

Fit for Flight: Fitness & Medical Screening in Commercial Spaceflight Tourism

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Summary

There currently are no fitness or medical requirements that have been established for the commercial spaceflight industry for the purpose of making a “fit for flight” determination for commercial crew or commercial spaceflight tourists (SFT)¹. Commercial spaceflight policy experts also warn that regulations and standards that are too rigid or restrictive could potentially ground the industry before it even takes off.

Research and lessons learned from the FAA and NASA indicate that physical fitness and good health are essential for the conduct of safe and successful space missions. With the establishment of commercial space tourism, the aerospace medical community and private care providers have a need for a standardized and comprehensive, yet not too restrictive and rigid, physical fitness and medical evaluation.

Problem

The current physical fitness and medical requirements battery used by government entities to evaluate and screen professional government and military astronauts could be considered too restrictive for the less rigid and profit-centric commercial space industry.

Discussion

The early stage of the manned commercial spaceflight industry will be primarily composed of sub-orbital and/or orbital missions (< 24 hour stay in microgravity), both of which are considered short-duration for the purposes of mission classification and medical requirements. The primary concerns affecting health and human performance in these types of short-duration spaceflights are:

- Disorientation
- Neurovestibular disturbances and space motion sickness
- G-force tolerance
- Sinus congestion²
- Urinary and gastric impairment²

A comprehensive physical fitness and medical evaluation should be developed to examine each of the aforementioned factors affecting human performance.

Recommendation

The table below illustrates a proposed battery of diagnostic and functional tests that are designed to assist the aerospace medical professional or private care provider in making a “fit for flight” determination for commercial spaceflight tourists.

Assessment/Test	Days Prior to Launch
Health History Questionnaire	L-180d/notify changes L-45d
FAA Class II Medical (Orbital-crew and SFT)	L-180d/*sub-components re-evaluated as launch nears
FAA Class III Medical (Sub-Orbital SFT only)	L-180d/*sub-components re-evaluated as launch nears
Resting Electrocardiogram*	L-45d
Resting Blood Pressure (Supine, Seated, Standing)*	L-45d/L-5d
Pulmonary Function Test*	L-45d
Valsalva Maneuver*	L-45d
General Orthopedic Assessment	L-180d

References

¹Grenon SM, Saary J, Gray G, Vanderploeg JM, Hughes-Fulford M. Can I take a space flight? Considerations for doctors. *BMJ* 2013; 345:e8124

²Flight Crew Medical Standards and Spaceflight Participant Medical Acceptance Guidelines for Commercial Spaceflight. (2012). *Center of Excellence for Commercial Space Transportation*. Retrieved from <http://www.coe-cst.org/core/scripts/wysiwyg/kcfinder/upload/files/2012.08.06%20Task%20183-UTMB%20Final%20Report.pdf>