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**Statement of  
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National Aeronautics and Space Administration**

**before the**

**Subcommittee on Space and Aeronautics  
Committee on Science and Technology  
U. S. House of Representatives**

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to appear today to discuss the NASA Astronaut Medical and Behavioral Health Care Program. I am privileged to serve as the NASA Chief Health and Medical Officer. The Office of the Chief Health and Medical Officer was established as a new office in 2000 based on the recommendations of external advisory groups. The purpose was to provide an expanded oversight and policy role for the NASA's health care system. I am pleased to provide you with insight into NASA's comprehensive health care system and discuss our plans regarding the findings of the NASA Astronaut Health Care System Review Committee and the internal review conducted at Johnson Space Center (JSC).

Over the last two decades, the Johnson Space Center Space Medicine Division has developed an excellent relationship with the astronauts through astronaut and flight surgeon cooperation. The NASA Astronaut Medical and Behavioral Health Care program has succeeded in keeping our astronauts healthy and ready to perform the challenging tasks that NASA asks of them. Over the course of our Nation's 40-year human spaceflight endeavor, the health care system has contributed to the success of all NASA human space flight missions. No NASA mission has thus far been shortened or terminated because of a health care issue. Longer-duration exploration missions will provide new challenges and we are committed to ensuring our program continues to provide the best medical and behavioral health care to the astronaut corps. The health-related recommendations of the Astronaut Health Care System Review Committee are thoughtful and will contribute to meeting the behavioral health challenges that lie ahead.

**NASA Astronaut Medical and Behavioral Health Care Program**

The NASA Astronaut Medical, Dental, and Behavioral Health Care program was established almost 50 years ago by NASA to ensure the health and well being of astronauts and their dependents. The program provides a comprehensive health care system for astronauts. Health care services are provided to ensure that astronauts meet established human health standards in support of mission needs.

Policy governing astronaut medical and behavioral health is set by NASA Headquarters. My office, the Office of the Chief Health and Medical Officer (OCHMO), is responsible for establishing policy and providing oversight of all NASA health and medical operations. The Johnson Space Center is responsible for management of all NASA space medical activities in support of human spaceflight. Astronauts and dependents have traditionally received health care services at the NASA Johnson Space Center Flight Medicine Clinic that included medical and dental care, as well as psychiatric and psychological services. As the focus of space flight changed to longer-duration missions, a separate behavioral clinic was

established and behavioral health support was added to the pre-, in and post-flight support of astronauts flying on the International Space Station (ISS) and their families.

The Astronaut Medical, Dental and Behavioral Health Care program has evolved over time to meet changing mission needs and has incorporated enhancements that were a direct result of internal and external review. Notably, the Institute of Medicine (IOM) released a report in 2001 entitled “Safe Passage, Astronaut Care for Exploration Mission.” This report led NASA to adopt an occupational health model for the health care of astronauts.

The findings of the Columbia Accident Investigation Board (CAIB) had an important impact on the NASA culture and this certainly touched the health care system. A governance structure including independent technical authorities was established to set technical standards and assure programmatic adherence to technical requirements. The Health and Medical Technical Authority was established in 2006 to take responsibility for health and medical program requirements and standards, and ensure NASA program compliance with them. The Health and Medical Technical Authority also provides a path for issues and concerns to be raised relating to crew health issues, and works very well with our occupational health model for astronaut health care delivery.

### **Roles, Responsibilities and Decision Making**

Flight surgeons in the Space Medicine Division provide medical care to the astronauts utilizing the Flight Medicine Clinic at the Johnson Space Center. Primary medical care and annual physical examinations for aeromedical certification for spaceflight are performed by the flight surgeons. Medical conditions may arise that necessitate referral or consultation with external expert practitioners. Conditions that violate an established medical standard may require that an astronaut be relegated to duties not involving flying (DNIF) until the condition resolves. This is referred to as “grounding” an astronaut. Flight surgeons have the authority to ground astronauts who have developed health conditions that prevent them from meeting medical standards. Any grounding decision is reviewed by the Chief of the Flight Medicine Clinic (FMC), and the Chair of the Aerospace Medicine Board (AMB), who must provide concurrence.

Waivers may be granted for many medical conditions if they are deemed stable and of no significance to the mission. Medical waivers must be based on best medical evidence and professional opinion and supported by sound aeromedical rationale. All cases for medical waiver consideration are reviewed by the Aerospace Medicine Board. In the case of permanent waivers, a recommendation is forwarded to me for review and disposition. The NASA Medical Policy Board (MPB), consisting of internal and external medical experts, is available to me for consultation on waiver decisions as well as all NASA medical policy matters.

Behavioral health specialists have been primarily responsible for evaluation of astronaut candidates for selection and for support of long-duration space flight astronauts and their family members. Astronauts are evaluated by psychiatrists or psychologists and are provided education and training on the rigors of long-duration space flight and confinement. This training enables the astronaut to recognize personal reactions to the isolated environment and aids the astronaut in maximizing performance and mission success. Counseling and therapy services are provided upon request to all astronauts and to all dependents. Behavioral health providers have the same authority to ground an astronaut (issue a DNIF status) and to bring a case to the AMB for evaluation and recommendation for waiver or disqualification.

