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Radiology Department & St. Luke's Hospital, Kansas City
present an
Update on Radiology**



GE Medical Systems' all-purpose single photon emission computed tomography (SPECT)/computed tomography (CT) imaging system called "Infinia"

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Scientific/Editorial

Current Status and Issues of Concern in Diagnostic Radiology

by G. David Dixon, MD

Just as the Interventional Radiologist uses the tools of radiology to work inside the body, so will Molecular Imagers use our tools to observe molecular and cellular processes.



G. David Dixon, MD, FACR, FSIR, is Clinical Professor of Radiology at the University of Missouri - Kansas City School of Medicine and Saint Luke's Hospital, Kansas City. Dr. Dixon is a MSMA member and was coordinator for this Radiology Update issue of Missouri Medicine.

In the early 1960s, when I started my residency, the field of diagnostic radiology was miniscule in content as compared to today. At that time, an update in radiology of as appears in this issue of *Missouri Medicine*, would have included diagnostic exams such as barium studies, intravenous pyelograms, plain films and angiography.

Ultrasound and nuclear medicine were in their infancy. Training to become a radiologist included studying radiation therapy, which was 50% of the typical three-year program. During my residency training, we performed approximately 50 to 100 each of barium enemas, upper GIs, gallbladder, and intravenous pyelograms (IVPs) on a daily basis. A workup for abdominal pain at Saint Luke's Hospital in Kansas City when I came here in 1970 was generally performed on an inpatient and included an IVP, gall bladder, upper GI, and barium enema. Today these studies are virtually passé. Diagnostic radiology is now a four-year program plus one preliminary year. I was virtually the last of the breed of radiologists trained in both modalities and I have never practiced radiation therapy. Little did I know that I would evolve into a radiologist doing therapy of an entirely different type. As a board certified radiologist with a Certificate of Added Qualification (CAQ) from the American Board of Radiology (ABR) in interventional radiology, I have evolved into a therapist of an entirely different kind. Dr. Alexander Margulis¹ introduced

the term "interventional radiology" in 1979 and its practice has been a great ride for me.

Today's update in radiology, as appears is limited to diagnostic radiology. It includes terms not even heard of in the mid '60s - "Interventional," "CT," and "MRI" to be specific. Ultrasound (US) and Nuclear Medicine were in their infancy. Mammography for screening was just being accepted. Zero-Mammography and thermography have come and gone.

Presently diagnostic radiologists are completing a computer revolution in radiology with the installation of Picture Archiving and Communication Systems (PACS). Techniques that utilize computer programming have gradually taken over plain film studies and angiography of the 1960s. Today, without computers, virtually none of our modalities could exist. Even mammograms and plain films are digitized. Image quality has improved dramatically over the decades as a result of this computerization. Along with new technological improvements in imaging, have come problems with resulting issues. Some of these issues, rooted in history, are currently impacting radiology.

PACS: Advantages and Risks

Today Picture Archiving and Communication Systems (PACS) bring all of the images produced by our many imaging techniques together into a single workstation, allowing the radiologist to manipulate them - e.g. window and level, magnify, reverse, etc. In addition to

perhaps therefore the false biopsy rate as well. CAD is also being applied to CT screening studies for lung cancer and virtual colonography.

LBBH: Made Worse by Obesity Epidemic

Limited by Body Habitus (LBBH) is the term used when a patient is too obese to be imaged satisfactorily. Obesity is a societal problem that is causing us many problems. Ultrasound and x-rays don't penetrate large amounts of fat well. CT, MRI, and interventional tables are not generally designed for patients over 300 to 400 pounds. A recent study²¹ stated the number of "limited" reports nearly doubled from 0.10% in 1989 to 0.19 % in 2003. This is a larger increase than the corresponding number of obesity cases suggesting these patients also get sick more often.

Summary

I have tried to give a little history, discuss some current topics: PACS, inappropriate image utilization, CT screening, Night Hawk, molecular imaging, sonoscope, CAD, and LBBH. I hope these issues are more familiar to you now.

The articles that follow from the faculty of the University of Missouri-Kansas City School of Medicine and Saint Luke's Hospital will bring you up to date regarding the current status of CT, MRI, ultrasound, nuclear medicine, mammography, and interventional radiology.

Acknowledgment

As author of the article, I would like to thank Daphne Urquhart, radiology residency, program coordinator, for her valued assistance in this project. As editor of this series

of articles giving you an update on Diagnostic Radiology, I need to give special recognition to Linda Lynch, PhD. These articles were primarily written by residents and students with the advice and assistance of our teaching faculty. Without the critical eye of Linda and her organizational/editorial skills my job would have been much more difficult. I seriously doubt that I could have gotten the job done very well by the date given to me by Dr. Hagan without Linda's valuable and dedicated assistance.

Dr. Lynch's expertise is in the area of information science and learning technology. She works in the Center for Research and Innovation at Saint Luke's Hospital of Kansas City—one of only two Baldrige Award winning hospitals in the country. The Center is a research incubator established by the leadership of Saint Luke's Hospital and supported by the Saint Luke's Hospital Foundation. It facilitates the research productivity of our busy medical and nursing staff. The Center provides assistance to new and established investigators in many of the steps required for obtaining research funding and of course, as in this case, provides the organizational skills and editorial expertise needed to assist busy clinicians and researchers in preparing manuscripts for publication. Linda, I thank you not only for a job well done, but a job which you approached eagerly and tirelessly.

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