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From Berlin to Brady: Tracing the Origins of the Urology Residency

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Introduction: Urology was one of the first subspecialties in medicine to employ the training model known today as residency, yet no definitive account currently exists of how urology residency programs came into existence. These events are rarely taught in formal urologic curricula. It is imperative that tomorrow's urologists understand how today's system came to be.

Sources and Methods: We performed a comprehensive review of the literature, referencing primary and secondary sources including journal articles, books, textbook chapters, monographs, bulletins, editorials, and transcribed speeches, to compile sufficient evidence to complete this historical review.

Results: During the 13th-18th centuries, surgical training was undertaken in small and non-regulated apprenticeships. Napoleon created the first versions of the residency training model in early 1800s France. In Berlin, Bernhard von Langenbeck (1810-1887) devised the most direct early predecessor of the modern system. An early trainee, Theodor Billroth (1829-1894) later mentored American surgeon William Halsted (1852-1922) and passed along the training methods. At Johns Hopkins Hospital, Halsted drew on Billroth's methods to establish the "pyramidal" training model in 1890. This was later adapted by Edward Churchill (1895-1972) at Massachusetts General Hospital into the "rectangular" structure in the 1930s, which is closer to existing residency programs today. Hugh Hampton Young (1879-1944), the 'Father of American Urology', was hired by Halsted at Hopkins and quickly became Chair of the Department of Genitourinary Diseases in 1897. Young informally recommended aspiring urologists to Halsted for appointment in the surgical residency, spawning the beginnings of the urologic specialty. In 1915, the Brady Urological Institute opened at Hopkins via a donation from Young's patient James Buchanan Brady (1856-1917), and a 7-year training program was designed alongside it. With this, the first formal urology residency in the country was born.

Conclusions: American urology residency formally began in 1915 at Johns Hopkins Hospital under the direction of Hugh Hampton Young and shares deep roots with the history of surgery itself. Recognizing where this training model originated is a critical context for all who seek to improve how the urologists of tomorrow are trained.

Key Words: History, urology, residency, education, surgical training, house officer

Urology was one of the first subspecialties in American medicine to employ the training model known today as residency, stemming closely and directly from the original format brought from Europe and implemented by Dr. William Halsted at Johns Hopkins Hospital in 1889.(1) Though formal surgical training predated Halsted by hundreds of years, aspects of the apprenticeship model previously used are still largely ingrained in the fundamentals of how modern surgeons are molded, especially in surgical subspecialties such as urology.(2) Thus, it is fitting that the first formal residency training program in American urology was founded by Hugh Hampton Young, the 'Father of American Urology' and one of Halsted's former surgical interns at Johns Hopkins.(3)

Despite urology's rich history, fewer than 50% of residency programs include historical content in their formal education curricula even though 83% of program directors believe history should be taught.(4) When history content is included in a program, reports suggest that 88% is achieved through "pimping" in the operating room and only 15% in dedicated lectures on urologic history. A total of 17% of program directors (PDs) felt history should not be taught in formal residency curricula and 4 of 5 PDs agreed with the statement that "residents can read about (history) on their own."(4) The American Urological Association (AUA) University provides a comprehensive resource

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on 22 urologic domains deemed important to the development of the resident in urology. None are devoted to urologic history, how residency training came about, or the complex financial and legislative history allowing residency training to exist. There is no published resource on the history of urology residency training in the United States. Our objective was to identify the pioneers responsible for, and the steps taken to develop, the modern American urology residency system. Our secondary aim was to provide a resource for inclusion into formal urologic curricula so that future urologists may better understand how today's training systems came to be.

SOURCES AND METHODS

Primary and secondary sources were identified via online literature search engines including PubMed (pubmed.ncbi.nlm.nih.gov), the National Library of Medicine (nlm.nih.gov), and Google Scholar (scholar.google.com), among others. Additional sources of particular importance included Young's autobiography and a named lecture delivered by Halsted at Yale in 1904.(5, 6) We also used academic journal articles as well as books, textbook chapters, monographs, bulletins, editorials, and transcribed speeches. Non-digitized books and other references were accessed in hard copy via the Edward G. Miner Library at the University of Rochester Medical Center or digitized de novo using an interlibrary loan system. We used the resources of the William P. Didusch Center for Urologic History (Linthicum), the National Library of Medicine (Washington), and online search engines to identify images, which were used with permission or confirmed to be in the public domain prior to being selected.

