

American Medical Informatics Association Nursing Informatics History project

Purpose

The overall purpose of the Nursing Informatics History Project is to document and preserve the history of nursing informatics.

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Marion J. Ball

Interviewer: What is your name?

Marion Ball: My name is Marion J. Ball.

Interviewer: Your educational degrees and what's your current title?

Marion Ball: Okay. Well, I'm currently... I have two titles. I'm a full professor in the School of Nursing at Johns Hopkins, and I'm also a Vice President for Clinical Informatics Strategies at Health Link, an IBM corporation.

Interviewer: How did you get involved in nursing informatics? Talk about your career.

Marion Ball: Okay, that's a... that's a fun topic and I'd love to. My discipline is actually in medical education. That's what I got my doctorate in at Temple University in the middle 70's, 1975. The way I got into this whole area is I started in the clinical laboratory as a very young woman at the University of Kentucky. Worked on the first IBM 1800 data acquisition and control system, and worked in the lab, and was the liaison from the lab to the nursing department. That's as a nurse... where I...was a programmer. I programmed in, would you believe, in Machine language and Assembly language? I mean, we go back. This is now in the early 60's.

So I was then asked to become more involved with selection of equipment. And every meeting I went to, there were only men in the room except for myself. And, of course, since I was a female, automatically everybody just assumed, 'Well, she has to be from nursing.' So all of the questions for nursing always came to me, and I didn't know any of them. So I immediately got very much involved with the nurses, and saying, 'Look gals, I need to answers these questions. You should be sitting there.' And they go, 'Oh, no, no, no, no, we don't know anything about computing. I don't want anything to do with it. You speak for us.' So we wrote... I wrote the first book, the very first book I did was on how to select a computer for the pathology clinic, a laboratory system. So that got me

into book-writing situations. Then I... and this was all at the University of Kentucky, so this was between 1965 and 1968.

So in '68, my husband got a wonderful position in Philadelphia at Temple University, and we have to leave Lexington to my great sorrow, because I loved being there—my parents were there—and I got a job as an Assistant Director of Computing at Temple University. And one of my first jobs was to help in the selection of a hospital information system, and a clinical lab system for them.

Then realizing that the importance of having nurses present in the decision-making, I started to say, 'Listen, time-out. I'm now an administrator. I've have got to get these nurses to not be that shy and let's see what we can do. So we'll give them a little training, let them get moving into this.' And, remember, this is now 19... between 1968 and 1970.

So I talked to the Dean of Nursing at Temple University, and she informed me that unfortunately they had just been de-accredited. And I said, 'Well, we've got to do something with the computing area.' So I went and talked to the woman who was head of medical records, and said, 'Could we start a course, Introduction of Computing to Health Care?' and started to see if some of the nurses would get involved in that. And my husband, who really is the smartest in the family said, 'You know, Marion, the future is going to lie in seeing how you develop programs for nursing. Nursing is the biggest health care professional.' They're the things that I say now 40 years later, you know, they're the foot soldier of the health care delivery system. We really need to see how we can bring that profession into play.

Shortly after that, I met Katherine Hanna, who was...just finishing her Ph.D. in...at the University of Georgia. And she and I met at...in those days, it wasn't even AMIA. It was the Society for Computer Medicine, and I was the President of the Society of Computer Medicine. And so she and I had lunch together, and she said, 'Look, I'm trying to put a course together, also, for the introduction of health informatics. Can you give me some

materials? There are no books, there's no nothing. There's just an article here, and article there.' So she and I exchanged articles, and we had, you know, Xeroxed, sometimes mimeographed documents that we would give to our students. And she and I decided, 'You know what we need to do? We need to put a book together.' And she said, 'You know, that's a great idea.' I said, 'You know, we're call it *Introduction to Computers and Nursing*. I'll be the computer piece and you be the nursing. And I brought the book along, and you can take a picture of it. It's a green book which you're all very familiar with.

