

# Inflight Incapacitation in The Era of COVID-19

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# Outline

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# Definitions

Definition of Incapacitation Inflight may vary considerably depending on:

1. Interest of the Observer(s)
2. Perspective
3. Population of Pilots being studied
4. Sources of Data( accident, surveillance, voluntary reporting or IC registries)
5. Incapacitation may occur when preparing for a flight, during pre-flight, while taxiing, airborne, on approach or landing or just after completing a flight – data/surveillance must cover the entire flight cycle.

# Definitions II

Definition of Incapacitation Inflight may vary considerable depending on:

1. “ Any change in the ability of a flight crew member to function appropriately whether due to physiological or psychological reasons”
2. “Inability of a pilot(flight crew member) who is part of the operating crew, to carry out their normal duties because of the onset, during flight of the effects of physiological factors”

# Definitions III

Definition of Incapacitation inflight may vary considerable depending on:

1. “ Any change in the ability of a flight crew member to function appropriately whether due to physiological or psychological reasons”

The definition of Incapacitation Inflight must be inclusive of all possible disease states and other temporary and traumatic causes.

Incapacitation Inflight is classified into Sudden and complete/Obvious e.g. Death inflight or Subtle and partial e.g. Stress and Fatigue

# Why Is Incapacitation Inflight A Safety Imperative?

- The impact of incapacitation inflight is Complete or Partial Loss of Control leading to accidents or incidents and loss of life and property;
- Obviously in a single pilot flight environment, the safety of the flight is severely compromised due to Loss of Control(LOC);
- Loss of Communication with ATC;
- In multi-crew operation, incapacitation of only one of the pilot is unlikely to present complete LOC , and this is mitigated during pilot training;
- Although rare it is possible to have Incapacitation of both Pilots;
- Compromised air space management e.g. infringement or loss of aircraft separation;
- Incapacitation places a heavy workload upon the remaining flight crew members.

# What Causes Incapacitation Inflight I

The causes of Incapacitation inflight are many and may be classified into two groups:- Physiological and Psychological

## A. Physiological

- ✓ Hypoxic hypoxia(Lack of enough oxygen) – flight above 10,000 ft in an unpressurised aircraft, or loss of cabin pressurisation;
- ✓ Cardiovascular disease(heart attack, arrhythmia) and Cerebrovascular disease (stroke, migraine, seizure, fainting or syncope)
- ✓ Gastrointestinal disease e.g. Food poisoning, diarrhoea and vomiting , bleeding peptic ulcer and Food allergy(common with sea food)
- ✓ Other medical & surgical emergencies e.g. ruptured ectopic pregnancy, low blood sugar, spontaneous abortion and COVID -19

# What Causes Incapacitation Inflight II

The causes of Incapacitation inflight are many and may be classified into two groups:- Physiological and Psychological

## A. Physiological

- ✓ Smoke, Fire & fumes in cockpit e.g. contamination of air conditioning system;
- ✓ Sleeping – Obstructive sleep Apnoea in obese Pilots , Circadian rhythm ;
- ✓ Physical Injury – Bird strike, or falling
- ✓ Malicious act e.g. assault by unruly passenger, terrorist, small firearms, high powered lasers used by person on the ground);
- ✓ Pesticide poisoning during locust control or crop spraying.



# What Causes Incapacitation Inflight II

The causes of Incapacitation inflight are many and may be classified into two groups:- Physiological and Psychological

## B. Psychological

- Alcohol and Drugs Use by flight crew member e.g. Positive alcohol or/and drug test results; - Very common and often unrecognised;
- Fatigue – lack of sleep, loss of focus, jet lag, ageing, flight after a heavy meal, over exertion;
- Stress due to social relationships, financial and emotional factors;
- Mental illness – Anxiety and depression – Common and rarely diagnosed;
- Any psychological condition that leads to impairment judgement and decision making.

