

# DEBATE ON CVA



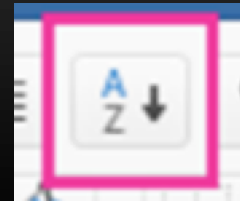
Associate Professor  
Pooshan Navathe

Dr Punita Masrani

Dr David Powell

Dr Sanjiv Sharma

Dr Quay Snyder



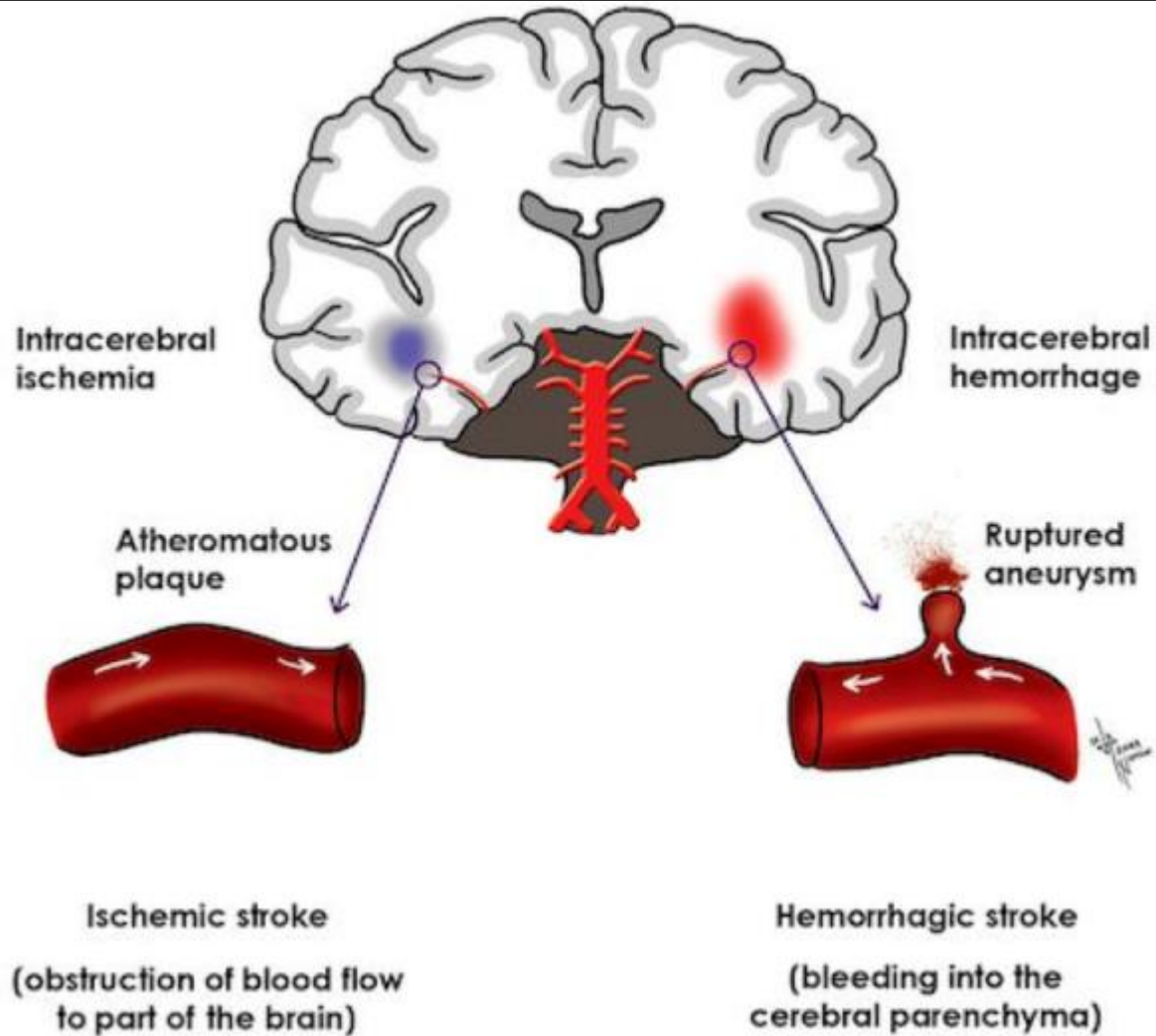
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## DEFINITION

CVA (stroke) is characterized by the sudden loss of blood circulation to an area of the brain, resulting in a corresponding loss of neurologic function

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# PROPOSITION

It is safe for a pilot to fly after a CVA

ALL IN FAVOUR.....