RESULTS

Origins of Surgical Training

Surgery is an ancient profession, with written accounts of surgical technique first emerging in Egyptian papyri around 3000 BCE and further examples of modern procedures, such as incision and drainage, dating as far back as 1068 BCE in Mesopotamia.(7, 8) Surgical training has traditionally been viewed by modern scholars as an apprenticeship, although not always formal or structured. Apprenticeships began as informal arrangements with family or acquaintances, but over time rules took shape even as the length and content of training varied.(2) For example, apprenticeships during the 16th century often began with trainees around the age of 12 years old and lasted 5-7 years, with the option to pursue further years of training after in a so-called

Figure 1. (Left) The "Founder of Clinical Teaching", Herman Boerhaave (1668-1738), and his alleged favorite pupil Gerhard van Swieten (center) (1700-1772), who would eventually bring his mentor's teachings from Leiden to Vienna. Decades later in France, similar bedside teaching practices became institutionalized in Napoleon's "*L'internat des hôpitaux de Paris*" system. (Right) Jean-Charles Faget (1818-1884) became its first American graduate, or *AIHP*. (Public domain, National Library of Medicine, Bethesda)

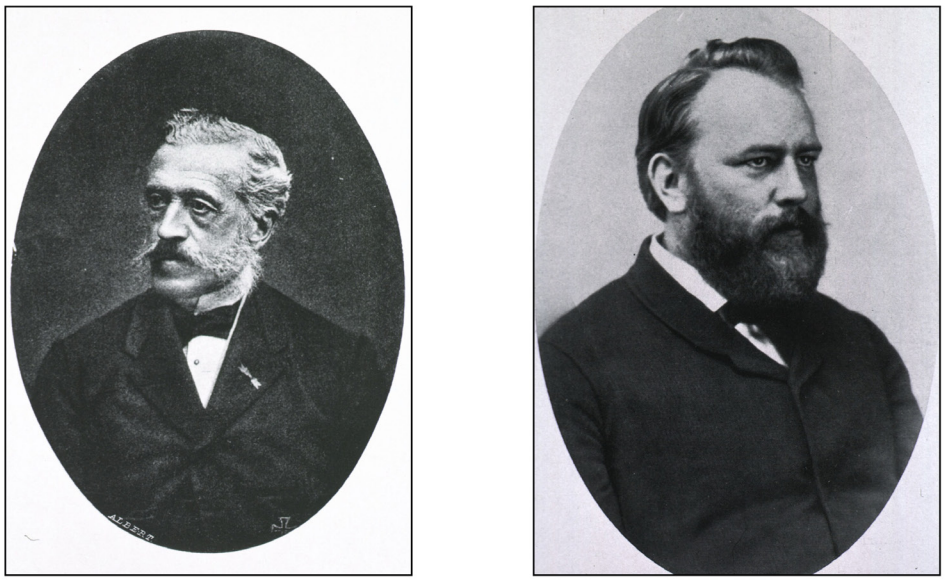

Figure 2. (Left) Bernhard von Langenbeck (1810-1887), Berlin's 'Father of the Surgical Residency', developed and refined a system of training 'house officers' who were the predecessors of modern-day surgical residents. One such house officer, Theodor Billroth (1829-1894) (right), eventually became Chair of the University of Vienna's surgical department and it was there that he later met and influenced a young William Halsted. (Public domain, National Library of Medicine, Bethesda)

'journeymanship'.(2, 9) Though not necessary to practice surgery, such itinerant opportunities allowed the apprentice to gain further experience under the same or a different master.

