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## Case Report

# The Role of Dr. Colonel Vance H. Marchbanks in developing an oxygen delivery system: A “Forgotten First” in Aviation and Aerospace

## Abstract

In our series of unsung or forgotten medical heroes, we first published a manuscript on Alvin Blunt, Jr, M.D. who was the first African American MASH physician in the Korean War. Dr. Kenneth L. Wilson’s manuscript changed United States military history. Our second manuscript in our series, Medical Miracle in Indianola, Mississippi: The Untold Story of Dr. Clinton Battle and the Indianola Conjoined Siamese Twins, introduces the world to a 29-year-old physician who vaginally delivered the first set of conjoined twins to be successfully separated and both survived the operation. This great feat was done at Rev. John and Missouri Matthews’ home without anesthetics or ultrasound. Dr. Battle died dejected because he never received any credit for this magnificent accomplishment in medical history. In this manuscript, we present the compelling story of Dr. Colonel Vance Marchbanks, who monitored astronaut John Glen during his historic space flight. Dr. Marchbanks was a pioneer Flight Surgeon who developed an oxygen delivery system that enabled flight crews to fly at higher altitudes.



**Vance H. Marchbanks, Jr.**  
1905 – 1988

## Early Life

The movie “Hidden Figures” was about three African American women who were very instrumental in America’s first space flight by astronaut John Glen. Often forgotten, and unrecognized is the tremendous contribution of Dr Vance Marchbanks, Jr, United States colonel who was equally significant contributor to the success of Glen’s historic flight. Dr. Marchbanks was a pioneering flight surgeon who medically monitored Glen during his flight.

Beginning in his early childhood years, Vance Hunter Marchbanks, Jr., displayed a profound interest in medicine. After undergoing an operation himself at 10, he cultivated a friendship with the surgeon. Their favorite pastime, was to go out into the back yard and “operate” on cherries. He would cut them open, take out the seeds, and sew them up again [1]. Marchbanks was born January 12, 1905 at Ft. Washakie, Wyoming where his father, Vance Sr., a U. S. Army Cavalry

veteran (i.e., 20th Century “Buffalo Soldier”) was stationed. His early years were spent at Fort Huachuca in Arizona, the military post from which his father would later retire as a commissioned officer [2]. In 1929, while in his sophomore year at the University of Arizona in Tucson, Marchbanks received a West Point appointment from President Calvin Coolidge. He was, however turned down because he did not have the proper academic credits. Despite this rejection, he continued to pursue his pre-medical curriculum while working as a postal employee. During his tenure as an undergrad at the University of Arizona, he was not permitted to live in a dormitory. Marchbanks was forced to live in a boarding house off campus because of his color, the only place he was permitted to eat at was a local railroad station where he often found cockroaches had been placed in his food [3].

## Medical Training

Twice accepted at Howard University Medical School in Washington, D.C., he decided to terminate his postal

employment and focus on his medical career. He enrolled at Howard University and in 1937, earned his Medical Degree. Also, while at Howard he met his future bride, Lois Gilkey of Los Angeles. From 1937 to 1939, Dr. Marchbanks interned and served as the assistant resident physician at Freedman's Hospital in Washington, D.C. before leaving to become a member of the medical staff at the VA hospital in Tuskegee, Alabama.

## Military Career

During World War II, in the spring of 1941, Dr. Marchbanks began his military career as a 1st Lieutenant in the Army Medical Corps at Ft. Bragg, NC. He later completed the correspondence course for the Army Air Corps' School of Aviation Medicine. *"It was a whole new field, full of glamour, but of course without thoughts of space."* Dr. Marchbanks recalled during a speech to aspiring astronauts [4]. In 1944, he was deployed overseas to Italy in the US Army Air Corps as a Flight Surgeon with the all-black, 332nd Fighter Group (a/k/a "Tuskegee Airmen") in Italy (Figure 1).

Following his promotion to rank of Major, Dr. Marchbanks was one of the first of the Group's flight surgeons to centralize medical support under one US Army Air Corps organization. He in conjunction with his staff treated everything from frostbite and ear infections, to "air-sickness in pilots operating in poorly heated, high altitude cockpits, as well as combat casualties and routine sick calls at the main camps [5] (Figure 2).

After World War II, Dr. Marchbanks military service continued in the US Army Air Corps. (The US Army Air Corps would later separate, becoming two distinct branches, US Army and US Air Force.) Dr. Marchbanks tenure—post WWII and during the Korean and Vietnam wars, was with the Air Force branch.

Among the many contributions and achievements during his career that spanned three major wars; he was the Commander of several base hospitals; logged airtime flying in nearly every Air Force plane, including a 1, 270 mph (Mach 2) ride in a Delta Dart and flew on three combat missions over Korea [6].

He received two Air Force Commendation Medals for his research projects. One was for the design of an oxygen mask that became a standard item for air base equipment inventory.