Anyway, so that started our foray into the nursing. And I've always said there'll never be a book with anybody in a professional that professional, because I... when I was doing the lab books, everybody thought I was a med-tech. When I worked with the medical record people, they all thought I was a member of the medical record, which has been really wonderful, because now I'm an honorary member, just like an honorary nurse. I'm also... and HEMA has me as a lifetime member. So I can wear a lot of different hats, which is very... it's been wonderful, because now we're at the point where everything is becoming very interdisciplinary, and having a good concept of what goes on in these different, up to now, siloed professions, and we're realizing that we're becoming a team, and in my opinion, where the nurse needs to be the team leader, because that is the profession that's interfacing with all of these others—interfaces with labs big time, interfaces with medical records big time, physicians.

So... anyway, so just like my friend, Susan Newbold, who was one of my co-editors in my one consequent book, all of the... writing and how I got into this whole area of nursing informatics was really to see the need for nurses to play a major role. So we started with textbooks.

Now, and it was really quite funny, because since the school at Temple was not accredited, I decided... I lived out on the Main Line in Philadelphia, and I met this wonderful, wonderful woman, whose name was Louis Fitzpatrick, who was the Dean at the Villanova School of Nursing. And she was very innovative and was like, you know,

five minutes from where I lived. And so she said, 'Marion, you know, forget about Temple. Come on and do something for us at Villanova.' So I did. We went to Villanova, we had... she said, 'Forget the students. My faculty are the... first, the ones that have to know even a few things about what is informatics all about,' which is a big problem now, too. I mean, the students sometimes know more than the faculty. Anyway, so we got started on that, which worked out very nicely for about a year-and-a-half. And then my husband got a huge offer, and a wonderful opportunity to come to the University of Maryland. So she said to me, 'I can't believe it. You're leaving. We're just getting things started.' She said, 'I'll... there's a woman down there who's head of the Division of Administrative Services, who graduated from Villanova, and her name is Barbara Heller. And when you go to Temple, I'm going to give Barbara Heller the biggest present she ever had, because I'm going to tell her she's now going to be the one with you, which she'll start some formal program in nursing informatics.' There was... nobody had it. It was just like we were doing a little here and a little there.

Anyway, I came here. Barbara at the time was, you know, a division head in nursing administration, and she and I hit it off magnificently. And she's... she always said, 'Marion put down the gauntlet, and we just had to do something in informatics.' So together, we started to put the... a formal program together, and the first... and I said, 'You know, what we need to do is to have a summer institute. Let's see if we can garner some interest in that.' So that was now about 15, 16 years ago, we had the first... I think it's the 16th one this year.

So 16 years ago we thought about it. We had the first one. I brought you a picture of one of the earlier ones. It might be, actually, the second one that we had. And Barbara took up the gauntlet and through the nursing profession, through the Academy of Nursing, through AMA and whatever that the nursing organizations, and through the federal government got the funding, and she, she can truly take credit for establishing the first nursing informatics formal program as an undergraduate degree, then a master's degree, and over time, also, the doctorate degree. I think... she then became dean, and then had

other interests, and really took other roads. But those very early days, she is really one of the people with... in the nursing profession to do that.

In the meantime, Kathy Henna and I, and she in Canada was doing the same thing. And we said, 'Well, we've got North America covered.' You know, we've got the U.S. and we've got Canada. And they had a requirements by the nurses... the nursing union that all of the Canadian nurses had to have some basic education in informatics. So she and I did a lot of teaching. It was like maybe the pre-willies, which, of course, our Susan is still the mother of and did such a fabulous job on. But we did very short courses for the nurses in Canada, and then Kathy and I said, 'You know, we really need to do a second book.' We take the book, the green book, and the... and she said, 'We'll... the next book we'll do is *Introduction to Nursing Informatics*. And there are so many things that have to be done, we'll leave that publisher, and we'll start a relationship with Springer Verlag, and with Springer we started then in the 80's to establish our series. And the first book in the series was *Introduction to Nursing Informatics*.

Then we did some other books... I mean, there are something like 23. But then we said... we had Volume 1 for introduction, but now we have quite a few nurses who really were moving up the ladder and who were really getting quite good, and we then did this... I... and Kathy was the first author of the Intro book and we always took turns. And then I'm the senior editor of the second book, which was called *Nursing Informatics, Where Caring and Technology Meet*. And we did that to coincide with one of the IMIA, first IMIA Nursing... it actually wasn't a sig then, but it was a working group. And we had a wonderful meeting in Ireland, and that book, *Nursing Informatics, Where Caring and Technology Meet* was the title of that meeting. And that the proceedings... instead of proceedings, we gave them the book. And Noah Daley at that time was the one who was running that meeting, and has been... was head of the Nursing Board of Ireland. This was in Ireland at Trinity College. So that's how we started to really establish ASPIC.

