

## Shadows and Lucencies: 100 Years of the UP-PGH Department of Radiology

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### I. Revisiting the Past

Quite by accident, Wilhelm Konrad Roentgen discovered the x-ray in 1895. He discovered that he could make images by training this heretofore unnamed beam on a body part and capturing this image on sensitive paper. This discovery earned him the Nobel Prize for Physics in 1901.<sup>1</sup>

In as little as 15 years after that discovery, the Department of Radiology of the Philippine General Hospital was born. In September 1, 1910, the Philippine General Hospital opened its doors to the public. There was a small "X-ray and Electro-Therapeutic Department" located in what was formerly known as Floor 15 with an equally small Radium Emanation Room. Dr. A. Clemente, a PhD in Chemistry, was in charge of this little kingdom.<sup>2</sup> In 1910, the MD Anderson Medical Center and St. Jude Children's Hospital were not even in existence. There were only a few other hospitals in Manila then--UST Hospital, Mary Johnston Hospital, San Juan de Dios, Chinese General Hospital and a small hospital known as St. Luke's.

In 1918, when there was war in Europe and when Francis Burton Harrison was governor of the Philippine islands, the department got its first chairman in the person of Dr. Ricardo Fernandez. In a report submitted to the Bureau of Health, the department's work was described as follows: *All roentgen, electrical and other physical-diagnostic works for outside private and government pay patients; photographic works for the hospital and the College of Medicine and Surgery; teaching medical students and post-graduate students at the College of Medicine and Surgery, pupil nurses and interns.*<sup>2</sup> That year

1,320 skiagrams (defined as a picture made up of shadows or outlines) were done. The physical work at the time already included the treatment of cancer patients with radiation.

In 1920, the department was relocated to what is now Ward 7. There were now three separate room for x-rays, for retrograde pyelography and for deep x-ray therapy, respectively. A small, portable x-ray unit was likewise acquired. There was only one radiologic technician, Dr. Felipe Somera, who was a dentist by profession.

In 1932, while the Great Depression was gripping a country half a world away, Engr. Luciano Niguidula joined the staff as Chief of Repairs and Machinery. He became a towering presence (in spite of the diminutive size) in the department as he later on became the hospital's first medical physicist—a valuable asset and a dedicated teacher.

In 1937, Dr. Paterno Chikiamco took over the reins of the department. This was the year that the PGH obtained the country's first spot-filmer which utilized long film cassette. In 1938, the department was once again relocated to what is now the PGH Emergency Room Complex. It was in that same year that Commonwealth Act #398 entitled "An Act Creating the Cancer Institute" was passed by the Philippine National Assembly.<sup>3</sup> This came to pass

through the efforts of Dr. Chikiamco, Dean of the UP College of Medicine and concurrent PGH director Dr. Antonio G. Sison and Assemblyman Antonio Villarama. The Cancer Institute was envisioned to "promote and address advances in training, treatment and research of cancer in the country." On October 16, 1941, a few months short of the start of World War II, President Manuel L. Quezon inaugurated the Cancer Institute Building along Padre Faura Street. It was baptized "Institute of X-ray and Radium Therapy." To this day, the name is still visible, carved above the elegant columns of the facade of the Cancer Institute.

During World War II, the department continued functioning for as long as it could. The supply of films was erratic. When no films were available, only fluoroscopies could be done. There was a time when Japanese brand x-ray films were obtained and used up quickly. Once consumed, it was back to fluoroscopies. X-ray work had to be suspended finally when the supply of electricity was cut off.



**Paterno S. Chikiamco, MD,** the longest serving chair of the department.

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When peace (and electricity) finally came back, PGH had the benefit of discarded US Army x-ray machines.