Figure 1: From Cora "Tess" Spooner on behalf of Dr. Marchbanks Family. WWII. Flight Surgeons overseas. (L to R): Maj. Vance H. Marchbanks, Captains William K. Allen, Arnold H. Maloney, Jr., Bascom S. Waugh, and 1st Lieutenant, Clark Smith.



Figure 2: From Cora "Tess" Spooner on behalf of Dr. Marchbanks Family. 1946 at Lockbourne Army Air Base. Premature baby girl born at Lockbourne AAB Hospital. L to R: Dr. Marchbanks, Dr. Edward Cooper, Dr. Arelious King, and nurse Nancy Leftenant.

The other was for his "human engineering" work with the B-52 bomber crews, which included participation in the first airborne Strategic Air Command (SAC) alert, and a 22 1/2 hour, 10,600-mile non-stop flight to Argentina and return during which he recorded positive and untoward characteristics of the B-52 as well as tested the crew for signs of stress. The stress tests and rating systems he developed were subsequently incorporated into crew examinations and astronaut testing protocols.

- \* *Dr. Marchbanks said this work probably led to his selection as one of 11 Air Force flight surgeons by the National Aeronautics and Space Administration (NASA) to be Project Mercury medical monitors.*
- \* *"I didn't know anything about space medicine. NASA gave us training. Telemetry was the new thing. From our ground station, I monitored Glenn's electrocardiogram, respiration and heart rate as he passed over."*
- \* *"We talked about those flights for two years and I worked on the chimp flight and the empty capsule orbits also. We were the only people who believed we'd make it."*
- \* *...And then with typical understatement, he added about the Glenn mission, "When he was up there, it was just routine for us. We'd been practicing and practicing. I'd studied his ECG for over a year. I hardly realized it was real until it was all over. It was like playing in a game and not realizing you had won until the end."*

## Glenn's Flight

On February 20, 1962, during the epic triple orbit of the Earth by astronaut John Glenn in "Friendship 7"—Dr. Marchbanks was stationed at the Kano, tracking station in Nigeria, West Africa. If one of the "aeromedical monitor" doctors at any tracking station determined the astronaut was in dire distress, he could recommend the space flight be prematurely halted [2].

During Dr. Marchbanks 35 days at the African outpost, he discovered that the hygiene at the medical library was

inadequate. So, typical of his concern for every community in which he lived, he volunteered his assistance. Thus, while in Africa, Dr. Marchbanks wrote medical colleagues and publishers and collected over 200 texts for the school [2].

## Military Retirement

In 1964, after having completed some 23 years of distinguished service, Dr. Marchbanks retired from the USAF as a Colonel and Chief Flight Surgeon [2]. Dr. Marchbanks began his new journey as a civilian in Hartford, Connecticut as Chief of Environmental Health Services at Hamilton Standard, a division of United Aircraft Corp [2]. Among his responsibilities, he oversaw the medical testing of the moonsuit and backpack that were eventually used in the Apollo Space missions [2]. He left Hamilton Standard in 1970 and continued in private practice, specializing in aviation and space medicine. He served as a consultant in space medicine until 1986.

## Sickle Cell Anemia Research

However, it was perhaps his pioneering study of sickle cell anemia that led to the inclusion of more blacks as pilots and astronauts that left an indelible mark. His friendship with the Tuskegee Airmen afforded him the opportunity to right a wrong that ended military careers and kept young men from even applying. During the 1970's, if the military found the genetic trait for sickle cell in the blood of healthy service members they were discharged. Marchbanks took on the military's post-WWII policy on sickle cell anemia. Sickle cell is an inherited disease, primarily affecting people of African and Mediterranean descent. In his three-year study Marchbanks drew blood from black airmen he knew during World War II. He published his findings in an essay entitled, "Sickle Cell Trait and the Black Airman." The essay helped to convince the military that people who carried the trait did not necessarily develop the deadly anemia. The military ultimately ended its practice of discharging service members who had the trait [2].

## Death

On October 21, 1988, Dr. Vance Hunter Marchbanks, Jr. died at 83 years of age. His life as a devoted husband to Lois, a proud father to two daughters, Roslyn and Joy, a doting grandfather, and a friend to many in both the military and civilian life. With his passing, the world lost an esteemed American hero.

## Conclusion

Dr. Marchbank is like the three women in the movie Hidden Figures; he played a large role in astronaut John Glenn's historic flight. They are now receiving accolades for helping to advance the United States very successful space program. His foresight and efforts were instrumental to the development of aeronautic or aviation medicine as we know it today (Figure 3).



**Figure 3:** From Cora "Tess" Spooner on behalf of Dr. Marchbanks Family. Astronaut, Colonel John Glenn, with Dr. & Mrs. Vance H. & Lois Marchbanks at an event at Wright Patterson Air Force Base.

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