An Interview with Dr. Stanley White, One of NASA's First Flight Surgeons

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- **BACKGROUND:** In the early days of the National Aeronautics and Space Administration (NASA), medicine in support of the astronauts was led by military experts from the U.S. Air Force as well as experts from the U.S. Navy and U.S. Army. In the early years, a physician with expertise in aerospace medicine was assigned to the Space Task Group and then to NASA. One of these individuals was Dr. Stanley White, a U.S. Air Force physician. To capture more of the early space medicine pioneers, a contract was established between the National Library of Medicine and the principal investigator at the University of Cincinnati to conduct a series of interviews with these early pioneers. An interview with Dr. White took place in his home while he was in hospice care. This audiotaped interview and other written and oral histories within NASA archives and the literature were reviewed to support this work. A series of questions were prepared for the interaction with Dr. White. These questions provided further clarification on his background and contribution. Responses to questions elicited open-ended discussion. The conversation provided a historical summary of Dr. White's contribution to NASA as one of its first flight surgeons.
- **KEYWORDS:** history, flight surgeon, spaceflight, NASA.

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In 1958, the National Aeronautics and Space Administration (NASA) was established from the National Advisory Committee on Aeronautics. During this same period, the Space Task Group (STG) was established by NASA to work at the Langley Research Center in Hampton, VA, in support of the early Mercury Program.¹ The STG eventually became the Manned Spacecraft Center (MSC) (NASA Johnson Space Center) in the early 1960s. There were three military aeromedical consultants, Drs. Stanley C. White [U.S. Air Force (USAF)], William Augerson (U.S. Army), and Robert Voas (U.S. Navy), who were assigned work on life sciences issues related to the human in the system. Dr. White served as the director of the Life Sciences Branch within the Flight Systems Division for Project Mercury.

Dr. White was a graduate of the University of Cincinnati's College of Medicine in 1949. After a short stint in the U.S. Navy, he transferred to the USAF in 1951, where he became a flight surgeon. Over the course of the next several decades, Dr. White's career was intertwined with NASA's Life Sciences and Space Medicine efforts. He held a number of senior leadership positions with NASA's Life Sciences group at the MSC and NASA Headquarters (HQ) in support of Skylab and the Pentagon, and was the president of the Aerospace Medical Association from 1980–1981. **Table I** highlights Dr. White's career path from medical school, aerospace medicine training, and his work with NASA in the Mercury Program, Gemini, Apollo, and Skylab. During his period, he remained in the USAF and was assigned various roles with NASA.¹

The rich history of NASA's development of space medicine is not as well documented as other equally important tasks at NASA. For example, a lot is written about rockets, satellites, engineering challenges, and politics to name a few. In order to better understand the individuals who impacted space medicine as we understand it today, a contract between the National

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Table I. Summary Timeline of Dr. White's NASA Career.

YEAR	POSITION	ORGANIZATION
1949	Medical Student Graduate—M.D.	University of Cincinnati
1949	Physician	U.S. Navy
1951	Physician	U.S. Air Force
1952	Training in Aerospace Medicine	Brooks Air Force Base, San Antonio, TX
1953	Graduate student—M.P.H.	Johns Hopkins School of Public Health and Hygiene
1954–1958	USAF Physician, Flight Surgeon	Aeromedical Laboratory, Wright Air Development Center, Dayton, OH Man in Space Soonest
1958	USAF Member of the Aeromedical Team	NASA Space Task Group—Life Sciences Division Langley, VA / Houston, TX
1959–1962	Chief, Life Systems Branch, STG (Medical Operations)	NASA Manned Spacecraft Center
1962-1963	Crew Systems Division Chief	NASA Manned Spacecraft Center
1963	Bioastronautics	Brooks Air Force Base
1966	Manned Orbiting Laboratory / Biomedical Research Program	Brooks Air Force Base
1970–1975	Senior Staff—Medical Payloads for Skylab	NASA HQ, Office of Life Sciences and Office of Manned Spaceflight

Library of Medicine and the University of Cincinnati was awarded to collect oral histories with pioneers in space medicine. Over an 18-mo period (2010–2011), interviews were conducted with a number of space medicine pioneers. The first one with Dr. Arnauld Barer was published in 2017.²

Existing oral histories and Dr. White's memoriam, published in this journal, were reviewed. This formed the basis of a series of questions which were sent to Dr. White in preparation for the interview. The interview was conducted by the principal investigator and author of this manuscript with Dr. White on October 6, 2010, in his home in Satellite Beach, FL. He had entered hospice care a few weeks earlier and succumbed to his illness on September 10, 2011.³

The conversations began with a background of what the physician, the flight surgeon of the 1950s knew or did not know with regard to space and humans. One of White's statements which stood out was: "They had broken the sound barrier, but they had not measured anything on the guy. And the best answer that I ever heard was a test pilot say, when asked by one great pontificator in the clinical field, 'how do you know that you were not unconscious while you were doing this maneuver' and the pilot responded, he said 'I had not really thought about that, let me think about it. The fact that I am here, talking to you!"

Those early flights on experimental aircraft in the 1950s and Kittinger's high-altitude balloon flights did not have instrumented participants. This predicament resulted in the development of biomedical instrumentation to measure physiological output not only during rest, but also during routine tasks as well. This was before the first flight of Mercury. Before the STG existed, most of this research was conducted through the USAF Bioastronautics Research Program in the late 1950s.

