ICAO UNITING AVIATION

Age considerations in commercial civil aviation

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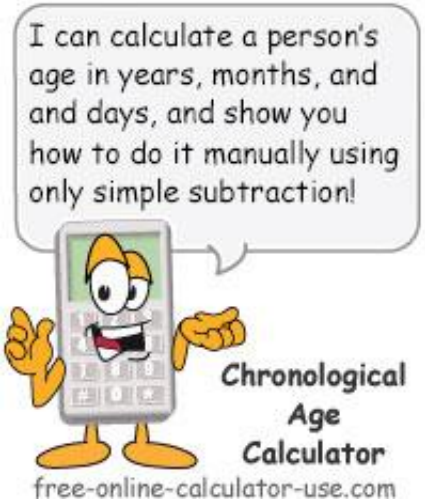
Overview

- Age concepts to consider
- Aviation factors to consider
- Risk assessment models
- Gaps in current data and tests
- Approach for the future

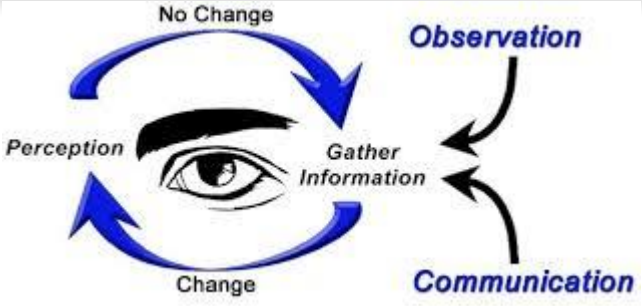
Definition of age

- Chronological age
  - the number of years a person has lived
- Biological/ physiological age
  - describe a shortfall between a population cohort average life expectancy and the perceived life expectancy of an individual of the same age
- Functional age
  - Age defined in terms of physical or functional capacity
  - a combination of the chronological, physiological, mental, and emotional ages (Mosby's Medical Dictionary, 9th edition. © 2009, Elsevier.

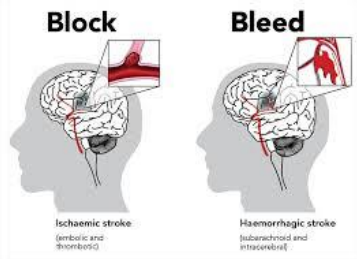


The ageing process

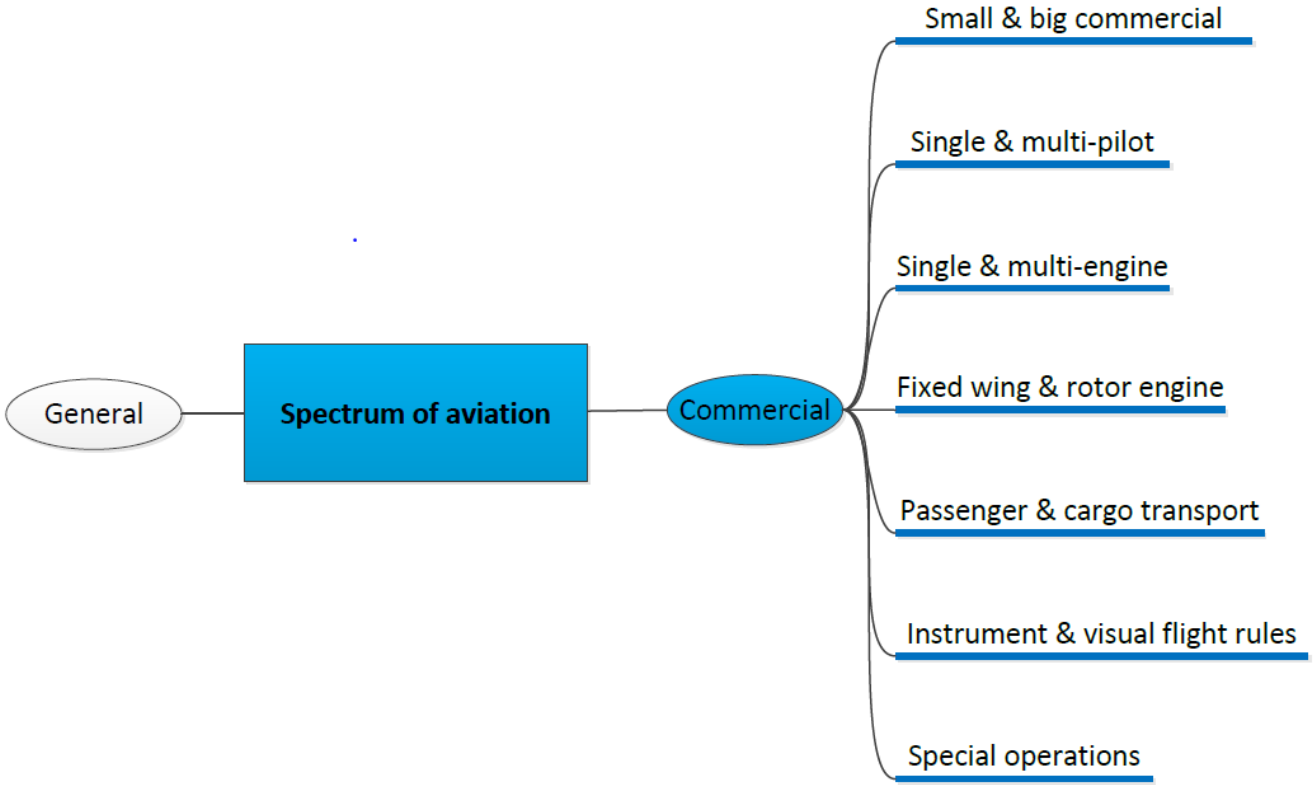
- Normal ageing process
  - Physical changes
  - Physiological
  - Psychological
  - Neurocognitive
  - Sensory and psychomotor



