

Journal of Digital Imaging

From the Editor's Desk

Janice Honeyman-Buck, PHD, FSIIM

SAMUEL J. DWYER, III, PHD, FSIIM
(1932–2008)

It was with deep sadness that we received the news of the passing of Samuel J. Dwyer, III, PhD, FSIIM, of Charlottesville, VA, USA on February 5, 2008. Sam was one of the pioneers in the picture archiving and communication system (PACS) field and, at the time of his death, was also an Associate Editor for Journal of Digital Imaging (JDI). He was a long-time friend and contributor to Society for Imaging Informatics in Medicine (SIIM), and I considered him one of my mentors and a close friend.

In 1989, not long after accepting an appointment to the Department of Radiology at the University of Florida—Shands Hospital, I was traveling in Kansas and called Sam and asked to stop by to meet him and see the status of PACS at the University of Kansas. You should know that at that time, I could hardly even spell PACS. He graciously spent an afternoon with me talking about the field I was entering and giving me some of his wonderful advice. The next year, I was attending the North Atlantic Treaty Organization Advanced Study Institute meeting, “PACS in Medicine” in Evian, France which was held in October, 1990. Sam had agreed to do a presentation on Networks and then could not attend the meeting so he asked Bernie Huang to call me and ask me to do his presentation for him. I was very new in the field and to have Bernie Huang call me at home to ask me to present work for Sam Dwyer was amazing. What an opportunity for a new person in the field! Later, Sam, Brent Stewart, and I collaborated on a paper that was published in the Journal of Computerized Medical Imaging and Graphics. He was a steadfast and truly inspirational friend to me for many years. I will miss him.

The SIIM web site has several tributes to Sam. I want them to be recorded in JDI as a permanent tribute to a truly great man who supported our profession to the very end. I received a letter from him only a few weeks before his death with some ideas on research we should promote at SIIM and JDI.

Tributes to Samuel J. Dwyer, III, PHD, FSIIM

PRESENT AT THE BEGINNING: AN APPRECIATION AND MEMORY OF SAM DWYER

For most of us, at least those who have grown up in the United States, our picture of a revolutionary is strongly colored by our collective exposure to media over the years. We think of Ernesto “Che” Guevara (who was a physician), Vladimir Lenin, or Mao Zhedong. Around the Fourth of July, we might be reminded of our own revolutionaries: Washington, Adams, Paine, Franklin, Henry, and the others whom we know from our elementary school lessons or seeing the famous paintings of these historical American stalwarts. With some notable exceptions, revolutionaries in science and engineering are less well known. In medical imaging, many would think of Sir Godfrey Hounsfield, Paul Lauterbur, and Sir Peter Mansfield as major revolutionaries. However,

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*Online publication 22 April 2008
doi: 10.1007/s10278-008-9119-y*



Samual J Dwyer, III, PhD, FSIIM (1932–2008).

touching at least as many of us (and the general public), is the “father of PACS”, Samuel J. Dwyer, III. Meeting this humble man, you might not think of him as the leader of a revolution. But it was Sam Dwyer, together with Andre Duerinckx, who organized the first International Symposium on Picture Archiving and Communications Systems for Medical Applications in 1982.

Some may know that this meeting was preceded the year before by the meeting on Digital Radiography; Sam was there, and I was fortunate enough to attend as well. At one of the breaks, my colleague, Chip Maguire, and I had lunch and had a lively discussion about some of the works that we had heard from Sam—the idea of using computer networks to move digital images around instead of printing them on film. We had been doing some of this work ourselves in nuclear medicine, but Sam expanded the horizons, describing some of the work he was doing at the University of Kansas Medical Center. A year later, we were together again—this time, at that first PACS meeting sharing some of the work that had been accomplished since. The list of participants and institutions at that meeting is regarded by many as the list of pioneers in PACS.

