Presentation of the 2007 Morris F. Collen Award to William W. Stead, MD, including comments from recipient

W. Stead, MD

The American College of Medical Informatics (ACMI) is an honorary society established to recognize those who have made sustained contributions to the field. Its highest award, for lifetime achievement and contributions to the discipline of medical informatics, is the Morris F. Collen Award. Dr. Collen’s own efforts as a pioneer in the field stand out as the embodiment of creativity, intellectual rigor, perseverance, and personal integrity.

The Collen Award is given each year, when appropriate, to pioneers in the field of Medical Informatics who best exemplify the teaching and practice of Morris Collen. In 2007, the College was proud to present the Collen Award to William Wallace Stead (Figure 1). Throughout his career, Dr. Bill Stead, has been able to visualize better ways of achieving the purpose of work, and then to drop to ground level to figure out how to execute on the next step in that direction.

Bill Stead was born in Durham NC in 1948 as third child to Eugene Anson Stead, Jr. and Evelyn Emogene Selby. Gene Stead was Chair of Medicine at Duke. He trained a generation of independent thinkers and constantly broke the mold; changing the Duke curriculum to replace memory with research, using the Cardiovascular Databank to improve practice, and launching the physician assistant profession to increase access to care. Evelyn was at Gene’s side every step; raising Nancy, Lucy, and Bill, co-authoring an early low fat cook book, and editing the journals Gene took on. Every person or event she touched became special.

To many observers through the years, it seemed that Gene and Bill Stead were practically the same person. As Harry Jacobson, MD, Vice-Chancellor, Vanderbilt University Medical Center, observed, “They had both a loving relationship, but a mutual respect—and a mutual curiosity, intellectual curiosity about what we need to do in health care...that I think created a bond between the two of them that I thought was very unique.”

When Bill was four, the family purchased land on Kerr Lake in North Carolina. With Evelyn as Architect and Gene as Builder-in-Chief, they began their lake house. They started with a bath room and enclosed it with a screened area. This made a place to live while they built the house around it (Figure 2). The project took 20 years to complete, and it showed Bill how to break projects up into phases and that big things could happen if you kept laying one block after another. In this regard, Clem McDonald, MD, Regenstrief Professor Emeritus of Medical Informatics at Indiana University, said of Bill, “He’s a master planner...you know step-wise, progressive, he thinks a long time ahead how to get there. In many respects he’s like his Dad that way. The politics and the people and the funding and the motivation and building the infrastructure and keeping your eye on the prize...I think he probably did that even more focused than his dad.”

Bill is an Eagle Scout. Harry Rodenhizer was his Scout Master and Harry believed in letting the boys make mistakes and learn from them. The troop camped out every month, often hiking in and out. Bill’s first experience in leadership and organization came as a Patrol Leader and Junior Scout Master. When Bill was 10, he learned to ski behind a runabout with a 12 HP outboard. Almost 50 years later, water skiing is still his favorite sport.

Bill began his education at Durham Academy, continued at Durham High School, and finished at Duke University, where he received his BA in Chemistry and an MD and then completed a residency in Internal Medicine and fellowship in Nephrology.

Bill’s interest in applying computing to medicine began in 1968 when he joined Dr. Frank Starmer as an undergraduate work study student in the Duke Myocardial Infarction Research Unit. The unit’s Sigma V computer was located next to the cardiac care unit and supported real time data acquisition and interaction. When Bill started medical school, the Duke curriculum compressed requirements into 2 years, freeing a full year for basic research. Medical computing was not an established research track at the time, so Dr. Harvey Estes, Chairman of the Department of Community Health Sciences, agreed that Bill could work with Dr. Ed Hammond in his computer lab and receive credit for independent study. Bill’s father suggested he start this “3rd
year research” during the summer between college and medical school. With that head start, he was able to finish medical school in 3 years by taking courses year round. Ed Hammond, Ph.D., Professor Emeritus, Community and Family Medicine and Professor, Biomedical Engineering, Duke University recalls that time: “When Bill first joined me, and in typical Stead fashion, he actually did the third year rotation before he ever started his first year rotation at Duke. The first project that Bill was involved with was the development of a video interactive questionnaire for patients with headache. Not knowing Bill Stead very well, I came back after a week’s vacation and walked into the room and Bill had the walls covered with large white wrapping paper on which he had outlined all the frames for the interactive questionnaires. This project was very successful but somewhat ahead of its time.”

