the role of the attending physician?

Aeronautics Act

6.5 (1) Where a physician or an optometrist believes on reasonable grounds that a patient is a flight crew member, an air traffic controller or other holder of a Canadian aviation document that imposes standards of medical or optometric fitness, the physician or optometrist shall, if in his opinion the patient has a medical or optometric condition that is likely to constitute a hazard to aviation safety, inform a medical adviser designated by the Minister forthwith of that opinion and the reasons therefor.

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Duties of the Certificate Holder

(2) The holder of a Canadian aviation document that imposes standards of medical or optometric fitness shall, prior to any medical or optometric examination of his person by a physician or optometrist, advise the physician or optometrist that he is the holder of such a document.

Use of the information by TC

(3) The Minister may make such use of any information provided pursuant to subsection (1) as the Minister considers necessary in the interests of aviation safety

Protection of the Practitioner

(4) No legal, disciplinary or other proceedings lie against a physician or optometrist for anything done by him in good faith in compliance with this section.

Information is Privileged

(5) Notwithstanding subsection (3), information provided pursuant to subsection (1) is privileged and no person shall be required to disclose it or give evidence relating to it in any legal, disciplinary or other proceedings and the information so provided shall not be used in any such proceedings.

Consent

(6) The holder of a Canadian aviation document that imposes standards of medical or optometric fitness shall be deemed, for the purposes of this section, to have consented to the giving of information to a medical adviser designated by the Minister under subsection (1) in the circumstances referred to in that subsection.

Case 1 (cont'd)

- Your pilot patient is now 6 months post MI. He has had an uncomplicated recovery and has successfully quit smoking. He wants your opinion as to whether he should try to get his pilot's licence back, or sell his float plane.
- "Do you think I have a chance, Doc?"

Recertification after serious illness

- Major Medical Conditions = Unfit according to Canadian Aviation Regulations
- Flexibility can be applied if **accredited medical conclusion** is that certification is in the interest of public safety
- Accredited medical conclusion = us
- Accredited medical conclusion ≠ you
- But we rely on ***objective*** information from you

Back to our patient

Recertification considered 6/12 after event

- Stable with no symptoms and on acceptable meds
- Non-smoker
- Lipids controlled
- Blood glucose controlled
- Echo good LVf(x) (EF>50%)
- EST ***to good workload*** 6/12 after event shows no ischaemia
- If recertified will need yearly reports incl. EST

Acceptable CV Meds

- Standard post-event prophylaxis
- Standard modern anti-hypertensives
  - Please start low and go slow
  - Consider close follow up
- Nitrates are a red flag and not acceptable
- Prolonged use of second-line anti-platelets (e.g. clopidrogel) is red flag
- Anticoagulants (Warfarin and NOACs) acceptable in AF – need careful surveillance

Any expense incurred in proving medical fitness is the responsibility of the applicant!

Case 2

- 27 year old professional pilot, married with 2 young children
- Has URTI symptoms with cough, coryza, nasal congestion and thinks he will have trouble clearing his ears on descent
- Would like a note ***for his employer***

Do you need to report to Transport Canada?

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Canadian Aviation Regulations (CARs) 404.06

- **(1)** Subject to subsection (3), no holder of a permit, licence or rating shall exercise the privileges of the permit, licence or rating if
- *(a)* one of the following circumstances exists and could impair the holder's ability to exercise those privileges safely:
- (i) the holder suffers from an illness, injury or disability,
- (ii) the holder is taking a drug, or
- (iii) the holder is receiving medical treatment

Cough and Cold Remedies

Decongestants

- Pseudoephedrine
  - (Sudafed, Benadryl Allergy and Sinus)
- Phenylephrine
  - (Sudafed PE, Tylenol Sinus)
- Side effects can include tachycardia and hypertension, agitation, dizziness, confusion, drowsiness
- Should wait at least 24 hours before duties

Cough and Cold Remedies

Cough Suppressants

- Dextromethorphan
  - Tylenol Cough, Robitussin DM
  - Can cause dizziness and drowsiness
  - Some people metabolise slowly
  - 48 hours recommended before duties

Cough and Cold Remedies

Expectorants

- Guaifenesin
  - Balminil Expectorant, Benylin E, Koffex
  - Dizziness and Drowsiness reported
  - No evidence that it works!