Now, in the meantime, I was... became very involved in the International Medical Informatics Association, and we had... which was, of course, was more medical hospital

information system oriented and standards oriented and things of that nature. But we also early on decided, 'Look, we need to have an international initiative in nursing informatics.' And that group has been unbelievable. And then when I became president in 19... when did I become president?—in 1993, we worked very diligently to make the working group the first special... the first of AMIA. And it is so successful, as you know, that now has its meetings every three years independent of Med Info, which is a big international medical informatics association. So that brought the whole field of nursing informatics into the global world.

Now, the, the second book, I should say... that we have the first edition, and we had a second edition, and a third edition, and the people back when I was at Maryland, it was the second or third edition, I think it was the second or third edition—Susan Newbold will have to help me—but she's one of the co-editors of that, and I've also told her as soon as she finishes her doctorate, which she has got to do, we're going to do the next edition, and then she'll be the co-editor. So she's been very instrumental, also, in basic training aspects, and really seeing not only do we do it, how can we get nurses that are in training aspects and really seeing not only do we do it, how can we get nurses that are in training to become nurses, which would be in schools. But she and I both agree and still agree that the important thing is how do we disseminate the knowledge of nursing to women who might, and men who might never have had an opportunity to even have hands on any kind of equipment if they went to a university and got their degrees before the 70's or 80's. So I think the WINI programs have been very, very successful, and we've done a lot of journal articles, and we've published, also, and gotten research done as to what is the perception of nurses having taken an emersion course before and after. So we've really validated that what we are doing is moving the professional into the statute of a real subspecialty within nursing.

That's a long-winded answer for you, but that's how... we got into nursing informatics.

Interviewer: So during this career of yours has there been anything that really is your motivation overall for what you do?

Marion Ball:

Oh, well, I think you can notice I'm a very passionate person, and if I don't have a passion for doing it, I wouldn't do it. I have a very, very strong... strong belief that there are fabulous tools that are available to health care, and those that could capitalize on it and could use them to a degree to really improve the plight of patients. I mean, the best thing we can do is to see if we've got people that are ill how can we bring them back to their health in the most rapid way, give them the best possible technologies, just like heart transplants in, in the area of, of the clinical practice, or being able to do research to improve the cancer patients. But all, through all of this caring aspect of physician, patient and nurse, who is the one who spends 99% of their time taking care of that patient? And it's the nurse. So the passion is how can we give them the best tools? And informatics, certainly with the shortages that there are, that there are so many things that can be done in clinical decision support help, in the whole area of access to the medical and the nursing literature. How can we make that nurse be more confident in him or herself to be decision-makers, to get into administrations and to sit at the table with the board members and say, 'These are the kind of tools that we have.'

And one of the things that I did notice very much and I mentioned early, early on that just because I was a female I was tagged as being a nurse—always loved it, by the way. You now, I always had to fess-up that I wasn't a nurse, but it was always a big shock to everyone. But the bottom line is we needed real nurses who knew what they needed in the operating room, what did they need at the bedside, what did they need... and to bring them, the profession to the point to say, 'You are as good, if not better, than any of these IT people that are making these decisions.' And even in my early days, when I wrote my first book on selecting the computer for the pathology clinic laboratory, we would go... I remember very distinctly going to a lab and looking at the terminals that were being used. And they were all designed by engineers that there was no user portal interface between the terminal that they had to use and the Med Text, and this one woman said, 'I refuse to use this terminal.' And, you know, mine... and I... because I was writing a book at

that... 'Now, you seem so passionate about not using this, and,' she said, 'and we'll help you with your discounts and we'll help you, you know, when we do the A to D conversions in those days, you know, all of the order analyzers. I mean, this is in the 70's. And she said, 'You know, every time that I have to key in something, the keys are so hard to push down that I break my nails.' And I thought, 'You know what? I don't want to use the darn thing either.'

