

Medical Guidelines for Space Passengers

AEROSPACE MEDICAL ASSOCIATION TASK FORCE ON
SPACE TRAVEL

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In the foreseeable future, private companies will manufacture space vehicles with a capacity of transporting tourists into low Earth orbit. Because of the stresses of spaceflight, the effects of microgravity, and limited medical care capability, a system of medical clearance is highly recommended for these space tourists. It is our purpose to establish guidelines for use by private businesses, medical providers, and those planning on being a space tourist. Consequently, a Task Force was organized by the Aerospace Medical Association (AsMA) for the purpose of facilitating safety of passengers, fellow passengers, crew, and flight operations. The guidelines are meant to serve only as a template with the full expectation that exceptions might be made with appropriate rationale.

Keywords: space travel, fitness to fly.

IT IS ANTICIPATED that private companies in the foreseeable future will manufacture space vehicles with a capacity of transporting tourists into low Earth orbit. Although early flights will probably be of short duration—minutes to several hours—there will eventually be what could be called space hotels that could accommodate visitors for days, weeks, or even months. It is expected that many individuals with a taste for adventure or the exotic will enthusiastically accept the personal risks as well as the expense for the experience.

However, because of the stresses of spaceflight, the effects of microgravity, and limited medical care capability, a system of medical clearance is highly recommended. It is our purpose to establish guidelines for use by private businesses, medical providers, and those planning on being a space tourist. Consequently, a Task Force was organized by the Aerospace Medical Association (AsMA) for the purpose of facilitating safety of passengers, fellow passengers, crew, and flight operations.

The Task Force took into account the stresses imposed by short (up to one day) and long (up to one week) duration flights in microgravity, as well as the possibility of emergency ground egress.

Because of so many unknowns, such as duration of flight, cabin pressure, the direction of accelerative forces, and life support equipment requirements (if any), the Task Force did not intend to be dogmatic nor directive. The guidelines are meant to serve only as a template with the full expectation that exceptions might be made with appropriate rationale. Although disqualification might be recommended for a given condition, an exception might be in order depending upon further

evaluation as well as the profile and circumstances of the flight.

It is the intent of the Task Force to periodically review, refine, and revise these guidelines so they can be applied with greater confidence as we study increasing numbers of passengers who take to low Earth orbit and beyond.

GENERAL GUIDELINES

Any medical condition or treatment regimen which could endanger the health of the passenger, fellow passengers, or crew; compromise safety in flight or on the ground; or pose a threat to completion of the flight are causes for DQ. (DQ = Disqualify)

CARDIOVASCULAR

- Coronary Artery Disease
Symptomatic = DQ
Asymptomatic = Evaluate for exception
- Arrhythmias/Conduction Defects
Hemodynamically significant = DQ
Nonhemodynamically significant = Evaluate for exception
- Pacemaker/Implantable Defibrillators = DQ
- Pericarditis/Myocarditis
DQ
Evaluate 6 months post-recovery
- Heart Transplant/Replacement
DQ
- Hypertension
Severe or poorly controlled = DQ
Well Controlled = Qualified with possible exceptions
- Structural/Valvular Defects
Symptomatic = DQ
Asymptomatic = Evaluate for exception
- Cardiomyopathy
Symptomatic = DQ
Asymptomatic = Evaluate for qualification

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NEUROLOGICAL

- Multiple Sclerosis
Active = DQ
Exceptions could be made depending on condition and neurologic deficit
- Parkinson's and Other Movement Disorders
DQ
Exceptions could be made depending upon degree and extent of impairment
- Cerebral Vascular Disease/Malformations/Aneurysms
DQ
Evaluate for neurological dysfunction and musculoskeletal disability
- Seizure Disorder
DQ, unless there is a reasonable seizure-free period
- Dementia
DQ
Evaluate for possible exception depending upon cognitive impairment related to organic disease
- Headaches
DQ if frequent, severe, or incapacitating (particularly migraine)
- Syncope or Other Disturbance of Consciousness
DQ if recent or unexplained
- Intracerebral Neoplasm
DQ
Requires evaluation for exception
- Fixed Neurological Deficit From Any Cause
DQ
Requires evaluation for exception