Antihistamines

Older Generation

- Diphenhydramine (Benadryl)
- Chlorpheniramine (Chlor-Tripolon)
  - Very sedating and not safe

Newer Generation

- Loratadine (Claritin), Desloratadine (Aerius), and Fexofenadine (Allegra) etc. considered safe
  - Trial period of 7 days recommended
- Cetirizine (Reactine), Rupatadine (Rupall), Bilastine (Blexten) may produce drowsiness, acceptable but be careful (take night before flying, be careful if new med)

Always consider underlying condition

- You have to consider underlying condition as well as medication
- If your patient is sick enough to take medication they are too likely too sick to fly or control aircraft

Case 3

- 63 year old patient wants to take flying lessons and be a private pilot, he asks you if it is a good idea
- He is on a Disability Pension for his chronic low back pain and takes Hydromorphone Contin 6 mg bid
- What do you tell him?

Narcotics in Aviation

- Not acceptable
- Both the underlying condition and the medication make the applicant unfit
- Exception: ICAO guidance is occasional Codeine up to 16 mg q 6h probably acceptable
- Remember underlying condition

Case 4

- 42 year old male patient, on pension from military due to PTSD
- Prescribed medical marijuana by a local cannabis clinic at a dose of 1g daily
- Wishes to start a new career as an Air Traffic Controller and asks you if he thinks that he will have any difficulty gaining medical certification

Medical Marijuana

- No

Case 5

- 61 year old patient
- He has a Private Pilot's Licence
- Admits to you that he smokes cannabis about twice weekly
- "It's okay Doc, PM Trudeau made it legal and Transport Canada knows about it"
- Do you have a duty to report this under Section 6.5?

Impairment

- Impairment causes Incapacitation
  - Incapacitation can be ***sudden*** or ***subtle***
- Intoxication is Impairment
- But Impairment is more than Intoxication!
  - Withdrawal effects
  - Hangover
  - Long term effects on cognition, motor skills, etc.
- No ‘soft’ or ‘hard’ drugs
- A drug is a drug
- Drugs cause impairment

Alcohol

- Effects of alcohol may be present long after blood alcohol level returns to 0
- 8 hour "bottle to throttle" rule
  - CARs 602.03 (pilot)
  - CARs 801.01 (ATC and Flight Service Specialists)
- ***These regulations also state "while under the influence of alcohol"***
- ***This includes being in withdrawal or hung-over***
- ***If someone flies or controls aircraft hungover they are in violation of CARs 404.06 and 602.03 or 801.01***

Cannabis

- Complex substance
- More than 400 chemical structures made by hemp
- About 60 cannabinoids
- 2 of most concern
  - Δ^9-tetrahydrocannabinol (THC)
  - Cannabidiol (CBD)
  - Also synthetic cannabinoids on the market

Cannabis

- Not like alcohol
  - Different methods of ingestion (smoking vs eating)
  - Potency usually unknown
    - 3%-5% in 1960’s
    - Now typically 10% up to 40%, sometimes 80%-90% resin
  - Impairment not usually as obvious
    - No slurring speech or weaving gait
  - Stored in adipose tissues for a long time
  - Impairment may be present long after use

Evidence of Impairment

- years of cannabis and cognitive impairment are positively correlated
  - Solowji *et al* JAMA 2002, *287*, 1123
- deficits in tracking error is significantly correlated with cannabis concentration in blood
  - Karshner *et al* Drug Test Analysis 2016, *8*, 682-689
- increased impulsivity in cannabis smokers compared to controls
  - Lyons *et al* Psychol. Med. 2004, *34*, 1239

Evidence of Prolonged Impairment

- marijuana use impairs critical cognitive functions, both during acute intoxication and for days after use
  - Volkow *et al* NEJM 2014, *370(231)*, 2219-2227
- cannabis appears to continue to exert impairing effects even after 3 weeks of abstinence and beyond
  - Crean *et al* J.Addict Med 2011, *5*, 1