So what do we need... we needed nurses in industry to help make equipment that is efficacious and that is user friendly, and that addresses... that was just a typical thing, but just imagine how do you actually do a Med Text administration, how do you your documentation? All of these things, if we trained nurses, industry would use them because they can make much better money if they sell a system. That is something that nurses will gladly embrace and use. And we still have that problem. We still have too much engineering, shall we say, saying this is the way it needs to be physically. And then in the software development, still don't have enough people who are actually involved in developing the software from a very clinical nursing... and, I mean, for all these physicians, and Med Text, and everyone else. That's... As I keep saying, who's the biggest population? It's the authors.

So that's my passion, and I'm working now with... now that I have my full professorship at Johns Hopkins, we'll very actively two projects. I mean, now we're move... you know, fast forward to today, but it's still, it's the same scenario throughout this entire almost 40-year odyssey of my professional life. And that is to work with the military to see how in the... how can we get the military nurses who are out in the field, use the technology to do the best they can for the solders, who are in distress in Iraq, or in Afghanistan, or whatever war we happen to be fighting, what are the minimum competencies that they would have across the board, and then say, 'What do the regular nurses in the... sector where we are, what are the madam... minimum competencies that we need?' So we're working with Diana Skiba, with all kinds of folks in the... nursing profession, with some of the... Dean Angela McBride, and with the Institute of Medicine

to put together, which I'm passionate about, a TIGER team. And TIGER, which has a nice ring to it, anyway, because it's like we're going to catch this, you know, we're are a...we are going to win this battle. But TIGER stands for Technology Informatics Guiding Educational Reform, with the idea of putting together a summit meeting to develop a roadmap for what the basic minimum competencies should be for every nursing school in the country, every practice... everything continuing nursing program, that these are a set of minimum competencies everybody should know and feel comfortable and be not a nurse informatician. That's something that AMIA, the American Medical Informatics Association can do, and they do it beautifully. We need faculty; we need all of that too.

But to get me back to the masses, what does everybody need to know? So between the military and what our TIGER team is doing, that is where I am at the moment in working with my colleagues and the Diane Skiba's of the world, and the Connie Delaney's, and Joyce Sensmeier, and so on, to get that together. So that's, that's where the passion comes from.

Interviewer: When you look back over your time, what do you see as the key events that moved the profession forward? Are there particular events or particular technology developments that have been involved in moving things along?

Marion Ball: I think... that's a good question. I think we can say that that has been moved along by the vendor community. I think that very early on, the Tekkon TDS system has a great affect on the profession. And, I think, you know, this morning when we have Margaret McClure's presentation, and at New York University Hospital, with Patsy Morris, some of the really early pioneers, who had to take it upon themselves to bring in these systems that were selected primarily by administration, very often not even physicians being involved, and trying to make it work. So some of the seminal changes that have put nursing informatics on the list, and say, 'Gosh, we just have to get more involved in making these decisions,' came from some of these very early systems, like NYU, El Camino Hospital, some of the work that was done at the University of Utah with the Help

system. You always found, even if you look at partner systems, things that we're doing up in Boston, there always were well-known physicians involved. You know, in Missouri, Don Linberg, and if you went to Homer Warner in Salt Lake City, or you look at Octo Barnett... but if you looked one level lower, who were the ones behind these people doing the bulk of the work and making them look good, and making it work in the environment, which meant getting the nurses to do it. It was always a nurse. They were self-trained, they were self-motivated, there weren't many courses, they read the few books that we had out there. I mean... people come up to me now and say, 'You know, 15 years ago this was the only book there was. It really gave me such an idea what it was all about. And I started there, and I took courses in information sciences.

And so more and more and more nursing programs have developed, and the establishment of the University of Maryland's school is another one of those seminal events that took us to then having an offspring at the University of Utah, and now you've got nice things happening all over the country. So, that would be... those are some of the seminal events that, that I can point to.

And then the, the, the professional organizations, the fact that you had special interest groups with AMIA, and that women and men could come together and talk about what they learned and information they could share with each other. The AMIA organization. I think HIMSS, the Health Information Management Systems Society, did a great deal early on as well from the more practical side to take the road that I'm interested in right now, to get the basics down. And then AMIA took the road of seeing how we can develop professors of nursing informatics.

Interviewer: Are you surprised by how the field has developed?

