Obesity & its complications in Aviation Pilots and current regulatory requirements

Case Study

Dr. Bimal Dias

Senior Civil Aviation Inspector – Aviation Medicine

Head of Aeromedical Services, CAASL, Sri Lanka

Introduction

- Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health.
- Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2).
- More useful if you use BF% which consider more criteria.

Adults

For adults, WHO defines overweight and obesity as follows:

•overweight is a BMI greater than or equal to 25; and

•obesity is a BMI greater than or equal to 30.

Introduction continues…

- More than 1 billion people worldwide are obese – 650 million adults, 340 million adolescents and 39 million children. This number is still increasing. WHO estimates that by 2025, approximately 167 million people – adults and children – will become less healthy because they are overweight or obese.
- Obesity is a complex chronic multifactorial disease. Genetic, nutritional, medical, pharmacological, socio-economic and lifestyle factors all play a part.
- Obesity is a disease impacting most body systems.

  It affects the heart, liver, kidneys, joints, and reproductive system.

  It leads to a range of non-communicable diseases (NCDs), such as type 2 diabetes, cardiovascular disease, hypertension and stroke, various forms of cancer, Obstructive sleep apnea, as well as mental health issues.

  People with obesity are also three times more likely to be hospitalized for COVID-19.

Causes of Obesity

What causes obesity and overweight?

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended.

Globally, there has been:

•an increased intake of energy-dense foods that are high in fat and sugars; and

•an increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization.

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Prevalence of Obesity in Flight Crew

- The exact prevalence of obesity amongst all pilots is not clear
- There is significant variation between different types of flight crew.
- Military members flying jets –

  less likely to be obese due to virtue of the job they do and their organizational fitness requirements and anthropometric requirements.

- Private or long haul commercial pilots –

  more trend to become obese due to more sedentary working life. A recent Brazilian study found a prevalence of 53.7% of pilots being defined as overweight and 14.6% being obese.

Case study

- 43-year-old male pilot with Pilot-in-Command rating, employed by an Air Operator found that he has following;

1. Height 173 cm, weight 130kg, neck 35 cm, abdomen 120 cm.
2. **BMI – 43.4** kg/m2, **BF% - 39.4** (lean body mass 78.7kg & Body fat weight 51.3kg)
3. On treatment for **Hypertension** and **type II DM** for more than two years.
4. Blood pressure and Diabetes – well controlled with medication.
5. No history of hospital admission for last one year.
6. During medical examination – revealed that he has tendency of having day time sleepiness.
7. All other parameters are clinically normal.

Case study continued…

If you are the AME who does the medical assessment on this Pilot;

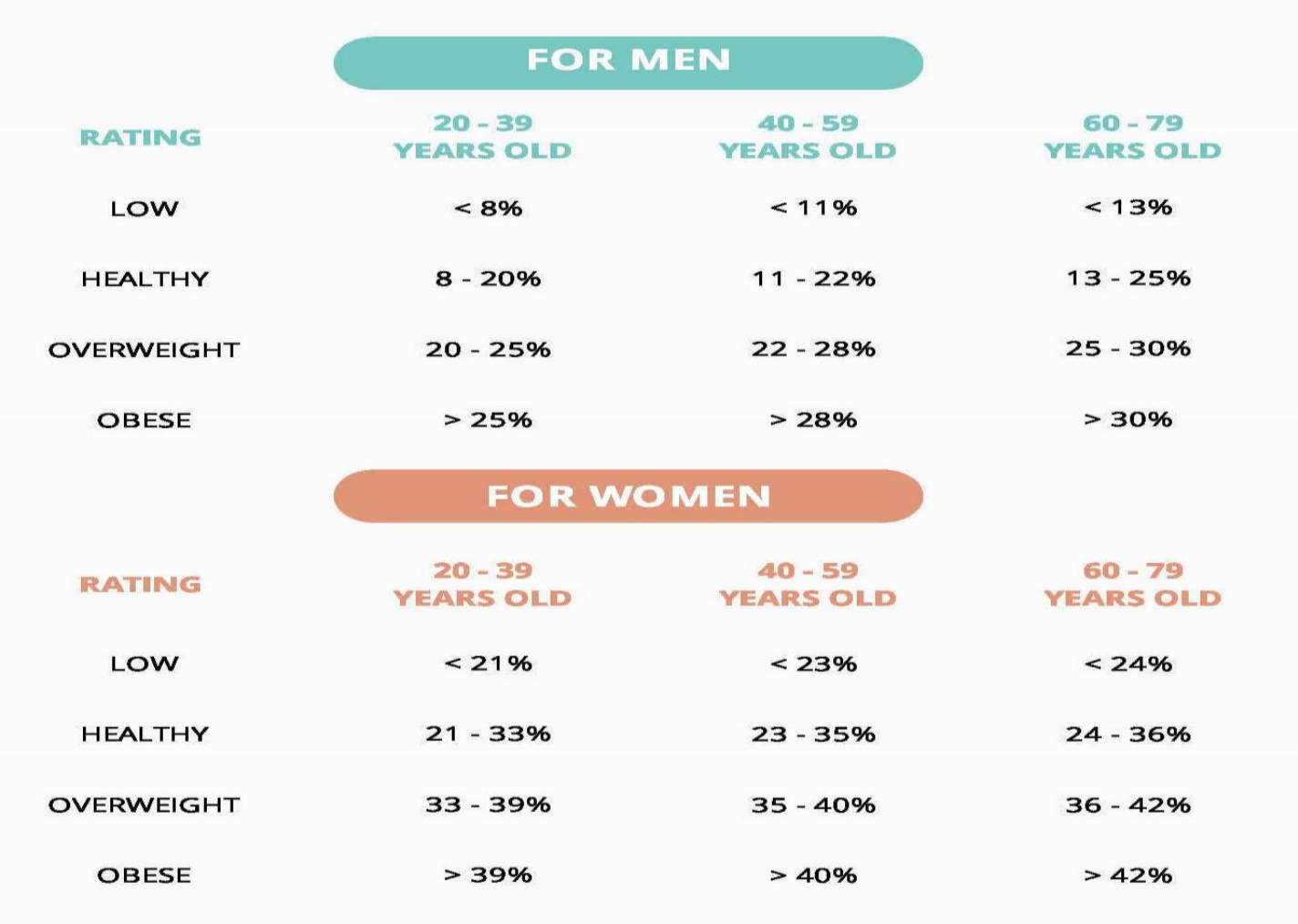
1. What is your approach & decision on certifying the Pilot for the next one year?
2. Any further investigations required prior to certifying?
3. If yes, what investigations?
4. If you decide to further investigate, what are the aeromedical standards you use to justify your decision?
5. What is your acceptable range of weight reduction of this Pilot?
6. What advises you give to this Pilot on his medical ailment?