While in the USAF, Dr. White was assigned to Wright-Patterson Air Force Base, specifically Wright Field in Dayton, OH, where he worked on the development of pressure suits, medical monitoring systems, and instrumentation. There were altitude chambers that could be used to conduct simulations and a variety of test facilities. During his time in Dayton, Dr. White indicated that a congressional delegation was visiting the laboratory. Experimental equipment was placed in a storage room so it could not be seen. As you might imagine, a congressman looking for the bathroom stumbled upon the storeroom and equipment and inquired what it was. Dr. White nervously explained and the congressman quipped "by god it's about time somebody does something like this!" At that time, that work was not necessarily sanctioned as there was a policy in place-the word "space" was not used by the team at Wright Field or anywhere government funding was provided. Shortly after this, the STG was assigned the responsibility for developing human spaceflight activities and choosing the first astronauts for Project Mercury. Space medicine was an evolutionary step as White recalled: "You saw a need, you figured out how to do it, which lead to new approaches in medicine even though primitive at the time."

Dr. White's next assignment was at Edwards Air Force Base, where the X-15 was to be deployed. In those days, there was no interstate highway system, so Dr. White was driving to California from Ohio with his family and was stopped by the highway patrol near Albuquerque, NM. The officer had a message for him but the phone number was incorrect (it was for the Spanish Embassy). He reported to Edwards and was promptly directed to return back east under orders from his superiors, Generals Bernard Shriver and Don Flickinger. White's new assignment was to work with NASA and the STG under the direction of Robert Gilruth, director of the STG!

White was joined by Robert Voas, a human factors physician from the U.S. Navy, and eventually U.S. Army scientist William Augerson. Their first task was to develop a request for a proposal to build a spacecraft. The original design did not have an accessible window for crewmembers to look out. The engineers at the time did not think an astronaut could observe anything on the surface from space! White and Voas insisted on a window, but it remained an issue. This was finally resolved in part with the help of Dr. Randall Lovelace. He asked Dr. White and Dr. Rufus Hessberg to attend a meeting at Woods Hole, MA. During this meeting, White and others were grilled by the engineers, who said, "man had no role in controlling, observing, or participating in this movement." The physicians had to speak "engineer". The real change came when astronauts (the Mercury 7) had a say. The window was part of the design and Gordon Cooper famously watched a train near the Himalayas enter a tunnel, all from the comfort of his spacecraft some 160 mi above the Earth. Postflight, the train schedule was checked, confirming Cooper's observation!

After spending time with NASA, White returned to the USAF and began to work on the Manned Orbiting Laboratory

until it was cancelled and then he returned to NASA, initially at Langley and then to the MSC. Early on in human spaceflight, the objective was to get into space, not necessarily development of a robust medical or research effort. The tempo at the time was do and see what comes out. As Dr. White posited, regarding Cooper's flight and the aforementioned train he saw from space, "Well you can't believe how that opened up just a flood of other questions. And that became feasible. But until you had something like that in hand and proved it to be true."

Since much was unknown about the space environment and the astronauts, every step and resultant outcome was primitive and, as White put it, "every little part you had to fight dog....dog and cat to...because again one thing you have to be sensitive to during this whole period, there were a hell of a lot of people, starting with that Woods Hole meeting I told you we went to, who didn't want man in there in the first place." The extramural medical and science community questioned why anyone would fly in a risky mission to space. But against the engineering community and some in the medical community, the first flyers (not called astronauts yet) proved their worth. Each of these individuals were subjected to testing and evaluation as test pilots (self-sufficient, inquisitive, and survivability by controlling the spacecraft). During this time, about 10% of test pilots per year lost their lives, so the Mercury 7 had survived a number of harrowing experiences before their first space mission. Selection of individuals for spaceflight was based on the quest for a 20-yr-old with 30 yr of experience, which was not possible, so the criteria changed. President Eisenhower was the one who finally directed that the individuals come from the cadre of military test pilots. White indicated that the first seven were different as night and day, but worked closely together.

In the early years, the STG was fairly autonomous and would interact with General Charles Roadman, who was detailed to NASA HQ via phone, when medical at MSC needed something. After Mercury, the Gemini and Apollo Programs instituted more structure, albeit small things. Nevertheless, tasks seemed to take longer to complete. As White put it "*Brownian movement*"! The more complex the task or mission, the more individuals had to sign off. This early period brought Dr. Clark Randt from HQ to the MSC to "organize" the group.⁴ Dr. White commented, "we had been working our butts off and we were gonna run out of hours as it was, and how we were now gonna be organized and get more hours in."

During the Skylab mission, White returned to HQ as a senior medical advisor to support the medical payloads for those missions. He also participated in the first United States/ Union of Soviet Socialist Republics three-volume (four books) publication on Space Biology and Medicine.^{5,6} This work involved bilateral exchange visits between the two nations.

Dr. White also commented on the next big leap: "Well I think there are two things. First of all, I would suggest to you that most of the technologies and things supporting space medicine, and this includes instrumentation, data collection, interpretation, and so forth, will continue to progress in the civilian market because it's been captured. Most of the people who are doing this kind of work now hardly will recognize or don't want to recognize that its origin came back from these we've been talking about." He also commented on the NASA Syndrome in Melbourne, FL, due to the tremendous stress and strain of those early years of the STG.

Dr. White stressed his commitment to the great endeavor that human space exploration is. His contribution to the National Advisory Committee for Aeronautics, the STG, and NASA helped set the stage for those who have followed in his footsteps. The foundations of monitoring crews, the challenge of the pressures of succeeding in a mostly engineering domain, and the international area serve as the basis of how we practice space medicine today.

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