Like the rest of the country, the 1950's was a time for recovery. New modalities were being used. The PGH could offer kymography, tomography and angiography. There was growing interest in Radiology as a career as shown by the increasing number of applications for residency. Initially, there were only three sections: Physical Therapy, Radium and Diagnostic. In 1955, the section of Occupational Therapy was included under the department's auspices. So, the department was about as heterogeneous as it could get; x-ray machines and radiation therapy equipment alongside whirlpool baths and galvano-faradic simulation machines, radiologists and technicians alongside with masseurs and physiatrists. The Physical Medicine Section was headed by Dr. Guillermo Damian.

The 1960's were considered the golden years as there was a rush to acquire the necessary equipment for the department. The first superficial x-ray therapy unit in the country was installed and in February 1962, the first Cobalt-60 Unit and the first Cesium-137 teletherapy unit were acquired.

In 1970, the Physical Medicine Section was spun off into its own department under the chairmanship of Dr. Guillermo Damian, leaving all radiation diagnostic and therapeutic modalities under the Department of Radiology. At this time, the Department of Radiology also found a new home in the Cancer Institute. The location was a logical choice as a big part of the department's work involved radiation treatments for cancer. Dr. Paterno Chikiamco, after 34 years, handed over the chairmanship to Dr. Reynaldo Gregorio in 1971. Dr. Chikiamco was and still is the longest serving chair of the department. Research and training were of prime importance. Most of the residency graduates went to the USA for fellowships. Dr. Antonio Chavez became Chair in 1976. To this day, the retired Dr. Chavez continues to read x-rays daily and train the residents on the finer points of deciphering the blacks, whites and grays that we see on film.

Dr. Robert Reodica assumed the chairmanship in 1978 and held the position for 10 years. Concurrent with this, he also held the position of Assistant Director for Fiscal Services of the Philippine General Hospital. The closing years of the decade saw Dr. Manuel Fetalino as Chair. The dark days of the 80's were dominated by a bad economy and political turmoil. The purchase of the latest technology lagged behind even if computer technology itself was advancing in leaps and bounds. It did not mean, however, that the Radiology trainees did not know how to use the technology. They got their theoretical knowledge from the foreign fellowship-trained graduates who were coming home at this time. What was lacking was practice.

The early 1990's was a good time for the Radiology Department. In 1991, the new PGH Central Block was

inaugurated, complete with the new permanent home of the Department of Radiology. A new Chair in the person of Dr. Eduardo Nievera led the department. The Cancer Institute was renovated by the Andres Soriano Foundation. All radiotherapy facilities were transferred to the Central Block, right alongside the diagnostic facilities. 1991 saw the installation of new x-ray and fluoroscopy machines, a new angiography machine, a CT Scan in the new right Central Block, a CT Scan in the OPD, an x-ray simulator, a new cobalt machine and several new ultrasound machines. Equipment was new and more plantilla items for residency positions were made available. One-year fellowship programs in CT Scan and Ultrasound were started. A one-year fellowship program in Radiation Oncology was likewise established. This would later be increased to 2 years.

Dr. Vicente V. Romano, Jr. became Chair in 1997 and held the position for 2 terms. Meanwhile, a new spiral CT Scan machine was installed in 1998 even as the conventional CT Scan (circa 1991) was still kept operational. In 1999, because of the dizzying number of new modalities and sheer volume of what had to be learned, the period of residency training was increased from 3 to 4 years.

## II. The Here and Now

The first decade of the 21st century was a roller coaster ride for the department in terms of equipment--massive breakdowns alongside major equipment purchases. Both the highs and the lows have been extreme.

Radiology has become very popular among students of the Organ System Integration (OSI) curriculum. Elective subjects are offered to 2nd, 3rd and 4th year students, alongside the regular rotation (Radiology 250) for 3rd year (Year Level 5) students. All the electives are "full house". The new curriculum also offers a straight internship in Radiology, which is a program meant for students who are keen on a career in Radiology. So far, subscribership to this internship program has been consistently 100%.

