Age and performance in pilots

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International Aerospace Medicine Congress
Bogota, 4 April 2019
b Havana 1945
HQ Montreal/Geneva
Company
Represents airlines
280 Airlines, 120 Nations

b Chicago 1944
HQ Montreal
UN Organisation
Sets global standards
All states adhere
Disclosure:

Opinions are my own

No official IATA position on this matter
Capt Liney Lozano (27 yrs)
History

1919 – International Commission for Air Navigation (ICAN)
   - Age 45 years limit
1947 – ICAO takes over from ICAN – no age limit
1959 – FAA Age 60 limit imposed (PIC and co-pilot)
   based on supply-demand politics - Govt, Unions, airlines
1960 – IATA recommends upper age limit of 60 to members
1963 – ICAO Recommendation (not mandatory)
   - Age 60 limit for PIC; no mention of co-pilot
2008 - ICAO increased limit to 65 for multi-crew airline operations
The Biology

[Graph showing a trend over age and everything decreasing]
“Everything”

• Neural processing speed – especially for rapid complex decision-making and reaction time
• Mental flexibility
• Vision (cataract) and Hearing (presbyacusis)
• Physical mobility
• Physical conditions (cardiovascular, renal colic, prostate problems disturbing sleep)
• Fatigue vs endurance
Individual Variation

Performance

Pass/fail

Age

Good performers

Poor performers

65 yrs

70

75

80
Normal age related memory loss

Accelerated cognitive decline in Alzheimer's
Decline in processing speed but not executive function, attention and memory. Faster cerebral and white matter atrophy were related to faster decline in verbal memory.

Leong RLF et al. Longitudinal brain structure and cognitive changes over 8 years in an East Asian cohort (2017) Neuroimage 147: 852-60
https://doi.org/10.1016/j.neuroimage.2016.10.016
The Biology

![Graph showing a decrease in Everything with age.](image-url)
R. Simons (1),
A. van Drongelen (1),
A. Roelen (2),
R. Maire (3),
O. Brouwer (2),
H. van Dijk (2),
P. Valk (1)

1 Netherlands Organisation for Applied Scientific Research (TNO)
2 Netherlands Aerospace Centre (NRL)
3 Practice of Cardiology, Internal Medicine and Aviation Medicine, Switzerland

Final Report EASA_REP_RESEA_2017_1

Research Project:

Age Limitations
Commercial Air Transport Pilots
CURRENTLY - Commercial Air Transport Pilots

- SINGLE PILOT Ops to AGE 60
- MULTICREW Ops to AGE 65

Analysed mainly risk of incapacitation in flight
- Mostly not preventable (GI, LASER, headache)
- Severely under-reported
Main Findings

Loss of medical certification ("grounding")
- in 6 EU States
- Clear increase with age (51-60 vs younger)
- 19% cardiovascular conditions

Considering effectiveness of cardiovascular screening and risk prediction....
Caution

“Although not in the context of the current research in which only total incapacitation was to be considered, it should be considered that inadequate pilot performance is a causal factor in 35-75% of accidents. Considerations concerning age limitations should therefore not solely be based on the medical fitness, but also on other aspects like individual cognitive and sensory performance in order to generate a more complete picture of the pilot’s ability to fly safely.”
Recommendations

- Increase Single-pilot limit to 65
  - Add increased screening after age 60
  - Including Coronary CT Angiography/Calcium Score
  - Proficiency check or Simulator check 6-monthly

- Maintain Multi-pilot limit at 65, gather more data
  - What happens to the pilots who stop flying
  - Incapacitation events
  - Assessments of cognitive performance (line/sim)
Since the age 60 limit introduced

- Pilots are living longer
- Incapacitation training introduced in 1970s
- Aircraft are less demanding to fly
- Various protections in-built
- Therefore the risk of an incapacitation cause accident is less

Evans 2006
20-year passenger growth outlook (2017-37)

- North America: 544m, +64%, 2.5%
- Latin America: 373m, +103%, 3.6%
- Europe: 492m, +46%, 1.9%
- Middle East: 276m, +132%
- Africa: 197m, +146%, 4.6%
- Asia Pacific: 2,126m, +137%, 4.4%

Source: IATA/Tourism Economics
Individual Variation

- Performance vs. Age
- Good performers vs. Poor performers
- Age milestones: 65 yrs, 70 yrs, 75 yrs, 80 yrs