The PACS meeting, sponsored by the International Society for Optical Engineering (SPIE), has

been held every year since 1982, though the name was sometimes a bit obscure. For awhile, it fell under the name of “Application of Optical Instrumentation in Medicine.” It was held in Kansas City on two occasions and allowed the attendees to visit the KU Medical Center and see first hand what Sam was working on—a prototype PACS. The Chairman of the Department of Radiology at KU Medical Center, Arch Templeton, was so enthusiastic about Sam’s work that he invited attendees of the PACS meeting to visit him while he was still a patient in the hospital. Sam Dwyer continued to be a leader for the SPIE PACS conference both as a co-chairman of the meeting and always as an advisor to the leadership.

An emphasis at the first SPIE PACS meeting was on the need for standards. The need for them in medical imaging formed the basis for a session of the conference and a topic for a spirited discussion (the transcription of which was included in the meeting proceedings). Sam later was influential in the start of the American College of Radiology-National Electrical Manufacturers Association (ACR-NEMA) Digital Imaging and Communications Standards Committee. As a member of the Institute of Electrical and Electronics Engineers, he brought the influence of the engineering fraternity to the fledgling efforts of the American College of Radiology, the National Electrical Manufacturers Association, and the Food and Drug Administration in establishing what would become the ACR-NEMA Committee. My initial involvement in the ACR-NEMA effort begun when Sam told me about the work that was getting started.

Sam continued his leadership role in imaging informatics, serving as the Chairman of the Radiology Information Systems Consortium (RISC) and of Society for Computer Applications in Radiology as well. Throughout all this, Sam continued his research at the University of Kansas followed by faculty appointments at UCLA and the University of Virginia, Charlottesville, VA, USA. Sam’s work on the retrieval rates of radiological examinations formed the basis for the storage system design of virtually all PACS. It is only in recent years that, owing to the rapidly falling costs and exponentially increasing capacities of magnetic disk drives, some systems departed from the “short term–long term” design fostered by Sam’s studies. In fact, the concept of hierarchical storage design has persisted

as requirements for disaster recovery and storage of very large examinations are increasingly important.

Sam thought about display system design as well and implemented the first use of a then-experimental 2000-line cathode ray tube display. This was during a time when the typical computer display was 640×480 pixels, and image processing systems might support up to $1,280 \times 1,024$ pixels. Introducing this display to radiologists had the effect of spurring the industry to develop additional high resolution displays for medical imaging. Not content just to try out and exhibit hardware, Sam also studied how radiologists performed on these displays. At one Radiological Society of North America (RSNA) meeting, his exhibit featured softcopy displays on which radiologists could view images and evaluate their performance against other attendees—Sam produced an receive operating characteristic plot for each person willing to test themselves. I tried it and was relieved to find that my performance was on par with that of other radiologists.

In the years that I have known Sam Dwyer, he has been both a mentor and role model. It was a great honor to me that he treated me as a colleague. Sam gave advice willingly and was an honest but gentle critic when he thought ideas were not as robust as they could be. I knew him to be always ready with a smile or infectious laugh and with a perpetual gleam in his eye that spoke of his friendly manner. There are some who would claim the title of “PACS Man”, but it is Sam Dwyer who led the revolution in PACS. Whenever we use workstations, teach our residents about storage models, discuss information security, or learn about almost any facet of imaging informatics, we should remember that Sam Dwyer was a major pioneer who brought many of the important advances in technology to us and helped move concepts from the realm of engineering to that of healthcare. I will miss Sam very much, but the strong memory of him is never further than the PACS workstation I use every day.

*Steve Horii, MD, Professor
Department of Radiology,
University of Pennsylvania Health System*

MEET THE JDI ASSOCIATE EDITORS

Sam Dwyer was one of the original PACS pioneers and is well known for his leadership in

PACS and informatics. His PhD is in Electrical Engineering from the University of Texas in Austin, but he has had academic appointments in radiology departments since 1978—first at the University of Kansas, then at the UCLA School of Medicine, and currently at the University of Virginia where he is now retired. As I peruse his lengthy curriculum vitae, I see that he has been the author or co-author on at least 284 papers and has had numerous scientific exhibits, mostly at RSNA.

