

## 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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**Susan J. Grobe**

**Introduction:** Susan J. Grobe, PhD RN. Professor of Nursing, University of Texas, Austin

Interviewer: Your definition of nursing informatics?

Susan Grobe: Nursing informatics is really the use and the science of looking at information and its use for the profession, both for developing knowledge, for testing knowledge, and for supporting practice.

Interviewer: Your career as a nurse? Transition to Nursing Informatics NI?

Susan Grobe: The transition to informatics happened because I started in radio television film and had the naïve idea that everyone had to make their own videotapes to do some effective teaching. I knew computers were coming along because of what was going on around us at the University, so I decided that it would be important to develop what I called an authoring system so that faculty did not have to learn programming, did not have to learn all the intricacies of how to use the computer, but if I could make a program that would allow them to just put the content in a shell, then they could make CAI (computer-assisted instruction) for their students. So I set about to find some money and to develop what I called an authoring system, which was in 1980 a totally foreign concept to most people.

We began in '81 and from '81 to '84, had some money to develop this authoring system. And it really was entitled NEMAS (Nursing Education Module Authoring System). So, we were successful in developing the shell software for nurses and faculty to put content in on the different five steps of nursing process. However, what happened was, when we put in the corrective factors so faculty could use the software to correct the nursing process steps, we all of a sudden saw how difficult it was for faculty to correct the intervention aspect because people used so many different words to put in the interventions. The students would say “teaching” in one way and would say “education” in another way and “training” in another way and we couldn't automate the corrections in

these care plans. So we finished NEMAS and then I went about to find out if there was a standard way that we could look at interventions to use an automated process to correct these interventions.

Interviewer: Was there an ah-ha moment when you made the transition – nursing information/patient care?

Susan Grobe: That came in the research focus because we needed to find a way to collect in our research project a large number of interventions. So we simulated patient-care situations and went around with our computer to all the nursing meetings we could and had nurses enter interventions from real patient cases. We took real patient cases and reconstructed them for computer collection.

Interviewer: Was there a moment when you realized the value of potential if data vis-à-vis data and patient care?

Susan Grobe: I'm not sure there was a particular moment. I've always had that respect for patient data telling us important information and we were raised that way in terms of our education and then as we started with informatics arena, it just became more clear and more clear because it was so missing from the way people thought about things. People can't seem to separate in their minds individual patient care and patient data that needs to be aggregated to show us what patient care is doing.

Interviewer: In 1984 you wrote "Conquering Computer Cowardice." Talk about that.

Susan Grobe: "Conquering Computer Cowardice" was an article that we wrote because we were very involved- -- we held one of the first conferences on computers in nursing education in Austin in about 1981. Had about 200 people come and they were so involved in terms of knowing what was going to happen with computers, how it was going to impact education. We just took some of the comments from the Continuing Education program, the enlightenments that people got from that conference and fashioned them into an article that we could present. I think it went to the general continuing education.

At the same time, we were starting to get lots of inquiries from our colleagues overseas about what we were doing and we started to have a stream of visitors to the University. So the Nightingale Scholar came from England and then she introduced us to the rest of the world and then we started going back and forth across the pond to work with people on informatics.

Interviewer: What's your sense of your individual accomplishment?

Susan Grobe: I think I started in Computer Assisted Instruction CAI and gradually evolved into the whole area of researching nursing informatics. We started with that NEMAS project and then went to this Nursing Intervention Lexicon and Taxonomy. We carried that research value, I think, throughout all the informatics arena because what we did, we got involved with the two major organizations – NLN and AMA – and those of us in NLN started to define competencies. We got together with our Swedish and European colleagues and defined those informatics competencies, which included research, which many of the other competencies at that time did not. Then, I believe that what we did was we brought research papers into every one of the nursing conferences – London in '82, Calgary in '85, Ireland in '88, Australia in '91; '94 we hosted a conference in San Antonio. That was a wonderful conference that I think we brought one major new thing into the nursing informatics arena. We started having student papers; we started having student posters; and we made students a full part of that process. Subsequently, we were about to donate 35,000 to AMIA to support the best student paper at AMIA every year. I think they had 2,000 at least each year to support the best student paper. That has been a lasting legacy from nursing informatics '94. And the proceedings show the quality of the research in that conference as well.

Interviewer: Pioneers in the field?

