Dr. Margaret Simpson: An Oral History

Infectious Diseases, Early AIDS Epidemic,

Infection Prevention, and Employee Health

at Hennepin County Medical Center

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Infectious Diseases, Early AIDS Epidemic, Infection Prevention, and Employee Health at Hennepin County Medical Center

Interviewed by Mary Ellen Bennett, RN

March 13, 2023

At Hennepin County Medical Center, Minneapolis, Minnesota

Edited and redacted by Mary Ellen Bennett and Michele Hagen

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Direct quotations are based on recollection. The entire text has been edited for length and clarity. Portions of the text are redacted as noted due to privacy, confidentiality, or sensitivity of the content.

MARY ELLEN BENNETT: The following interview was conducted with Dr. Margaret Simpson on behalf of Hennepin Medical History Center for the History Center's Oral History Project. It took place on March 13th, 2023, at Hennepin Healthcare. The interviewer is Mary Ellen Bennett.

We are so happy to have you here today, Dr. Simpson, and we are excited to have you tell the story of your career with Hennepin County Medical Center. Dr. Simpson, can you tell us a little bit about your personal history? Where you grew up, went to college and medical school, and what led you to do Infectious Diseases at Hennepin County Medical Center.

MARGARET SIMPSON: Well, it's good to be with you again Mary Ellen. And just to put a quick plug in here that Mary Ellen and I worked together for about 30 years in the infection control, infection prevention program. So, a lot of these initiatives we'll talk about, we did together, and with her team of course. It's not just the two of us.

So, I actually was born and grew up in California but my father's work, when I was in high school, took us to West Virginia. And so, I looked at West Virginia University, as the tuition was quite reasonable for in-state residents, and that's where I went to college. Then was accepted into medical school. This reveals my age, but I graduated in 1976 from medical school and came up here for residency. The story with that is that the head of our Department of Medicine was originally from here, his name was Dr. Edmund Flink. He was actually personal friends with Doctor Schultz[1] who was the chair of the Department of Medicine at the time I came. And actually, his son was in the residency program here, and we had a lot of people who did their residency from Minnesota come down to West Virginia and do their residency. And one actually said to me, "apply here to Hennepin County Medical Center, not here," which is one of the other teaching hospitals in the cities. And so, I applied here. Didn't know much about the weather. But I applied here, and this is where I matched. I wanted to get west of the Mississippi because having been born in California and my parents and my sister were all west of the Mississippi. So, I got my one mile west of the Mississippi. I stayed here for my residency, completed that, took a short period off after to prepare for boards, and then started an infectious disease fellowship which was sponsored by the University of Minnesota. But I spent my time here. So, then in 1983, I joined the faculty. I was doing the medicine clinic but started doing some infectious diseases and some of that was doing Infection Control Committee.

I became a member of the Infection Control Committee, and this was in an era where there was a lot of hepatitis B among our staff. It was actually a rite of passage when you went through renal, to unfortunately acquire hepatitis B. And a lot of our renal nurses had it. Most recovered quite well, but some became ill with it, and had a lot of time off with it. So, the vaccine had just been released and we needed a process for administering the hepatitis B vaccine. That was the first policy. I actually wrote that policy and how to roll that out. The other part of it being that if we offered it to an employee who did clinical work, we also had to offer it to all staff. And even if their risk factors weren't related to the hospital for hepatitis B, it couldn't be closed, which turned out to be a big benefit actually. But we had to

[1] Dr. Alvin Schultz was the Chief of Medicine at HCMC from 1965-1987. Dr. Schultz set and maintained high standards of teaching excellence at HCMC and by 1987, 300 residents had completed training in internal medicine. Under his leadership the department of medicine achieved national recognition for the quality of its clinical, research, and educational programs.