In the summer of 1970, Bill joined Ed Hammond as one of a team of five medical and undergraduate students (Figure 3). Together they developed assembly language programs for the PDP-12 and merged them into GEMISCH, an application development and database management environment. Working with Dr. Al Heyman in Neurology, Bill used this environment to develop an interactive video questionnaire to capture the history of present illness directly from patients presenting with headache. The program’s differential diagnosis was comparable to that of attending neurologists. By 1972, Ed’s team had combined history and physical “exam takers” into a prenatal electronic health record. When Bill started his OB/GYN clerkship, the attendings were unhappy because it took too long to find what they wanted in the long printouts. He went back to the computer center and stayed up all night to re-write the print format to match the outline the students had been given for admission notes. The resulting system was used at Duke until 2002.

Bill was in the last internal medicine and resident group at Duke who were “on call” five out of seven nights of the week. This clinical immersion was intense and left no time for computing. However, in 1975, Bill became a fellow in nephrology under the tutelage of Dr. Ike (Roscoe R.) Robinson. Dr. Robinson switched the usual order of clinical and research training for Bill. Starting with research, he allowed Bill to build tools that he could then test and refine during his clinical year. It was during the research year that Bill developed a working prototype of a general purpose electronic medical record. A dictionary of metadata managed clinical content and entity-attribute-value data structures handled sparseness. In time, Ed Hammond and Bill would evolve this prototype into TMR, a full function practice management system, which supported at its peak over 40 sites in 20 different settings ranging from a 2 person practice to a 60 bed cancer research hospital. Morris Collen, MD, Emeritus Director of Research, Kaiser Permanente, recalls that “Soon the TMR system was used in other medical centers in the United States. Since some medical information such as Word Process Narrative still requires a paper base record, Bill published the succinct disclaimer that TMR was a chart-less record and not a paperless record.”

Early in his clinical fellowship year, Bill met Janet Mackey. Janet was the daughter of John and Mary Mackey. She grew up in Beverly, MA and graduated from Salem Hospital School of Nursing. She had come to Duke the previous year to accept a position on the Duke Inpatient Renal Unit. Bill and Janet were never apart after their first date, and they married in 1977. Bill skied to the wedding dinner and he and Janet foiled the guests who wanted to decorate their car by leaving the wedding by boat.

Bill then joined the Duke faculty in Nephrology. Since Ike Robinson was both Chief of Nephrology and CEO of Duke Hospital, he arranged to split Bill’s time between directing the dialysis unit at the Durham VA Hospital and serving as physician liaison for the Duke Hospital Information System. The dialysis unit provided a test bed for TMR. The hospital system, DHIS, developed at Duke and marketed by IBM as PCS/ADS, provided an opportunity to test ideas on an enterprise scale.

Bill’s and Janet’s daughter, Elizabeth Mackey Stead, was born in 1984. Elizabeth graduated from Lipscomb University last year with a degree in elementary education and she now teaches in Nashville (Figure 4). In 1985, Bill stepped in as Director of Medical Center Information Systems at Duke. Two seasoned medical center administrators, Mr. Bob Winfree and Dr. Jane Elchlepp met with Bill two hours every week for his first four years to guide him as he learned to manage at this level of the organization. Bill obtained model development and implementation grant funding from the National Library of Medicine’s Integrated Academic Information Management System, or IAIMS, ini-
tative (Figure 5). Through this work he developed what he views as his primary technical innovation—an enterprise information architecture to manage the information from all applications in repositories independent from, yet accessible to, the applications, allowing new functionality to be purchased and plugged in or developed on site with less hassle and without upsetting other programs and processes. This architecture underpins Vanderbilt’s clinical IT and a derivative is the foundation of the “Volunteer eHealth Initiative,” regional data exchange demonstration project in southwestern Tennessee.