# FORMAT

- Dr Powell For the proposition
- Dr Sharma against
- Dr Snyder for
- Dr Masrani against
  
- Contributions, comments & questions from the floor
  
- Summing up by panel against
- Summing up by a speaker for





**KEEP  
CALM  
AND  
KEEP AN  
OPEN MIND**



# ICASM 2018

BANGKOK



## SHARING THE SKY SAFELY

11-15 November 2018 Millennium Hilton Bangkok, Thailand



**SHARING**





**KEEP  
CALM  
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# Debate – The “Pro” Position

## CVA/TIA and Flying

Quay Snyder, MD, MSPH

President & CEO,  
Aviation Medicine Advisory Service

Aeromedical Advisor  
Air Line Pilots Association, International

15 November 2018



# Disclaimer

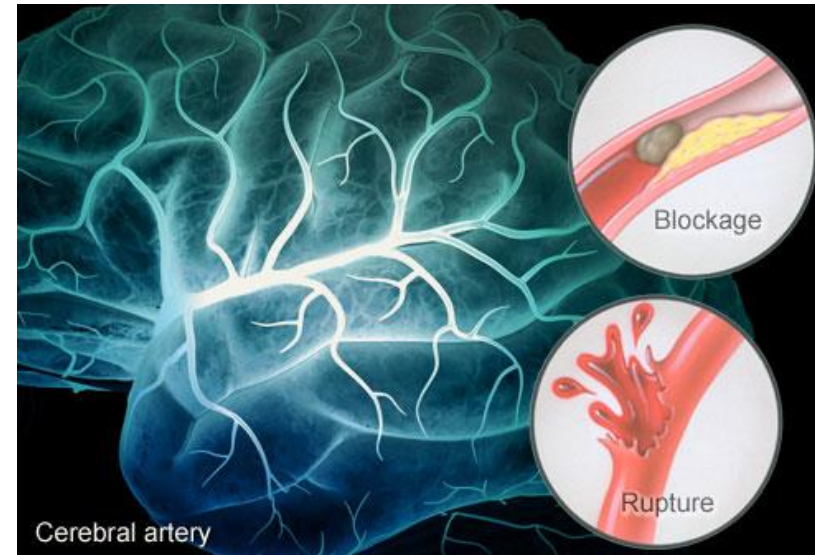
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- Aeromedical Advisor, Air Line Pilots Assoc., Int'l
- No financial relationships or benefits
- Opinions expressed are my own
- Like David, I was “voluntold” to defend this position



# Types of Cerebrovascular Accident

- Ischemic –
  - Cardiovascular
  - Thrombotic
  - Compressive
- Hemorrhagic
  - Arteriovenous Malformation
  - Arterial Dissection
  - Tumor
  - Others





# US FAA Regulations

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- **§ 67.109 Neurologic.**
- Neurologic standards for a first-class airman medical certificate are:
- **(a)** No established medical history or clinical diagnosis of any of the following:
  - **(3) A *transient loss of control of nervous system function(s) without satisfactory medical explanation of the cause.***
- **(b) No other** seizure disorder, disturbance of consciousness, or ***neurologic condition*** that the Federal Air Surgeon, based on the case history and appropriate, qualified medical judgment relating to the condition involved, finds –
  - **(1)** Makes the person ***unable to safely perform the duties*** or exercise the privileges of the airman certificate applied for or held; or
  - **(2) *May reasonably be expected, for the maximum duration of the airman medical certificate applied for or held,*** to make the person unable to perform those duties or exercise those privileges.

