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## **A Knight at Keen's Table: Ernest H. Wood**

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## A Knight at Keen's Table: Ernest H. Wood

In a photograph given to me by Mrs Janet Wood, her father, Dr Ernest H. Wood, looks somewhat baby-faced, clear-eyed, mischievous, and dapper (Fig 1). Behind this nearly forgotten face is a man responsible for much of neuroradiology as we know it. For the last 15 years, a lecture in his honor has been given here at the University of North Carolina (UNC) by a visiting neuroradiologist, and during my tenure, he has been a sort of *eminence grise* to us all. Despite being one of the 14 founding members of the American Society of Neuroradiology (ASNR) and its fourth President, little has been written about him in our journal or elsewhere.<sup>1,2</sup> Because 2012 marks the 50th anniversary of our Society, I hope to add to this celebration with biographies of some individuals who have impacted neuroimaging. This first one describes the first full-time American neuroradiologist.<sup>3</sup>

### Early and Midlife

Ernest Harvey Wood, born in New Bern, North Carolina, in 1914, was a Capricorn, who graduated from Duke University and went on to obtain his MD from Harvard Medical School. While at Harvard, he worked with Drs Merrill Sosman (the first neuroradiologist in the United States, but he did not work as one on a full-time basis) and Harvey Cushing at the Peter Bent Brigham Hospital.<sup>4</sup> He served as an intern at the Philadelphia General Hospital and then began training in radiology at Columbia Presbyterian. At Columbia, he trained with Cornelius Dyke, but his residency ended abruptly in 1943 when he was called into service, for which he received the Army Commendation Ribbon, a Meritorious Unit plaque, and several campaign medals. A certificate, dated July 1945 and signed by the secretary of Columbia University, appoints him as Assistant Professor of Radiology without salary and grants him a leave of absence (between 1946 and 1952 he rose to the position of full Professor there). After the war, he returned to Columbia, where in 1952, the post held by Dr Dyke became available and Dr Wood was named Director of the famous Neurologic Institute. During his tenure there, he worked mostly by himself as "fellowships" in neuroradiology had not been established (neuroradiology fellowships would begin later under Dr Taveras at the same institution [*vide infra*]).

At Columbia, Dr Wood wrote his first book, entitled *An Atlas of Myelography*.<sup>5</sup> This book was prepared for the American Registry of Radiologic Pathology and sold for \$5.00. The same year he published an article on the diagnosis of spinal meningiomas and schwannomas by myelography.<sup>6</sup> In it, he emphasized the broad dural attachments of meningiomas, which could be used to distinguish them from schwannomas.

In 1952, he was recruited as the first Chair at the newly formed Department of Radiology here at UNC. A colleague of his, Dr Sprunt, remembers Dr Wood as a "good boss," supportive and an excellent overall radiologist. Dr Francis Pepper, a resident at that time, told me that Dr Wood was a quiet, reserved, and distinguished individual, who always defended



**Fig 1.** Portrait of Dr Wood (date unknown). The back of the photograph is stamped by Fabian Bacharach, who ran the oldest portrait photographic studios in the United States where pictures of all presidents from Lincoln to Bush, foreign heads of states, sport luminaries, and Hollywood actors were taken by 2 generations of his family. Mr Bacharach died in 2010.

radiologists against any allegations against them. It is said that while at Columbia, another colleague (who also later came to UNC), Dr Charles Bream, would hold radiographs out of a fourth-floor window of the Neurologic Institute and Dr Wood would correctly interpret them from his office window on the eighth floor!<sup>7</sup> During his tenure as Chair at UNC, Dr Wood took a sabbatical leave (1962–1963) at St. George's Hospital (a different source states that he was actually at the Atkinson Morley Hospital, which is part of St. George's) in London as a Special Fellow of the National Institute of Neurologic Diseases and Blindness of the National Institutes of Health. There he wrote "Angiographic Identification of the Ruptured Lesion in Patients with Multiple Cerebral Aneurysms," which was published the following year.<sup>8</sup> In that study, he concluded that features that helped identify (with a 95% certainty) which aneurysms bled were size, neighboring hematoma or cerebral edema, and associated vasospasm.