Marion Ball: Well, I tell you what... the opposite. I would have liked these things to go much faster. I think we're still grappling with many of the same issues that we did 40 years ago. So that's a matter... you know, that maybe is a glib statement, but I do think it's been very slow. And very often you can pick up a journal article, and sometimes I read my own

material that's five or six years old, like, you know, the electronic health record, or personal health record, or banking on good health, six or seven years ago I read the thing and I'm thinking nothing has changed.

Now, I do think that just within the last year or two, we have seen a, a sea change. So I think things happened in plateaus. You know, you go along, and then, all of a sudden, there's a jump. I think that the, the, that the U.S. government has given us the... a czar of medical informatics by putting David Braylor in and saying, 'Look, we're going to do something.' That funding has gone to art, that we're looking at systems, that we're much more involved in CMS making statements about we're going to use a diatom stand, that we're going to use HL7. In other words, until we start getting some standards, and we have some rules of the road, we're not going to get anywhere. And that is starting to happen. So I'm very excited about that. And I think it's not only nationally, this is an international phenomenon.

So, yes, indeed... it must be wonderful for somebody to start their profession now because now they can stand on the shoulders of giants and see a lot further and really see where we're going. So I just hope I live long enough to really see that paperless computerized patient record and the individual person health record, and having that come together the way I would like to see it, and have dreamed about for a good 40 years.

Interviewer: What are the challenges?

Marion Ball: Well, the... and we touched on that, really, the biggest challenges... let's say, for example, a unified patient identifier. I mean, that is a major challenge, you... plain simple. But until we can do that we're not going to get very far.

Standards. For example, it took hundreds of years to establish the fact that when you write a letter that the address goes in the middle of the envelope and that the stamp goes in the upper right-hand corner. That is the standard around the world, or most places, and, again, there's nothing 100%. But until we get to the point and say, 'You know this

is how we're going to document, this is how we're going to...' even the nomenclature we're going to use. I think the National Libraries of Medicine have done a wonderful job, for example, getting the SNOMED coding systems available to everyone, looking at unified medical language and saying, look, we've got to be able to say if say a heart attack and myocardial infarct and somebody has another term, that we can put these together and we're all talking about the same thing.

So those are the...it's really... I guess the best thing one could say is the devil is in the detail. And that's where we're now finally doing what Max Planck told us a long time ago when he was interviewed by the press when he changed the whole way physics was to be for the rest of our lives and, and beyond. And the press asked him, 'How did you come to this incredibly discovery? I mean, did it just, you know, come like Venus out of the shell, coming in... born into?' He said, 'In the correct formulation of the question lies the key to the answer, and I came to the point and was able to ask the write question.' And I think we are now at that stage. So my enthusiasm and my energies now for the rest of my career, maybe another 10 or some years is pushing that forward, because I think we have jumped that plateau, plateau and we now are saying we need to answer this question, this question and this one, like unified patient identifiers, like standards, like a unified language, etc., etc. So that would be my answer to that.

Interviewer: So then going back to your early career, when you first started out in this field, was there any moment when you understood the value of technology?

Marion Ball: Well, you see, I was really very lucky. I had an incredible set of parents. And my father was really a visionary, one of the fathers of sports medicine. I was... I married very young. I was 18 when I married. I married, also, a professor, who was substantially older than I was. So I had the guidance of really, really good people—first my father, then my husband, then people like Dr. Morris Cullen, who was the father of the whole Kaiser Permanente plan and did the very early work in standardizing health care for Kaiser Foundation, multi-phasic health testing. So I, I almost fell into... Don Lindberg, people who have just been wonderful mentors to me, and it was like, well, that's the only way

there is to me. I mean, I didn't have to have the a-ha experience. I was...swept into it by people who fortunately I was surrounded with and who gave me the opportunity to see through their glasses.

Interviewer: Any advice?