# US FAA Guide to AME's

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“Completed stroke or TIA – Requires FAA decision” – All classes

- Neurologic
  - Imaging
  - Neurological exam
- Cardiovascular
  - Exercise stress testing
  - 24 hour Holter monitor
  - Echocardiogram
  - Carotid Doppler
- Metabolic
  - Fasting Blood glucose
  - Lipids
  - Complete blood count
  - Coagulation profile

# US FAA Guide to AME's

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“Completed stroke or TIA – Requires FAA decision” – All classes

- Neurocognitive Evaluation

- Review of all records by FAA trained neuropsychologist
- CogScreen AE
- WAIS – processing speed and working memory
- Trails Test A & B
- Executive function - Wisconsin Card Sorting Test, & Stroop Color-Word Test
- Paced Auditory Serial Addition Test (PASAT).
- A continuous performance test
- Test of verbal memory
- Test of visual memory
- Tests of Language
- Psychomotor testing
- Personality testing to include MMPI-2

- NOTE – No simulator testing

# US FAA Observation Period

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- Standard
  - 2 years from most recent event
  - All risk factors controlled
- Exceptional circumstances
  - 1 year from event
  - Easily identifiable & avoidable or treated provocateur (e.g. Patent Foramen Ovale, traumatic vertebral artery dissection)
  - Atrial fibrillation – evolving policy
- Review
  - FAA Cardiac Panel
  - FAA Neurology panel

# Risk Mitigation

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- Management of Hypertension
- Adequate Control of Blood Glucose
- High Dose Statin Therapy if CVA due to Cardiovascular Ds
- Treatment of Obstructive Sleep Apnea
- Smoking Cessation / Avoidance of Second – Hand Smoke
- Regular Physical Activity  
(120 – 150 min/wk moderate- vigorous exercise)
- Anti-platelet therapy

# DHC-3 Fatal Accident - 2010



- Killed - Senator Ted Stevens + 4
- Survived –  
Former NASA Administrator and CEO Airbus Group, Sean O’Keefe  
Deputy Administrator to NASA James Morhard + 3
- NTSB Report – “The Federal Aviation Administration's internal guidance for medical certification of pilots following stroke is inadequate because it is conflicting and unclear, does not specifically address the risk of recurrence associated with such an event, and does not specifically recommend a neuropsychological evaluation (formal cognitive testing) to evaluate potential subtle cognitive impairment.”

# DHC-3 Fatal Accident - 2010

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- Probable Cause -the pilot's "temporary unresponsiveness for reasons that could not be established from the available information."
- "A medical condition leading to transient incapacitation or impairment (of the pilot) could explain the circumstances of this accident," ..... However,..... "it is not possible to determine whether such a scenario occurred."

# US Experience

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- Certification for 20+ years – ? Dozens per year
- Several databases within the Aeromedical Certification Division
  - Difficult to isolate CVA/TIA from other neurological insults
  - Manual review required to determine certification after recurrent stroke
  - Stroke after previous certification with Special Issuance unknown if pilot elects to not reapply for medical certification
- FAA Cardiology and Neurology Panels
  - Vary philosophically from panel to panel
  - Increasing involvement
  - Neurocognitive testing subsequent to Alaska Accident



# **STROKE REGULATORY PERSPECTIVES**

CVA Debate  
ICASM 2018 - Bangkok

# ICAO

- Ischemic and hemorrhagic stroke -  
Disqualifying for all classes of medical certification
- Heterogenous entity with many causes
- Individual evaluation

# ICAO

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
PFO with paradoxial embolism and successful closure	Case to case basis	1 year		Young	
Arterial dissection		1 year		<ul style="list-style-type: none"><li>• No recurrence</li><li>• Risk of recurrence &lt;1%</li></ul>	
Lacunar stroke with hypertension related small vessel disease		1 year			