In France, even while apprenticeships continued to flourish, efforts to advance surgical education began to appear and foreshadowed the reforms that would take place centuries later. The College de Saint-Côme, established in Paris in 1210, eventually began an effort to train academic surgeons separately from their often minimally-trained barber-surgeon counterparts.(2) Academic physicians, or those with formal training or university education, became "surgeons of the long robe" and barbers "surgeons of the short robe." The schism in training and practice persisted across Europe, with records in London of the separate Guild or Fellowship of Surgeons and Company of Barbers existing as early as 1368 and 1308, respectively.(10) Eventually the two would join in 1540 as the Company of Barbers and Surgeons, which existed until 1745 when a bill signed by King George II allowed the surgeons to break away as the Royal College of Surgeons, which persists to this day.(10) Eight years earlier, in France, the surgeons also broke away from the barbers thanks to the efforts of King Louis XV's personal surgeon, François Gigot de La Peyronie (1678-1747).(11) Despite these organizational changes and the early 13th century French innovation in training, informal apprenticeships would still predominate in Europe for centuries more.(2) In 1370 for example, an act of English Parliament mandated 7-year apprenticeships for guilds such as that of the surgeons.(10) While surgery slowly evolved from a trade to a profession, it would be a number of centuries before another burst of innovation was seen in the training model.

Throughout the 18th and 19th centuries, a handful of notable individuals would make important contributions to the eventual development of the residency training model. Herman Boerhaave (1668-1738), the 'Dutch Hippocrates' and 'Founder of Clinical Teaching', famously began conducting regular bedside teaching rounds at the University of Leiden in the early 1700s, drawing students and visitors from all over the world (Figure 1).(12, 13) Though bedside teaching had existed in the prior century in an intermittent fashion, Boerhaave added structure by having pupils observe a set number of cases in his 12 dedicated teaching beds on a twice-weekly basis. These rounds continued until his death in 1738 and ultimately set clinical training on a course towards the model still used today, with Halsted remarking that "the development of clinical teaching can be traced by unbroken tradition directly to Boerhaave."(5) After his death, Boerhaave's influence continued to spread, with his favorite pupil Gerhard