do a rollout because of availability, cost, staffing. But we started administering it focusing on clinical employees first. The hepatitis B vaccine essentially eradicated the acquisition of hepatitis B in our employees and so was fairly successful. Low acceptance rate at first because it was a little bit different vaccine. And as we are seeing recently with the COVID outbreak, there's some distrust with a newer vaccine and concerns. Over the years though, the major advantage is more and more people have received the vaccine without adverse effects. And then it has been expanded, so anybody who was going to medical school, nursing school, they started promoting the vaccine among the students who became, you know, converts to, "this is part of being in medicine, therefore, I will need to get these vaccines." That's been a plus and now it's also been expanded as one of the vaccines for schools and mandated for schools with certain exceptions, which are fairly narrow.[2]

BENNETT: It's impressive that the hepatitis B virus was essentially eradicated in healthcare workers after the vaccine was implemented. Can you describe the acceptance of the vaccine? You said that some people were a little bit leery of it, but how did we get to have a broad coverage of the vaccine so that we had almost nobody acquiring hepatitis B from then on?

SIMPSON: There's, I think, a couple of factors. One is a lot of peer-to-peer education. I think that was a big part of it. I think with nursing, for nursing role models, people within the infection prevention program talking about their associates who had acquired it. We all, in the residency programs, knew of people who had acquired it, and in fact my future husband acquired it while he was a resident. And that was probably related to a non-renal situation. Back in that era, the other thing that happened is, we did a lot of things with blood on our hands without wearing gloves. This was pre-AIDS, so the promotion of glove use wasn't at nearly the same level that it is now. I think the biggest is having it available, promoting it, and I think peer-to-peer education. Both nurses, physicians and allied health personnel all knew somebody that had been affected by hepatitis B. And, if you became a chronic carrier, it could affect some components of your future career. I think in looking at vaccines and what we've learned is, it really is your friends, your associates, people you work with and respect day-to-day that convince you more than advertisements do alone.

BENNETT: I agree. Can you talk a little bit about your history with HIV? You were the lead for HIV care and the Medical Center and Hennepin County back in the day and I'm sure that you have many stories. Can you kind of describe what it was like and your role?

SIMPSON: Certainly, HIV was a dominant situation. It was evolving as once hepatitis B vaccine was available in this area. We did not have our first patient until about 1983. But, in 1981 Centers for Disease Control and other international organizations delineated this, the occurrence of mostly young men and women who were acquiring unusual infections that we would usually see in people in high dose steroids or other immunosuppressants. The primary one was Pneumocystis pneumonia. The other was an unusual malignancy called Kaposi sarcoma, which historically had occurred in a different risk situation.

They classified this as AIDS or AIDS related complex and this was a clinical definition. We weren't seeing it. It wasn't much of a reality until about 1983 when we had our first patient. And that is where I became actively involved then. But also, the viral etiology, and this is what is technically fascinating, viral etiology

[2] More information on hepatitis B vaccine can be found at https://www.cdc.gov/vaccines/vpd/hepb/index.html

was identified within three years. Whereas you have something like the bubonic plague and it took 400 years for them to delineate the etiology for the disease. So, the technology really has caught up with the times. And we saw this with COVID also.

But by 1985, they had testing for what was HTLV 3, which became retitled as HIV.[3] At that point, I was medical director of the Red Door.[4] We started doing testing in persons who felt they had a personal risk factor for HIV disease. And so, they wanted this testing at places like a sexually transmitted disease clinic because they didn't want men who had personal risk factors, or men and women who had a history of parenteral drug use that were felt to have personal risk factors, going to blood banks to obtain the test. Because that's when the screening of the blood supply started occurring too, because of transmission through transfusions. That's how I started becoming clinically involved. And since I was interested in developing that as patient care became part of the spectrum of this, I became actively involved in that at the hospital.