Marion Ball: First of all, I think we've got to be... we've got this big nursing shortage. We've got to be very, very careful that we don't... that they distract nurses from what their core values are to be able to take care of patients. So that's one of the reasons that I don't want to spend my energies to the degree that we take people away from the nursing profession, so far away that they are not in touch with what's happening at the bedside. So my advisor to somebody that goes into this field is to always try and keep one foot in that world. Just like in myself, I consider myself an academician. I have... and I work with IBM now, since IBM owns Health Link... and I made a special codicil to my contract with them that I will only joint IBM if I can keep my identity with one foot in the academic community, which is with my professorship at Johns Hopkins. Very unusual for companies, you know, not to have your 100% loyalty. But I said to him... to them, 'That's what makes me a more valuable person.' I sit on the Board of Regents at the National Library of Medicine. I sit on the Board for HON, Health on the Net to see how we validate web pages. I'm very, very interested in this whole area of... and the latest book that we did was on consumer informatics. How do we... how does the consumer play in this? How does nursing informatics play with the consumer to be able to advice them into how to use the treasures of the National Libraries of Medicine. How do we bring the interdisciplinary people together, and when we look at a patient now that the patient becomes part of the team that takes care of him- or herself, that you empower the patient, just like I feel that the nurse has to be empowered to go beyond the nursing, become very good at some aspects of financial management, become very good at understanding the various types of equipment, and then use that clinical expertise to apply that to practice setting. Then, of course, we will need... you know, I don't want to degrade, or denigrate the fact that we need professors, because we need those, too. But

I'm interested in the masses. I'm interested in those 2.7 million nurses that are here to take care of the Americans, and later on, probably even myself. Thank God, I'm so healthy. You know, I'm never in the hospital. But who knows? And that's... those are the ones that I want to empower.

So the advice, then, to answer your question specifically is no way your core loyalty lies first. If you're a nurse first, you're a nurse first, and then add to that knowledge, but always bring it back to what your original passion was. That should be my message to the future nurse implementation.

Interviewer: What do you like about working with nurses?

Marion Ball: Oh, I... well, if I have one regret in life is that instead of becoming an undergraduate math major and taking my computer science courses and my differential equation degree, I would have gone into... I should have gone into nursing. But first of all, I think that they have a culture that appeals to me. They've gone into nursing because they care. They want to do good things. I have to... nurses by and large, just have a good heart. And that appeals to me. I mean, they are not in it to become wealthy businessmen. Not that it's a bad thing to make money, but to me, to devote your life to want to help others means something to me, so that I feel privileged that they have adopted me as an honorary nurse because their culture and my culture seems to blend. So that's what I like being... that's why I like to be in the nursing school, and that's why I like to work with nurses.

Interviewer: What do you see as your major accomplishments, your contributions to the field of nursing informatics?

Marion Ball: Well, first of all, I think I have been very lucky being able to mentor a lot of nurses to go into the field that really isn't quite my field, but have really excelled and they're doing a lovely job. And, you know, giving you an example, somebody like Krisha Hudson, who graduated from here and who is one of our wonderful instructors at Hopkins; my dear

sweet Sue, who I call one of my daughters. And I think, you know, not to be self-serving, but I think I have had a little bit of influence in helping and promoting the profession, and bringing some people into devoting themselves to nursing and informatics. So that's been one of the things that, you know, I think I've contributed.

I think that there are, actually, some good textbooks. And I mean, now there are many more, but the very, very first ones, to have an actual concept of developing a discipline where you have books, where you can learn, where you can actually get a degree, which the University of Maryland has to be credited for. They started it. This the mother house of nursing informatics, where I would say those that would call themselves informaticians in America, 90... 80% were trained here that have a degree. There are others, but, I mean, that's something that really... and that I had a little piece to do with that makes me feel that I've made a contribution.

And I hope that my contributions aren't over yet. I hope that now the things with the TIGER team and our initiative to see if we can put the summit together, develop a roadmap, and see how we can work with the military, and with the consumers of health care, and the nurses to get a competency that is like reading and writing and arithmetic, which we know are basic to the development of our society. If I contribute a little bit to that, I feel like my life was worth living.

Interviewer: It must have been very exciting when you were working on that first textbook and developing like a new practice. What was that like?

