

### Headache

Aeromedical Decision-Making Considerations

#### **Dr Sarita Dara**

MD (Aerospace Medicine), MSS (ISU), GDOM, PGDipPH, PhD FASMA (US), FACASM (Oceania), FRAeS (UK), Academician (IAASM) CNZHFE, MRO Senior Medical Officer (Aviation Medicine)



### Introduction

Headache is a common neurological symptom in Aviation Medicine It can be benign or can signal an underlying incapacitating condition

Objective:

Share CAA NZ's approach to Headache assessment and certification

Civil Aviation Authority 23 June 2025

### Case study

- 23-year-old applicant, Initial application for Class 1 and 2
- Headache history declared in application for medical certificate
- Date of first headache episode: January 2015
- Most recent headache episode: March 2025
- Number of headaches in last 1 year 6, irregular frequency
- Duration 2-4 hours
- Medication taken: Ibuprofen and Topiramate 50 mg (prevention) prescribed by specialist

Civil Aviation Authority 23 June 2025

### Case study

- Reports symptoms as distracting, sometimes major distracting (when headache is severe)
- Associated with nausea and vomiting, only with severe headache
- No photophobia
- Has visual aura "blurring"
- Numbness in face and fingertips
- "can feel it coming on with visual blurring, sometimes cannot feel sensation in my face, numbness in face and fingertips, then headache. I can continue working most times, and only take Ibuprofen as required. Pain Severity is 5-8/10"
- Triggers Stress and lack of sleep
- Diagnosed as Migraine (Neurologist in 2020, prescribed Topiramate 50 mg)
- Stopped all medication about 1 month ago
- No headache in the past month



### Questions

- What are the considerations for assessment for this application for a medical certificate?
- What further information would you need?
- What is the aeromedical disposition?

### Headache: There are many types!

#### The International Classification of Headache Disorders - ICHD-3

#### The Primary Headaches

- Migraine
- Tension type headaches
- Trigeminal autonomic cephalagia (TAC's)
- Other primary headache disorders

#### The Secondary Headaches

- Trauma
- Cranial or cervical vascular disorder
- Infection
- Substance use or its withdrawal
- Other secondary headache disorders

#### Neuropathies & Facial Pain and other Headaches

### **Headache: Aeromedical Challenge**

- Common condition
- Various types
- Under diagnosed
- Inadequately treated
- Incapacitation variable
- Difficulty to predict future events and its progression
- Medications and medication side effects
- Compliance with medications
- Operational impact