- Pathology or potential risks associated with age of aeromedical significance
  - Cardiovascular
  - Cerebrovascular
  - Neurological
  - Neurocognitive deficit
  - Cancers
  - Communication



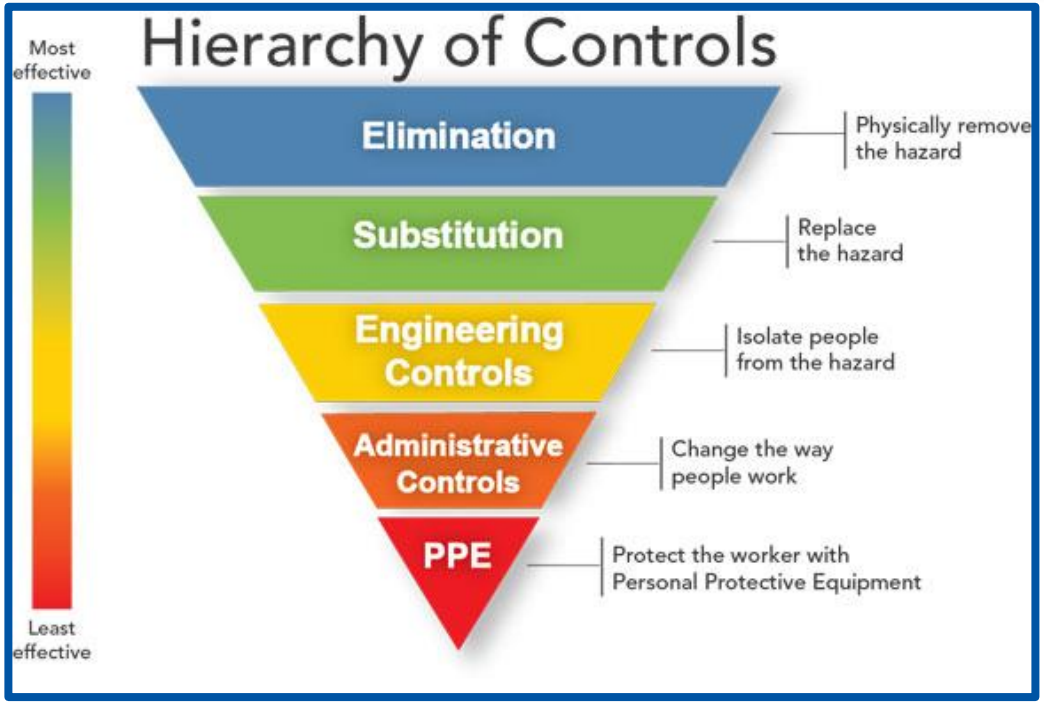
Aviation considerations



- External factors
  - Weather
  - Time of day
  - Geographical

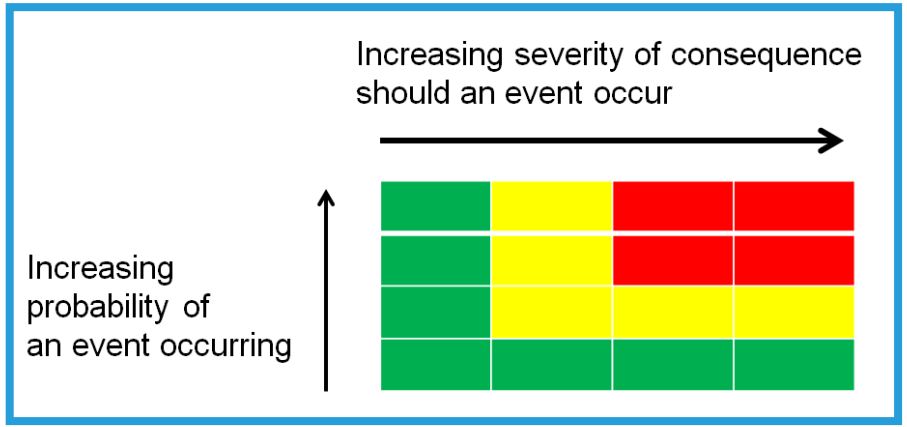
Occupational Health Risk Assessment

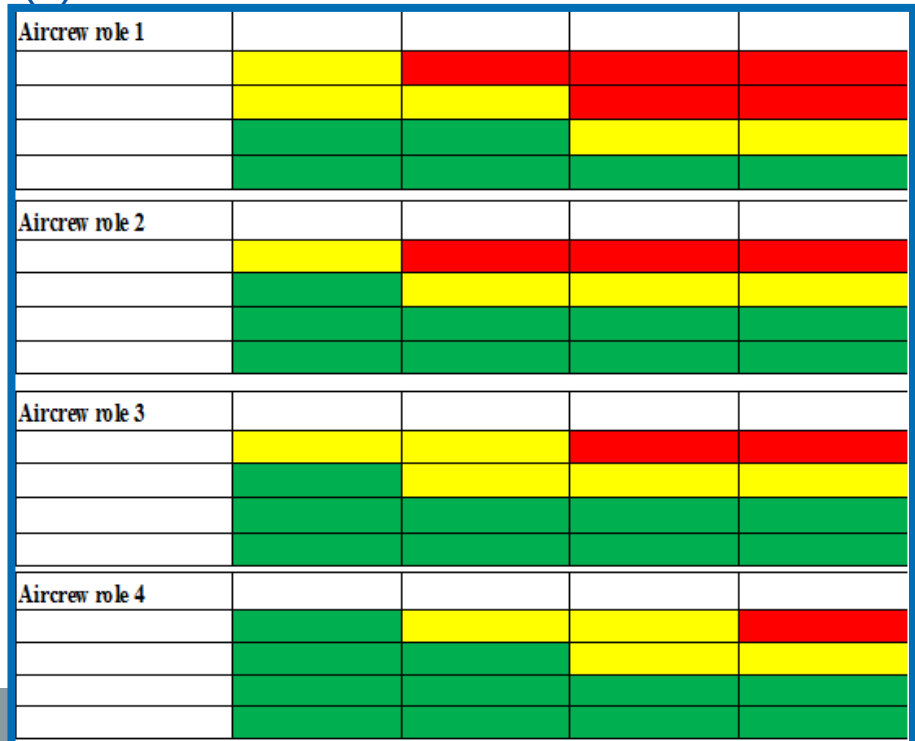
- Levels of risk mitigation in occupational health
- End point = ALARP (as low as reasonably practical)
- Avoidable risk vs non-avoidable risk
- Determination of an acceptable level of risk
- Acceptable level of risk might be different for different stakeholders



Risk Assessment Matrices

- Two dimensional (likelihood & outcome)
- Multi-dimensional matrices (likelihood & outcome & aircrew role)
- Multi-dimensional matrix - operational application (?)





