Joel Buchanan Part Two

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Benita Albert concludes her series on Joel Buchanan by looking at advances in medical technology and even a glimpse into what he sees as the future in his field.

In 1973 the first mobile phone was introduced by Motorola, and the first example of a complete personal computer was revealed in March of 1973, namely the Xerox Alto. Joel Buchanan graduated from Oak Ridge High School (ORHS) in the same year. By the time personal computers became commercially accessible to the public, Joel was beginning medical school. Only twenty years after his ORHS graduation, Joel would be appointed the Medical Director of Information Systems for the University of Wisconsin Hospital and Clinics, a position he would hold until his retirement in 2019.

Of Joel's first introduction to computer technology, he wrote, "There were no PCs available when I graduated ORHS. In our computer science class taught by Barry Fernandez, we used Hollerith punch cards. Each card contained one line of a program. We created our programs on the cards, then ran them through the school's IBM 1620. Jim Pollock and I were taking German from Evelyn Armstrong. We wrote a program that was a rudimentary language translator, English to German. At Duke, it was the same story—type on cards and load into the big, IBM mainframe computer."

Joel's interest in gadgets and experimentation, which his mother described as beginning in early childhood, has not subsided. In 1986 he purchased his first PC, a Leading Edge Computer. Ultimately, his respect for technological advances and his interest in medical applications merged into a plan to build an interface useful for medical practitioners. Utilizing the expertise of medical experts from nationally recognized programs, Joel has developed a problem concept map to filter relevant information from patients' electronic health records (EHRs). The filter enables physicians to sort EHR information related to medications, labs, imaging, procedures, clinical notes, and hospitalizations pertinent to a patient's condition.

Joel's innovative approach is backed by long experience in the field of medicine. His professional resume' includes work as an emergency room doctor, an attending staff physician in internal medicine, and a professor of medicine for the University of Wisconsin Medical School. Though both he and his physician wife chose to retire in 2019, his work to provide a problem-oriented medical record system to a larger medical audience continues. A pilot study was funded by the National Institute of Health in 2017-18, and his work then continued with the support of the Isthmus Project of the University of Wisconsin.

Joel left Oak Ridge for Duke University in the Fall of 1973. At the urging of one of his professors, Joel applied to become a Duke Scholar and was accepted at the end of his sophomore year. The Scholar's program offered summer studies at Oxford University in England where Joel enhanced his academic portfolio by choosing coursework in British history. He also joined fellow scholars on back packing trips through Europe. His extracurricular activities with the Duke band and student-run radio station (which have been previously cited) also included writing for a student-produced book which described courses and rated professors. Joel said, "I basically coordinated the evaluations for the whole engineering college." Finishing his biomedical degree in 3.5 years, Joel worked with a Research Triangle company that made medical devices before entering medical school at Vanderbilt University in the Fall of 1977.

In the summer of 1979, a medical student from Tufts University, Julie Fagan, elected a summer program at Vandy. Unknown to Joel at that time, he was meeting his future wife. Later, Julie and Joel traveled across the US searching for medical internship positions mutually attractive to the both of them. They requested and received release from their fourthyear medical school studies at Tufts and Vandy for a month-long immersion in their proposed specialties at the University of Wisconsin (UW). Joel said, "We rode our bikes back and forth to the hospital where I worked in general internal medicine. Julie did a rotation in kidney medicine. We really liked Madison, WI." They applied for internship positions, and both received early acceptances for residencies at the UW Hospital.

I asked Joel what factors lead him to choose internal medicine. His response was, "I wanted to be in primary care. I liked the variety of problems and the chance to develop long term relationships with my patients. I had worked for a summer with the Appalachian Student Healthcare Coalition where, as medical students from Vanderbilt medical school, we helped with health fairs in Eastern Kentucky." The medical students conducted free physical examinations with follow-ups as needed by faculty physicians. Joel explained that this experience with people who had limited access to medical resources made him even more interested in hands-on care.

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Joel and Julie married in 1981. While in medical School at Tufts, Julie received tuition support from a Public Health Service Program. Then after residency, she was obligated to practice in a medically underserved area. She accepted a position in a rural, underserved part of Maryland, and this was their home from 1984 to 1987. Finding it difficult to secure a job in internal medicine, Joel accepted a position in the emergency room (ER) of Anne Arundel General Hospital in Annapolis, MD.