Associated with Accidents

- Drivers with [detectable THC] in their blood had a significantly higher likelihood of being culpable [of fatal driving accidents] than drug-free drivers [2.7 times greater]
- For drivers with blood THC concentrations of 5 ng/ml or higher the odds ratio was greater [6.6 times greater]
  - Drummer *et al* Accident Analysis and Prevention 2004, *36*, 239-248

Associated with Accidents

- Cannabis in general also caused an increase in accident risk [13.4 times greater for levels of 1 to ≥ 5 ng/ml]
  - Kuypers *et al* PLoS ONE 2012, *7(8)* 1-9
- Cannabis smoking associated with poor driving performance and approximately doubles risk of involvement in MVA
  - Ashbridge *et al* BMJ 2012 , *344*, 536

Cannabis and Aviation

- Being impaired by, or under influence of, marijuana is unacceptable
- This includes withdrawal

Cannabis and Aviation (2)

- Continuing use of any kind unacceptable
- Not issue of legal or illegal use
- Many legal medications not compatible with aviation safety

Category 1 and 2 (Professional Pilots and ATCs)

- If use declared or suspected
  - Assessment by Specialist in Addiction Medicine
  - Drug Screen
  - If Transport Canada satisfied no ongoing flexibility may be applied
  - TC will request random testing

Category 3 (Private Pilots)

- If use declared or suspected
  - Assessment by family physician or Specialist in Addiction depending on situation
  - Drug Screen
  - If certified follow up assessments and random testing
  - Any evidence of use before flying (at least 30 days) or evidence of cannabis in system is disqualifying
  - Proven use will likely void insurance

Bottom Line

The side effect profile, inconsistent rates of elimination, and long-term cognitive side effects of cannabis make it incompatible with aviation safety.

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Case 6

- 32 year old pilot, history of MDD in his late ’teens
- Recent marital break-up
- Presents to your office with depressed mood, poor hygiene, has been giving away some possessions to friends and family
- States that he intends to fly his airplane into his former wife’s home so “they can be together forever”

Do you call TC?

- Yes, but that should not be the first call you make!
- Treat the acute condition
  - Appropriate form for Emergent Psychiatric assessment
- Report under Section 6.5 of Aeronautics Act when acute situation has been managed

Case 7

- 32 year old professional pilot
- 1/12 h/o depressed mood, insomnia, difficulty concentrating, irritability, no suicidal ideation
- You think he would benefit from an SSRI or SNRI, he is worried about the effects on his career
- How do you advise him?
- Do you inform Transport Canada?

Depression and Anxiety

- Symptoms make them unfit for aviation duties
- Reportable under Section 6.5 of Aeronautics Act
- Are unfit until condition is stable
- 4 months on stable dose of acceptable medication
  - Citalopram
  - Escitalopram
  - Sertraline
  - Fluoxetine
  - Bupropion
  - Low Dose Venlafaxine
  - Paroxetine very sedating and generally not acceptable

SSRIs

- Professional pilots and Air Traffic Controllers will have to provide a report from a Psychiatrist
- Private pilots may submit report from Family Physician or Nurse Practitioner
- ***Please** remember to write dosages and start and stop dates!!*
- https://www.tc.gc.ca/eng/civilaviation/publications/tp13312-2-menu-2331.htm#psychiatry-ssris

In Summary

- Family Physicians have an important role in aviation safety.
- Duty to report any significant medical condition under Aeronautics Act
- When prescribing to Pilots and Air Traffic Controllers, think of underlying condition and side effects
- When in doubt, ask
- We answer the phone!

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Civil Aviation Medicine Website

https://www.tc.gc.ca/eng/civilaviation/opssvs/cam-menu.htm

Civil Aviation Medicine Jobs

https://www.canada.ca/en/public-service-commission/jobs/services/gc-jobs.html

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Session #: T197

Session Name: My Patient is a Pilot: What do I need to know?

YOUR FEEDBACK IS IMPORTANT TO US!