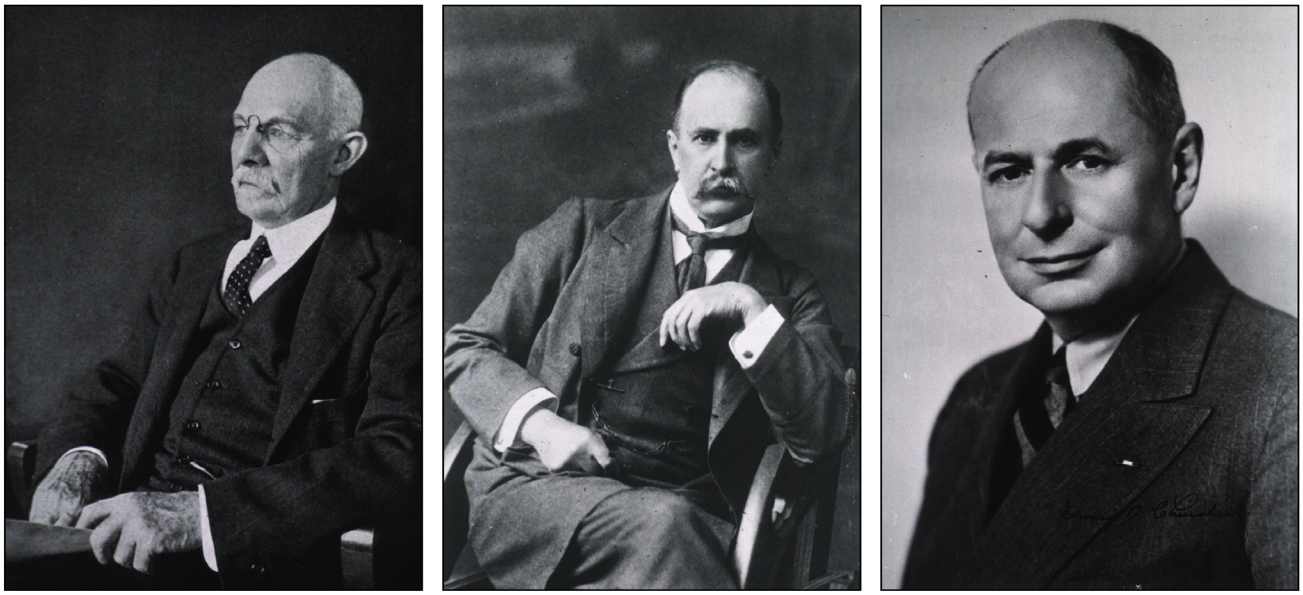

Figure 3. (Left) William Halsted (1852-1922), American surgeon and the 'Father of Modern Surgery', established the first American surgical residency program at Johns Hopkins Hospital after William Osler (center) (1849-1919) proposed the idea of a European-style residency training program to the Hopkins Board of Trustees. Decades later, Edward Churchill (right) (1895-1972) adapted Halsted's "pyramidal" model into a "rectangular" model at Massachusetts General Hospital, which remains the backbone of surgical residency program structures today. (Public Domain, National Library of Medicine, Bethesda)

van Swieten (1700-1772) accepting an invitation to teach at the medical school in Vienna in 1745 and shortly thereafter becoming its president (Figure 1).(12, 14) By 1754, the school's clinical instruction had been revolutionized, with bedside teaching rounds implemented by Anton de Haen (1704-1776), another of Boerhaave's pupils.(14, 15)

Not long after, in France, similar changes were brewing. In 1802, Napoleon created "*L'internat des hôpitaux de Paris*"—or Interns of the Hospitals of Paris (IHP)—training program in response to their disorganized medical system after the French Revolution.(16) Like Boerhaave's, this reform emphasized centralized teaching at the bedside referred to as "*au lit du malade*" and created a system of roles that would foreshadow those found in surgical residencies today.(16) "*Externes*", lowest on the totem pole, managed up to six patient beds and handled scut work such as morning examinations, progress notes, and small medical tasks or procedures. Fewer than 15% of them advanced to the IHP stage, a period of training lasting three to five years and encompassing both clinical education and written examinations.(16) Together, the "*internes*" and "*externes*" handled most of the work in the hospital through a daily presence and rotating night call, sometimes even living at the hospital.

A first of its kind, this system was akin to early models of American surgical residency and drew trainees from around the world. The first American graduate, or "*ancien*" IHP (AIHP), was Jean-Charles Faget (1818-1884) who completed his "Internat" program in 1842 and became an AIHP with his thesis on the management of pediatric obstructive uropathy in 1844, before returning to New Orleans in 1846 (Figure 1).(16) Another American who brought the French training influence back home was William Osler (1849-1919), who is noted to have visited Paris to observe the "*au lit du malade*" teaching rounds during the late 1800s.(16) Eventually, Osler would draw on this influence in proposing a surgical residency at Johns Hopkins.

Residency Takes Shape in Berlin

In the early 19th century in Berlin, Bernhard von Langenbeck (1810-1887) began to weave a fateful thread which would eventually lead to Halsted, Hopkins, and ultimately a urology residency at the Brady Institute (Figure 2). Upon graduating medical school in 1834, von Langenbeck traveled abroad for two years of post-doctoral study and visited France during the same years that the IHP model was prominent.(17) Eventually joining the University of Berlin in 1848 as a staff surgeon, he would ultimately become known as the 'Father of the Surgical Residency.'(18) At Berlin's famous Charité Hospital, von Langenbeck developed and refined a

Figure 4. (Left) Hugh Hampton Young (1870-1945), the "Father of American Urology", established the first American urology residency program at Johns Hopkins Hopsital's new James Buchanan Brady Urological Institute in 1915. (Public Domain, National Library of Medicine, Bethesda). (Center) Frank Hinman Sr. (1880-1961), a previous appointee to Halsted's surgical program, became the first chief resident under Young. (Right) William A. Frontz (1885-1934) succeeded Hinman the following year and thus became the first Brady resident to complete a full chief year. (William P. Didusch Center for Urologic History, Linthicum)

system of training "house officers" who might be seen as predecessors of modern-day residents. Under his system, medical graduates spent long hours in-house at the hospital, often living on-site, and undertook graduated responsibility in the care of surgical patients.(10, 19)

One of his many prominent house officers was Theodor Billroth (1829-1894),(19-21) the 'Founder of Abdominal Surgery' (Figure 2).(22) In Berlin, Billroth studied under von Langenbeck in medical school and then became his assistant in the surgical clinic at Charité.(22) In 1860 he accepted a surgical professorship at the University of Zürich, leaving seven years later to assume the chair position in the University of Vienna's surgical department.(20-22) A century prior, Boerhaave's pupil, van Swieten, had reformed medical education in Vienna, and now it was Billroth's turn to make his mark by bringing with him the house officer training model of Berlin and von Langenbeck.(14) Years later, Halsted would be exposed to this revolutionary system while training under Billroth in Vienna during his European travels of 1878-1880 (Figure 3).(23, 24) Heading across the Atlantic in 1878, due to the lack of surgical exposure in his brief stint at New York Hospital, Halsted may not have predicted that the trip would also ready him to transform American surgical training.

