



The AIUM Celebrates 50 Years of Excellence

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In 2005, the American Institute of Ultrasound in Medicine (AIUM) will celebrate its 50th anniversary. The first 50 years of the AIUM are closely intertwined with the evolution of ultrasound and with the pioneers and developments responsible for propelling ultrasound into its position as one of the leading imaging modalities in North America and around the world. I am delighted that Beryl R. Benacerraf, MD, editor-in-chief of our prestigious *Journal of Ultrasound in Medicine*, asked me to write this introductory article in honor of the AIUM's first 5 decades.

The AIUM has a number of activities and items planned for these next 2 years. First and foremost will be a series of articles on the history of ultrasound, which will be published in our journal from this June until our June 2005 annual convention in Orlando, Florida. These articles will highlight the history of ultrasound from its earliest days to the present. The articles will be written by key ultrasound pioneers and preeminent scholars of the AIUM and will describe the remarkable progress and changes that have taken place in ultrasound over these 5 decades. Among the topics expected to be addressed are abdominal, breast, cardiology, contrast-enhanced, emergency, intraoperative, musculoskeletal, obstetric/gynecologic, ophthalmologic, pediatric, retroperitoneal, and vascular ultrasound, as well as changes in AIUM administration/governance, bioeffects, instrumentation, medicolegal issues, and neurosonology.

Today, the AIUM is known and respected around the world as a unique, dynamic, multidisciplinary organization, blending clinical and basic science in the pursuit of excellence in ultrasound. It is a society of more than 8200 members and represents a true cross section of ultrasound professions, including physicians (sonologists) from almost all diagnostic fields, sonographers, basic scientists, engineers, and ultrasound industry representatives.

It is difficult to believe that only a little more than half a century ago, few people had heard of ultrasound, and even fewer could describe how it could be used in medicine. Today, virtually everyone knows about diagnostic ultrasound, and many have had the firsthand experience of undergoing an ultrasound examination. In fact, by some estimation, more than 80 million ultrasound examinations are now performed annually in the United States.

In the 1940s and 1950s, when ultrasound was just emerging as a diagnostic technique, display technology was largely limited to A- and M-mode tracings and crude bistable static B-mode images. At that time, the only nonresearch clinical application for ultrasound was for therapy rather than diagnosis. High-power, low-frequency ultrasound was already widely used to provide therapeutic heating of deep tissues.

There were no professional associations or educational meetings dedicated to ultrasound. Those interested in ultrasound met in informal groups.

In the summer of 1951, while attending the American Congress of Physical Medicine and Rehabilitation, a group of 24 physiatrists (physicians who administer physical therapy or specialize in physical medicine) met in a hotel room in Denver, Colorado, to discuss the need for organizing an ultrasound subgroup of that congress. This informal group of ultrasound pioneers hoped to expand the scope of physical medicine to include new therapeutic techniques in ultrasound, a field in its infancy in Europe. Among the organizers was Disraeli Kobak, MD, who became the first president of the AIUM 1 year later.

In 1952 in New York City, this group again met informally during the American Congress of Physical Medicine and Rehabilitation. They elected officers and adopted an official constitution and bylaws. The group decided to call itself the American Institute of Ultrasonics in Medicine, a name that later evolved into the American Institute of Ultrasound in Medicine.

By 1953, with the use of ultrasound in medicine gaining momentum, plans were formulated for the American Conference on Ultrasonic Therapy in Medicine, which would be held in Chicago, Illinois. In August, 14 papers relating to the use of ultrasound for conditions such as asperiarthritis, geriatrics, referred pain, muscle disease, and subdeltoid bursitis were presented. All presentations were published in the *Journal of Physical Medicine*. Some of the early work was also submitted to the *Journal of the Acoustical Society of America*.

In 1954, as word spread of the annual meeting of the AIUM, the number of participants rose to 375. That year, the meeting was arranged in 3 sections: research, clinical investigations, and case reports, and it ended with a panel discussion by all who presented papers.