The Infectious disease section at that time consisted of three of us. I was the one doing that work as well as then working with infection prevention on working with the employees understanding the risk for acquisition as a healthcare worker. Which is very low. And I think what was happening by the time testing came out, a place that was a Center for taking care of HIV infected people was San Francisco General Hospital. They did a very large study of their healthcare workers. People there thought they had it, hearing Dr. Paul Volberding speak.[5] They thought, "I worked with AIDS patients, and I probably have it." And they found 15 out of about 750 employees who had it and they all had personal risk factors. So, it was not something you acquired easily. It was not nearly, if you speak of bloodborne diseases, it was not nearly as infectious as hepatitis B was by risk situations, which was very helpful in delineating to staff. And I think they also may have promoted the hepatitis B vaccine a bit for blood borne pathogens. People started becoming worried about it. So, as we did that, treatment then became available within the next year. We started testing people after they had a high-risk exposure. And so, that was mostly needle sticks. Sometimes vomiting blood and it would get in the eye or mucous membranes. Skin exposures not as much unless as extremely significant. We started doing post-exposure evaluation. At first, we didn't have medications, but in 1987 we started having medications for the therapy of HIV related disease. That expanded then to post exposure prophylaxis. As we move into the 80s and 90s, when there were two studies that occurred. One was in pregnant women, as high as the 25% risk for their baby to be HIV infected if they did not take medications. It was starting to reduce as we treated mothers but then a regimen came out to treat the mother as babies were being delivered. And then treat the babies after their exposure, which most of is in utero but it is also in the birth process. And we reduced that 25% significantly down to about 7 or 8% by treating them.

And then they did one among healthcare workers as a comparative study of healthcare workers who didn't receive any therapy to healthcare workers with significant exposures to known HIV patients and found that we could reduce that to a very low level. The risk of a needle stick situation is about one quarter of a percent. So, 1 in 250, and we could take it down to 1 in 1000 by using a single medication in that era. It was AZT or Zidovudine as we call it. And it is still being used some, not as much as it was then.

[3] More information on HIV disease can be found at https://www.cdc.gov/hiv/default.html
[4] Red Door Clinic provides sexual health care and is funded by Hennepin County, MN
[5] Paul Volberding, MD, Biography can be found at https://medicine.ucsf.edu/people/paul-volberding

During this period of time, a lot of other things occurred over the next decade with this. I was becoming involved in employee health. This is how I became involved in employee health and was medical director as well as chair of infection prevention.[6] But then 1) we were starting to use combination therapy, 2) we were starting to have available a test that we could get back within an hour. So instead of treating every employee with a needle stick presumptively, thinking that the patient might have HIV disease, we could narrow it down to those we knew had a high risk of disease. Once an employee started medications, they were convinced, and I understand the mindset, but they were convinced they were HIV exposed. And so many wanted to continue the therapy when they probably didn't need to. The vast majority of our exposures occurred in known patients with risk. But once every five or seven years we would identify a new patient that was HIV infected, by testing them because of a healthcare worker exposure. But the vast majority were in known situations where we knew the patient had HIV and related diseases.

So, we were able to offer these services to employees to prevent infection. But there was a lot of fear in taking care of HIV patients. What changed things? I think they found out they were just like you and me, people with families, people with loved ones who cared for them. They were just as scared of giving the disease to health care workers. I had some [patients], as we evolved to universal precautions, come and say, “they didn't wear gloves when they drew my blood. I don't want anybody to get this from me.” And so, people then realized it really was narrowed down to a certain type of risk for them. But that it could be taken care of fairly easily. [7]

BENNETT: So, it seems as though with more education, the more we were able to get studies that defined what the risk was for the employees after blood and body fluid exposures, that it helped take some of the fear out it.

SIMPSON: It did. I mean some people felt they had to change professions because of this. I understand there was concern and interestingly sometimes when I met with employees, it was their spouse who is more concerned of their exposure risk. And it wasn't only for HIV at that time. It was quite a bit focused on HIV, but was sometimes with TB exposures the same thing would happen. A great deal of fear and the risk if you take precautions, was quite low.