In 1991, Ike Robinson recruited Bill to Vanderbilt. Ike had been at Vanderbilt as Medical Center as Vice Chancellor and the Medical Center CEO for 10 years, and he was ready to give Bill a fresh canvass to build Biomedical Informatics as Bill thought best. They agreed to focus on linking information into workflow to help people make better decisions. Carol Aronson, Bill’s long time assistant, agreed to come to help with the effort.

Bill decided to bring all information management and utilization functions, including the library, into a center managed at the level of the medical center; to implement the information architecture from his Duke plan, and to establish biomedical informatics as a scholarly discipline within the new center. Together, these decisions turned the operation and decision support infrastructure of the medical center into an applied laboratory for biomedical informatics. Clem McDonald observes that “It’s absolutely essential to the field that there be informatics programs that have enough critical mass and are embedded in the health care system at their place well enough to be able to do the inventive and imaginative things that the health care system needs.”

What Bill still calls “the Vanderbilt experiment” is a journey. The first leg (1991–1994) involved basic infrastructure: construction of the Eskind Biomedical Library to make space for the academic program, connecting buildings with fiber optics for networking, refreshing transaction processing systems, and adapting them to the enterprise information architecture. In this setting, Dr. Harry Jacobson observes, “It is amazing how much you can get done if you have a few principles—like: it doesn’t matter who gets the credit, don’t sacrifice success for control, and treat other people like you want to be treated. I mean very basic principles...and Bill lives them.”
The second leg (1994–2003) applied techniques from the science of biomedical informatics to come up with new ways to help people do their work. This leg began when Dr. Randy Miller and his team from Pittsburgh (Nunzia Giuse, MD, MLS; Dario Giuse, DrIng; Antoine Geissbuhler, MD, and Steven H. Brown, MD) joined the Vanderbilt team. Other established leaders joined in quick succession as Bill sought to assemble a critical mass of talent. Biomedical Informatics gained departmental status in the School of Medicine in 2001. Applied informatics breakthroughs included an enterprise-wide electronic medical record together with workflow, communication, and decision support tools, and new models for librarianship.

As Randolph A. Miller, MD, the Donald AB and Mary M Lindberg University Professor of Biomedical Informatics, Medicine, & Nursing at Vanderbilt, notes, “You’re not going to win every argument, but if you know that the person listening to the points of view understands the points of view—weighs them carefully, and will make a fair decision that he can explain to everybody—that’s about as good as it gets. And that’s how Bill does things.”

The third leg of informatics development, beginning in 2002, rethinks the nature of biomedical and healthcare work given the “art of the possible” through informatics. This leg began when Dr. Harry Jacobson (who had succeeded Ike Robinson in 1997) and Bill partnered to launch the Vanderbilt Center for Better Health as infrastructure to accelerate change in healthcare. The Center’s methods are helping Vanderbilt and partners manage the transition to systems approaches to evidence based personalized care.

Over the course of this journey, the Informatics Center grew from two to over 500. The Department of Biomedical Informatics, with Dr. Dan Masys as current Chair, is the 6th largest in the School of Medicine with 55 faculty spanning clinical, bio-, and educational informatics. As each new unit was assimilated or formed, Bill took it over, ran it for a period, and then recruited a leader to take it to the next stage. Dr. Miller recalls, “At one point in time he was director of the biomedical library, at another point in time he was the acting chair of the department, at other times earlier in his career he was a programmer and a clinician...so it’s because he’s been in all of these roles that he has the right experience and the right know-how to make things happen.”

Similarly, Donald Lindberg, MD, Director of the National Library of Medicine, observes that “If you say, well, someone saw the future and he sees the importance—that’s great but that’s preaching to the choir and it doesn’t get you anywhere. I think a lot of us have done that, I think Bill has done more...I think Bill has figured out the importance of everyone in the institution sharing that vision in his own way...and being supportive of those ideas.”