Any astronaut wishing to contest a flight surgeon grounding decision can appeal to the Chief, Flight Medicine Clinic, or the Chief, Space Medicine Division. The appeal is reviewed by the Aerospace Medicine Board with a recommendation forwarded to me as indicated. Appeals can be raised directly to my attention by the astronaut for review and final decision.

Medical issues that arise immediately pre-flight or in-flight are discussed between operational, medical, and astronaut management authorities on a need-to-know basis giving due consideration to privacy, crewmember health and safety, and mission impact. The Agency governance structure provides a path for dissenting opinions to be raised through the Health and Medical Technical Authority chain of command.

I made earlier reference to medical standards. They are defined to establish fitness for flight and fitness for duty. Under the leadership of the Space Medicine Division of the Space Life Sciences Directorate at the NASA Johnson Space Center, standards are developed by teams of experts in various fields of clinical medicine and aerospace medicine. The standards are reviewed and approved by the Aerospace Medicine Board at the NASA Johnson Space Center. The standards are then submitted to the OCHMO at NASA Headquarters, which authorizes a review by the Medical Policy Board (MPB) and final approval is granted for implementation. These standards were first developed in 1978 and have undergone several revisions since that time. The most recent revision was completed in July 2007.

### **Internal and External Review of Medical Practice**

Biennial internal audits of the Flight Medicine Clinic are performed by my office. The objective of these audits is to review clinical practice, recordkeeping, and compliance with applicable regulations. The most recent audit was conducted February 5-9, 2007. The findings of this review cited a number of Flight Medicine Clinic (FMC) practices as Agency Best Practices.

In addition, quarterly self-evaluations are performed to review standards of care, medical record documentation, and adherence to clinic policies and procedures. Documentation deficiencies that are identified are reviewed and corrected. In addition, the Chief of the Flight Medicine Clinic reviews all physical examinations for accuracy, consistency, and adherence to established policies.

External review of our behavioral medicine services was performed in February 2007. This review determined that NASA provided a competent group of behavioral health providers (BHP) rendering excellent clinical and occupational care. Recommendations were also made for improvement, and actions were in place to address many of these areas at the time of Dr. Bachmann's review. These actions specifically included credentialing of NASA BHP providers, privileging of BHP providers by the FMC, plans for external consultant peer review bi-annually by an aerospace psychiatry consultant, and implementation of a formalized, quarterly, internal peer review process.

### **Summary**

NASA takes the recommendations of the Committee seriously, and we thank the Committee for all the time and effort involved in their study. We are evaluating each recommendation and are in the early planning stages of responding to them. This task is made more difficult by the anecdotal nature of some of the findings of the report. Our overarching goal is to improve behavioral health and medical care for the astronauts. Several of the Committee recommendations were accepted immediately, and many more will be accepted in the coming months.

Specifically, NASA accepts the recommendations concerning analysis and use of behavioral health data, and will convene experts to address psychological testing as recommended. Briefings by the flight surgeons to crewmembers concerning medical monitoring activities and briefings by principal investigators concerning research data collection, in the context of obtaining informed consent, will be re-emphasized. Effective communication between astronauts and flight surgeons will be addressed; we will ensure both groups are aware of the multiple pathways to communicate safety and health concerns; and

we will be working together in support of NASA senior leadership to reinforce these concepts. Flight surgeon scheduling and task assignment and flight medicine clinic operations will be closely examined, with the goal of enhancing continuity of care to the greatest extent feasible. Options for providing effective behavioral health services to all flight assignable astronauts for the purposes of performance enhancement will be reviewed, and a behavioral health assessment will be conducted as part of the annual astronaut physical examination. Options for flight surgeon behavioral health assessment training will also be defined.

A common credentialing and privileging process will be applied to behavioral health and aeromedical services, and peer review of practice will be enhanced for both. NASA's electronic medical records system will be re-examined to provide maximum privacy consistent with safe medical practice, and compliance with all applicable statutes and regulations governing privacy of medical information will be assured. Process linkages between the behavioral health records system and the electronic medical record will be reviewed and established, and all appropriately credentialed and privileged practitioners will be granted records access as appropriate. NASA will examine options for assuring quality of care delivered by community consultants and practitioners. Written operational instructions and procedures for the behavioral health clinic will be examined and enhanced as appropriate. The Aerospace Medicine Board charter will be reviewed and updated to reflect appropriate membership, authority and accountability, and regular meetings will be scheduled between behavioral health staff and flight surgeons to enhance clinical communication.

These initial responses were reviewed and endorsed by the Medical Policy Board on August 21, 2007. The Medical Policy Board will provide ongoing implementation oversight. I will continue to coordinate and provide feedback to the Office of Safety and Mission Assurance and the Flight Crew Operations Directorate at the Johnson Space Center. Together we will provide regular progress reports to the NASA Administrator.

Commitment to the health and welfare of the astronauts and all NASA employees and to flight safety remains the foundation of our effort, and we look forward to system improvements that will be realized as a result of this report.