The History of Urology at the Minneapolis Veterans Affairs Health Care System

Giulia Lane, Maria Uloko, Vikram Narayan, and Cesar J.J. Ercole

OBJECTIVE The Section of Urology at the Minneapolis Veteran's Affairs (VA) Medical Center has a long history of contributions to Urology including the Gleason Score, Fuhrman Grading system, testicular tumor marker development and the birth of Endourology. The objective of this manuscript is to compile and present the Urologic history of the Minneapolis VA.

METHODS The Urologic literature and institutional records originating from the Minneapolis VA Medical Center from 1946-2017 were reviewed and presented herein.

RESULTS The Minneapolis VA Health Care System originated in 1921 and currently employs 5 Urologist who serve over 16,000 veterans per year. Historic achievements from the Minneapolis VA Section of Urology include the development of the Veteran's Affairs Cooperative Research Group (VACURG) which was instrumental to development of the Gleason grading system for prostate cancer in 1965. Additional urologic oncology achievements originating from the Minneapolis VA Section of Urology included the development of the diagnostic utility of tumor markers in testis cancer in 1976 and The Fuhrman Grading System in 1982. Perhaps the greatest contribution to the field of Urology was the birth of Endourology at the Minneapolis VA in the late 1970s under the direction of Dr. Paul Lange. Currently the Minneapolis VA is a premier center for Evidence Based Urology by housing Cochrane Urology and the U.S. Grading of Recommendations Assessment, Development and Evaluation network (US GRADE).

CONCLUSION Since 1946, the section of Urology at the Minneapolis VA has contributed basic science, clinical technique and evidence based medicine to the field of Urology while providing care to the nation's veterans. UROLOGY 123: 7–11, 2019. Published by Elsevier Inc.

INTRODUCTION

The Veterans Health Administration is the largest health care system in the United States, serving more than 8.9 million Veterans each year.[1] It is estimated that 60% of all medical residents train within the 168 Veterans Affairs (VA) Medical Centers, making the VA the largest provider of healthcare training in the United States.[1] Within the VA system, the Minneapolis VA Health Care System is one of the largest training programs. Many leaders in Urology have trained or served at the Section of Urology within the Minneapolis VA. We recount the Urologic contributions of the Section of Urology at the Minneapolis VA.

MATERIALS AND METHODS

A review of Urologic literature from the Minneapolis VA from 1946 to 2017 was performed and a detailed description of innovations in Urology was compiled.

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From the University of Minnesota, Minneapolis, MN; and the Minneapolis Veterans Affair Health Care System, Minneapolis, MN

Address correspondence to: Giulia Lane, M.D., VA Medical Center (112D), One Veterans Drive, Minneapolis, MN 55417. E-mail: giulialane14@gmail.com

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RESULTS

President Lincoln mandated "To care for him who shall have borne the battle, and for his widow, and his orphan."[2] This mission has been carried forth by the National Homes for Disabled Volunteer Soldiers (1865-1930), the Veterans Bureau (1921-1930), the Veterans' Administration (1930-1989), and the modern Department of Veterans Affairs (1989-present).[2,3]

The Minneapolis VA Health Care System originated in the era of Veterans Bureau (1921-1930) when the Aberdeen (St. Paul, MN) and Asbury Hospitals (Minneapolis, MN) were leased to provide care for World War I Veterans.[4,5] It was not until 1927 that the first brick-and-mortar VA hospital in Minneapolis was dedicated.[4,6] This served veterans until 1946 when the Fort Snelling Army Hospital was incorporated into the Minneapolis VA.[6,7] The Minneapolis VA hospital underwent several expansions and reconstructions until 1987 when a new 1.5 million square foot, 845 beds were built.[4]

While the hospital underwent physical reconstruction, local and national policy changes affected the Minneapolis VA. In 1946, the Minneapolis VA became affiliated with the University of Minnesota as part of national legislation designed to alleviate post World War II physician shortages.[3] Although the Minneapolis VA was joined by law with the University of Minnesota under the chairmanship for Dr. Creevy, the Urology Residency at the Minneapolis VA remained separate from that of the

Figure 1. Minneapolis VA Urologists, 2017-2018. June 2018. James Kyle Anderson, Eduardo Fernandes, Cesar Ercole, Philipp Dahm, Michael Risk. Not pictured: Kristin Chrouser, Sevann Helo. (Color version available online.)