From materials provided to me by his family, I found an article published in the *North Carolina Medical Journal* entitled "Enlargement Radiography without Special Apparatus Other than a Very Fine Focal Spot."<sup>9</sup> This is one of the first descriptions of magnification radiology that curiously deals with bone and chest lesions (he received a prize from the American Academy of Orthopedic Surgeons for this work). Later on, he was to apply this technique to the study of the sella turcica. While at UNC, he became interested in thermography. The thermograph was based on a heat-seeking device developed by the space exploration and national defense programs. The apparatus recorded temperature variations 60,000 times onto a photographic image. Registering heat variations, he was able to diagnose occlusive carotid artery disease as well as occlusion of the ophthalmic artery.<sup>10–13</sup> His work on nuclear medicine imaging of the spleen received a prize from the American Roentgen Ray Society (no date found on the medal). During his tenure at UNC, he was actively involved in giving

conferences to the community and expanding the reach of neuroradiology and was named President of the North Carolina Radiologic Society. He was President of the Association of University Radiologists in 1959.

It is not exactly clear when and where Dr Wood met Dr Juan M. Taveras. Both were at the University of Pennsylvania and at Columbia at similar times. Although Dr Taveras' initial interest was gastrointestinal radiology, he and Dr Wood began work on their famous book while the latter was at Carolina and Dr Taveras had taken over as Chief at the Neurologic Institute in New York City. *Diagnostic Neuroradiology* first appeared in 1964, was 960 pages long and heavily illustrated, and sold for \$32.50.<sup>14</sup> I have 2 reviews from that time; one states that "pearls drop in abundance from each chapter, the book was replete with excellent drawings, anatomy and physiology explanations, and the proof of the pudding comes from excellent radiographic illustrations" (source unknown). The other review comes from the *Journal Belge de Radiologie* and was equally laudatory.<sup>15</sup> The book comprised 3 sections: the cranium, pneumoencephalography, and spinal cord pathology and 2 supplements (selection of examination methods and cranial trauma and its consequences). It went on to become the standard textbook for generations of neuroradiologists in America and abroad.<sup>16</sup> In 1964, Dr. Taveras left the Institute to become Chair of Radiology at the Mallinckrodt Institute in St. Louis and Dr Wood returned to Chair the Neurologic Institute once more.

### Late Life

Perhaps it is not completely correct to call this section "Late Life" as Dr. Wood died at the relatively young age of 60 years, but here I attempt to describe some aspects of the latter part of his life. In 1965, Dr Wood went back to New York City. During his time in London in the early 1960s, he had met Dr James Scatliff, who later went on to Yale University. Dr Wood helped persuade Dr Scatliff to become the second Radiology Chair here at UNC. Once this was accomplished, he returned to Columbia and continued with the fellowship program and the postgraduate course in neuroradiology initiated there by Dr Taveras (the latter, still in existence but now sponsored by the Massachusetts General Hospital under the direction of Dr Gilberto Gonzalez, is the longest continuous running course in neuroradiology). At Columbia, he continued his academic endeavors, publishing articles dealing with cerebrovascular disease, thermography, and brain tumors. In 1966, he became the fourth President of ASNR, and from that year until his death, he was a member of the editorial boards of *Radiology* and *Neurology* (*American Journal of Neuroradiology* did not exist at that time). Throughout his entire career, he served the American Board in different positions, most prominently as Trustee (1975–1963) and Vice President of the Board (1960–1962).

Together with Dr Taveras, he wrote a book on tumors of the brain and eye,<sup>17</sup> as well as the second edition of the pre-eminent *Diagnostic Neuroradiology*.<sup>18</sup> This second edition was extensively translated, and I remember as a medical student that it was being constantly referenced by radiologists (Fig 2). It is to be noted that both of these books went on sale after Dr Wood's death. Dr Wood died from a heart attack in his office on February 11, 1975.<sup>19</sup> In a letter to his wife, Mrs Ruth Wood, the editor at Williams and Wilkins said, "I shall always remember Dr Wood as a giant among men who was committed to his

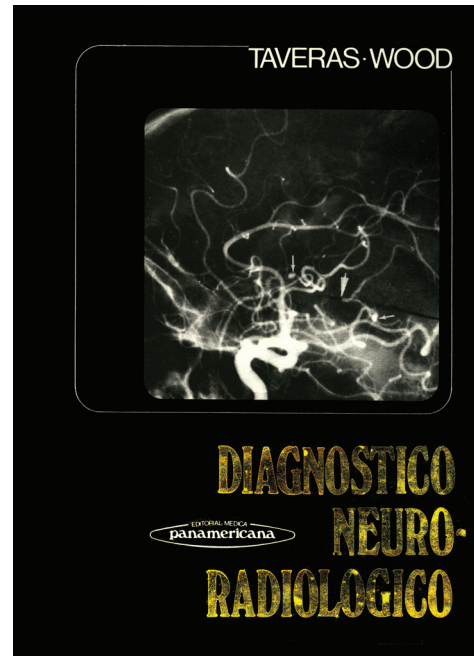


Fig 2. Cover of the Spanish translation of *Diagnostic Neuroradiology*.