### Medical Certificate Application form



MEDICAL	HISTORY Have you ever experienced any o	of the follow	ving: (pleas	se tick the o	correct answer)	
1.1	Eye or vision trouble	Y 📵	N (	1.37	Anxiety disorder/panic disorder	Y () N ()
1.2	Needed new glasses or contact lenses since last CAA medical examination	Υ (	N (	1.38	Learning difficulty	Y 🔵 N 💿
1.3	Eye or comeal surgery	Υ ( )	N (	1.39	Attention deficit or hyperactivity disorder	Y 🔵 N 💿
1.4	Hay fever	Y (0)	N ()	1.40	Post traumatic stress disorder	Y () N ()
1.5	Middle ear infection	Υ ()	N (e)	1.41	Suicide attempt	Y () N ()
1.6	Sinusitis	Υ ()	N (	1.42	Any mental illness	Y () N ()
1.7	Hearing trouble	Υ ()	N (	1.43	Substance dependence or	Y O N ®
1.8	Problems with balance	Y ()	N 💿		substance abuse  Use of legal or illegal recreational	
1.9	Any other ears, nose & throat problems or surgery	Y ()	N 💿	1.44	drugs or substances	Y () N ()
1.10	Asthma or wheezing	Υ ( )	N (	1.45	Alcohol dependence or abuse	Y () N ()
1.11	Chronic cough	Υ (	N (e)	1.46	Muscle, bone or joint injury	Y O N 💿
1.12	Any other lung problems	YO	N (	1.47	Back pain, injury or 'back trouble'	Y () N ()
1.13	Any shortness of breath	v ()	N (	1.48	Swollen or painful joints	Y ○ N ●
1.14	Pulmonary embolism or deep	Υ ()	N (	1.49	Suffered any pain severe enough to be disabling	Y 🔵 N 🖲
	vein thrombosis		_	1.50	Passed blood with or in urine or faeces	Y ○ N ●
1.15	Coughed or vomited blood	Y ()	N ()	1.51	Kidney, bladder or prostatic disease	Y 🔵 N 💿
1.16	Any severe allergy	Y ()	N (•)	1.52	Easy fatigue-ability or sleep in the day	Y () N ()
1.17	Heart problem Vascular problem	Y ()	N (	1.53	Investigations for abnormal glucose tolerance, high blood sugar, or diabetes	Y ○ N ●
1.19	Suffered any chest pain	γ ()	N (III)	1.54	Medical Certificate for absence of 7 or more days from work or school	Y () N ()
1.20	Rheumatic fever	v 🔾	N (	1.55	Rejection or premium loading for life or health insurance	Y () N ()
1.21	High or low blood pressure	Y (	N 💿	1.56	Rejection or retirement from	v 🔾 N 🔘
1.22	Severe abdominal pain	Y (	N (		employment on medical grounds	-0
1.23	Hernia	Y (	N (	1.57	Admission to hospital, psychiatric or in patient facility	A 🔘 N 🕡
1.24	Oesophagus, stomach, liver, gall bladder or intestinal trouble	Y ()	N	1.58	Taken any type of medicine or alternative medicine for more than 2 weeks	Y 🍥 N 🔘
1.25	Diagnosed or treated for cancer, tumour, growth or malignancy (including skin cancer)	Y ()	N	1.59	Had a positive laboratory test for HIV infection	Y () N (
1.26	Anaemia or blood disease	γ 🔘	N 💿	1.60	Investigation for any disorder	Y 💿 N 🔘
1.27	Headaches/migraines which have interfered in any way with daily living	Y (	N (	1.61	Any major medical or surgical procedure	Y 🔵 N 💿
1.28	Headaches/migraines requiring medication	Y (	N ()	1.62	Day surgery	Y 🔵 N 💿
1.29	Dizziness or fainting spell	ν 🔾	N (	1.63	Any other illness, disability, debility, infirmity, treatment or surgery	Y 🔾 N 💿
1.30	Unconsciousness for any reason	γ ()	N (	FEMALE	SONLY	
1.31	Head injury	ν ()	N (	1.64	Any troubling menstrual problems	Y () N ()
1.32	Seizures/fits	Υ 🔾	N (	1.65	Other gynaecological problem	Y () N ()
1.33	Stroke	Υ ()	N (	1.66	Any obstetric problem	Y () N (e)
1.34	Paralysis	ν ()	N (	1.67	Breast lump or other breast problem	Y () N (•)
1.35	Any other neurological disorder	v ()	N (iii	1.68	Pregnancy - Are you pregnant?	Y () N (•)
		- 0				

Civil Aviation Authority 23 June 202

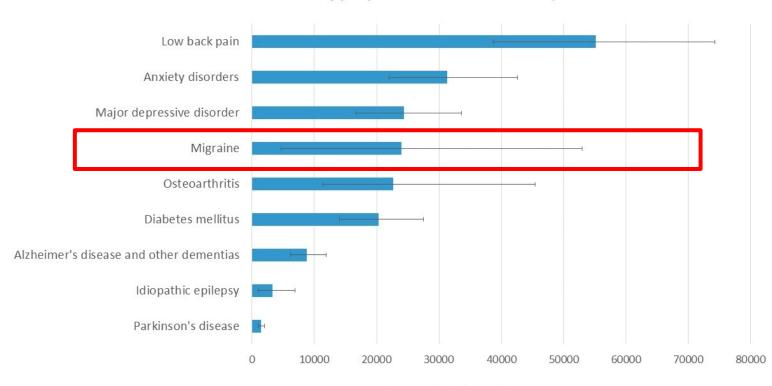
### Migraine

- Common disabling primary headache disorder
- Affect 1 in 7 people globally
- Ranked second—highest cause of disability worldwide (Global Burden of Disease 2018)
- Affects three times as many women as men