Bill has been at the center of the emergence of biomedical informatics as an organized field. He was a member of the first executive committee of the American College of Medical Informatics and later served as President of the College. He was program chair of the 11th Symposium on Computer Applications in Medical Care. As President of the American Association for Medical Systems and Informatics, he worked with Dr. Ted Shortliffe, President of the College, and Dr. Clem McDonald, President of the Symposium, to bring the resources of those organizations together in what became the American Medical Informatics Association (AMIA). He led the committee that developed the business plan for the Journal of the American Medical Informatics Association (JAMIA) and served as JAMIA’s Founding Editor-in-Chief. In this regard, Dr. Lindberg, who was AMIA’s first president, observes, “I think another thing that we wouldn’t want to forget about Bill having done really well is to be the first editor of JAMIA. And I recall very well when he expressed an interest in that...and fortunately both of us were holding glasses in our hands, and we agreed very, very quickly that he’d be the ideal editor and he took it on and was the ideal editor.”

Bill has followed in his father’s footsteps to membership in the Institute of Medicine and service on the Board of Regents of the National Library of Medicine. He served as Presidential appointee to the Systemic Interoperability Commission. As Chair of the Board of Regents of the National Library of Medicine, he guided development of the Long Range Plan for 2006–2016, as co-chair with former Speaker of the House Newt Gingrich. In reference to this, Clem McDonald said, “Having him help the Library plan the 2006 to 2016 long range plan was a master stroke for Don Lindberg, to have that kind of master architect planner so involved.” And Lindberg, in his role as NLM director, opined ‘I think he and Newt Gingrich both especially liked the issue of vision—what was the world going to be during that 10–15 years we...’
were planning for and how would NLM fit into that world of the future. And I think they egged each other on, and both did a wonderful job.

Bill is intense when focused on work. He takes relaxing with the family and pets equally seriously. He breaks the tension at the family’s retreat on Center Hill Lake. He is at his best working outdoors or chatting over dinner cooking on a wood fire. In this context, Ed Hammond notes, “Bill is quite an outdoor cooking person and what Bill does is he has his own recipes that he continues to test and make notes on the side, improving the product until it reaches perfection. This is the same intensity and energy that Bill puts into all of the projects that he does.”

Bill is truly a pioneer in the tradition of Morrie Collen—he looks for the right interaction among people’s roles, process, and technology—he looks for information architectures flexible enough to support iterative change—and he looks to organization approaches to develop the intellectual horsepower to fuel both changes. Dr. Collen, the award’s namesake, observes “William Stead truly represents the highest level attainable for excellence in all aspects of medical informatics. . .the science, teaching, and the practice of medical informatics.”

Dr. Lindberg offered asummary observation on the occasion. “The Collen Award may mark a transition for Bill in which he moves from just his own group and his own fine institution. . .to more of a country-wide responsibility”, he said, “...feeling more comfortable with looking at the country’s ability to adapt to these new ideas and to facilitate the progress.”

**Comments on Acceptance of the 2007 Collen Award by William W. Stead, MD**

I am humbled to receive this award from my peers in the College. Janet and Elizabeth, please stand up and join me in accepting it.

This award is a tribute to the many people who have mentored me and given me running room. It is a tribute to the teams I have had the privilege to lead. I thank each of you.

When we established the Collen Award in 1993, we wanted to celebrate the careers of the awardees in a way that showed people starting their careers how a career unfolds over time. I now want to speak to the young people in the audience.

I have good news and bad news. The good news is that we face unlimited opportunity. If we play our cards right, history will look back on the next 15 years as the golden age of biomedical informatics. Healthcare faces a perfect storm of unacceptable costs and quality, the demographics of aging baby boomers, and the data tsunami from the genomics and proteomics. Healthcare will implode unless we come up with a new way to make clinical decisions. Information technology is in the critical path of any conceivable solution.

The bad news is that you cannot simply insert information technology into the current approach to healthcare and get the desired result. As shown in the recent literature, such an insertion will cause as many problems as it solves. To get the desired result from information technology, you have to change the ecology of practice—changing process to simplify and standardize—using information technology to reduce dependence on memory and to provide a forcing function—while allowing people to provide compassion, pattern recognition, and judgment.

What does this mean to people starting their careers in biomedical informatics? You need to ask what might be possible, or what it might take, instead of saying why it cannot be done. You need to get your hands dirty—doing anything it takes to solve a real problem. In the process you will figure out how information technology can sustain the improvement. If you do these three things, you will become a go-to person and your career will be assured. To put it differently, this means thinking is necessary but not sufficient—you need to both think and do!

Thank you.