Upon his return to America in 1880, Halsted stepped into a faculty role at the College of Physicians and Surgeons in New York City.(23-25) Over the next six years, he taught and practiced at five other city hospitals, including Bellevue and Presbyterian, and was known to be a daring surgeon and a prolific educator.(26) Drawing on his European training and those influences dating back to Boerhaave, he held medical student lectures, implemented regular bedside clinical teaching rounds, and even arranged for laboratory training with his future Hopkins colleague William Welch (1850-1930), who was also at Bellevue at the time.(23, 24, 26) As a result, his students were consistently successful and his growing renown and influence as a leader in surgery and medical education began to spread.(5, 23)

Unfortunately, Halsted developed an accidental cocaine habit in 1884 while experimenting with the drug as a local anesthetic after German ophthalmological research introduced its potential for use in procedures.(23-27) With the influence of cocaine addiction, scholars have written that his papers began to deteriorate and his other clinical and academic duties suffered.(23, 26) However, he still found time to travel abroad back to Vienna in 1885, where he shared the anesthetic properties of cocaine with Billroth's first assistant, Anton Woelfer.(26) At the height of Halsted's addiction, declining health and erratic behavior led his friend and colleague Welch to arrange an intervention of sorts, traveling together by boat to the tropical Windward Islands. (23, 26) The journey failed, with Halsted breaking into the ship's medical supplies to steal drugs. Shortly after returning home, he checked into six months of 'rehab' in Providence, Rhode Island.(23-26)

There, Halsted successfully weaned off cocaine but traded it for morphine and a tainted reputation.(23, 26) Without a career in New York to return to, Halsted next landed in Baltimore after accepting an invitation to live with Welch

'DIAMOND JIM' GIVES $220,000 TO HOSPITAL

Thank Offering to Johns Hopkins for Cure, Which He Celebrates with a Dinner.

FIRST SOLID MEAL IN MONTHS

Illness Forced Him to Give Up the Things in Life He Enjoyed Most —Plans Another Dinner.

James Buchanan Brady, Vice President of the Standard Steel Car Company, known from ocean to ocean as "Diamond

Figure 5. (Left) Announcement of initial donation by 'Diamond Jim' Brady establishing the Brady Urologic Institute (New York Times, 8/13/1912). (Right) Hugh Hampton Young examining one of the famous diamond rings willingly displayed by his patient, James Buchanan Brady (1856-1917). (William P. Didusch Center for Urologic History, Linthicum)

and join his pathology lab at Johns Hopkins University. (23-26) After another brief stint in rehab in 1887,(23, 26) Halsted succeeded in impressing his new peers and by 1889 was appointed surgeon at the newly opened Johns Hopkins Hospital.(23, 26, 27) In 1890 he was made its first Surgeon-in-Chief and, in 1892, became the first Professor of Surgery at the recently opened School of Medicine.(23-27) He is now considered one of the founding 'Big Four' doctors at Hopkins—alongside Welch, William Osler, and Howard Kelly (1858-1943)—and it was at Hopkins that Halsted would also establish the first American surgical residency program.(2, 10, 23)

The Halsted Model

A residency program at Hopkins was originally proposed by Osler to the Board of Trustees in 1890, likely stemming from his prior exposure to the French IHP system.(16) Upon his arrival and appointment, Halsted quickly and enthusiastically implemented the system for surgical training (Figure 3).(2, 24) Halsted's "pyramidal" model of surgical residency training at Hopkins updated but drew heavily on the French and German training systems he encountered when traveling and studying abroad.(2, 9, 23, 25, 27, 28) While giving the 1904 Annual Address in Medicine at Yale, his alma mater, he stated, "It was our intention originally to adopt as closely as possible the German plan."(5) Still, his methods were not without innovation and certainly unlike any other surgical training program in America at the time.(29)