Civil Aviation Authority 23 June 2025

### **New Zealand Data**

#### Years lived with disability (YLD) for diseases in New Zealand, 2019



n=642,000

Social and economic costs – approx. NZ\$ 5 billion a year

Rate per 100,000 population



Based on Global Burden of Disease data (http://ghdx.healthdata.org/gbd-results-tool, accessed February 2022)

### Migraine is more than a headache

"...capable of distraction or interfering with the visual, sensory and motor functions, affecting the ability to concentrate because of pain, nausea, vomiting, photophobia, and impaired motor function..."

"Rapid speed of onset, unexpected onset, long episode duration of few hours or longer, need for strong analgesia, and disruption/cessation of activities"

Civil Aviation Authority 23 June 2025 10

### **Overlapping Phases**

- Premonitory phase hours or days, non painful symptoms
  - Yawning, mood changes, difficulty concentrating, neck stiffness, fatigue
- Aura transient focal neurological symptoms in a third of patients
  - Visual aura (90%), sensory aura (30-45%) and language aura (31%)
- Headache- throbbing pain, progressive, disruptive
  - Associated with nausea and vomiting, photophobia, phonophobia
- Postdrome migraine hangover
  - Tiredness, drowsiness, hypersensitivity to noise, difficulty concentrating

Can last 4-72 hours

### **Aeromedical Considerations**

#### **Triggers**

- Stress
- Fatigue
- Lack of sleep
- Hormonal changes
- Strong light
- Exertion
- Weather changes

#### **Challenges**

- Triggers are common
- Clinical course cannot be predicted
- Definitive intervention not often possible
- Aviation environment can be provocative
- Medications and flying

### Co morbidities

A good example of research into migraine and comorbid conditions was the MAST study, by Buse et al., (2020), which surveyed over 90,000 people, 15,133 who live with migraine. Not only did the study find a number of conditions associated with migraine (Fig 1.), they also found p with more headache days per month and worse pain have an increased risk for almost all conditions; most significantly, comorbid gastric ulcers/GI bleeding, diabetes, anxiety, depression, insomnia, asthma and allergies/hay fever.

Figure 1. Odds ratio for migraine vs. non-migraine for each health condition

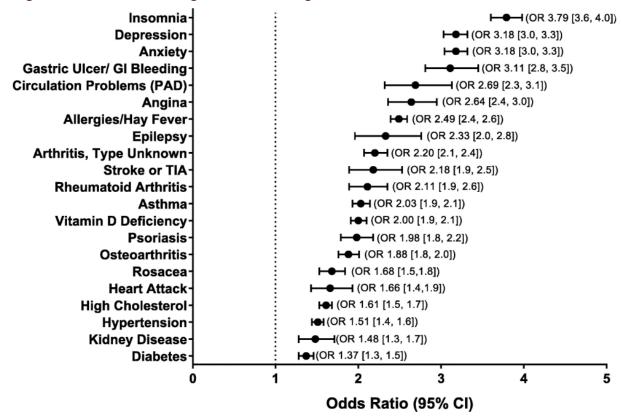


Image Courtesy Busa et al (2020) from Comorbidities - Migraine Australia

### Assessment approach

- AME initial evaluation: triage and escalation protocols
- Headache investigation report for all cases presenting with history of migraine or recurrent headaches and any episode of moderate or severe headache in recent years
- General Practitioner medical notes for a period of time
- Specialist neurologist report (as applicable )

#### Part 67 headache/migraine investigation report

Applicant Name:

Class(es) of Medical Certificate sough



CAA Participant Number

	Class 1				Clas	s 2					Class 3		
						His	tory						
Date	of first attack					****	,	Date	of the	e n	nost recent attack		
Number of headaches in the last year											es an attack last?		
		,											
					- 1	Medi	icatio	n					
For symptoms							Forp	preventi	on				
Description of your headaches or other migraine they affect you (in applicant's own w													
										1 (N	nild)	j	10 (Severe)
						Yes	No		If ye	es,	give details and degr	ee of capa	city
1.	Avoidance o	f routine activity											
2.	Distraction				Ĩ								
3.	Nausea				[								
4.	Vomiting				[								
5.													
6.	Motor or ser	nsory features			[								
7.	Aura / visual	symptoms											
8. Acute medical / hospital treatment needed													
<ol> <li>Any other symptoms e.g. mood changes, sleep disturbance or hangover effects</li> </ol>			•р [										
					Sei	verit	y Crite	eria					
Dis	tracting (able	tracting to continue but ma erformance)	,	Α	Able to	conti		cting ctivity be mpaired			Unable to conti	acitating nue routin	e activity
					Pre	dict	ability	y Factor	rs				
Patte	erns		Yes	No	N/A		•			e de	etails and degree of	capacity	
1.	Premenstru	al						,-	, 6				
2.		ve medication	H	一									
3.	Hormonal m		H	$\equiv$	$\Box$								
Trigg					_								
4.	Foods												
5.	Alcohol or o	ther beverages	$\Box$										
6.	Stress												



✓ Symptoms

✓ Frequency

✓ Duration

✓ Severity

✓ Incapacity

✓ Aura

✓ Rapidity of onset

✓ Therapy and effectiveness

#### Part 67 headache/migraine investigation report

Applicant Name:

Page 1 of 2

C
//

CAA Participant Number

Class(es) of Medical Certificate sought					
Class 1	Class 2			Class 3	
	Hi	story			
Date of first attack	711.	iory	Date of the	most recent attack	
Number of headaches in the last year			How long do	es an attack last?	
·					
	Med	ication			
For symptoms		For pr	evention		
Description of your headaches or other migraine symptoms and how they affect you (in applicant's own words)  Pain headache intensity scale (Applicant mark on line using "!")					
				L 5 Mild)	10 (Severe)
	Yes	No	If yes,	give details and degr	ee of capacity
Avoidance of routine activity					
2. Distraction					
3. Nausea					
4. Vomiting		Щ			
5. Photo / phonophobia (light, noise	intolerance)				
Motor or sensory features     Aura / visual symptoms		Н			
Aura / visual symptoms     Acute medical / hospital treatmer	nt needed	H			
Any other symptoms e.g. mood cl					
disturbance or hangover effects		_			
	Severit	y Criter	ria		
Distracting Distracting (able to continue but may impair performance)		ce is im	ivity but		acitating nue routine activity
	Predict	ability	Factors		
Patterns	Yes No N/A		If yes, give d	etails and degree of o	apacity
1. Premenstrual					
2. Contraceptive medication					
3. Hormonal medication					
Triggers					
4. Foods					
Alcohol or other beverages     Stress					
7. Other					
53161					

Any warning signs of the headach	e 🗆 Yes	□ No			
How long before the attack?		Describe the warning			
Medical Examiner	o complete (asses	ssment of headache	e/migraine	e symptoms	and management)
Management of symptoms		gement of triggers	;		t management (if applicable)
☐ Excellent	☐ Excel	lent			cellent
Good	Good	l			ood
Sub Optimal	Sub C	Optimal		Su Su	ub Optimal
	Additional Inform	<b>ation</b> (please attac	h to this a	s available)	
GP notes (required if	Neurologist S	pecial Eye Report	Other (ple	ease specify)	
obtainable)					
Examiner's Declaration: I hereby of that this report, with any attached					ned on this medical report and
that this report, with any attached	notes, embodies m	y examination compi	etery and c	orrectly.	
Examiner Name					
Signature		D	ate of Appl	lication	
Medical Exam	ner comments ab	out aeromedical ri	isks associ	ated with h	eadache/migraine

CAA 24067-215 Rev.