# ICAO

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Atherothrombotic disease with risk factors	Case to case Basis	2 years			
Hemorrhagic strokes – with cause identified and addressed satisfactorily		1-2 years	Recurrence risk evaluated	<ul style="list-style-type: none"> <li>• Full neurological evaluation indicates satisfactory recovery,</li> <li>• No relevant risk factors</li> </ul> e.g. Hemorrhages related to anticoagulants may not result in significant deficit	

# Transport Canada



# Transport Canada

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Ischemic Hemorrhagic	Unfit				
Lacunar	Case to case basis	4 years	<ul style="list-style-type: none"> <li>• Repeat MRI</li> <li>• 2D Echo</li> <li>• Carotid artery Doppler</li> </ul>	<ul style="list-style-type: none"> <li>• Small</li> <li>• stable</li> <li>• no significant deficits</li> <li>• risk factors controlled</li> </ul>	Multiple lacunae
Cerebral venous thrombosis	Case to case basis	2 years		<ul style="list-style-type: none"> <li>• No e/o* ongoing or recurrent risk</li> <li>• no e/o epilepsy</li> <li>• no significant sequelae from thrombosis</li> </ul>	

\*e/o – evidence of

# Transport Canada

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Arterial Dissections	Case to case basis	2 years	Repeat MRI	<ul style="list-style-type: none"><li>• Good recovery</li><li>• no e/o cerebral infarction</li><li>• no e/o epileptic seizures</li><li>• MRI – good restitution of flow</li><li>no e/o aneurysm</li><li>no e/o Sub Arachnoid Haemorrhage</li></ul>	

# FAA USA





# FAA USA

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Ischemic or Hemorrhagic Stroke	Specifically disqualifying condition Requires FAA decision for Special Issuance	2 years	<ul style="list-style-type: none"> <li>• All hospital records</li> <li>• neurological evaluations</li> <li>• brain scans</li> <li>• current neurological evaluation</li> <li>• MR or CT Angio head and neck</li> <li>• FBS, S. Lipids</li> <li>• Carotid artery Doppler</li> <li>• Cardiovascular evaluation</li> <li>• 2D Echo</li> <li>• TMT</li> <li>• <b>NEUROCOGNITIVE TESTING</b></li> </ul>		

# FAA USA

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Treatable cause – Afib, Blockage in artery that can be treated	Exception	1 year			