Since the early 1990's, the PGH residency-training program has also been known as the biggest and best training program. There are 25 medical officer plantilla positions at any one time, the most number of residents among the 40 training programs in the country. The batting average in the Board Examination is consistently high. Figure 1 shows passing rates over time.<sup>4</sup> There was only one examinee in 1999 because this was the transition year for the 4-year residency program.

The residency graduates were also well-distributed all throughout the country. While the majority of graduates opted to practice in Manila, many have gone home to their provinces to practice. This is especially true among the more recent graduates. All major cities from Ilocos and Cagayan Valley to South Cotabato and Davao have PGH Radiology graduates.

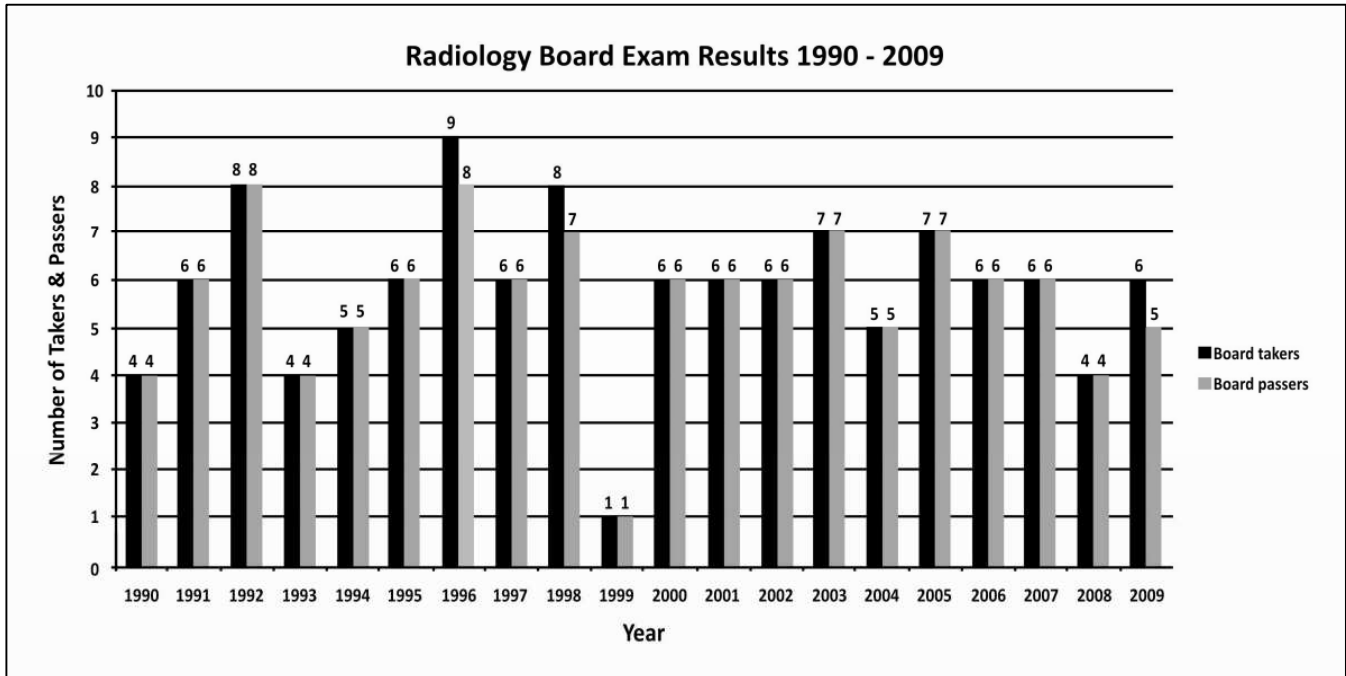


Figure 1. Specialty board examinees and passers from 1990 to 2009

The Radiation Oncology fellowship program was abolished in 2004 when the straight 4-year residency in Radiation Oncology was created. A new fellowship program was created in 2005—a one-year fellowship in Interventional Radiology. Initially, two radiologists were trained. Since then, one fellow has been accepted every other year.