Of interest, at the same time, to protect employees, we used to just say if we know they have hepatitis C, if we know they have hepatitis B, if we know they have HIV, then we put them into bloodborne transmission precautions and that's where we wear gloves. Then when we were getting exposed to blood, take more precautions. And wisely, this was moved into part of our universal precautions. And so, with every blood draw, and it was quite a culture shift, every blood draw, every IV insertion, you wear gloves at a minimum. If you weren’t sure of the patient is agitated or they're a very hard blood draw, or needle stick, or you're putting in a central line, you wear a mask, you wear a gown, so there isn't spraying of blood to you or others around you. And that was a lot of work also on the other end because people had been trained for years to do things without gloves on. And so, learning how to use new techniques to accommodate that took a lot of work. It took a lot of work clinically. It took a lot of work

[6] Dr. Simpson was chair of the Medical Center’s Infection Prevention Committee
[7] More information on HIV post exposure prophylaxis can be found at https://www.cdc.gov/hiv/risk/pep/index.html

educationally. But it was gradually accepted as part of our universal attempt to protect the employee from risk from infections.[8]

BENNETT: Dr. Simpson, you had many hats in the HIV/AIDS era. Would you talk about the many roles that you had, including your role with public health, Red Door clinic in the state and the county, etcetera?

SIMPSON: Certainly, it was a fascinating era. And medicine in that era, when you talk about three and four decades ago, it was more straightforward. It was a little less complicated. More systems have been developed which is a plus, but they looked at that point, as much to the doctor for providing advice. And so, it's interesting because we had a lot of county areas that were concerned about acquiring HIV. So, both because the clinicians who became involved, which were by and large infectious disease clinicians, were called upon to be the experts in providing advice for policy development and we became involved in correctional facilities. That's when I have visited in correctional facilities both on a state level as well as a county level, became involved in task forces. It was one of the early, you probably remember Mary Ellen where we, especially with universal blood and body fluid precautions, we became involved with all the other county facilities and then actually metro area facilities in standardizing how we implement our guidelines for the employees on universal blood and body fluid precautions. Because we have faculty who go to multiple places, we had residents going to multiple places and we wanted to give the same message to everybody in the same way. That kind of eventually led to standardizing all our precautions within a few years, and that initiative you were more involved in. We wanted to present that same information across multiple facilities and everybody is very collaborative. They wanted to do this. This was before CDC provided quite as much information in their guideline development. A lot of facilities were already working on this. It was an interesting area to be involved administratively as well as clinically.

Then we were expanding our testing at the Red Door Clinic. The Red Door clinic is a sexually transmitted infection clinic, and we were seeing primarily people with things like syphilis and gonorrhea that we could treat. But we were doing HIV testing. And initially we were also doing it where they could, the one time in medicine I've seen it, where we would take names that probably, and identifying information, was not that individual's real name. Knowing that, we gave them the option of being anonymous. That option, we didn't make available forever. It was kind of the first ten years. As we've recently seen again in different situations, but still occurring, is discrimination based on gender identification issues and a lot of political lack of responsiveness and advocacy. To me it's sad 30 and 40 years later, that we're seeing some of the same things we saw back then too. And so, some people were very fearful of seeking healthcare, having this documented, having their insurance receive records on this. And so many laws protecting the information evolved. That was part of some of the public health. I did a lot of talks on sexually transmitted infections as well as AIDS prevention, as well as the diseases themselves, during that era. There were MMA[9] task forces on HIV as well as including the hospital and public health part. And at that time, some of the work within the healthcare systems was that for physicians, we have to do continuing medical education credits. Periodically these, I don't know if nursing had them or not, but periodically we had to have, at least I think it was one hour of credit a year related to blood and body

[8] More information on isolation precautions in health care facilities can be found at https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html

[9] MN Medical Association

fluid precautions. So, we would be providing that education as well. I think now that has turned more to narcotic use and addiction. But that was the first evolution of you have to have at least one credit in this area. And so, if you went to a national meeting, they would always have a course on some of these issues.

So, we did a lot of great intervention at the Red Door. It was called a counseling and testing site where we, at that point, promoted safer sex. As a part of AIDS prevention, was promoting what was termed safer sex at that time, in the prevention of transmission. Now interestingly, we move from post-exposure prophylaxis to what's called pre-exposure prophylaxis, where we're actually treating people such as discordant couples, people who feel like maybe at risk, that we are treating them with medications to decrease their risk of acquiring HIV disease. So that's how things have evolved. Also, we've evolved into multidrug therapy for post exposure prophylaxis. I was looking recently at information and we are very fortunate that fewer than 100 healthcare workers have probably acquired HIV disease through their profession. Unfortunate for those 100, but a lot of different methodologies have been able to decrease this significantly, which provides reassurance to people entering the healthcare system now.