# Recent Examples

## 1. A319, Vicinity Glasgow, UK, 2018

Airbus A319 Captain had to complete a flight into Glasgow with FO who left flight deck after suffering a flying related panic/anxiety attack. Emotional & performance related stress – Flight completed

## 2. A320 flight en-route North of Marseilles, France 2017

Both flight crew partially incapacitated by effects of fumes, detected when following a smaller aircraft on holding point in Geneva and waiting in line behind before taking off – Smoke and fumes in the cockpit

- Flight diverted

# Recent Examples

## 3. A320, Vicinity Abu Dhabi, UAE

Captain when positioning for approach to Abu Dhabi at night became incapacitated due to Stroke – Cerebrovascular disease with probable Coronary Artery Disease

FO took over and declared MAYDAY to ATC.

Captain had undiagnosed medical condition which predisposed him towards blood clot formation that led to stroke. ( COVID-19 and AF) are such conditions.

## 4. A320, vicinity London Heathrow, UK, 2019

On approach to London, flight crew detected strong smell(fumes in the cockpit), after donning oxygen mask, completed approach and landed safely – One pilot incapacitated and the other unwell after landing, other occupants unaffected

# Recent Examples

## 5. B738, Vicinity Porto, Portugal, 2015

While about to commence descent, a green laser was directed at the aircraft. The pilot flying responded by shielding his eyes and was unaffected, the other pilot sustained flash blindness and “ crew coordination was compromised ‘

# Recent Examples

Recent Local Examples;

FO had 2 episodes of seizures after landing at an International Airport in an Asian Country, - Alcohol and drugs suspected

A female Captain flying a commercial airliner while airborne sudden developed a ruptured ectopic pregnancy diversion not possible due to bad weather. – Flight safety was highly compromised, and she just made it to the hospital;

Cabin crew – Seizure on his way home from the airport after uneventful domestic flight – Alcohol and drugs, fatigue suspected.

# How COVID -19 & Vaccination May Cause Incapacitation

## 1. Example of Incapacitation during pre-flight – Probable COVID-19 Blood Clot(pulmonary embolism)

A 41 year old airline pilot notice that, pre-flight he was short of breath and could hardly climb 2 flights of stairs – He called sick and examination was positive for raised pulmonary artery pressure on Electrocardiography, he was referred to hospital and an emergency and on admission a CT Scan confirmed Segmental emboli common with COVID-19; although his SARSCOV2 PCR was negative – He was treated for pulmonary embolism for 3 months and made full recovery.

2. A 40 year old flight attendant developed severe generalised itchiness after receiving Pfizer Biotech vaccine during layover on a flight to the New YORK USA – The itchiness lasted for 6 weeks, during that time she as was unfit flight attendant duties. She was successfully treated, recovered and returned to work

# How COVID -19 & Vaccination May Cause Incapacitation

3. FO developed moderately severe COVID -19 while on schedule Simulator training abroad, he was isolated for 4 weeks and returned to Kenya after a PCR negative test – medical assessment and laboratory evaluation after returning was positive for elevated cholesterol and blood sugar, there was not evidence of blood clot formation. He was recently cleared fit for flying. – This caused the operator a huge unexpected financial loss!

# How Can We Minimise Incapacitation Inflight?

1. Creating Awareness among crew and managers on conditions causing incapacitation;
2. Initial and Period Medical assessment and healthy lifestyle promotion by AMEs.
3. Random Alcohol and Drug Testing
4. Staggering meal times and menu for crew before and during flight
5. Ensuring availability and appropriate use of SOPs.
6. Adhering to Recurrent Training of flight Crew members,
7. Adequate maintenance of aircraft and especially training in control of the pressurisation system;
8. Using Emergency Oxygen to prevent hypoxia and protect crew from effects of smoke and fumes in cockpit;
9. Use of Onboard Therapeutic Oxygen for crew and passenger whenever needed



# Conclusion & Recommendations

- Aircraft accident & incident rate are low, however there is still room for improvement;
- Older Single crew environment have high rates of accidents and incidents compared to multi –crew commercial environment;
- Concerning medical fitness & well-being of flight crew, Health Education and Health promotion e.g. COVID -19 vaccination are likely to be more effective in reducing medical factors causes of Incapacitation inflight than stricter medical standards/requirements;
- Develop & populate a mandatory, trustworthy Incapacitation registry and surveillance system at the regional level.