Halsted selected eight surgical residents the first year, with four occupying one-year positions and four remaining on in perpetual appointments.(5, 18, 25, 27-30) Of the latter four, one was appointed the chief or "house surgeon", with the other three as assistant surgeons in line for promotion once Halsted personally approved the chief for graduation to independent practice.(5, 18, 25, 27-30) There was no set duration of training for the four residents on permanent staff, and advancement was not guaranteed.(5, 18, 29) The system was biased to create a single exemplary academic surgeon, somewhat at the expense of the others. Even those who did not rise to the top, however, still went on to have illustrious surgical careers.(23, 25, 30) While Halsted adamantly defended his system's soundness, detractors pointed to the arduous length of training and pyramidal structure as obvious faults.(18, 28) Still, the Halsted model became prominent thanks to his many trainees spreading its tenets after departure, such as Harvey Cushing (1869-1939) upon his 1912 arrival at the Brigham Hospital in Boston.(9, 27)

Even alongside the Halsted model's success, other programs existed and innovation slowly took place. For example, two- and three-year surgical training programs were common at other hospitals such as the University of Pennsylvania and Massachusetts General Hospital (MGH) in the early 1900s, but it was felt that these

graduates were still not fully ready for independent practice.(30) The first major evolution of Halsted's model came in 1922, when his 13th resident, George Heuer (1882-1950), left to become Chair of Surgery at the University of Cincinnati.(27) Heuer's model borrowed from Halsted's, but replaced its perpetual appointments with set training durations. In Heuer's residency, a one-year internship was followed by a six-year surgical residency, and it was the first to introduce regular rotations in various surgical domains. For example, residents in their third year primarily focused on urology and orthopedics.(31) In 1932, Heuer moved to Cornell Medical Center in New York and established another surgical residency in the same style of Cincinnati's.(31)

The next major shift came in 1938, when Edward Churchill at MGH proposed his "rectangular" residency model (Figure 3).(30, 32) A major critic of Halsted's long and autocratic structure, Churchill favored a training model which emphasized groups of surgeon mentors instead of a single dominant master.(30) Critiquing the fast and frequent exiting of residents from Halsted's program, he famously remarked, "half a surgical training is about as useful as half a billiard ball."(25, 28, 30) MGH's previous two-year training program had been expanded to three in 1935, and in comparison, Churchill's new system accepted fewer candidates but kept them longer to ensure each resident received a complete and holistic surgical education.(30, 32) All six residents would complete five years of training, and two could then optionally stay on for an additional supervisory year of clinical work or education in preparation for an academic career.(30) Churchill's model traded the competitiveness of Halsted's for a collaborative approach, and still serves as the backbone of surgical residency programs today.(18, 25)

DISCUSSION

Hugh Hampton Young and the Brady Institute

Residency in urology would eventually arise under the influence of Hugh Hampton Young, one of Halsted's initial residents (Figure 4). Born September 18, 1870 in Texas, Young began to spend time with his grandfather, a surgeon in Virginia, around age 12 and quickly developed a knack for working with his hands.(3, 6) Just over a decade later, he followed in his grandfather's footsteps and earned a medical degree from the University of Virginia in 1894.(3, 6) In his autobiography, Young commented on the poor state of medical education at the time and lack of clinical practice among most of the teaching professors, perhaps foreshadowing his subsequent desire to improve urologic training. Young arrived at Hopkins shortly after graduating and initially worked in pediatrics, bacteriology, and pathology as Halsted had no surgical intern positions available at the time.(3, 6) To Young's excitement, he was soon able to fill a temporary vacancy and ultimately was appointed to stay on as a house officer.(1, 3, 6)

In 1896 he began to study bladder dysfunction and by 1897 was made Chair of the Department of Genitourinary Diseases at age 27, after the death of its former leader, James Brown, two years prior.(3, 29, 33) Despite his research, Young had no particular clinical interest in urology at the time and instead expected to pursue other routes within general surgery.(6) In response to the promotion, famously cited as occurring after Halsted and Young literally ran into each other in the hallway, Young stated, "This is a great surprise. I know nothing about genitourinary surgery."(1, 6) Halsted then replied, "'Welch and I said you didn't know anything about it, but we believe you could learn."(1, 6) And learn he did, helming the department through 1941 and embarking on an illustrious career which ultimately led to his reputation as the 'Father of American Urology'.(3)