# UK CAA



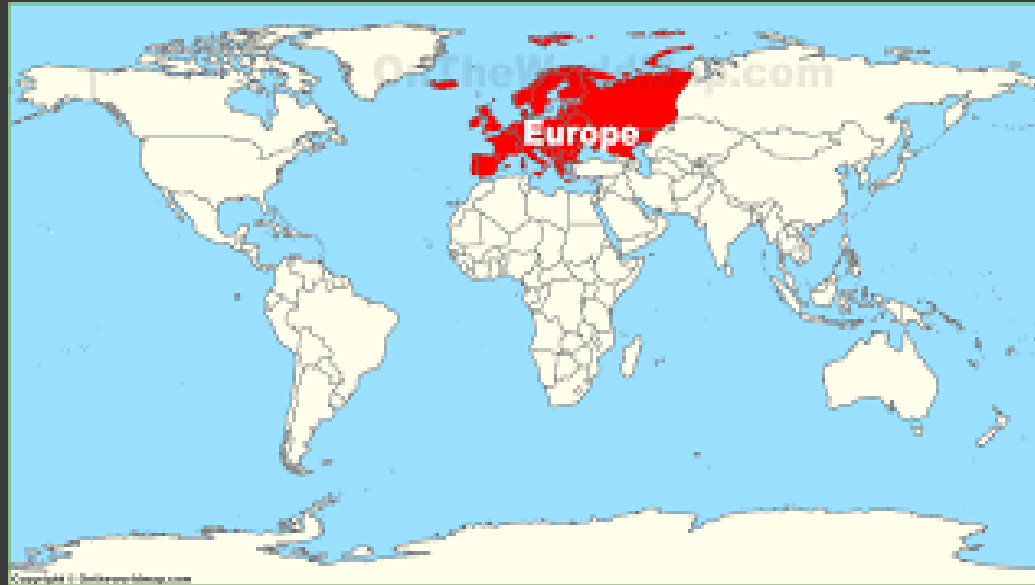
# UK CAA

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Class 1	UNFIT				

# UK CAA

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Existing Class 2 holders	OSL - Case to case basis	1 year	<ul style="list-style-type: none"> <li>• All hospital records</li> <li>• Neurological evals</li> <li>• Risk factors control assessment</li> <li>• Cardiovascular eval</li> <li>• TMT (annual)</li> <li>• 2D Echo, Holter</li> <li>• Caroid artery Doppler</li> <li>• Thrombophilia screening if indicated,</li> <li>• <b>VISUAL FIELD MAPPING</b></li> <li>• <b>MEDICAL FLIGHT TEST</b></li> </ul>	<ul style="list-style-type: none"> <li>• No residual impairment,</li> <li>• Age &lt;70,</li> <li>• No- DM, uncontrolled HTN, CAD, AFib, Heart failure, anticoagulation, no stenotic lesion &gt;50%</li> <li>• Annual cardiological review with TMT, review and investigation of risk factors</li> </ul>	

# EU States



# EU States

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Stroke	Case to case basis OML permanent if risk 1-2%	1 year	<ul style="list-style-type: none"> <li>• Baseline investigations</li> <li>• Signs of recovery</li> <li>• <b>VISUAL FIELDS</b></li> <li>• Psychology report if indicated</li> <li>• Management of underlying medical condition</li> <li>• Estimation of risk recurrence</li> <li>• Cardiovascular evaluation</li> <li>• <b>Medical Flight Test</b></li> </ul>	<ul style="list-style-type: none"> <li>• Complete recovery</li> <li>• Full visual fields</li> <li>• Normal psychology report</li> <li>• Successful closure of PFO</li> <li>• Afib well managed and covered by DOACs</li> </ul>	Risk >2% - UNFIT Class 1

# CASA Australia





# CASA Australia

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
		1 year	<ul style="list-style-type: none"> <li>• Hospital records,</li> <li>• Neurological evaluations</li> <li>• Brain scans</li> <li>• Blood tests</li> <li>• Current neurological evaluation</li> <li>• Functional assessment if required</li> <li>• Cardiovascular assessment before certification</li> </ul>	<ul style="list-style-type: none"> <li>• Successful treatment of reversible cause</li> <li>• Absence of significant risk factors</li> <li>• Artery dissection as cause</li> <li>• Age 18-50 years</li> </ul>	<ul style="list-style-type: none"> <li>• Permanent/significant functional impairment</li> <li>• Significant CAD, Co-morbidities – Diabetes, uncontrolled, Hypertension, CAD, AFib, Anticoagulation, previous TIA</li> </ul>

# CAA New Zealand



# CAA New Zealand

Cause of stroke	Likely outcome	Wait period	Risk assessment	Favorable factors	Unfavourable factors
Successful closure of PFO	Class 1, 2, 3 Case to case basis		<ul style="list-style-type: none"> <li>• Hospital records</li> <li>• Investigations</li> <li>• Neurological evaluations</li> <li>• GP notes of 2 years</li> </ul>	<ul style="list-style-type: none"> <li>• Adequately treated cause</li> <li>• Absence of safety relevant sequelae</li> </ul>	
All other causes	Class 1	Unlikely			
All other causes	Class 2 – Restricted fitness case to case basis	2-3 years	<ul style="list-style-type: none"> <li>• Hospital records,</li> <li>• Investigations</li> <li>• Neurological evaluations</li> <li>• GP notes of 2 years</li> </ul>	<ul style="list-style-type: none"> <li>• Absence of sequelae</li> <li>• No identifiable vascular disease or cardiac ischemia</li> </ul>	

# *Aeromedical Tourism??*