Sam loves guns and collected guns for many years beginning during his military service and through his employment at the University of Virginia. I recall visiting him at the University of Virginia where he kept a small rubber dart shooting pistol at his desk to surprise colleagues as they walked by his office. He had some quite rare pistols, including an 8-mm Type 94 semi-automatic Pistol (you can check it out on Wikipedia). The story is that General Douglas MacArthur collected most Japanese weapons after World War II and dumped them in the ocean, so although a large number of these Japanese pistols were manufactured, only a small fraction survived after the war. He owned a German 9-mm Luger pistol, a gun known for its long service life and ergonomic design. One of his favorites was his High Standard 22-caliber semi-automatic pistol. He also owned a collection of rifles and shot guns. He told me that he would take a selection of pistols to a range at least once a year to shoot them.

Sam has given his collection to his youngest son, Richard, who I am sure treasures them as much as his father did. Sam seems to be comfortable in his retirement and keeps up on current imaging informatics issues. He is helping us put together some articles on digital pathology so we can all broaden our imaging interests.

All of us in PACS and Imaging Informatics owe a great deal to the pioneering work done by Sam Dwyer.

*Janice Honeyman-Buck, PhD
Editor-In-Chief,
JDI, from SIIM News,
Summer, 2007*

A TEACHER, A MENTOR, A GENTLEMAN

As with many things, it is only with the perspective of time that the context of an individ-

ual's interactions becomes clear. I am humbled to consider Sam Dwyer my friend but describing him as such leaves an incomplete picture. I was very fortunate to make Sam's company early in my career in medical imaging. However, it is only now with the perspective and, arguably, wisdom as a seasoned industry veteran that I can say the blessings of his company, friendship, and mentorship have become fully appreciated.

Within months of taking a position with a major medical imaging company, I was thrust into the middle of a development project with a prestigious and well-regarded customer—the University of Kansas. As the “low man” on my team that day among VPs and international dignitaries, we met with the University of Kansas Chairman Dr. Arch Templeton and a dark-suited scientist by the name of Samuel J. Dwyer III, Ph.D. While the discussion was way over my head, all the action items fell to the “low man.” We were going to do digital chest radiography with a “beer keg” image intensifier (57 cm), 525-line TV camera and visual analog scale—Matrix Digistore. Anxious to proceed but with no clue as to how, Sam's teaching, patience, counsel, and encouragement made this project work—well, sort of. Digital chest never panned out at this low resolution, but the first digital fluoroscopy system arose from this failure. This was the first of several projects I had the pleasure and honor of working on with Sam.

Visionary, pioneer, vanguard—all these are fitting to describe Sam and his many accomplishments. But for me, my treasured memories are much more personal. Already well accomplished at the time of our first meeting, Sam made the time to take an eager but inexperienced student under his wing. I was not an “assigned” graduate student or research assistant from the university to which he had an obligation. I was a product manager from a vendor-partner. Over the years, answering technical questions in an understandable way to providing unassuming career guidance, as well as a sympathetic ear to the challenges of fatherhood or life's many challenges and struggles, Sam was always there for me. I hope, in some small way, my accomplishments satisfied him.

While Sam left a legacy through his professional accomplishments, perhaps more lasting is the heritage of leadership he has left behind. He felt it his obligation to pass on his knowledge and wisdom to the next generation, and I was blessed as a

recipient. I have and will continue to honor Sam by sharing his wisdom with those that come after me. Through this legacy, Sam will live among the radiology community for generations to come.

*John Strauss
Director of Marketing,
FUJIFILM Medical Systems*

“Sam was a phenomenal resource and the veritable fount of information on what we should do with informatics and where the whole field was likely to go. He was never wrong, in my experience. He will be sorely missed by those of us who had segments of or even entire careers shaped around what he had developed and moved forward.”

*C. Douglas Phillips, MD FACR, Professor
Depts. of Radiology, Neurosurgery,
and Otolaryngology-Head and Neck Surgery,
UVA Health Systems*

Sam Dwyer was so kind to me as I tried to learn the workings of JDI and journal administration.