profession as few are, and one who never settled for anything less than perfection in his contributions to his fellow men" (letter from Mrs. Ruby Richardson, May 28, 1976). Dr Taveras stated at the beginning of the second edition of *Diagnostic Neuroradiology*, "It is the destiny of man to live and die without being able to choose the beginning or the end."

Although Drs Wood and Taveras had been colleagues and friends (I assume) for some time (as evidenced by the latter's continued involvement in the postgraduate course at Columbia, and the fact that when Dr Taveras received the Gold Medal from the American Roentgen Ray Society, it was Dr Wood who introduced him to the audience<sup>20</sup>), I find it strange that in 2 seminal articles describing the history of neuroradiology, Dr. Taveras did not mention Dr Wood nor did Drs Leeds and Kieffer in their reflections on neuroradiology.<sup>3,21,22</sup> In his detailed article on the birth and growth of neuroradiology in the United States, Gutierrez also does not mention Dr Wood.<sup>4</sup> Dr Michael Huckman, in his article describing the founding of ASNR, states that Dr Wood was invited by Dr Taveras and was present during the now famous dinner at Keen's Steak House (still at 72 West 36 Street, NY) when the creation of ASNR was proposed and adopted.<sup>1</sup> Although the Knights of the Round Table continues to exist only as an Arthurian legend, the names of those who sat at Keen's table are well known but not all have been honored appropriately. I hope that this short biography partly rectifies some of those omissions and makes our membership aware of one of our most prominent neuroradiology figures.

### References

1. Huckman MS. Dinner at Keen's: the founding of the American Society of Neuroradiology. *AJNR Am J Neuroradiol* 2001;22:1803–05
2. Wolpert SM. Genesis of a journal: the story of the birth of the American Journal of Neuroradiology. *AJNR Am J Neuroradiol* 2005;26:2441–43
3. Taveras JM. ASNR: the silver anniversary—neuroradiology: the next 25 years. *AJNR Am J Neuroradiol* 1994;19:572–74
4. Gutierrez C. The birth and growth of neuroradiology in the USA. *Neuroradiology* 1981;21:227–23
5. Wood EH. *An Atlas of Myelography*. Washington, DC: Registry Press; 1948

6. Wood EH. The diagnosis of spinal meningiomas and schwannomas by myelography. *Am J Roentgenol Radium Ther Nucl Med* 1949;61:683–89
7. Lee JK, Scatliff JH, Clark RL, et al. University of North Carolina Department of Radiology. *AJR Am J Roentgenol* 1994;162:227–30
8. Wood EH. Angiographic identification of the ruptured lesion in patients with multiple cerebral aneurysms. *J Neurosurg* 1964;21:182–98
9. Wood EH. Enlargement radiography without special apparatus other than a very fine focal spot. *NC Med J* 1954;15:69–75
10. Wood EH. Thermography in the diagnosis of cerebrovascular disease: preliminary report. *Radiology* 1964;83:540–42
11. Wood EH. Thermography in the diagnosis of cerebrovascular disease. *Radiology* 1965;85:270–83
12. Wood EH, Hill RP. Thermography in the diagnosis of cerebrovascular occlusive disease. *Acta Radiol Diagn (Stockh)* 1966;5:961–71
13. Wood EH, Hill RP. Diagnostic value of thermography in extracranial carotid occlusive disease. *Trans Am Neurol Assoc* 1965;90:124–27
14. Taveras JM, Wood EH. *Diagnostic Neuroradiology*. Baltimore: Williams and Wilkins; 1964
15. *J Belge de Radiologie* 1966;49:Fasc 4
16. Huckman MS. Juan Manuel Taveras, 1919–2002. *AJNR Am J Neuroradiol* 2002;23:1065–68
17. Wood EH, Taveras JM, Tenner MS. *Atlas of Tumor Radiology: The Brain and the Eye*. Chicago: Year Book Medical Publishers; 1975
18. Wood EH, Taveras JM. *Diagnostic Neuroradiology*. Baltimore: Williams and Wilkins; 1976
19. Seaman WB. Ernest Harvey Wood, M.D., 1914–1975. *Radiology* 1975;116:494
20. Leucutia T. The sixty-ninth annual meeting of the American Roentgen Ray Society. *Am J Roentgenol Radium Ther Nucl Med* 1968;104:914–17
21. Leeds NE, Kieffer SA. Evolution of diagnostic neuroradiology from 1904–1999. *Radiology* 2000;217:309–18
22. Taveras JM. Neuroradiology: past, present, future. *Radiology* 1990;175:593–602

