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# LEGENDS IN UROLOGY

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I was brought up in a small (15-20,000) town in Southern West Virginia, located in a county where, at the time, the economy was dependent on the smokeless coal industry. My parents started me one year early in grade school after 3 years of kindergarten and persuaded school officials to let me skip the first grade, putting me two years behind in years compared to my classmates. Not recommended. As the schools there offered only two years of a language and the highest Math course was Algebra 2, my parents enrolled me at a prep school, the Mercersburg Academy, entering in the 10<sup>th</sup> Grade. I credit Mercersburg for teaching me how to organize and compartmentalize. During the summers, I would work at home at one of what were then called the Miners Memorial Hospitals. The staff was remarkably good, and my summers cemented my desire to become a doctor; the other choice offered by my parents was to become a lawyer. One summer, I worked for a particularly brilliant internist, one of whose favorite statements was that his new patients were “being doctored to death” – I haven’t forgotten that. Another summer, I worked for a pathologist making Gough sections, thin sections of the lungs of coal miners who had died of black lung disease (I still have some of those). I also watched post mortem exams and did an occasional foray into the countryside to retrieve corpses, learning why many pathologists smoke cigars (counteract the odor). I also played age appropriate competitive tennis. At that time, the process of college admissions was an entirely different ball game, and I was lucky enough to gain admittance to Princeton. Many of the courses were superb, some not so. I majored in Biology and did my senior thesis on hypothalamic control of sexual behavior in the female rat. I credit my advisor, (Robert D. Lisk), a young faculty mentor, for imparting a genuine enthusiasm for scientific planning and execution, and writing. My senior thesis resulted in my first publication, Neurological site of action of estradiol in eliciting estrous behavior in the spayed rat. *Am. Zoologist*, 2:304, 1962. The general biology course was fabulous, but my favorite by far was taught by a fellow named William Jacobs, Experimental Plant Biology. The course had little to do with plant biology, but everything to do with the scientific method and how to prove or disprove that “a” was related to (caused by or caused) “b”. Princeton was a great springboard for my acceptance to Penn Medical School.

The medical school experience at Penn was superb – hard, repetitive and demanding. I did well (AOA) but with little hope of being number one (there was in our class a fellow named, Mike Brown – later Nobel Prize Winner). Gradewise, there was Mike and everyone else! At that time, Penn was blessed with some of the true greats in surgery, I.S. Ravdin, Jonathan Rhoads, William Fitts, and many others. My favorite course though was Pharmacology, taught by a brilliant star-studded faculty. It was amazing to hear those folks explain exactly why things happened. I’ve been interested in that field ever since. I loved surgery and did a rotation on Urology. I met Tom Rohner (still a resident, later chair at Penn State) and Harry Schoenberg, a somewhat gruff but extraordinary surgeon and human being, and I liked the subject matter. With one of my classmates, I did some canine based research and some (badly done) outcome studies, but met a young surgeon who was working on hyperalimentation (Stan Dudrick). Stan was a model for how to get things done. Dr. Rhoads (the concept originator of hyperalimentation) simply turned Stan loose on the project, and with a team of biochemists, and non-stop work, Stan succeeded in proving the concept was clinically viable in dogs to humans. Good lesson. We had dogs to care for as well, and had to find someone to care for them when we were on vacation. Stan offered to do this, because, as he put it, “I’m always here—no problem”.