Susan Grobe: I think a lot of my international colleagues when I think of that. Ella (?) of The Netherlands; Ula Gareden from Sweden, Maureen Shulz from England, Kathy Hanna from Canada, and Sue Norman from Britain. They were some of the central, first people that really infiltrated the informatics organizations at the international level. Then as it began to develop, more and more of my colleagues here in the U.S. got on the bandwagon. Virginia and Judy Ozbolt were two key people. And Judy has really pushed things in the research arena tremendously. Those are the major people.

Interviewer: How were you received when you started out?

Susan Grobe: Informatics back in the late '70s and early '80s was a mystery to almost everybody. In the late '70s people were very confused by the term informatics. In fact, we were confused in nursing by informatics. We were at that point still calling it computers in nursing. About '81, we established the NLN committee on nursing informatics – the forum on nursing informatics. That got a little bit of press but not very much. I still today – in 2005 – have to explain what's informatics.

Interviewer: Were those early meetings fun? How did this develop?

Susan Grobe: In those early meetings, we had glorious meetings. And it was very interdisciplinary. We were in panels, in papers, with physicians, with informaticians, with computer people, etc. Wherever our content fit, we were very well integrated and they were fun meetings. They were wonderful meetings. For some nurses, it was one of the first times that they truly felt a very good interdisciplinary spirit. And I think that's carried through to today.

Interviewer: Is that a key thing about nursing informatics? Talk about field, textures, etc.

Susan Grobe: Nursing informatics is very broadly interdisciplinary. We could not begin to do our nursing informatics science without our colleagues. I feel so fortunate to have been in an environment where I can easily call on computer scientists, computational linguists, communication experts, the whole gamut of scientific colleagues who really support the use of information in science. We are the ones who apply it to nursing, but just to have

that whole circular group of people talking about how you use information, how you disseminate it, how you find it, how you analyze, how you scope it – it's phenomenal.

Interviewer: What's special about nursing in informatics?

Susan Grobe: Nursing informatics gives us a wonderful opportunity to really look at nursing's data and how these abstract kinds of concepts that people are having difficulty formalizing and putting into systems – how these abstract data need to be captured, need to be analyzed and need to be disseminated back to the nurse. I sat for five years on National Library of Medicine committees talking about these mesh indicators, these mesh terms for indexing the literature. I would bring to the table the nursing terms and I'd say, "these mesh terms aren't doing the job for the clinicians." It took three years of being there and talking and their having the experience that the clinical terms needed for the guidelines panels were not getting the literature that the guidelines panels needed. That reinforced that nursing terms were not just diseases, they were not chemical substances, they were very special terms that have a different level of extraction. No one had been talking much about those kinds of terms before.

Interviewer: Your answer to charge that "informatics has nothing to do with patients? Too impersonal..."

Susan Grobe: Informatics might be impersonal but informatics is the key to making care better. It's phenomenal that nurses can care for individual patients but don't always stretch their minds enough to say that there's aggregate data that can tell us how to do this better. If we can get the data out and if we can analyze it, and then use it – get nurses to think that way. I have an elective right now in Nursing Informatics. I keep staying to students: "data, information, knowledge." Yes, individual patients, but we need aggregate data so we know what your care is doing for the group of patients.

Interviewer: Lexicons. Your project, back story?

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Susan Grobe: We started the Nursing Intervention Lexicon Study in about 1981 and it was a different approach than most people were taking. I knew from my community health experience that nurses did not like to use standardized terms. If they were given a list of nursing diagnoses, they always took it and wanted to fix it and make it very much to their own liking. When I began the Nursing Intervention Lexicon, I said that I wanted to get nurses' natural language. Then I wanted to use the processes to analyze it in natural language. I got a computational linguist on campus and said to him, "let's analyze this nursing intervention and, since their actions, the verbs are most important." He said, "Grobe, you're crazy. Nobody analyzes the verbs." I said let's figure out a way that we can do that. So we began. Our basic philosophy was: let's take the empiric data from nursing, what nurses say, and then build up to categorization. It was a totally different approach than the theorists that were saying, "Here are the terms," and very much deductively, "use those terms, etc." That meant nurses had to learn a whole new vocabulary and they weren't free to use their own terms to describe what they were doing.

When we had our first site visit to get funding, several of the people on the committee were from the nursing diagnosis group and they challenged us. Why were we not using the diagnosis?. I said we're using the problem list because nurses understand that better. If you will show me a community health setting where nurses are using nursing diagnosis and they haven't fixed it for themselves, then I'll be happy to use it. But, my own scientific feeling is, let's get these problems, and not encumber them with any kind of boundary. This was not very well accepted in the nursing community. So we continued on. Our goal was not to find a language, but methods for analyzing nursing language in categories and interventions in these categories that would then serve to identify the broad concepts that nurses dealt with. It's kind of an interesting factor that some of our categories eventually found their ways into other people's categories when originally they had said, "there's no such thing as indirect care." Care of the environment, for example, is one. It wasn't in many to begin with. But it eventually found its way in. So it was a little hard to get publications in the literature because people wanted to standardize language and not push the reasoning underneath it so people could understand the terms.