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## EDITORIAL

### Self-Referral in Neuroradiology

**S**elf-referral in radiology is a complex and contentious topic that has received a great deal of attention recently. In addition to radiologists, others expressing concern about this phenomenon are Congress, the Centers for Medicare and Medicaid Services (CMS) and other payers, state legislatures, consumers, journalists, and so forth. We know who cares about the problem, but here is the key question: Why do they care and what can be done to limit the ill effects of self-referral and still maintain the benefits that are purported by its proponents to accrue to patients and the health system as a whole from this pattern of practice?<sup>1–10</sup>

The case for self-referral rests on 3 principal arguments: First, access, convenience, and coordination of care are touted; second, expertise is invoked; and third, economic efficiency is asserted. These can be taken in turn. The argument regarding access is relevant to the lower technology modalities such as plain films and sonography, which are frequently provided at the time of a patient visit in primary care, orthopedic, and obstetrics and gynecology practices. The data show rather convincingly that same-day service is not often the case with respect to CT and MR imaging studies, those of most interest to the neuroscience and investor community. With respect to access, there are no well-conducted studies, to my knowledge, that support the notion that an inadequate supply of scanners in underserved communities results in the installation of im-

aging instruments by clinical neuroscience physicians. To the contrary, the data suggest that the safety-net payers are under-represented in practices that are organized on principles of self-referral. The argument based on improved coordination of care falls flat when one considers that increased imaging occurs in self-referring practices after the installation of the referring physician by the owned or leased instrument and that patients imaged in a physician-owned facility are more likely to undergo invasive treatment rather than conservative management of back pain, for example. Self-referral may facilitate more expensive and aggressive treatments than are well-grounded in a rigorous evidence base.

Some advocates of self-referral practice models imply that the expertise of clinical physicians in the neurosciences is superior to that of radiologists. Again the data do not support this hypothesis. Some consider investigation of the question to be absurd because the degree of training and experience, associated in other areas of medicine with better patient outcomes, are demonstrably far superior with respect to the performance and interpretation of imaging examinations among neuroradiologists compared with members of other specialties. We need not rely on an argument from first principles; we can actually look at data. Radiologists as a group are better at reading imaging studies than members of other specialties. Paradoxically, this seems to be the case both when clinical information is available and when it is not. Evidently, the patient presentation is simultaneously a distracter and lodestar in diagnosis. One must concede that when a specific piece of clinical information is available to 1 physician and not to another, related diagnoses are likely to be superior when all the information is taken into account. However, this argues for communication, not commercialization.

Economic efficiency demonstrably favors the separation of the clinical and imaging functions. Costs are generally higher in self-referral situations than in standard referral relationships, and costs of episodes of care are higher when self-referral for imaging is part of the pattern of care. This is true for a number of reasons including classic business principles and behavioral economic effects. From the standpoint of business organization, the essence of economic efficiency in advanced imaging rests on the amortization of capital costs and fixed operating costs over the largest possible number of studies. This is because the large fixed costs are, by definition, constant regardless of the number of scans actually performed. A referral base larger than 1 or a few self-referring specialists decreases the cost of each scan, theoretically making it possible to provide services at the lowest possible prices. One must say “theoretically” because the economic theory of marginal prices converging on marginal costs rests on the assumption that transparent frictionless competition prevails and that barriers to entry and exit are low. These conditions do not prevail in health care at present.

Behavioral and classical economic models suggest that individuals will act in their self-interest as they define it. We do not need to dwell long on the concept that a referring physician will tend to order more studies when he is paid to do so from the proceeds of those imaging tests, because this has been repeatedly observed. We do not need to agonize as to the theoretic and practical implications because the increases in imaging are well documented across the imaging spectrum. That