

Proposal for Forming an IAA Study Group

Title of Study: *Medical Safety Guidelines for Passengers on Commercial Orbital Space Flights*

Proposer(s): *Melchor J. Antuñano, M.D. & Rupert Gerzer, M.D.*

Primary IAA Commission Preference: *Commission 2 - Space Life Sciences*
Secondary IAA Commission Interests: *Commission 5 - Policies, Laws and Economics*

Members of Study Team

Chairs: *Melchor Antuñano, M.D. (USA) and Rupert Gerzer, M.D. (Germany)*

Secretary: *Thais Russomano, M.D. (Brazil)*

Other Members:

<i>Denise Baisden, M.D. (USA)</i>	<i>Nick Kanas, M.D. (USA)</i>
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<i>Ronald White, Ph.D. (USA)</i>	<i>Martina Heer, Ph.D. (Germany)</i>

Short Description of Scope of Study

Overall Goal: *To identify and prioritize minimum medical requirements to preserve the health and promote the safety of paying passengers who intend to fly onboard orbital commercial space vehicles. The definition of these recommended medical requirements will be influenced, among other things, by the various operational and environmental stress factors that represent risks (actual and potential) to the occupants of commercial space vehicles. Actual risks include exposure to high acceleration (supersonic and hypersonic speeds) and deceleration (atmospheric re-entry) forces, to microgravity or weightlessness (acute and repetitive/chronic effects), to solar and cosmic radiation (acute and repetitive/chronic), to noise and vibration, to unfamiliar motion (space motion sickness), to a sealed cabin environment (cabin air quality), and to circadian desynchronization (jet lag) and fatigue due to the extremely rapid crossing of time zones. Of particular concern are the effects of exposure (short-term and repetitive) to microgravity on the cardiovascular, neurological, endocrinological, musculo-skeletal, and gastro-intestinal systems on both healthy and diseased passengers. Other potential risks include exposure to very low or absent barometric pressure, to temperature extremes (heat and cold), and to a unique cabin environment influenced by the effects of microgravity on the distribution of contaminants (biological, chemical, particulates, etc.) suspended in the air. Another very significant issue will involve the required criteria to grant waivers to individuals with pre-existing medical conditions. These conditions have the potential of becoming aggravated or exacerbated by exposure to environmental and operational stressors such as acceleration, microgravity, and solar/cosmic radiation.*

Intermediate Goals:

1. *Due to the wide variety of possible approaches that can be used to design and operate manned commercial space vehicles in the foreseeable future, the study group will first have to categorize the potential physiological impact of flying onboard these vehicles based on their proposed operational flight envelopes.*
2. *Based on the operational categorization of proposed space vehicles, certain practical assumptions will be made in order to enable later generalization of the medical recommendations.*

Methodology:

This retrospective review-type study will utilize a panel of subject-matter experts who will be involved in: 1) Assessing the current state of knowledge in space medicine applicable to manned reusable launch vehicle (RLV) operations, 2) Identifying gaps in scientific medical/physiological data that require the formulation of experience-based assumptions, and 3) Providing common-sense medical recommendations that do not impose an unnecessary obstacle to the development of the emerging manned commercial space transportation industry.

Time Line:

This study will require 1 to 2 years to complete depending upon the time-availability of the study group members.

Final Product (Report, Publication, etc.):

The final product will be an IAA position paper entitled "Medical Safety Guidelines for Passengers on Commercial Orbital Space Flights" that will be made available to the manned commercial space transportation industry (including space tourism companies) for voluntary implementation.

Target Community:

Manned commercial space transportation industry, prospective space passengers/tourists, space life sciences community, government space agencies.

Support Needed:

The initial support requires the voluntary participation in this study group of IAA members who have expertise in space medicine, and an at least one attorney specialized in space law who is interested in the legal aspects of manned commercial space transportation.

Potential Sponsors:

*Commercial space transportation industry.
Space commercialization advocacy groups.
Space tourism advocacy groups.
Adventure tourism organizations.
Government space agencies.
Aerospace Medical Association.
International Academy of Aviation and Space Medicine.*

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Date: *December 30, 2004*

Signature:



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