I figured I was a surgical personality and went about excluding other surgical specialties for various reasons. I liked the subject material and because Tom Rohner, Terry Malloy, Joe Corriere and Harry Schoenberg, as well as my dad's urologist at MGH, Ed Parkhurst, were good role models, each in their own way, I settled into Urology and stayed at Penn for Surgery, research and Urology. My co-residents were John Gregory and Tom Sansone, both superb. We shared research projects under the auspices of a training grant and entered our clinical training. John Murphy was our chief, back from a "crash course" in Urology at Michigan, following full training in Surgery at Penn. Surgery and Urology residencies were hard, laborious, and the night schedule (in house) was M-W-Sat-Sun, then Tue-Thu-Fri. The atmosphere was different, the schedule seemed to be appropriate for patient care, and we all accepted the "scut" as a necessary part of the training. Harry Schoenberg was the shining light of our residency – superb surgeon, great judgment, always took full responsibility for whatever we did and always "had our backs". Hopefully, I've been able to imitate him in regard to the way he conducted himself. My research as a resident was oriented towards lower urinary tract physiology and pharmacology. I was lucky enough to have the help and support of members of the Department of Pharmacology (Dave Jacobowitz, Marilyn Hess, Neils Haugaard), and I was continually amazed at how brilliant and willing to help these mentors were. At the outset of my year in the lab, I showed them a smattering of what was available in terms of the area of lower urinary tract (LUT). They were not impressed and felt the field could use an upgrade. They continued in their roles as facilitators during my residency and after I came back from the service.

I was in the Berry Plan and spent two years after residency as a urologist at Fort Benning. Harry Schoenberg left Penn, went to St. Louis University as chair and took John Gregory with him. John succeeded Harry, who subsequently became the chair at the University of Chicago. Tom Sansone went into practice in the Philadelphia suburbs and eventually became chief at Bryn Mawr Hospital. When I arrived at Benning after basic training, there were four working urologists on staff, soon to become three, then two. My partner, Gerry Halpern, had been trained at Northwestern, and we had a great relationship, trading the knowledge that each of us lacked. I was able, due to the grace of Joe Corriere, to go back to Penn periodically and do some lab work which Joe sponsored and continued in my absence. I liked the Army. As a major, I had a lot of privileges, a relaxed work schedule and what seemed like plenty of money. I lived off post in a development occupied mostly by field grade officers. They and the enlisted men constitute what was called the real army. I came away with a great respect for their motivation and love of country. Almost all had been in Vietnam, an experience which greatly affected their lives. I'm sorry I lost contact with the folks I became friendly with there.

My plans after the service originally included a private practice in Phoenix, Arizona, with Charlie Saunders, one of my co-residents. We didn't find the climate for a new set of urologists there particularly warm and couldn't bankroll a new practice setup. After looking at a few jobs, I decided to go back to Penn, where I knew I would be comfortable. John Murphy was the chief, Grant Mulholland (a truly great guy, super scientist and surgeon) was on staff at Penn, Joe Corriere had just left to be the chair at U.T. in Houston, and I was essentially replacing Joe. My first position was chief at the Veteran's Hospital and staff at the University Hospital. We had great residents, three of which were George Benson, Larry Lipshultz and Andy Van Eschenbach. We had absorbed Pennsylvania Hospital into the program (Terry Malloy as chief) and were responsible for the VA and Children's Hospital as well. We were busy. The years 1975-1980 were turbulent times at Penn Urology. Let's leave it at that. Grant Mulholland left to become chair at Jefferson, and I hired Stan Greenberg, who ultimately left because of the turbulence to go into practice in Columbia, South Carolina. That left John Murphy and myself.

In the meantime, I knew I wanted to pursue research in the area of LUT pharmacology and physiology, but I had reached the limit of my knowledge of the techniques necessary to advance the field. I credit Leonard Miller, the then chair of Surgery, with encouraging me to recruit a basic scientist to further this goal and with initially funding the position and the program. My friends in Pharmacology were, as usual, very helpful and ultimately suggested talking to an individual they knew well and who had just finished his post doctorate in cardiovascular pharmacology. I met with Bob Levin, and we agreed that as a first project we would map out the receptor content in the bladder and try to correlate this with function. We were off to the races. Bob was incredibly bright, insightful and hard working. He organized a lab that came to include the folks in Pharmacology, recruited Penny Longhurst, Mike Ruggieri and Mike DiSanto. We enjoyed an enviable record of extramural funding and productivity, which made my rise in the tenure track to professor rather easy, along with, by that time, a very large clinical practice.