Leigh Burke

“GIVE A MAN A FISH; YOU HAVE FED HIM
FOR TODAY. TEACH A MAN TO FISH; AND YOU
HAVE FED HIM FOR A LIFETIME”

The embodiment of this ancient Chinese proverb, Dr. Sam Dwyer was a teacher. While he could (on something as simple as a paper napkin) describe the very complex, technical aspects of the oldest, or most contemporary technology in his field, he was much more inclined to engage a willing audience with a new opportunity to learn—soup-to-nuts. “Dr. Sam” was by far one of the kindest, gentlest, and most respectable souls our industry has had the pleasure to know. As well as his unmatched intellect and his ticklish laugh, Sam brought depth and heart to digital imaging. The “Grandfather of PACS,” Sam was a true visionary with an unending dedication to improving health-care through the use of technology. His innovative and pioneering nature fed his drive for change as he graciously invited participation in his plight by all willing to join. In the words of an admirer, Sam “once convinced an entire industry that its future was digital.” Sam was not afraid of thinking outside the “box” (or, of endlessly thinking on

how to get things into, and out of the “box”). He was likewise undaunted by opposition or challenge. Sam stood strong in his convictions, backed by research and scientific principle, and he was accepting of alternative points of view, equally supported in science. I was a young lawyer—in a vast sea of academics, physicians, technologists, and the like. Sam gave me confidence to pose new ideas and thoughts and taught me to remain willing and ready to educate and learn from others with patience, humility, and grace. As he did many others in his lifetime, Sam taught me to fish! His legacy is strong and his contribution to our industry, unequalled. This world is a better place because of you, Sam. We will miss your smile!

*Kristen (Kris) Knight, JD, Director
Privacy Compliance,
Philips Healthcare*

MY FATHER, SAM DWYER

My father loved his work and the people that he worked with in radiology. He never quite accepted that he could not continue his work. For those that continued contact with my father, I thank you. He treasured every call and wanted to go back and be part of the excitement. His notes by his chair Tuesday evening when I arrived at the house included handwritten formulas and letters to colleagues. He missed it all so much that it was heartbreaking to watch. Thank you all for your thoughts in prayers as we grieve his loss but are so thankful that he is no longer in pain and suffering, which he continually tried to cover up.

*Donna Phillips
Technology Network Administrator,
Maize USD266*

Sam was one of the first individuals I met when I got into the PACS business, some 25 years ago. He was extremely supportive of and patient with this neophyte. I will miss him.

*Wayne DeJarnette, PhD, President and CEO
DeJarnette Research Systems, Inc.*

The professional Legacy of Samuel J. Dwyer, III, Ph.D. is phenomenal, with many of us owing our careers to Sam. However, it is surpassed by his personal legacy. He was friendly to everyone he met and would go out of the way to help people.

He had a great sense of humor and loved to tease his family and friends. Sam never had a disparaging word about anyone—a true gentleman. He was very humble (“call me Sam not Dr. Dwyer”) and often shied away from praise or taking credit. However, Sam was quick to praise others. He put my name on several papers where I only did a little to contribute, but Sam insisted. He never complained, even when his health was failing. Sam was always positive. He could never quit working. He was an unpaid consultant to me and even contributed to a paper several of us submitted last year. Sam was a very dear friend and I feel like I lost my big brother. I feel very privileged, as I may be the last person in Medical Imaging to talk to Sam. He called me the morning before he passed away and talked for a very long time. Sam reminisced about many of the great times we shared, both professionally and personally. Looking back, I wonder if he felt the end was near. Sam was a great scientist and a great man. I cannot find the words to fully and properly thank Sam for all he did for Medical Imaging and for me personally. I am left with a simple prayer:

Dear God, Thank You for Sam Dwyer.

*Ronald G. Gesell, Manager
Product Development Medical Imaging Solutions,
Compressus Inc.*

I worked as the administrative assistant to Dr. Bruce Hillman in the Department of Radiology at the University of Virginia for over 10 years. Dr. Dwyer was a very sweet, humble man. There was never a time that he did not ask me about my boys and always gave me excellent parenting advice. I always took his advice very seriously because I figured he was a professional with the number of children he had! Dr. Dwyer will be greatly missed. My best to his wife and family.

*Kimberly Thibodeau Oakes
University of Virginia*

Sam Dwyer was an inspiration to many of us and I know that his vision and passion stimulated me to enter this avenue of work. I hope SIIM will create a lasting tribute to this leader, perhaps a named student award or research grant.