6: April 2025

Warning Signs (pain/vision/tingling etc)

23 June 2025

Page 2 of 2

### **Diagnosis**

 Based on IHS Classification of The International Classification of Headache Disorders 3rd edition

Civil Aviation Authority 23 June 2025 16

#### 1. Migraine

- 1.1 Migraine without aura
- 1.2 Migraine with aura
  - 1.2.1 Migraine with typical aura
    - 1.2.1.1 Typical aura with headache
    - 1.2.1.2 Typical aura without headache
  - 1.2.2 Migraine with brainstem aura
  - 1.2.3 Hemiplegic migraine
    - 1.2.3.1 Familial hemiplegic migraine (FHM)
      - 1.2.3.1.1 Familial hemiplegic migraine type 1 (FHM1)
      - 1.2.3.1.2 Familial hemiplegic migraine type 2 (FHM2)
      - 1.2.3.1.3 Familial hemiplegic migraine type 3 (FHM3)
      - 1.2.3.1.4 Familial hemiplegic migraine, other loci
    - 1.2.3.2 Sporadic hemiplegic migraine (SHM)
  - 1.2.4 Retinal migraine
- 1.3 Chronic migraine
- 1.4 Complications of migraine
  - 1.4.1 Status migrainosus
  - 1.4.2 Persistent aura without infarction
  - 1.4.3 Migrainous infarction
  - 1.4.4 Migraine aura-triggered seizure
- 1.5 Probable migraine
  - 1.5.1 Probable migraine without aura
  - 1.5.2 Probable migraine with aura
- 1.6 Episodic syndromes that may be associated with migraine
  - 1.6.1 Recurrent gastrointestinal disturbance
    - 1.6.1.1 Cyclical vomiting syndrome
    - 1.6.1.2 Abdominal migraine
  - 1.6.2 Benign paroxysmal vertigo
  - 1.6.3 Benign paroxysmal torticollis

### Certification considerations: Generic guidance

A history of headaches / migraines should be assessed as being of aeromedical significance unless:

- There is absence of nausea, vomiting, photophobia, phonophobia, aura, sensorial or motor features; and
- There is an avoidable triggering cause;
- There is no need to take medication other than Paracetamol or a NSAID;
- There is no need to attend for acute medical treatment; and
- There is no inability to carry on with a task when suffering from an episode of headache / migraine; and
- The headaches / migraines are infrequent, occurring less than twice per year; or
- The headaches / migraines have not occurred in the past 5 years; or
- The headache / migraine was a single event related to a temporary benign illness.

### Flexibility process (Accredited Medical Conclusion)

- Through the flexibility process many cases of migraines / headaches have a favourable outcome.
  - A Class 2 applicant with migraines that are predictable and infrequent, have auras of slow onset, do not interfere with function, and are not accompanied by severe headaches, vomiting or neurological impairment, is likely to obtain a medical certificate ...with operational restrictions.
  - A Class 1 applicant is less likely to be issued a certificate. However a young applicant, with a similar history of mild migraines / headaches, who has been free of symptoms for over two years, is more likely to obtain a medical certificate following the flexibility process. Operational restrictions may apply.
- Risk Based, evidence informed, focusing on medical as well as operational mitigations

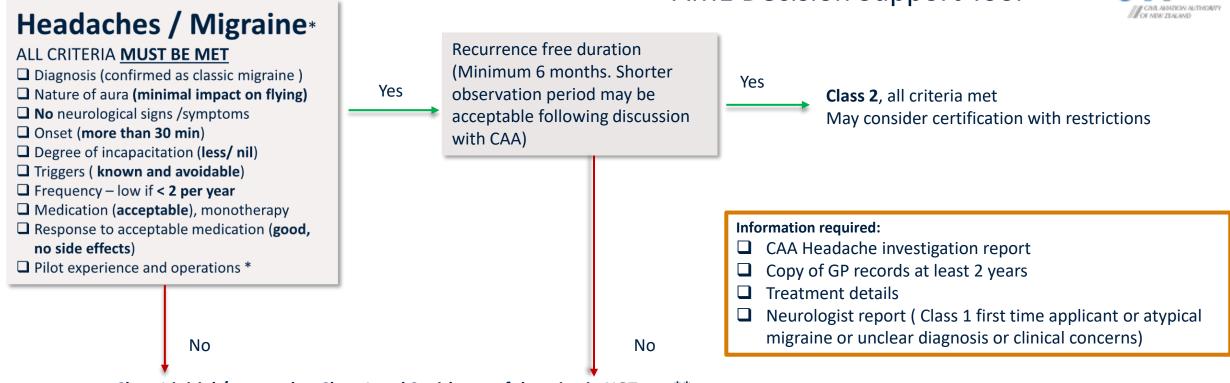
### Certification decision making pathway