University of Minnesota until 1969.[8] In 1969, Dr. Fraley merged the University of Minnesota and the Minneapolis VA Urology Residency programs as a prerequisite to accepting the position as Professor and Chairman of the Division of Urology at the University of Minnesota.[8]

Today the Minneapolis VA Health Care System is a Level 1a (High complexity), tertiary care center that employs over "3,000" and serves nearly 400,000 veterans.[9] It is designated as 1 of 5 national Polytrauma VA Medical Centers.[4] The Traumatic Brain Injury Center of Excellence and the residential Transitional Rehabilitation Program provide further support to Veterans with polytrauma.[4] The Minneapolis VA is also home to 1 of 24 national Spinal Cord Injury/Disorders Centers of Care.[4] Additionally, the Minneapolis VA houses one of the first national Women Veterans Comprehensive Health Center.[2]

The section of Urology employs 5 Urologists who provide care in general urology care and fellowship trained expertise in the areas of Urologic Oncology, Endourology and Laparoscopy, Reconstruction, and most recently Andrology, Sexual Medicine, and Male Infertility (Fig. 1). In 2015, over 16,000 veterans were served within 11,000 clinic visits, 1000 operative cases, 2400 office cystoscopies, and 240 prostate biopsies.

The VA Cooperative Urologic Research Group and the Gleason Score

The development of the Gleason Score began with Dr. George Mellinger (Urology Section Chief, 1960-1969) who sought to study the impact of estrogen on low-stage prostate cancer.[10] He realized that to launch into this endeavor he required a standardized method to categorize prostate cancer as well as a multicentered and diverse patient base.[10] In 1959, Mellinger brought together 22 investigators within 14 federal healthcare institutes to form the Veteran's Affairs Cooperative Research Group (VACURG).[10]

An integral member of the VACURG was Dr. Donald Floyd Gleason (Chair of Pathology), who described 9 histologic patterns based on the prostate cancer pathology of 270 patients amassed by the VACURG. He then submitted his pathologic description, in addition to Dr. Mellinger's staging and clinical outcomes, to Dr. John Bailar III. Dr. Bailar combined the original 9 patterns into 5 and found that the prognosis was correlated to the histologic pattern.[10] The first VACURG results were presented at the North Central Section of the American Urological Association in 1965 and subsequently published by Gleason, Bailar, and Mellinger.[10-13] The Gleason Grading system was initially not widely accepted but has since become the primary grading system and remains one of the most influential predictive factors for prostate cancer.[14]

Ultimately the VACURG performed 3 randomized clinical trials for the evaluation of hormone therapy for newly diagnosed prostate cancer.[15] The major outcomes of these studies included the increased risk of cardiovascular death with diethylstilbestrol therapy, the lack of benefit of orchiectomy plus diethylstilbestrol therapy versus either therapy alone, and the importance of the Gleason grade on therapeutic decisions.[15] In 1987, Dr. Cesar Ercole and Dr. Lange published one of the earliest papers showing a correlation between prostate-specific antigen (PSA) and prostate cancer.[16] This ushered in the "PSA-era" in prostate cancer management which continues to evolve.

The Fuhrman Grading System

In 1982, Dr. Susan Fuhrman evaluated the histology of 103 renal cell carcinoma specimens obtained from patients at the Minneapolis VA Hospital from 1961 to 1974.[17] Her team devised a grading system for renal cell carcinoma based on their findings, and found that this grading system was an independent prognostic factor, especially for clear cell renal cell carcinoma.[17] The Fuhrman grading system continues to be utilized in the grading of renal cell carcinoma and has been found to be predictive of outcome among papillary cell carcinomas as well.[17,18]

Tumor Markers in Testis Cancer

Today, the use of serum tumor markers is integral in the diagnosis, staging, and management in testicular cancer. However, the use of tumor markers for testicular cancer was not initiated until the early 1980s. Many of the original descriptions of their diagnostic utility and clinical implications can be traced back to seminal work done by urologists at the Minneapolis VA.

