Peter Johnstone was born in Burlingame, California, and raised in Gresham, Oregon. He entered the United States Naval Academy in 1975, graduating in 1979 and accepting orders to USS INGERSOLL (DD-990). He commissioned INGERSOLL as Navigator and also served as Gun Systems Officer during his tour. The pre-commissioning crew was responsible for bringing the ship from the shipyard into active service; he coordinated the myriad functions associated with the ship's office and medical and navigation systems. As Gun Systems Officer, he had oversight of the ship's guns; the integrated fire control software, hardware, and radar systems; and all ammunition and small arms aboard. He completed a Far Eastern deployment and qualified as a Surface Warfare Officer.

He was assigned in 1982 to the Pentagon staff of the Navy's Chief of Information. As a Public Affairs Specialist, he served on the Navy Newsdesk as a media relations officer on aviation and politico-military issues. He was invited to join the Personal Staff of the Secretary of the Navy in 1983, to originate and maintain Secretary John Lehman's "Good News" Program. This ensured the broadest distribution of news of Navy successes in shipbuilding, research and development, and operationally to the White House and the Congress. During this tour he was selected as an Olmsted Scholar, for two years of study in International Relations at the Universite de Montpellier, France. Although this honor was declined for medical school, he did complete a Master of Arts degree in Communication from the University of Oklahoma in 1985.

He entered the Uniformed Services University of the Health Sciences in summer 1985 and received his M.D. degree four years later. A transitional Internship was completed at the National Naval Medical Center in Bethesda, MD, followed by Residency in Radiation Oncology at the National Cancer Institute, National Institutes of Health. He is a graduate of the UCLA training program, Medical Acupuncture for Physicians, and as such is a trained Physician Acupuncturist.

He reported to Naval Medical Center, San Diego, in mid-1993, and served as Chief of the Radiation Oncology service between 1996 and 2001. Under his leadership the NMCSD Radiation Oncology practice was accredited by the American College of Radiology in 1997 and 2000. He was Program Manager for the Defense Department Southern California Breast Health Initiative between mid-1996 and early 1998 and was inaugural Head of Breast Health Care at the Medical Center. In late 2001, Dr. Johnstone was selected as Director for Ancillary Services at the Medical Center, responsible for coordinating business and managed care aspects of Radiology, Laboratory, Pharmacy, and Physical Therapy services at the hospital and associated clinics. The position carried oversight of over 500 people and a budget exceeding \$60 million. Doctor Johnstone served as the Radiation Oncology Specialty Advisor to the Navy Surgeon General between early 1998 and late 2002. In that capacity, he administered Radiation Oncology practice in the Navy, and coordinated Navy residencies for the specialty. Academically, he was Associate Clinical Professor at the University of California, San Diego, and Medical Advisor for the Radiation Therapy Option of the Health Science Department, California State University, Long Beach.

The Navy selected him for promotion to Captain, but he retired in early 2003, prior to assuming that rank. He was recruited as a Georgia Cancer Coalition Distinguished Cancer Scholar, accepting a position as Professor of Radiation Oncology and Hematology/Oncology at Emory University, where his clinical practice was melded with program management responsibilities as Director of Cancer Survivorship at the Emory Winship Cancer Institute, and Research Core Director for the Grady Center for Health Equality. In these capacities, he was awarded grant support to start lymphedema clinics at Grady Memorial Hospital and at the Emory Clinic. Collaborating widely at Emory, he and researchers from the Emory Rollins School of Public Health performed and presented Health Literacy research in breast, lung, and head and neck cancer survivors at Grady Memorial Hospital.

In August 2007, Dr. Johnstone was named Chair and William A. Mitchell Professor of Radiation Oncology at Indiana University (IU); he served in that position until late 2013. In February 2008 IU President Michael McRobbie tasked him with integrating the freestanding program of the Midwest Proton Radiotherapy Institute (MPRI) into the portfolio of the IU Simon Cancer Center. On 18 August 2008, he was named MPRI President and Chief Executive Officer. Rebranded as IU Health Proton Therapy Center in 2011, the center was an acknowledged global leader in scholarship of proton finances and in use of protons for pediatric patients. In early 2013 the center's 2000th patient underwent treatment. To combine the complementary missions of proton beam development and patient therapy under single leadership, President McRobbie named Dr. Johnstone Director of IU Cyclotron operations in January 2010. Thus, his portfolio also included medical device production responsibilities under 21CFR.

Dr. Johnstone resigned from his Bloomington responsibilities in late March 2014 and accepted the position of Vice Chair of the Radiation Oncology Department at Moffitt Cancer Center. His duties in Tampa began on 2 September 2014. In this capacity he is a Senior Member of Moffitt Cancer Center and Professor of Oncologic Sciences at the University of South Florida. He was named Interim Chair in early 2021 and remained in this position for 13 months.

Dr. Johnstone was named a Top Doctor by Indianapolis magazine in 2011 and 2013, in Newsweek in 2015 and in Tampa magazine in 2018, 2021-3; he is listed in America's Top Doctors for 2016-7, 2019, and 2021-2. From 2006 -2012, he was the Genitourinary category Co-Chair of the ABR Radiation Oncology examination. He served as Editor-in-Chief of the journal Current Problems in Cancer from mid-2000 to 2012 and remains Associate Editor of several other journals. Dr. Johnstone was named a Fellow of the American College of Radiology in 2006, of the American Society for Radiation Oncology in 2017, of the American Radium Society in 2021, and of the Society for Integrative Oncology in 2023. He served on the ACR Board of Chancellors from 2011 – 2017, as President of the American Radium Society in 2010, and as President of the Society for Integrative Oncology in 2007.

Doctor Johnstone and his wife, Meg, celebrated their 43rd wedding anniversary in 2023; they live in Tampa. They have two sons, both of whom attained the rank of Eagle Scout. They became grandparents to Elizabeth Grace on April 27, 2013, to Katherine Ann on December 18, 2014, and to Anthony Flynn on June 13, 2015.