From 1897-1915, Young was allowed to recommend aspiring urologists to Halsted for appointment in the surgical residency, spawning the beginnings of the urologic specialty as we know it today.(1) One such appointee was Frank Hinman Sr. (1880-1967), who would later go on to become Young's first urology resident at Hopkins in 1912 before leaving in 1915 to open a private practice and then soon after assume the Chairman of Urology role at the University of California in San Francisco (Figure 4).(1, 6, 34) Coincidentally, his son Frank Hinman Jr. (1915-2011) was born that very same year and pursued urology himself, eventually joining his father's private practice in San Francisco and penning his famous *Atlas of Urologic Surgery* which is still widely used today.(35)

Young's illustrious career was full of landmark innovations and famous trainees, but undoubtedly his most famous patient was a wealthy businessman in the railroad and steel industries named James Buchanan Brady (Figure 5).(6, 36, 37) Known as "Diamond Jim" for his penchant for fine jewelry and elaborate collection of the aforementioned gemstones, he was "remarkably generous" and "one of the most extraordinary men I have known" in Young's words.(6) The two met in 1912, when Brady sought out Young's practice after finding no relief from other physicians in Boston and New York for his agonizingly infected and obstructing prostate.(36)

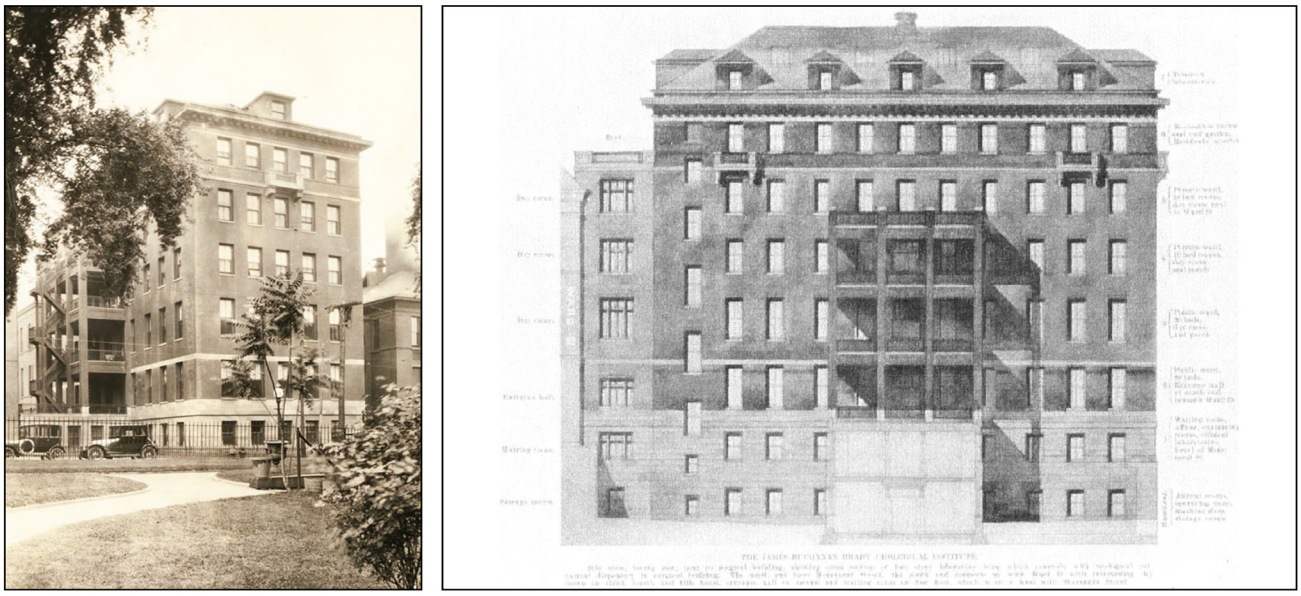

Figure 6. (Left) The James Buchanan Brady Urological Institute, exterior view, began construction in November 1913 and opened for patient care in January 1915. (Alan Masan Chesney Archives, Johns Hopkins Hospital, Baltimore). (Right) A schematic of the building published in a 1914 Johns Hopkins alumni magazine where a 7-year urology residency was designed and established by Hugh Hampton Young, the first urology residency in America. (Public Domain, J Hop Alumni Mag, 1914; 2: 96)