In 1976, Dr. Paul Lange and Dr. Fraley reported on a cohort of 205 patients with urologic malignancies, including kidney, bladder, penile, prostate, and testicular cancers.[19] Of these patients, 67 had testicular tumors and all were analyzed with a radioimmunoassay for alpha fetoprotein (AFP) and human chorionic gonadotropin. Patients had serum levels of these markers measured before and after treatment, with 40 patients followed over 22 months with monthly marker measurements. Dr. Lange et al astutely noted in their report to the *New England Journal of Medicine* that "perhaps the greatest clinical value of these markers will be in monitoring the effectiveness of radiation and chemotherapy in patients with non-seminomatous germ-cell tumors; marker levels have been either reflective or predictive-. . .of the progression or remission of disease."[19] A second study in 1980 reported on the implications of AFP and human chorionic gonadotropin levels in patients with seminoma and proposed that nonseminomatous germ cell tumor elements should be considered present in patients with histology-confirmed seminomas but elevated serum AFP.[20] The detection of placental alkaline phosphatase in men with seminoma was also studied in a separate cohort by the Minneapolis VA and was described in 1982.[21]

The Birth of Endourology

Dr. Fraley credited Dr. Lange, Dr. Arthur Smith, and Dr. Ralph Clayman in addition to Dr. Robert Miller (Radiology) at the Minneapolis VA as being primarily responsible for creating the field of endourology.[8,22] Dr. Lange trained under Dr. Fraley at the University of Minnesota and became Minneapolis VA Urology Division Chief for nearly a decade (1977-1986) prior to becoming the Chairman of Urology at the University of Washington (Figs. 2 and 3).[23]

In 1978, Dr. Smith, Dr. Lange, Dr. Miller, and Dr. Donovan Reinke (Chief of Radiology) published the first account of antegrade ureteral stent placement through a percutaneous nephrostomy tract, which was performed at the Minneapolis VA Hospital.[22,24,25] In 1979, Dr. Smith, Dr. Lange, and Dr. Fraley first coined the term endourology and defined it as the "closed, controlled manipulation of the genitourinary tract." [22,26] These pioneers also were instrumental in the widespread use of endourologic techniques, Dr. Smith and Dr. Clayman served as leaders in the creation of the Endourological Society, founding of the *Journal of Endourology* and creation of teaching courses for urologists.[25] In 1982, the first Endourology training course was held at the University of Minnesota and was instructed by staff at the Minneapolis VA. Dr. Smith went on to serve as Chairman at the Department of Urology at Long Island Jewish Hospital in 1982. In 1985, Dr. Pratap Reddy published a case series of 400 percutaneous nephrolithotomy cases performed from 1982 to 1985 at the Minneapolis VA.[27] The interdisciplinary team of authors on this publication attest to the collaboration that helped create Endourology and the volume and excellent results (99% stone-free rate) illustrates the technical skill of the authors.[27] Dr. Reddy served at the Minneapolis VA as Division Chief from 1985 to 1998.

Evidence-based Urology at the Minneapolis VA

Dr. Fraley recognized that the "Minneapolis VA had tremendous resources, especially in the research area, and a wealth of clinical material. The [Minneapolis] VA hospital was a mini-NIH, with tremendous academic development."[8] This has been proven not only by historical contributions described, but also current contributions to evidence-based urology. Academically, the Minneapolis VA is a major site for urologic residency training, hosting 4 clinical residents and 1 research resident continuously. The Minneapolis VA faculty published 24 peer reviewed manuscripts in 2017. A large part of the publications stemming from the Section of Urology at the Minneapolis VA pertain to evidence-based urology.

The focus of evidence-based urology is based on the foundations built by the VACURG. In 1996 Dr. Timothy Wilt registered the Cochrane Collaborative Review Group in Prostatic Diseases at the Minneapolis VA.[28] The Prostatic Diseases Group eventually became The Cochrane Urology Collaborative Review in 2015. Cochrane Urology is based within the Urology division of the Minneapolis VA and is funded by the Minneapolis VA and the University of Minnesota, Department of Urology.[28] Dr. Philipp Dahm, the only Urologist to head a Cochrane research group, currently serves as Coordinating Editor.