- Initial AME evaluation
- Red flags and escalation criteria
- Additional information and investigations
- Certification outcome limited vs full certification, conditions for surveillance and operational conditions
- Review of conditions in the future

Civil Aviation Authority 23 June 2025 19

#### **AME Decision Support Tool**





Class 1 initial / renewal or Class 1 and 2 with any of the criteria <u>NOT</u> met\*\* including unclear diagnosis, migraine variants – then flexibility (AMC) pathway

- \*Fixed wing / Helicopter / Single crew/ Multicrew /Type of operations /Pilot Experience
- \*\*If any of the following factors are present assess as aeromedically significant (flexibility (AMC) pathway recommended)
- 1) Diagnosis is not confirmed or unclear
- 2) Significant aura including nausea, vomiting, photophobia, phonophobia, sensory or motor symptoms
- 3) Onset less than 30 min
- 4) Significant incapacitation
- 5) No consistent avoidable triggers
- 6) Frequency more than 2 per year
- 7) Not acceptable medication <u>or</u> poor response to acceptable medication <u>or</u> stopped medication recently <u>or</u> changed medication recently <u>or</u> uses more than 1 medication <u>or</u> uses injectables

### **Comparative analysis**

	Features	Recurrence free
CAA NZ	Usually flexibility process, some cases ME can isssue Favourable features: predictable, slow onset, not interfering, not severe headaches, vomiting or neurological features	Class 1 – 2 years Class 2 – minimum of 1 year Usually with restrictions *Operational aircrew (case by case)
CASA	Demonstrated stability with acceptable medications Favourable features: known and avoidable triggers, sufficient warning of impending symptoms	Minimum of 3 months Restrictions may apply
CAA UK	Last attack disabling or not Favourable features: obvious and avoidable precipitating factor	Class 1 – minimum of 6 weeks to 3 months before certification can be considered, initially restricted for Class 1 Initial Class 1 – minimum of 1 year
FAA	Acceptable types with acceptable medication, AME can certify	Certification possible with no more than 1 episode / month

Civil Aviation Authority 23 June 2025 21



22

### **Aeromedical Considerations**

- Application
  - Class 1 / Class 2 / Class 3 (ATC)
  - Initial or Renewal
  - Type of operations
- Condition
  - Severity (symptoms/impact)
  - Frequency of recurrence
  - Recurrence free duration
- Treatment / Effectiveness of treatment
  - Symptom management (individual response varies)
  - Relapse prevention
  - Side effects
  - Stable dose
  - Duration of use
  - Acceptability