"Though I was not specifically trained, as doctors now might be for ER practice, I liked it. I ultimately served nineteen years of my career in the ER followed by sixteen years in internal medicine," Joel said. He described the ER as "a designated place for chaos, yet an exciting place." His decision to leave ER practice evolved over time. The need to alleviate stress, to better control his schedule versus working in a place where a 40-hour work week is unheard of, and to have more family time became the overriding decisions in Joel's change to a career as a general internist.

Julie and Joel returned to Madison, WI in 1987 where they have worked, raised a son and daughter, and now retired. The couple has enjoyed traveling across the US and abroad; ballroom dancing, including competitions; and Iron Man meets for Julie where Joel attends as her biggest fan and wears a tee shirt declaring "I get my wife back in 140.6 miles."

In 2017 Joel was awarded a research grant through the National Institute of Health to conduct a pilot study on the impact of a problem-oriented view on clinical workflow using concept mapping. The study revealed that physicians who used the problem-oriented system "could find information more quickly and more accurately with great worker user satisfaction and less cognitive stress."

In a profile of Joel's work via the Isthmus Project of the University of Wisconsin, a case is made for additional professional support. Included in the report is the following: "It is the hidden side of electronic health records: research shows that the average ER physician makes a mind-numbing 4,000 clicks per shift, spending nearly twice as much time on electronic record-keeping than they do directly working with patients, and clocking one to two hours of additional computer time after work to keep up with it all." ("Technology Solution Aims to Extinguish Provider Burnout," the Isthmus Project of UW Health)

The Isthmus Project, an innovation accelerator program of UW Health, has offered funding and business and legal expertise to further develop and implement Joel's Problem-Oriented View across a larger medical community. The project received funding from the EHR industry and is seeking additional support from corporate and government sources while maintaining an operating base through the UW Health system.

Joel's vision is: "To establish a Center for Problem-Oriented Concept Maps which he hopes will be supported by the National Library of Medicine to ensure long-term viability and to make technology available to institutions nationwide for a no-fee license." (www.isthmus project.com)

When Joel spoke of his plans, he did so with enthusiasm and clarity of purpose. He guided me, his former high school math teacher who has no medical training, through an online demonstration of his problem-oriented view. Go to <u>www.problemlist.org</u> to read much more under the title, "About Problem List MD." MD is a clever double entendre acronym for not only medical doctor, but in this use, also for metadata. An example of a concept map design application for epilepsy is accessible by clicking on the link included at the bottom of the introductory page.

Reflecting on his career, Joel said that teaching and mentoring medical students and residents was stimulating work, and this experience may have been a big impetus for him to stay in the ER for almost two decades. He participated in med flight missions for the transfer of critically ill patients and for accident scene treatments beginning in 1985. He has mentored upper class medical students in bedside clinical visits. He feels his later work in internal medicine permitted him greater personal relationships, especially with patients requiring continuing care.

Joel's life work brings credibility and empathy in advocating for greater assistance with the challenges medical doctors meet daily. He addressed positive changes he has observed in medicine during his career saying: "I like that patients can now be more involved in their care. Patient portals (the messaging component of electronic records) are great for datainformed interaction of patients with their doctors. Additionally, the internet allows people to explore and educate themselves on their medical conditions thereby becoming much more informed and involved."

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I also asked Joel to look ahead twenty years and dream of medical advances. He replied, "Computers will get much better; people will be more accustomed to electronic medical services; and hopefully, physicians' stress and cognitive workload will be lessened. Instead of a doctor interview followed by the doctor's typed, computer summary, a computer will listen to the doctor interview and write up the information. This allows the doctor more time to concentrate on the conversation with each patient. Such systems eliminate the need for an intermediary scribe to create patient summaries. Finally, such systems will become more financially feasible for doctors in all fields/practices."

In describing the effect of Covid on his work, Joel mentioned that both he and his wife retired from their medical practices shortly before the Covid restrictions were enacted. He said, "It was a happy accident that we chose to retire just sixmonths earlier. All of my current work is remotely accomplished. We haven't met in person since 2020."

It is the power of technology that has offered Joel the opportunity to stay on course in his work with expert medical consultants, to secure partnerships and financial support, and to put in place an operational system that hopefully will soon be available to a wider medical community. As for me, I can't wait to see the ingenuity of a former student, like so many other innovative minds who have graduated from ORHS, make this world a better place.

Thanks again, Benita, for this series that gave us some insights into medical advances and showed yet another amazing career of an Oak Ridge schools graduate.



Joel Buchanan