OPHTHALMOLOGICAL

- Visual Acuity
DQ if legally blind
- Narrow Angle Glaucoma
DQ
- Any Acute Condition
DQ if causing pain, discomfort, or interference with ability to see

EAR/NOSE/THROAT

- Any Acute Disease
DQ if causing pain or discomfort
- Meniere's and other vertiginous conditions
DQ
Exceptions could be made if treated and there is reasonable vertiginous-free period

ORTHOPEDIC

- Musculoskeletal Integrity (e.g. amputations, malformations, arthritides, use of appliances)
DQ if structural and functional integrity preclude capability of emergency ground egress and use of life support systems
- Osteoporosis
DQ if severe
- Acute Injury or Pain
DQ until asymptomatic
Evaluate for exception

GENITOURINARY

- Calculi
DQ if symptomatic
- Chronic Renal Failure/Renal Insufficiency
DQ
Evaluate for possible exception depending upon level of insufficiency
- Pregnancy
DQ
Evaluate for qualification 6 weeks postpartum (including loss or termination of known pregnancy for any reason)
- Dysmenorrhea
DQ if there is significant functional impairment
- Acute Infection or Urinary Tract Obstruction
DQ

DERMATOLOGY

- DQ for any severe skin disease such as psoriasis, chronic pruritus, skin tumors that may interfere with use of life support equipment

PSYCHIATRY

- Any Psychotic Episode
DQ
Exceptions could be made for those with a reversible cause
- Bipolar Disease
DQ
- Suicide Attempt/Gesture
DQ
Evaluate for possible exception
- Substance Abuse/Dependence
DQ if ongoing
For history of, evaluate for possible exception
- Miscellaneous Conditions Such Phobias, Anxiety, Panic Attacks, Depression
Evaluate for possible exception depending upon history of stability
DQ individual with claustrophobia with no immediate means of relieving apprehension from confinement

ONCOLOGY

- Cancer
DQ for any active or treated cancer which interferes with function of any organ system or has the potential for incapacitation.
Evaluate for possible exceptions

GASTROINTESTINAL

- Peptic Ulcer Disease
Symptomatic = DQ
Asymptomatic = Evaluate for exception
- Inflammatory Bowel Disease
Symptomatic = DQ
Asymptomatic = Evaluate for exception

GUIDELINES FOR SPACE PASSENGERS—AsMA TASK FORCE

- Irritable Bowel Syndrome
Symptomatic = DQ
Asymptomatic = Evaluate for exception
- Acute Pancreatitis
DQ
- Gall Bladder Disease
Symptomatic = DQ
Asymptomatic = Evaluate for exception
- Active Abdominal Pain, Nausea/Vomiting, Diarrhea of Any Etiology
DQ
- Hepatitis
DQ, if acute
- Cirrhosis
DQ
Evaluate for possible exception
- Ostomies
Evaluate for qualification
- Abdominal Surgery
DQ until recovery is complete

PULMONARY

- COPD
DQ
Evaluate for exception
- Asthma
DQ
Evaluate for exception
- Pulmonary function
DQ if significantly decreased from any cause
- Pneumothorax
DQ if current or recurrent
Evaluate all others

MISCELLANEOUS

- Diabetes
DQ if unstable, brittle, or poorly controlled
Evaluate all Type I diabetics
- Infectious/Contagious Disease
DQ for active disease
For blood-borne disease such as hepatitis B and HIV/AIDs, evaluate for qualification based upon risk of transmission
- Anemia
DQ if severe/symptomatic
- Medication
DQ if medication causes significant side effects such as somnolence, nausea/vomiting or exacerbation of illness if dosages are missed or poorly absorbed
- Dental
DQ if disease causes significant discomfort

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