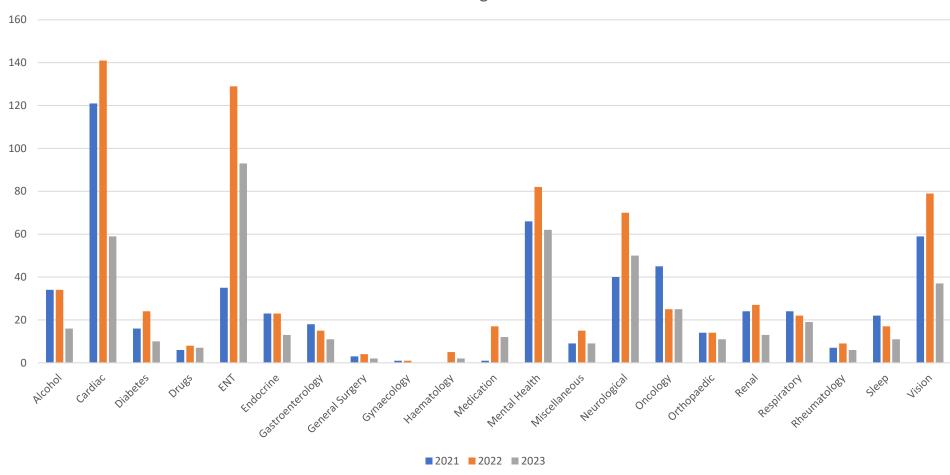






### **Accredited Medical Conclusion**

AMC Clinical Categories 2021 - 2023





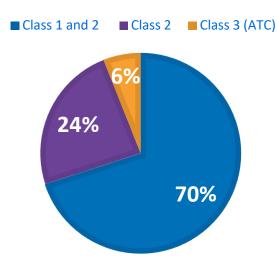
### **Accredited Medical Conclusion Data (2021 - 2023)**

Application	n
Class 1 and 2	35
Class 2	12
Class 3 (ATC)	3

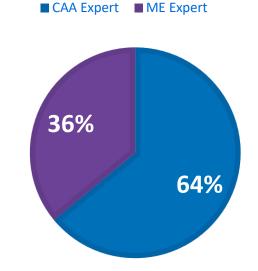
Experts	n	
CAA	32	
ME	18	

Certification	n	
Certified	35	Includes the Class 3 (ATC), with restrictions
Not certified	15	3 withdrawn

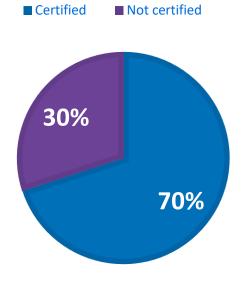
#### **APPLICATION**



#### **AMC EXPERTS**



#### **CERTIFICATION**



### **Lessons Learnt**

- Development of clear triage protocols and decision support tools
- Training of AME with realistic case scenarios during our AME training session
- Reducing delays in certification process
- Evidence informed certification
- Benchmarking with other regulators
- Continuous improvement

Civil Aviation Authority 23 June 2025 25

### Case study

- 23-year-old applicant, Initial application for Class 1 and 2
- Date of first headache episode: January 2015
- Most recent headache episode: March 2025
- Number of headaches in last 1 year 6, irregular frequency
- Duration 2-4 hours
- Medication taken: Ibuprofen and Topiramate 50 mg (prevention) prescribed by specialist
- "can feel it coming on with visual blurring, sometimes cannot feel sensation in my face, numbness in face and fingertips, then headache. I can continue working most times, and only take Ibuprofen as required. Pain Severity is 5-8/10"; distracting, sometimes major distracting (when headache is severe)
- Associated with nausea and vomiting, only with severe headache, No photophobia
- Triggers Stress and lack of sleep
- Diagnosed as Migraine (Neurologist in 2020, prescribed Topiramate 50 mg)
- Stopped all medication about 1 month ago
- No headache episodes since

26



### **Questions for discussion**

- What are the considerations for assessment for this application for a medical certificate?
- What further information would you request?
- What is the aeromedical disposition?

### Resources

CAA NZ Medical Manual Migraines and headaches | aviation.govt.nz

CAA NZ 24067-215 - Headache/migraine investigation report (aviation.govt.nz)

CASA Headache (including migraine) | Civil Aviation Safety Authority (casa.gov.au)

CAA UK Neurology guidance material GM | Civil Aviation Authority (caa.co.uk) and migraine-flow-chart-v2.pdf

FAA <u>HEADACHE or MIGRAINE (faa.gov)</u> and <u>CACI - Migraine and Chronic Headache Worksheet (faa.gov)</u>

Headache Classification The International Classification of Headache Disorders - ICHD-3

Headache diary <u>Keeping a headache diary - The Migraine Trust</u>

# ARE YOU FIT TO FLY?



Remember to give yourself the 'I'M SAFE' check before you take to the sky!







## Thank you



Acknowledgements:

Dr Tim Sprott, Chief Medical Officer, CAA NZ

Dr Claude Preitner, Senior Medical Officer, CAA NZ