The turbulence at Penn included a split with John Murphy at a time when I was covering both University Hospital and the V.A. I placed a frantic call to Phil Hanno, who was doing a post resident registrarship with Forbes Abercrombie in Portsmouth, England, and one word seemed appropriate, “help”. Phil returned early and I appointed him chief at the V.A., but with a heavy schedule at HUP as well. I formally became chief of the division in 1979, having served essentially as the acting chief since 1977. I also retained the administration of the residency program, which I had been running as well. I did both jobs until I stepped down as chief in 2017, but I still retain and enjoy the post of program director in Urology. In fact, that’s the best part of my job. Ultimately we recruited Keith Van Arsdalen in 1982, who spent part of a year as a neurourology fellow before taking over the stone, endourology and fertility programs, as well as being a superb surgeon in every other area of urology; Bruce Malkowicz, who did a fellowship with Don Skinner and was one of the first AUA scholars (at the Wistar Institute) and brought continent diversion and the Skinner cystectomy back to Philadelphia in 1988; Andrew Axilrod, as a general urologist; Greg Broderick, for trauma and erectile dysfunction and Eric Rovner for female urology and pelvic reconstruction. Phil Hanno left to become chair of Urology at Temple.

Meanwhile back on the research side, Bob and I and company continued to try and further knowledge on LUT physiology and pharmacology. Bob developed the whole bladder model for the rodent, and we began to study the effects of obstruction on the LUT, along with Ed McGuire and his team. We achieved an O’Brien Center Award, a project that was refunded many times. Sam Chacko joined the lab in 1993, having become involved with urinary bladder myosin in 1988, and became the director of the lab in 1997 when Bob Levin left for a tenured position at the Albany College of Pharmacy. Sam changed the focus of the lab to a more molecular approach and was very successful in securing extramural funding and super assistance for a number of years. A couple of dry years forced the lab to close in 2014 and Sam retired with his former title, tenured professor in the Veterinary School at Penn.

I thought the LUT was fascinating from a physiologic and pharmacologic standpoint. Although the brain remained a bit of a black box, the organization and the relatively discrete division between filling/storage and emptying and the relatively predictable deficits and dysfunction with neurologic injury and disease seemed to lend itself to a simple classification system involving the 2 phases of the micturition cycle. Tinkering around with this resulted in the functional classification of LUT function and dysfunction which could be utilized for understanding pathophysiology, urodynamics and treatment, understanding that some individuals had a failure to both fill/store and empty and those required a little more thought for management. The concept became popular simply because it was logical and easy to learn and apply. Another easy to understand corollary was that every point of physiologic function that involved neural or chemical transmission coupling or transduction was a point of potential pharmacologic manipulation. Too bad most of our drugs and combinations turned out better as concepts than effective therapeutic agents. Phil Hanno and I invited Vicki Ratner and her colleagues to discuss an oddity at that time called interstitial cystitis. Vicki, herself affected, had become the leader of the Interstitial Cystitis Association and was a real force in getting government attention and funding for the ICDB (Interstitial Cystitis Data Base) the first really organized attempt to study this “entity” from an epidemiologic standpoint. We were awarded the NIH database effort along with Richard Landis, an epidemiologist from Penn, and Lee Nyberg from NIH and came up with the first set of criteria for entry into studies of what we originally felt was the “classic” IC patient. IC became Phil’s “baby”, and Penn attracted and still maintains a large following of these patients (Phil is at Stanford now).

Paul Abrams and I were early supporters of the ICS (International Continence Society) standardization of terminology effort and came up with the concept of the “overactive bladder”, a term that we felt was understandable to both generalist and specialists and suggested, but was not always associated with, the urodynamic demonstration of detrusor overactivity. The term has had its critics, who felt that it was a pharma ploy to sell drugs, but it was in fact only a simple effort to replace the terms “detrusor instability” and the “unstable bladder” and make the condition (OAB) more familiar to non-urologists and gynecologists. The term has withstood the test of time.