*David Channin, MD, Chief
Imaging Informatics,
Northwestern University Feinberg School of Medicine*

TIPS FOR DOING GREAT REVIEWS OF JDI MANUSCRIPTS

JDI needs two main components to remain successful and to grow to meet the needs of its readers in the future. First, it needs excellent manuscripts from reputable authors who are reporting on the most interesting and novel aspects of the subjects of interest to the journal readers. Second, it needs great reviewers and editors to make the manuscripts the best they can be. JDI is very lucky to have some of the best authors, reviewers, and editors in the business and we are always recruiting new people to keep the content fresh and of very high quality.

Some of our reviewers have asked me to explain the guidelines for performing a good review. A few years ago, I wrote an editorial for the JDI on the process of reviewing manuscripts for JDI (1) and concentrated on the mechanics of using manuscript central—a system developed by a company named ScholarOne specifically for managing the processing of manuscripts for peer-reviewed journals. In this follow up, I would like to help reviewers understand what we are looking for in an excellent review.

JDI accepts four different types of manuscripts: Hypothesis-Driven Research, Experience Reports, Review or Tutorial manuscripts, and Technical Notes. We have developed slightly different score sheets for each type of manuscript, but the reviewers should understand that, at times, a manuscript might be assigned to the incorrect category and the score sheet may seem inappropriate. So we ask for your patience with this and try to use the score sheet assigned to the manuscript to the best of your ability. If, for example, a manuscript is a technical note that has been assigned the type of Hypothesis-Driven Research, simply do not rate the manuscript on the question “Do the results support the Hypothesis.” The most important parts of the score sheet include the rating values and the comments for the author and editor. The reviewers supply rating values for Timely issue, Instructional value, Value to JDI readers, Clarity of presentation, and Overall rating—each with a value from 1 to 10 where 1 is Reject and 10 is Accept. In addition, the reviewers are asked to comment to the author and editor. This is, by far, the most important part—the comments for the author are communicated to the author, and this is the only place where the associate

editors and I can understand your exact thoughts on the manuscript. Please consider this part very seriously.

A word of warning—Manuscript Central will time out after a period of inactivity when no mouse clicks have been recorded. If you are typing a long, thoughtful comment directly into the score sheet, you should save your work often to be sure you do not get timed out and lose your work. This has happened to me and to many others who have expressed their extreme frustration when it happens. I am now a little obsessive-compulsive about saving my work. Alternatively, you can write your comments in a word processing program and copy and paste them into the comment field on the score sheet.

Two other journals have published their guidelines for reviewing, and I highly recommend those articles for more information. (2, 3) Please remember, your comments are meant to be constructive criticism—things the authors should do to make their work better. Attacking the authors because they have different ideas from yours is not constructive and usually results in delays because I will send the manuscript out for another opinion.

Here are the elements of a good review which are very closely aligned with Dr. Proto’s editorial from Radiology:

First, write about the strengths of the manuscript—mention the things that are good, is the research sound, are the findings interesting? In the case of a review article, did the authors cover the major publications in the reviewed topic? In a technical note or experience report, do the authors express something new or of interest to the readers. Keep the beginning positive if possible.

Second, write about the weaknesses of the manuscript or research. You might mention that the statistics are not clearly documented or that the method was not well defined. Be constructive. If there is a better statistic method to use, point it out. Perhaps you believe the research does not support the conclusions. If the authors have not included important references you may know about, you should mention them.

Third, discuss the importance of this work for our field. Does this work advance new knowledge, is it important, and is it of interest to our readership?

When you have specific comments, use the page and line numbers to indicate the part of the manuscript you are referencing. Mention any

inconsistencies the authors may have introduced into the work.

The following are recommendations by Dr. Proto from Radiology for reviewing specific sections of a manuscript. Radiology mainly publishes hypothesis-driven research so they usually only review one type of article, but the ideas expressed can be molded to work in the JDI environment.

Abstract Authors should write the abstract after completing the body of the paper to be sure they really capture the important parts of the manuscript. Reviewers should follow the same rule, read the paper first, then the abstract and see if the abstract is complete enough to clearly describe the content of the entire manuscript. In manuscript central, sometimes, the abstract is included in the portable document format you download to read and sometimes, you will have to find the abstract separately on the manuscript page during your review. It is always available for you to review.