The department, while clinical, has always been grouped with the auxiliary services. The Philippine General Hospital is still the only government hospital that can provide a complete line-up of radiologic and imaging

procedures. When the department got its Magnetic Resonance Imager in 2004, the same year that Dr. Gaudencio P. Vega, Jr. became the chairman, the armamentarium was complete—not the most sophisticated but certainly the most complete government facility. There are plain and contrast x-rays, fluoroscopy, mammography, angiography, ultrasound, CT Scan, MRI, External Beam Radiotherapy and brachytherapy. Also available in the hospital are nuclear medicine imaging and bone densitometry. Figures 2 and 3 show some of the service performance indicators of the department over time.

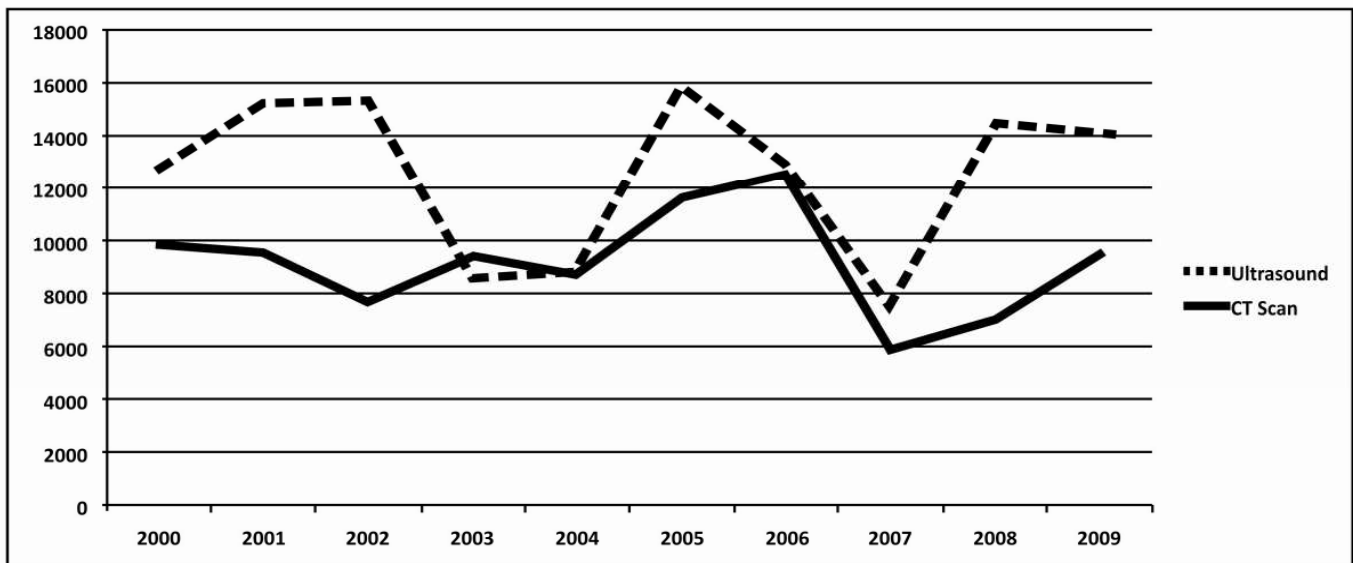
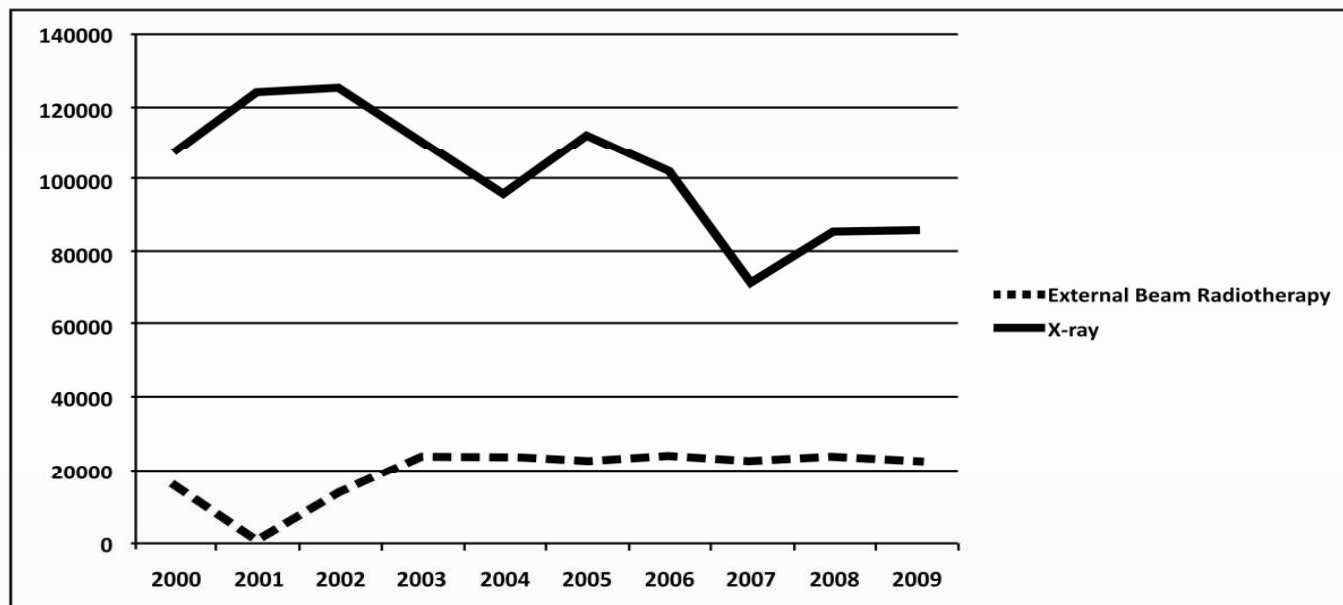