Interviewer: Can you give another example – your method found its way in?

Susan Grobe: The international way would show this. When I was at the Nursing Informatics meeting in 1991 in Australia, I walked up to one of the European people there and she had taken the very same approach – find all the interventions and then make categories. She had ten categories; I had seven. I asked her where she got the categories. She said, “I looked at these terms and I looked at the nursing actions and we kind of sorted them.”

Well, save for the three extra categories – which were really sub-categories that matched ours directly – we thought we had found a gold mine. She also had looked at the terms, looked at the verbs, and said since these are nursing actions we need the verbs. Her consultants – they weren’t computational linguists but they were classification experts – said, “Perfect. Those flow just perfectly. Thanks for those good examples.”

So, one on one, we had the same categories from two different data sets and similar numbers of interventions. It worked out well. That was Marguerita Enforth (?) and we’ve worked with her subsequently back and forth to perfect these categories and concepts.

Interviewer: How have things played out over time?

Susan Grobe: I think they’ve played out over time in a real interesting way because we did present to ANA data set committee and said, “Are these not your criteria for terms and terminologies in data sets? Ours come from a different scientific perspective, from a language and from a linguistic perspective but we could never get them to understand that we weren’t looking for just terms. We were looking for concepts. I think now, 10 years later, people are beginning to understand that the critical part in informatics, and in nursing informatics, is to get these abstract concepts and find a way to formally model them so they can be represented in systems. They’re not terms, they’re not UMLS terms, they are concepts that are above the term level. That’s still what’s keeping us from getting nursing adequately represented in systems and in the standards work. We’re beginning to get the model; we’re beginning to get ICMP, for example. We’re beginning to get the models



and the terms and the concepts in axes that will begin to allow us to get nursing better represented.

Interviewer: Has there been an overall vision; core principle that's guided your work?

Susan Grobe: The core principle has been, let's get good empirical data from nurses and then let's figure out how we represent it adequately in systems so that we can get that aggregated data back out in a variety of different forms to be used to improve care and create better nursing knowledge. Then we'll have the whole ball all together.

Interviewer: You're teaching students now?

Susan Grobe: Yes.

Interviewer: Current involvement in NI, education—where's the field going?

Susan Grobe: Nursing Informatics education has to go much stronger in the science arena. We have to have better-prepared nursing informaticians that are doing scientific work. We can't just rely on things in systems. We have to get the systems structured so they will give us back the right nursing data to be able to improve the practice and improve the knowledge base. It just has to be strengthened.

Interviewer: What does that mean – grounding in science?

Susan Grobe: Nursing informaticians in the future need to have a much stronger preparation in the basics of investigating nursing data, nursing data's use, and especially in retrieval of data from these systems. They have to get rid of this one-sided view of, "we'll take whatever people give us," as data out of these systems. They have to be much more aggressive in saying, "Here's the data we need. Here's the form we need it in. And, here's what we need to do with it to show people." It has to be the scientists leading and doing it, but feeding it back to the clinicians so the clinicians have the respect for that data as well and can use it in day-to-day practice.

Interviewer: Leadership qualities – what does it take? Personal qualities, etc.?

Susan Grobe: It takes a good scientist and someone who's willing to bring up other people. To really educate others, to give them that little push into the big world, and then be there to support them for a period of time.

Interviewer: Advice to someone thinking about entering the field?

Susan Grobe: For someone entering informatics, I would say they need to really dig a little bit into the literature, see where the research is, see where the science is, see where people are publishing, and then see where there's a good interdisciplinary team and then go for it.

It is not necessarily an easy field to strike out on your own. It is very uneasy to do that.

Interviewer: What's the difficulty; the challenge, if you want to make a difference?

Susan Grobe: The challenge in Nursing Informatics is getting into the swing of the science. To know truly that there's a direction to go. Finding a team that you're going to work with. And over years, maintaining those relationships and publish, publish, publish.

Interviewer: Are you surprised by the evolution of the field? Where do you think it will go?