BENNETT: And that 100 was nationally?

SIMPSON: Correct, that was in the CDC data. Though there was a period of time that it was very difficult to be both the clinician and the leading expert within a facility. Again, this is before we had as many other infectious disease faculty. But this is in about 1990, when there were five to six patients of a dentist who acquired the disease from him. And they have looked at the genotype and very closely studied these situations. And that's the only real situation in which that happened. But at that time, it became very politically popular to want to test all of the health care workers over one situation. What we found in dentistry or in other components of medical care, mostly surgical and dental, is that an operative hand or finger can be locating the location where sharp instrument is without direct visualization. It was called a “blind procedure.” That was one of the things then, the next step after universal precautions, was to be able to minimize that. We worked closely with dentistry who said that with the proper methodology, should be able to see how this is. But you know they did do mandibular blocks; sometimes with their finger and needle and proximal space. And it could happen in very deep spaces surgically. Again, it was a change that if you talked it through with the proceduralist, they could work through how to do this more safely. Also, part of this too, that’s only one example, but developing safer equipment. This is one area I think you're more expert at. You know, needle recapping used to be common with blood draws and IV insertions. We put the needle back in the cap and that's essentially prohibited now unless your hand is not the one to secure the cap. So, there is a lot of technical advancements because of this situation of HIV.

Part of it became hepatitis C also, which was one of the next diseases we have monitored. During my career I was very happy when I left and retired that we had no HIV conversions at this hospital while somebody was under our care and monitoring. We know there are some healthcare workers who acquired probably hep C before we are able to test for it. But we had no conversions as we were monitoring. We still do not treat hepatitis C exposures. That may be in the future now that we have medications. Phenomenal situation is hepatitis C, if you became a chronic carrier, which was 40 to 50% of those infected became chronic carriers - we used to have no medications. We can cure it now with 6 to 12 weeks of therapy. HIV now can be very managed with treating but we can't cure it very often.

BENNETT: There were so many years that you were the go-to person around here for HIV and hepatitis B and hepatitis C. All these exposures and all the twists and events that happened around those viruses. And so, thank you. You were a valuable resource to everybody.

We want to move on to healthcare acquired infections? Or, is there anything else you want to talk about.

SIMPSON: Actually, maybe we should talk about TB.

BENNETT: Yes, let's talk about TB.

SIMPSON: TB has been a disease here long before I started my career. But we started seeing TB had been decreasing in its frequency. And I wasn't as involved in the treatment of tuberculosis, but we had evolved and there were two things that happened. One, we had an immigrant population coming in and some do have TB because they come from places that are very at risk for tuberculosis and some of them had tuberculosis that was receiving incomplete treatment because of poor public health. Not in our state as much, our public health department has always been very strong. But in very large cities, they could not follow through very well. The other thing in that era, it took up to six weeks for *Mycobacterium tuberculosis* to grow in the lab. And I think you remember that era very well. Now we have a probe that you can look and do it on the specimen itself and delineate if it's *Mycobacterium tuberculosis* or not, within days. And sometimes it grows within days. So phenomenal technology again has made things easier. But we were seeing incomplete treatment and we found that in fact people with HIV disease that was coexisting with tuberculosis started relapsing and developing multidrug resistant tuberculosis. And that happened in the healthcare setting and correctional facilities, that there were actually employees then acquiring tuberculosis and actually with a few deaths.