Marion Ball: Well, you know, it was funny, because we had to... we needed... we even used very early on, and Sue will even remember that, we needed to relate it where you teach. And I have a degree in education, I have a doctor in education, so... and I also realized everybody thinks they can be a teacher. They can't. You learn to be a teacher and you learn methodologies to how to teach and how to get knowledge across. So one of the things that Kathy and I grappled with: How do we even get the concept of what is hardware, software, how do we link that to health professionals who are thinking of this

soft science of... well, actually, the... not the soft science, because that would be social science, but the basic sciences? And so we decided, 'A-ha! What's the basic science in... for nurses, physicians, dentists?' Anatomy and physiology. So we made analogies and we learned how to bring ideas that they could do the linkages and have the synapses they need. So we made our first introduction to what is hardware; we made that the anatomy. And then what is software, and that's the physiology. And so we started to use terminologies early in our very first... in the book, *Computers and Nursing*, to bring that whole concept as to, in those days, one of... I also wrote a couple of children's books, and my first book for children was *What is a Computer?* Because in those days, you know, people had no idea what was hardware, what was software, what was a memory unit, what was a control unit, what's an input device, what's an output... Now we... laugh at somebody if they say they don't know what a mouse is.

You know, we... But when we go back, I'm the first generation that grew up with a complete new discipline... with a complete new set of tools. In my lifetime, from the time... a little bit before I was born, because I was born in 1940. But the first digital computers were developed in my lifetime. So I grew up with something that, you know, we had to teach a whole generation to come, as to what it was. And now, I have grandchildren, I have five wonderful grandchildren, and my littlest... when she was three years old, the little Erika, boy, she gets... she had better hand-eye coordination than my husband, who could never quite figure out how to do the, the clicking and all this in, in his late 70's. He said, 'I don't know how Erika does that.' She couldn't read anything. She was up there finding her Barbie Doll web page and dress... you know, used to be doing cutouts with... you know, when we did paper dolls, and then clip them on the little dolls. She's dropping and dragging and doing... and, you know, this is whole new world. So you have new tools. It's just like it must have been during the horse and buggy days. You know, you had to feed the horse, you had shoemakers that had to... people who fixed the horses shoes, you had to know how to take care of the buggy, and then, all of a sudden, you went into driving automobiles. So for those generations of our parents, can

you imagine, to shift from sitting on the buggy and whipping the horse and knowing what to do to go and learning the... cranking it up and doing... and that's where we are.

So, I mean, that's what's exciting about that. And it's during my lifetime that we went from the horse and buggy to the car. You know, we went from manual handwriting to using technology and the computer, yeah.

Interviewer: Is there anything else you want to say?

Marion Ball: I would say just in closing that we're seeing more and more schools, nursing schools doing now, starting to realize that they have to address this issue. I think we're looking at, at issues. Some of the big issues are that the, the students are ahead of the faculty, and we're not doing enough in being... in doing in-service training for the faculty and for the VP's of nursing, those that are really in the decision-making world. So we need to concentrate on that. I think a lot of, because of the... having had computing already in schools, part of it will take care of itself. But we do have at this stage of our... of the process, you know, we'd say there's a big gap. And I think we need to concentrate and really put some funding into training those that are the teachers, because at the moment, we have a big problem there. So I think if we can get to the deans and we can do what TIGER team is saying, that, 'Listen, deans, this is the kind of roadmap that we're going to have to put in every school in this country.' And not every school, every nursing school in this country is aware of it as yet. And that is the year 2005. So you do need to take time out and say, 'Look, health care education and nursing informatics, we have a problem.' Ask the question. Once you've done that, you can move forward and address the issue with training the faculty, and then every trainer within every hospital in their training programs.

But I think that... it's a field that's growing. I think we... we're not really there. We've just touched the tip of the iceberg, and the nursing profession as a profession is going to become so much more powerful by being able to feel comfortable with the latest technologies, being in the driver's seat of making the decisions that will be used by their

co-professionals and not only doing it on the nursing level, but sitting at the table with the physicians, sitting at the table with the boards of the hospitals, sitting at the table with the deans, and saying, ‘This is what we need for our students.’ And I think that whole team effort, nurses, nurses are becoming more secure knowing that we are no longer a silo of nurses. We are one of the major team players—look at me saying ‘we,’ put on my honorary hat—but we are a member of a big health care delivery system, and the world of interdisciplinary care with the patient being one of those team players, too, is going to transform the culture of health care. And in this new culture, nursing informatics is going to play a major role, and, therefore, nursing will play a much larger role than they’re doing now, given the fact that they have the numbers.

End of Interview