My interests in these areas and their correlates and ramifications has stayed pretty consistent and expanded to include the pharmacologic management of LUT dysfunction, the concept of the drug/placebo ratio to try and level the playing field for comparison of one drug to another and, more recently, nocturia and its management, and the placebo effect itself.

My success is due to a lot of people who have furthered my career. First and foremost, to John Duckett, who I first met in 1970 when I was the first urology resident at Penn to rotate at The Children's Hospital of Philadelphia (CHOP). This was shortly after John was recruited by C. Everett Koop to head pediatric urology at CHOP. I thought John was the most innately talented urologist I have ever seen and was a great "rabbi" for my career. During another turbulent time at Penn, it was John who was really responsible for my ascent up the ladder of urology. Through his influence, I gained election to the ultimate "sext-fecta", the hallowed halls of the Residency Review Committee, the Exam Committee, the Board of Urology, the original AUA Update group, the GU Surgeons and the Clinical Society, all of which gave me the opportunity to become well acquainted with the "who's who" of urology. Everyone needs a John Duckett. Brantley Scott, another great friend, once told me that to be successful, you had to "jump over the fence". John threw me over!

There were others who greatly facilitated the climb up the greasy pole (apologies to some not mentioned). Joe Kaufman, the then chair of Urology at UCLA, and Pat Walsh at Hopkins, were great friends and advocates. Both were very supportive of me in my efforts and trials and tribulations at Penn and urology in general, and great role models in different ways. Pat picked me to replace Tom Stamey on the Editorial Board of Campbell's and ultimately to replace himself as the editor-in-chief, a real labor of love for me. Karl-Erik Andersson and Chet Degroat, pharmacologist and physiologist extraordinaire, were always answering important questions and were happy to help educate me in their areas. Karl-Erik was the ultimate role model for me in pharmacology; Roger Dmochowski, Paul Abrams, Linda Cardozo, Chris Chapple, Dave Barrett, Jerry Blaivas, David Staskin, David Sussman, Neil Matheson, Gina Carithers were a great crew of friends from the "advisory board days". Although these meetings and the pharma companies who sponsored them obviously had a set program of objectives, I will say that I rarely went to one at which I did not learn new facts or new ways of looking at an old problem. The group was like a mini brain trust.

I've enjoyed the good fortune of great friends and supporters in urology, who I think have been responsible for the awards I have been bestowed by various organizations: the AUA, the Federal State Institute of Urology of the Russian Federation, the University of Patras, the New York Academy of Medicine, the New Jersey Academy of Medicine, the Interstitial Cystitis Association, the Urodynamics Society (original name for the Society of Urodynamics and Female Urology and the Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction), the National Association for Continence, the Société Internationale d'Urologie (SIU) and the "big one", the Keyes Medal from the American Association of Genitourinary Surgeons. On February 5, 2020, I received a communication from the Board of Trustees of the International Continence Society (ICS) naming me the recipient of the ICS Lifetime Achievement Award, which will be formally presented at the ICS Annual Meeting in November of this year.

I continue to see patients, operate (no robots, no "huge" cases), serve on editorial boards and committees, continue to participate in educational activities worldwide, lecture, stay connected with research projects I enjoy, but ... what I value more than anything at present is my position as residency program director at Penn and the contact with the residents and medical students that it affords through their career from applicant to chief and beyond. The clinical work is enjoyable, but without the residents, would just be a job.

I've enjoyed my life at Penn, starting medical school in 1962 and never leaving except for Army service. As the chief of urology for 38 years, I enjoyed the responsibility, survived the conflicts, and was happy to have a hand in selecting my successor, Tom Guzzo, who is making his mark and will continue to do so. As the program director and elder statesman of our group, I continue to have a position that I enjoy, even with all the regulatory changes that have occurred and will continue to do so. When I schedule older patients for a yearly or two-year follow up, I tell them, I promise to show up if you do.

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