The CDC stepped in, and we looked at our isolation precautions. How did they acquire it? First is, you have to put them in the proper isolation. Well, in that era it was plain surgical masks that became very prevalent with COVID, but it was the same surgical mask. And it was looked at in a couple of ways. One was, what is the size, this is the first time a little more science was involved, what is the size of a tubercular organism compared to what we have other industry respirator utilization. And it's called dust mist filter testing. And the surgical mask does not filter out the extent that a respirator does. So that's when the introduction of N95s occurred for use with tuberculosis. That is when airborne precautions, so ventilation of the room, and Mary Ellen's more of an expert than I am on that part, but that's when they start introducing the respirator. Interestingly, we had a patient who reoccurred his tuberculosis about 20 years after treatment was completed. Actually, he came here for complicated hernia surgery and was on at least three or four stations within the hospital, and had this cough the whole time. Finally a resident, while he was on rehab, got a TB smear and it was positive. So, over 200 employees exposed. How many of those employees acquired their positive skin test for tuberculosis? None. So that was a regular surgical mask. If you use it appropriately in most situations except very highly infectious and laryngeal TB was particularly infectious. But CDC and OSHA said we need to do a better job than just a surgical mask so we move to the respirator plus annual fit testing, which was a lot of work with employee health. And that was probably to decrease the risk, by about .3% over what a surgical mask did. And looking at it though, we applied science. The biggest part of it we applied screening. Are you at risk for tuberculosis? And with AIDS patients, it got to a point where if they had a lung infiltrate, I didn't care what it looked like, if you have lung infiltrate and a cough, I started putting them in precautions. If I had another diagnosis and they're responding to treatment for that diagnosis, I felt much more

comfortable removing. But even I made mistakes and had a couple of patients with tuberculosis and there were hospital exposures. Fortunately, there were very small, very short periods of time. But you could not in an AIDS patient, the presentation was so broad, less classic, that we had to just say they're at risk. We put them in until we make a diagnosis and that they start responding to that diagnosis and their TB smears are negative. And so, it created a new standard and was one of the things that evolved and also, we can make that diagnosis more rapidly. We had a team here, since we are connected to the County TB program, we had a team here in our micro department who kept up with the technology. And then also the development of serological blood test for TB. We could now do all of these things that we could not do back in the early 1990s. So, it was an interesting evolution also for a very long-term disease.[10]

BENNNETT: And we followed up on every single tuberculosis patient and with everybody they had contact with and there were very few conversions, if any. We were talking about this before, how I would go overboard with my exposure workups. Those deaths from tuberculosis and healthcare workers I think were out on the East Coast?

SIMPSON: Correct, New York City area.

BENNETT: And were they in prisons?

SIMPSON: Yes, it was both correctional facilities as well as hospitals. And unfortunately, their public health system and also, we did strengthen it. We didn't have to do as much work, but we did strengthen the guidelines for which providers taking care of tuberculosis had to do very assiduous follow up, and actually counties or states took over a lot of the treatment and follow up of TB in those patients because the burden was very heavy on a provider to make sure they receive complete treatment. I was just reading at New England Journal that they're postulating we can do shorter treatment than we do. That has been decreased back from when I was a resident to two years, down to six to nine months. It depends the situations, how infectious they are. We do much more follow up of their smears and clinical situations as part of it. But quite a fascinating history, tuberculosis is still here.

BENNETT: It is. And we're very fortunate in Minnesota to have such a strong County Health Department and State Health Department who follow up on every case.

SIMPSON: Yes, yes.

BENNETT: We worked a lot on healthcare, acquired infections.

SIMPSON: We did.

BENNETT: Would you like to talk a little bit about that and your role in the collection of the data and the action that we took after we collected the data?

SIMPSON: Well, there are two parts of it, I think. One is, and this is a story on my perspective - how your perspective can influence some of your thought process. And I had to be taught something by the infection prevention program. One of the first initiatives was hand hygiene and we heard a lot with the COVID. But there were periods of times as we evolved into the 2000s and I would go on rounds and