Dr. Wilt (Professor of Medicine at the Minneapolis VA) served as the principle investigator of the Prostate Cancer Intervention Versus Observation Trial and was a member of the U.S. Preventative Task Force that formed the recommendation on

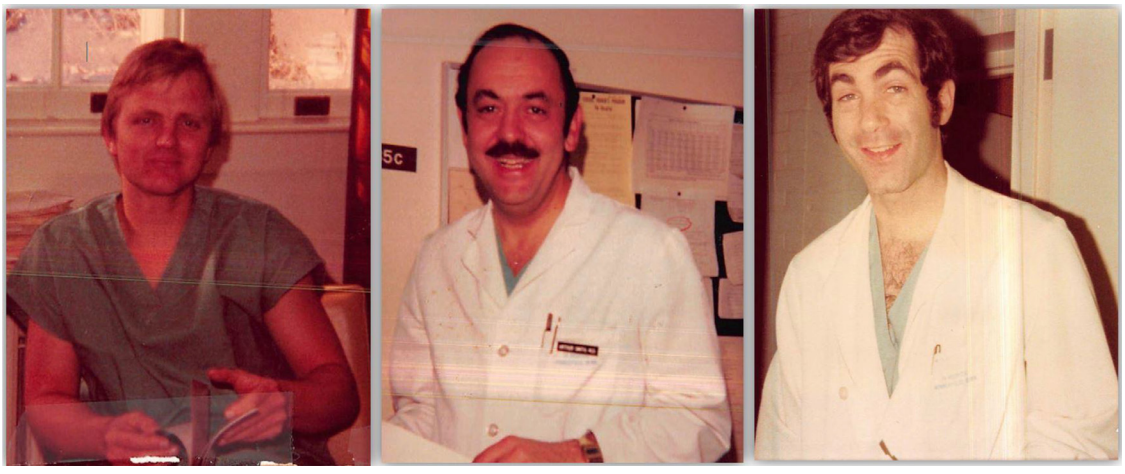

Figure 2. Pioneers in Endourology 1976-1979. Paul Lange, Arthur Smith, Ralph Clayman. (Color version available online.)

Figure 3. Minneapolis VA Urologists. May 1988. Back row: Cesar Ercole, Jose Hernandez, John Hulbert, Paul Lange, Ricardo Gonzalez, Kevin Zhang. Second row: Bruce Shingleton, Yuri Reinberg, Vargas, Pratap Reddy, Deborah Lightner, Nadim Koleilat, Arthur Wong, Donald Nguyen, Walter Schimon. Front Row: Carlos Vivas, Elwin Fraley, Lee Moore.

PSA-based screening for prostate cancer.[22,23] The Prostate Cancer Intervention Versus Observation Trial was the first prospective randomized controlled study to assess the impact of surgery in prostate cancer patients in the PSA screening era.[29] The primary objective of the study was to determine whether radical prostatectomy versus observation was more superior in the management of clinically localized prostate cancer. The results of the study showed that radical prostatectomy did not significantly reduce all-cause or prostate cancer mortality when compared to observation with at least 12 years of follow-up. This benchmark study has significantly impacted the management of prostate cancer in the world of urology.[29]

The Minneapolis VA also currently serves as a leading institution for the U.S. Grading of Recommendations Assessment, Development and Evaluation network.[30] This network, which began in 2000, is a collaboration of healthcare providers and researchers with a goal of providing evidence-based guidelines and methodologically sound systematic reviews. It is now endorsed by over 100 organizations worldwide and provides guidance to providers in regard to patient care.[30]

CONCLUSION

The Section of Urology at the Minneapolis VA has a long legacy of innovation in Urology through interdisciplinary collaboration with pathologists, radiologists, and basic scientists. The Minneapolis VA Urology faculty continue to provide world-class urologic care to the nation's Veterans while training future leaders and advancing discovery in Urology.

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