Dr Gary Gray, NATO presentation, ICASM 2017

Age as contributory factor to risk

- Normal ageing process
- Lifestyle in the past – nutrition, exercise
- Pathology associated with age
- Current lifestyle and behaviour e.g. sedentary, alcohol consumption
- Aviation-specific physiology e.g. hypoxia, fatigue, circadian rhythm
- Operational workload e.g. flight duration, flight schedules

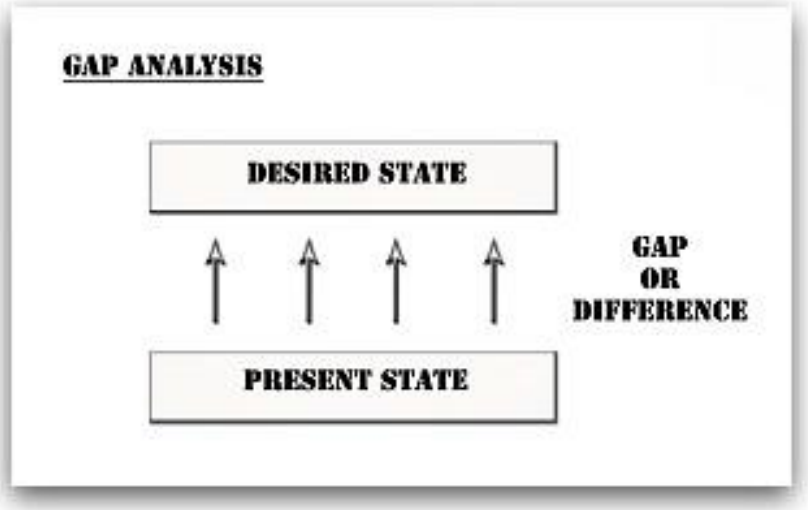
Role of fight simulator ?

Mitigating age as a risk factor

Statement	Question
Higher life expectancy	Equate to better health?
Improved healthcare & medical technology	Available everywhere?
Medical/ operational limitations	Justified on age or data driven evidence?
Frequency of medical/ operational checks	Justified on age or data driven evidence?
Type of additional checks	Justified on age or data driven evidence?
Role of automation	RPAS, response to system failure?
Additional training (flight, incapacity)	Limited under certain operational circumstances
Total pilot flight hours and experience	Protective effect – number and type of hours ?
Recent pilot flight hours and experience	Protective – how recent and type-specific?
Individual functional assessment as opposed to cohort	Applicable to all pilots, or after a certain age?

Gaps in current data

- Non-standardized data – medical incapacity, loss of licence & reporting on contributory medical causes of accidents
- Limited data on older pilots in CAT
- Limited data on pilot age distribution
- Difficult to determine association between age & medical incapacity
- Difficult to determine association between age & accident rates and age



Measuring functional performance

- Limited objective measurement of functional performance
- Difficult to determine objective assessment of functional loss due to ageing
- Flight surveillance and proficiency checks – can it be improved by developing different simulator and non-simulator protocols?
- Medical step-approach for the pilot above a certain age taking into account operational requirements (based on evidence-based data)
  - Prevention
  - Baseline screening
  - Enhanced screening based on risk profile
  - Neurocognitive assessment
    - Options: Individual neuropsychological assessment, computerized test battery, simulator assessment with neurocognitive profile*
    - Individual baseline at a certain age with scheduled comparison against baseline

*** Ageing, disease, alcohol and substances, etc. But cost and other considerations**

Proposed approach for the future

- Data driven & evidence based decision-making
- Develop aviation medicine taxonomy and accident reporting tool (medical contributory factors)
- Matrix risk assessment model
- Based on functional assessment

We are not there yet
but
would not like to be in the same position 10 years from now

ICAO next steps

- Data collection from Member States
  - Reasons for partial/ total on-duty incapacity
  - Reasons for loss of licence
  - Used in guidelines development for ICAO Manual of Civil Aviation Medicine
- Health promotion amendment to Annex 1
  - Audit of State reasons for medical incapacity, loss of licence & medical findings
- ICAO aviation medical taxonomy
  - Based on ICD11
  - Review by working group
- ICAO medical aircraft accident/ serious incident data taxonomy
  - Linked to ECCAIRS
  - Consultation with CICCT, NTSB, IATA
  - Review by working group

ICAO next steps

- State consultation – survey on medical confidentiality
- State consultation – survey on data and best practices
  - ICAO information sharing platform relating to national age limits & best practices
- ICAO MED work group*
  - Review of EASA age study
  - Consider global data and best practices
  - Review of medical evidence and operational requirements
  - Coordination with flight operations panel
- Develop risk assessment model for age requirements for specific operations

* Geographical distribution, subject matter experts, industry representation

ICAO

THANK YOU

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