Discussion

Body Mass Index

Classification	BMI
Healthy weight	18.5 -24.9
Overweight	25-29.9
Obesity I	30-34.9
Obesity II	35-39.9
Morbid Obesity	40 or more

Body Fat%



FOR MEN

RATING	20 - 39 YEARS OLD	40 - 59 YEARS OLD	60 - 79 YEARS OLD
LOW	< 8%	< 11%	< 13%
HEALTHY	8 - 20%	11 - 22%	13 - 25%
OVERWEIGHT	20 - 25%	22 - 28%	25 - 30%
OBESE	> 25%	> 28%	> 30%

FOR WOMEN

RATING	20 - 39 YEARS OLD	40 - 59 YEARS OLD	60 - 79 YEARS OLD
LOW	< 21%	< 23%	< 24%
HEALTHY	21 - 33%	23 - 35%	24 - 36%
OVERWEIGHT	33 - 39%	35 - 40%	36 - 42%
OBESE	> 39%	> 40%	> 42%

Discussion continues....

Aeromedical concerns

1. Limited cockpit space – reduced mobility ⇨ risk of thrombo-embolic disease
2. Sudden incapacitation due to sleep apnea, cardiovascular event, complications of DM, Pulmonary embolus
3. Distraction/Incapacitation due to back pain, pain due to gall bladder disease, osteoarthritis
4. Limitations of fully and safely operate controls in normal and emergency situations
5. Restricted ability to egress aircraft in an emergency
6. Body size/Weight may exceed design limitations of seat and harnesses
7. Impact on weight & balance of an aircraft (if small)

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Discussion continues...

LOW — Aeromedical risk — HIGH

BMI > 30 below age of 40	BMI > 30 over age of 40	BMI > 35	BMI > 40
Clinical assessment, History of any accident (aircraft or motor vehicle)			
BF% (Considered normal range - Men 12-25 & Women 21-36)			
HbA1C, Lipid Profile	HbA1C, Lipid Profile, Cardiovascular assessment		
Sleep study if Epworth score more than 8	Sleep study if Epworth score more than 8	Sleep study	
			Operational Flight Check ability to fully utilize all controls to full extent of travel and ability to exit aircraft expediently in the event of emergency

Discussion continues....

ICAO & EASA Standards

- **ICAO Annex 1 Chapter 6 Note 2.—**

Predisposing factors for disease, such as obesity and smoking, may be important for determining whether further evaluation or investigation is necessary in an individual case.

- **EASA PART MED - AMC1 MED.B.025**

Metabolic and endocrine systems

(b) Obesity Applicants with a Body Mass Index 35 may be assessed as fit only if the excess weight is not likely to interfere with the safe exercise of the applicable licence(s) and the results of a risk assessment, including evaluation of the cardiovascular system and evaluation of the possibility of sleep apnea, are satisfactory.

Conclusionally note

- Need to confirm the Obesity is a chronic disease or not , WHO disease clarification
- ICAO Standard ? There is only a note in the beginning of Chapter 6

Obese crew cant consider as unfit unless we do a proper screening & evaluation on risk of incapacitation.

Comments – Dr. Ansa (Chief of Aviation Medicine, ICAO)

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As service providers at PoE