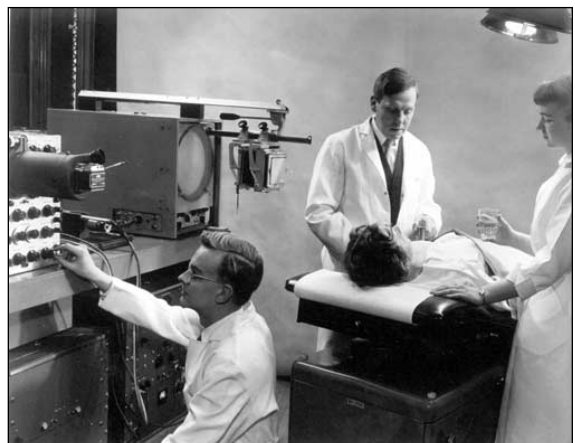
The August 1955 meeting was held in Detroit, Michigan. The first paper on the use of diagnostic ultrasound was presented by 2 ultrasound pioneers, John J. Wild, MD, and John M. Reid, BEE, and was entitled "Echographic Tissue Diagnosis" (Figs. 1–3). As each year passed, there were increasing numbers of papers on diagnostic applications of ultrasound in medicine.

In 1956, when the AIUM had a mailing list of 1000 names, the Executive Committee decided to cancel the planned scientific program. They reasoned that it would be more beneficial to hold biannual meetings to present clinical and research work in the field of ultrasound. Jerome Gersten, MD, who was involved in research of the therapeutic use of ultrasound and presented his first paper on the topic in 1953, became the second president of the AIUM.

In September 1957 in Los Angeles, California, the AIUM convened a 2-day international meeting called the International Meeting of Ultrasonics in Medicine. Papers addressed problems in basic physics, physiologic effects of ultrasound, high-intensity ultrasound, and therapeutic use.

With the next annual meeting, which would be the second international meeting, scheduled for 1960, unofficial meetings were held in Philadelphia, Pennsylvania, in August 1958 and Minneapolis, Minnesota, in September 1959. These meetings included clinical workshops and paper presentations. To this point, the AIUM did not have an executive home office, but it was becoming apparent that there was a need for one. In 1959, David Rubin, MD, became the third president of the AIUM.

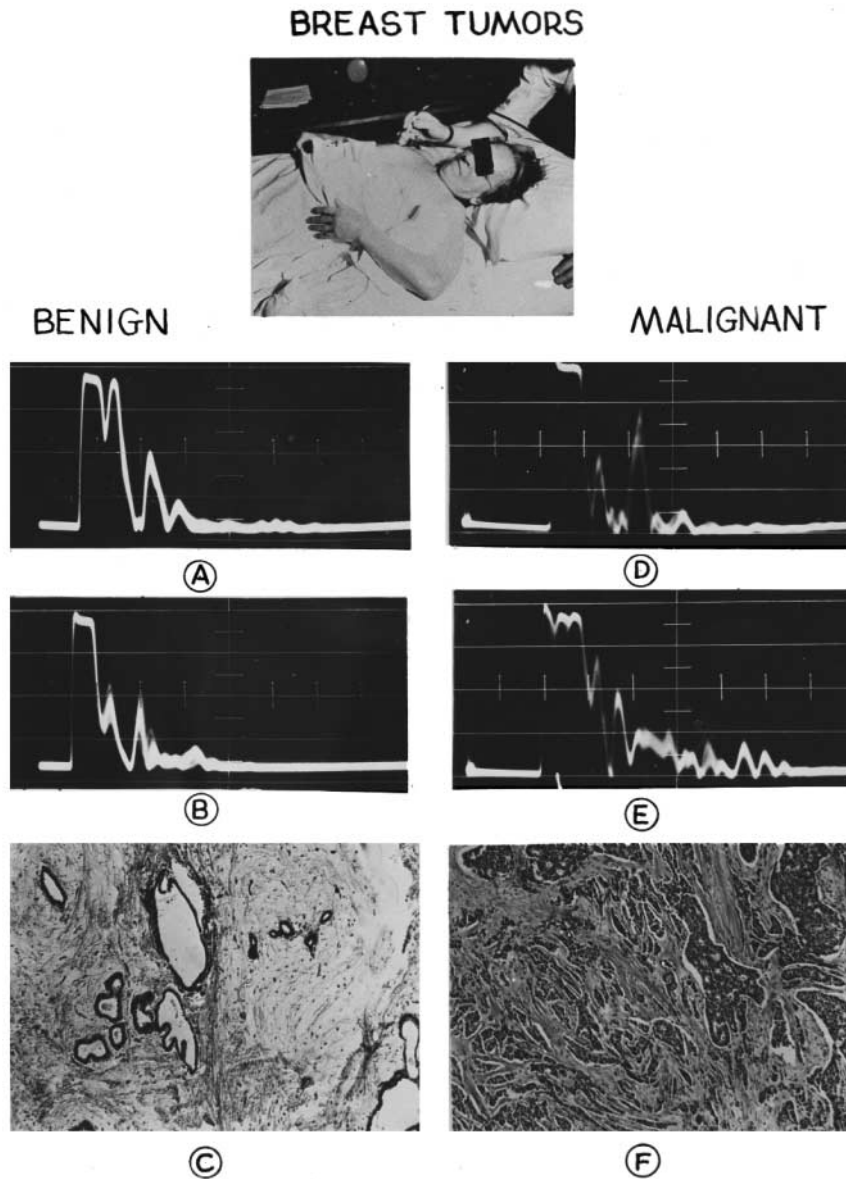
Figure 1. Demonstration of Dr Wild's clinical method for searching the breast for possible abnormal growths. To obtain access to glandular breast tissue, the breast was flattened under the influence of gravity. Mr. Reid was adjusting the ultrasonic B-scan instrument for maximal image production. Reproduced with permission from J. J. Wild, MD, Photo Gallery: Early Ultrasonic Mammography Clinical Research (1953–1960). Available at: http://www.wildultrasound.com/breast_research.htm.