Figure 2. Number of Ultrasound and CT Scan procedures from 2000 to 2009. Dips in both graphs represent times when not all machines were optimally functioning.



**Figure 3.** Number of x-ray and radiotherapy procedures done from 2000 to 2009. *Note: The 2 old cobalt machines (circa 1991) were decommissioned in 2001. One new cobalt machine was installed in 2002.*

### III. Images of the Future

So what does the future hold for the Department of Radiology?

The department still hopes to regain its (proper) place at the cutting edge of Philippine Radiology. The medical staff is both qualified and highly respected in the field. The manpower is competent; the staff does manage to keep up with daily demands. The clinical material is not a problem; the PGH will not run out of interesting patients any time soon. However, the equipment and its accompanying technology continues to be a challenge. After all, how long can the most skilled driver lead the pack if his race car is found to be wanting?

The future of imaging depends on the computer. Image resolutions are unprecedented in history. Storage capacities are in the giga- and terabytes when only 5 years ago, 256 kilobytes was state-of-the-art. It sounds almost ridiculous now. These innovations imply that the future can go anywhere. We have 2D, 3D and 4D ultrasounds. Our 16-, 64-, 128- and 256-slice CT scans allow us to do triphasic liver scans, “virtual” CT colonoscopy and CT angiography. Structural and functional imaging fusion will foreseeably be the standard in the next 5 to 10 years. Intensity-modulated

and Image-guided radiotherapy, once the stuff of science fiction novels, are already here. It is no longer a stretch to imagine how nanotechnology can be incorporated into imaging modalities.

There is very little that Radiology cannot see. What is beyond the capabilities of Radiology belongs to Pathology, and we will not even presume to touch that. Radiology affords us a different view of the world, a different perspective of the bodies we strive so hard to keep healthy. We welcome the future and are excited with the possibilities, and believe us when we say that there are many.

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