Susan Grobe: What I'd have to compare to in terms of looking at the direction of the field, I'd fall back in the 1980s, the mid-1980s, when the priority expert panel at NIH, in fact at NINR, made a direction, set out a strategic plan in terms of where the science needs to go. We've only taken baby steps. We're not very far. I trigger that to the fact that there are not really productive doctoral programs preparing the leaders doing the science. I tried to find some strong science papers at this meeting, some nursing. There's application papers but the science papers are in the minority. It needs to get better. It needs to infiltrate all the rest of the nursing organizations as well. We need bigger and better strides in terms of the science to bring us over the hump from thinking about terminology classification, etc. to concept representation, semantic analysis, and formal representation, and a program is

needed to prepare our nurse scientists to do that. Until we have that, we're going to stay clogged up where we are.

Interviewer: Go back in history – events, high points.

Susan Grobe: I think the high point is every three years when the nursing informatics group from the international arena gets together. They move the meeting each three years to different countries, different parts of the world, so that all the parts of the world – Pacific Rim, South America, North America, Europe – so everyone gets a chance to bring informatics to their country. Some of the highlights have been when we've gone to those countries and then had a day seminar for the nurses in that country who have never been exposed to informatics before. Those are some of the highlights in terms of introducing informatics to people. Some of those meetings have had very high science levels. Some of the AMIA meetings had very high science levels. People do want to come to AMIA because there are very good papers, very well refereed. I think those every-three-year meetings have been wonderful. Along with those meetings are the Med Info meetings that every three years as well. Those are in different parts of the world, so it's been a wonderful experience.

Interviewer: Do you consider yourself a maverick? Enjoy pushing the envelope?

Susan Grobe: I don't see myself as a maverick, but I see myself as thinking differently from other people. I think it's because I have a wonderful exposure to a variety of different types of scientists. I'm not in a health science center. I'm in a general research university. That has brought to me the benefits of the natural and social sciences that some of my other colleagues have not been fortunate enough to have. I can walk across campus and say to the computational linguist, "what do you think about this?" I can go to the School of Library and Information Science and say, "what do you think about this in terms of indexing, what do you think about this in terms of categorizing terms?" I can just go all over campus. One of my key people was from the College of Communication. It's really given me a great opportunity to think differently and I think that has infused the

knowledge tremendously. I see now work with some of the concepts developing off of that work.

Interviewer: What do you enjoy most about your career?

Susan Grobe: I think what I enjoyed most about my informatics career is the wonderful colleagues from around the world I've had exposure to and been able to work with. And to learn the different ways and to really see that nursing is nursing is nursing. Now, when I see that wonderful synthesis of all of nursing in ICNP, I think, wow, we've come many, many miles. It's so much better than that 1980 document that was just a very limited view of nursing and nursing intervention. I really see the tremendous improvement and that nurses around the world are talking to one another and emailing one another about major scientific things.

Interviewer: Where do you hope the field will go?

Susan Grobe: I hope the field keeps going in the direction of undergirding science and the multidisciplinary view. We've made great strides in becoming full partners in the informatics arena. We need to continue to work on that with emphasis in the science. We have to stand with our scientific colleagues.

Interviewer: That's your big push – have nurses at the table, being grounded in the science?

Susan Grobe: I think the nurses have to be grounded in the science to be able to sit at the table with the other scientists in informatics to be respected. They can't just be second partners; they have to be full partners.

Interviewer: What's in it for people to get involved in NI?

Susan Grobe: I think probably it's one of the most exciting arenas to have truly interdisciplinary work with other people. After a certain time with a certain level of experience, you begin to see some patterns in nursing care. How much better to capture the data you need from several

people's experience and to show that that makes a difference. It's a very concrete way to improve care with the use of data.

Interviewer: Lessons learned from your career to pass on?

Susan Grobe: Be kind to others. Look for the good reasons for collecting data. Look for the impact you can make in terms of improvement of care and the contribution to the knowledge. And, don't be afraid to start to write early, early, early. You have to be able to share with your colleagues and word-of-mouth doesn't do it.

Interviewer: What are you most proud of?

Susan Grobe: I'm most proud of the wonderful students who have graduated in informatics.

Interviewer: What touches you about working with students?

Susan Grobe: I think with students you really develop a future for the profession. In doing that, they will contribute far more years beyond you so it lets you retire and it lets them suffer through the next problems.

Interviewer: Anything I haven't asked you that you want to share?

Susan Grobe: I think we've covered the most of the things. The thing I was most proud of was Nursing Informatics '94 when we hosted the world. Two thousand nurses from 88 different countries came to San Antonio, had a wonderful time, learned a tremendous amount, ended up with wonderful proceedings, and a student thrust through the whole organization. I think that's been a highlight.

End of Interview