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PRE-FLIGHT MEDICAL POLICY FOR SPACE FLIGHT PARTICIPANTS IN SUBORBITAL FLIGHTS

Abstract

Establishing a legit medical policy for Space Flight Participants (SPF) is an emerging necessity due to the increasing number of commercial human spaceflights. In 2021, there were 26 civilians experienced suborbital and orbital flights launched from the United States and Kazakhstan. Medical requirements for suborbital flights consist of screening, selection, evaluation, and training, which are substantial for both SFP and flight operators to provide safety precautions for flight customers. Differing from the astronaut selection, SFP are not required to pass all medical criteria to be qualified on board in current suborbital flights. Moreover, the age of SFP flew in 2021 varies from 18 to 90 years old, and majority are between 50 and 60 years old. However, current U.S. law and regulations don't stipulate medical requirements for SFP. The medical requirements, screening and selection are highly dependent on the operator. This paper will review the current U.S. regulatory framework for SFP and human spaceflight. Physiological and psychological risks of commercial human suborbital flights will be reviewed in terms of aeromedical considerations such as the risks caused by acceleration, high G-loads, and space motion sickness. Medical screening guidelines and standards for SFP will be reviewed in terms of cardiovascular disease, back or neck pain, pulmonary disease and more. The pharmaceutical impacts on SFP will be also addressed in terms of capability of handling emergency scenarios and tolerating the duration of suborbital flights using some use cases for the analysis. At last, existing medical screening process of some suborbital flight operators will be analyzed to compare their screening requirements with existing guidelines and standards. This analytical research seeks to provide a framework for developing pre-flight medical policy for suborbital flights.