Thus ended the 1950s history of the AIUM. From their modest beginnings, both the modality of ultrasound and the AIUM have grown steadily. With so much activity and interest throughout the 1950s, why was 1955 chosen as the first year of the AIUM? On the basis of a careful review of the history of this first decade, it would seem that the decision was somewhat arbitrary. The more likely first year might have

been 1952. However, the decision to choose 1955 was made easier for us, because the AIUM had undergone a similar analysis a number of years ago and had celebrated its first 25 years at its annual convention in 1980. Held in September in New Orleans, Louisiana, the president at that meeting was Horace Thompson, MD, and the president-elect was my mentor, Barry B. Goldberg, MD.

Figure 2. Results of the 2 initial cases referred to Dr Wild at the Wold-Chamberlain Navy Air Force Base. The benign and malignant records are arranged with the time versus amplitude graphs over the microscopic sections, which are sections **C** and **F**. Records **A–E** were made with Dr Wild’s echograph. Top records **A** and **B** (left) and records **D** and **E** (right) are time amplitude graphs or A-modes of the histologic sections of **C** and **F**. **C** was diagnosed histologically as benign, and **F** was diagnosed histologically as malignant. Reproduced with permission from J. J. Wild, MD, Photo Gallery: Early Ultrasonic Mammography Clinical Research (1953–1960). Available at: http://www.wildultrasound.com/breast_research.htm.



Much has happened to ultrasound since the 1950s. From A-mode and bistable B-mode, gray scale sonography and tissue harmonics have evolved. The use of contrast agents has permitted further differentiation of tissues. Real-time imaging has been perfected. From two-dimensional imaging came three-dimensional imaging, and with increased computer power, real-time three-dimensional (or four-dimensional) imaging was developed. Transducer advances have produced lighter, smaller, and more sophisticated imaging transducers. With miniaturization of transducers, intracavitary sonography has evolved so that the state-of-the-art approach to the female pelvis is a transvaginal examination, and the standard approach to sonographic imaging of the prostate is by transrectal evaluation. Continuous wave Doppler imaging evolved into pulsed Doppler imaging, allowing analysis of deeper structures, and then into color and power Doppler imaging. Many interventional biopsies and treatments are now performed under sonographic guidance. Now, with the miniaturization of ultrasound machines, scanners no larger than small briefcases (handheld) can give the same image quality

as many of the larger machines and have opened the door for all physicians to use ultrasound.

The 50-year celebration will not be limited to articles in our journal. Beginning in June 2003, the AIUM's monthly newsletter, *Sound Waves*, will have inserts detailing the comprehensive history of the AIUM. All AIUM members will receive a 2005 calendar that will highlight the AIUM's long tenure as an integral part of ultrasound. The AIUM website will have a 50th anniversary section. At the 2005 annual convention, there will be historical displays and an anniversary party.

Who could have predicted such an amazing 50 years for both the AIUM and ultrasound? It is a time to step back and marvel at the accomplishments of both and to look to the future with anticipation of remarkable things to come.

Bibliography

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Figure 3. Static image of a real-time evaluation of the breast. This is the first B-mode scan ever produced of a malignant carcinoma in the living human breast. It shows an "echo cross section" of the nipple in a woman with a slight nipple discharge. Within the clinically inflamed nipple visualized in the echogram, a group of strong echoes can be seen. These echoes denote malignancy (T). Arrow denotes the skin surface with nipple; and W, water bath. From J. Wild, MD, personal communication; and J. J. Wild, MD, and J. M. Reid, BEE, Echographic tissue diagnosis. Presented at the Fourth Annual Conference of Ultrasonic Therapy; August 27, 1955; Detroit, Michigan.