The symptoms were so excruciating that Brady instructed his valet to open the safe one night, believing his death was imminent, and burn specific sensitive documents.(37)

Much to Diamond Jim's relief, Young recommended an exciting new transurethral approach with an instrument he had recently invented, as opposed to open prostatectomy, which his prior surgeons had deemed too risky due to Brady's severe obesity, diabetes, and heart disease.(6, 37) Thus, Young performed his famous prostatic 'punch' resection on April 7, 1912 and, despite a postoperative infection, Brady recovered quickly and remarkably well.(6, 37) Brady was so thrilled with the outcome that he showered Young and his family with elaborate gifts, and a strong bond of friendship developed as their clinical relationship continued.(6)

The following year, Young became interested in building a urologic hospital at Hopkins.(3) He had prepared rudimentary plans years earlier, but the funding fell through and the idea had been abandoned. (6) Revisiting the prospect, Young thought of Brady, who had previously confided in him an admission that his lavish spending on actresses and entertainment often felt like "mistaken generosity."(6) "Thinking of the money Brady had squandered, it occurred to me that he might be persuaded to build a hospital as a monument to himself," Young wrote.(6) At his next check-up appointment, Young proposed the idea and "saw that Brady was greatly impressed."(6) Soon after, Diamond Jim donated $220,000 (Figure 5) in order to establish the James Buchanan Brady Urological Institute at Johns Hopkins Hospital, which broke ground on November 15, 1913 and opened to patients on January 21, 1915 (Figure 6).(1, 3, 6, 37) In Young's words, "Brady often sent patients to be treated at his institute," and "(the) fact that they were all taken care of without expense was greatly appreciated by Brady, who often said that the pleasure he got from building the institute was great and that he was sorry he had not done it years before."(6)

The First Urology Residency

Alongside the Brady Institute's construction, Young drew upon both German and Halstedian inspiration and designed a seven-year surgical residency training program in urology, with six years spent in Baltimore and one away in Minnesota under the tutelage of Dr. Frederick Foley (1891-1966).(3, 6) The structure consisted of a chief resident of sorts, numerous subordinate house officers, and integrated medical students into the training just as Osler and those before him had emphasized.(3) Young's residents enjoyed an intern year; supplemental rotations in general surgery, gynecology, and pathology; research time; and multiple dedicated years of urology training. (3, 6) In their final year of training as chief, or "resident urologist", Young's trainees would take a more active role in leadership, teaching, and research at the institute and performed nearly all of the surgeries in the public

wards.(1, 3, 6)

In his thirty years presiding over the residency, Young's progeny numbered at least 38 chief residents and countless more assistant residents.(1, 3) Hinman Sr. was the first true urology resident at Hopkins, training under Young from 1912 until 1915, when Hinman briefly became the first chief resident at the brand new Brady Institute before departing for San Francisco.(1, 6, 34) However, it was his successor William A. Frontz (1885-1934) who would become the first to complete a full chief year at the Brady Institute after the residency program transitioned there in June, 1915 (Figure 4).(1, 6) After completing his training, Frontz stayed on at the Brady Institute as an assistant in urology and then as an assistant visiting urologist until his untimely death from an acute dilation of the heart at the age of 49.(1) The residency program was quick to become a remarkable success, with Young's many subsequent disciples often earning professorships and heading urology programs across the country immediately upon graduation.(6)

CONCLUSION

The first formal residency training program in American urology was founded in 1915 by Hugh Hampton Young alongside the opening of the James Buchanan Brady Urological Institute at Johns Hopkins Hospital. While these events are rarely taught in formal urologic curricula, their historical importance cannot be overstated. Recognizing where this current residency training model originated is critical context for all who seek to improve and evolve how the urologists of tomorrow are trained.

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