Introduction This section should explain why the authors chose to study and write about this topic. It should include a literature review to let the reader know that the authors are aware of similar work and that they believe their work is different (and presumably better) in some way. The reviewer should discuss whether the authors have convinced him/her that the reason for the work is important and unique and interesting. If this a hypothesis-driven paper, the hypothesis being tested should be clearly stated.

Materials and Methods This section should describe, in detail, the research or development work that was performed. Reviewers should discuss whether this section is clear and correct. Did the researchers use a large enough sample and were the statistics correctly used? In a non-hypothesis-driven manuscript, this section will describe what new technique the authors are using, perhaps how a new tool is used.

Results This should contain the results of the research if this is hypothesis-driven or the outcomes of using a new method or tool. The reviewer should comment on the results and if they support the hypothesis, or the reviewer should comment on the effectiveness of using a new tool or technique.

Discussion The authors should discuss the significance of any findings and suggest ways to improve or expand the work in the future. They should describe any weaknesses in their work and how they intend to improve it. Reviewers should look for this type of discussion and state their opinion of the section—does the reviewer agree with the authors?

Please look at the references and make sure they are current and complete. Look at the tables and figures. Are they complete? Are there too many? Too few? Are they clear or do they need revision?

Here are some important things that you do not need to do. You do not need to correct grammar, spelling, or punctuation errors. Springer has professional copy editors who do this work. If the language in the manuscript is grammatically too difficult to follow, then that should be mentioned, but do not attempt to fix every problem in your review; we much prefer thoughtful comments about the content of the manuscript.

The manuscripts are double blinded so you will not know who the authors are and they will not know you reviewed the manuscript. If you figure out who the authors are, please do not attempt to contact them for any clarification of items in the manuscript.

Please inform me or the associate editor who assigned you to a manuscript if you do not feel you can review a manuscript after accepting it for review; we will be happy to reassign it. We try to match the qualifications of the reviewers with the keywords in the manuscript, but from time to time, we might make a mistake in the assignments.

Thank you all for your willingness to review for JDI. We are all grateful for your continued support.

1. Honeyman-Buck, J: Reviewing Manuscripts with Manuscript Central. JDI 16(4); 319–323, 2004
2. Proto, A: Radiology 2007: Reviewing for Radiology. Radiology 244(1); 7–11, 2007
3. Rogers, L: Peer Reviewers: Reviewing Manuscripts for the AJR. AJR 178; 1051–1052, 2002

THE JOURNAL OF DIGITAL IMAGING JOINS THE 21ST CENTURY WITH ITS JDI BLOG

We are excited, pleased, and a bit apprehensive as we launch a new resource for SIIM members

and JDI readers. Blogs have become pervasive in the new era of social networking and will be our way to send our readers informal announcements, interesting discussions, and information on issues effecting our profession. We will alert readers when a new article is published online first, which can be up to a year before the print publication is available. Readers will be alerted to the newest research as soon as the peer review process is completed and the final article is published and available to be read and cited. In addition, we will search out and publish communications we believe will be of interest to our members and readers.

Readers will be encouraged to submit their own contributions to be posted. All contributions will be approved by the editor and editorial assistant prior to being posted. We will only accept contributions from people with valid e-mail addresses, and all posted blogs will be open

access, in other words, anyone will be able to read them. As we begin this adventure, we believe we will archive our blogs for approximately 2 years, but we cannot guarantee that all blogs will be archived. You will be able to include hyperlinks in a contribution, and we will check those links, but Springer and SIIM will take no responsibility or assume any liability for any content of those hyperlinks. We will do our best to be sure the links are valid at the time they are posted. All our guidelines will be published when the blog goes live summer of 2008.

Our blog will be found at <http://blogs.springer.com/jdi>. By the way (BTW), did you know that blog is a portmanteau of web log? Did you know that portmanteau is a word that fuses two or more words or word parts to give a combined or loaded new meaning? This little piece of information is direct from the Wikipedia.