[10] More information regarding TB isolation, treatment, and exposure management can be found at https://www.cdc.gov/tb/publications/guidelines/default.htm

everybody would do hand hygiene. I do my hand hygiene and they would all do theirs. And then it became a major initiative, including, it was one of the evaluation points for Joint Commission coming through. How well did we do hand hygiene? And I would say “oh we’re doing fine because I go on rounds, everybody does hand hygiene.” And a lot of personnel would tell me, “No.” So we started doing audits. And so, I went out and did an audit, and I was proved wrong. Not everybody is doing hand hygiene. And this was interesting because they weren't even doing it. They were doing it when they were rounding with me but when I was observing, there were people who were not washing their hands between patients. Some of it also changed because initially there were two components; 1) you had to wash your hands, and that took longer, and use appropriate soaps. And 2) was availability of the sinks. But there were some areas where you had to walk a little distance and it was suggested we could just use the patients sink. I did not find that very appealing when we're using their bathroom too. What if they had diarrhea and they aren’t always the best with their hand hygiene and cleaning up after themselves. So, there were a couple of reasons that I didn't want to use their sink and so that was a barrier and that's a barrier physicians identified. And they did do, I don't know if they did surveys and infection prevention meetings [professional conferences] for people like you, but they did surveys of physician meetings [professional conferences] and hand hygiene was not 100% I hate to say, after using restrooms. I think that it got better over time.

So, we had to do a lot of education and I was a part of the hand hygiene audits and it was worthwhile for me. But I do have to say it was a teaching experience, as always related to you may have a different perspective than somebody else. And so I had to learn that unless I rounded with everybody throughout the hospital all day long, they weren't all doing hand hygiene. But there were reasons, because we would have to stand at the sink and go through the soap and water. Twinkle, twinkle little star for the length of time and to get every nook and cranny. We had to look at products within hand hygiene. A lot of work was done by Mary Ellen and others in the infection prevention program to find products that employees were satisfied with. And so, I like the foam. I do not like the gels as much. So, the foam was made widely, and not just because of my opinion but because of other health care workers, we made the foam widely accessible and this was before the public awareness and the use of it as much in the public.

Then, as part of that initiative, hospital acquired infections and data is released on this, on you know, thousands of people dying of hospital acquired infections. What has evolved over 30 and 40 years within medicine is that people survive now that when I was an intern or resident, with the technology available, wouldn't have survived then and they survived now. Some of them very debilitated and placing themselves at risk. We’re seeing more diabetes, more open skin wounds, and risks for infections. So, we started seeing more 1) resistant organisms and 2) device related infections and we started being asked by CDC and other national entities to report these. And this took a tremendous amount of work by the infection prevention program. At first it was more related to the bacterial organisms and what you isolated and clinical judgment and calling it a certain type of infection. What became particularly, I think, burdensome but necessary, to standardize it. Because if you looked at one hospital and they never had any surgical site infections, whereas if you looked at a program with a different threshold or an outside program looking at them, they would have higher rates of infection. They [CDC] standardized and had definitions for these infections. And it was very, what I would term microscopic. It was very detailed. It was not a clinician deciding whether or not they [the patient] had an infection. Also, one reason I went into infectious diseases, I liked micro, I call it bugs and drugs. But we were using a lot of

antibiotics. If we didn't know we're a fever was coming from, we would utilize antibiotics. And as a component of this then was the development of the antibiotic stewardship campaign. When I started infectious disease that could remember all the doses for things I needed in my head. And now we have booklets to give us dosing, renal failure dosing, liver failure dosing. And actually, antibiograms or the mechanism of taking our labs information and delineating sensitivity of the organisms to these antibiotics that we utilize. And the benefit of that is, you can focus it on the drugs you have decided should be on your formulary.

But essentially these became so detailed that we had one infection preventionist doing all the work. And she knew that, could be a woman or man, but ours was very capable woman who knew these definitions. And some of them were hard because the organisms such as *Staph* coag-negative can be an infection or can be one of our most common contaminants in blood cultures and deep infections. And so, we found those controversial sometimes because even the CDC could not delineate all of them. And they would say, well if it's not these three organisms, then we have to call it real. And sometimes it's not. There's a clinical component here that you have to still look at, in order to not overcall some of these infections. We did find gaps. You know, so some of it, we did what was called a root cause analysis. Why did it occur? We found gaps in insertion, use, and we found gaps in nursing care components of it. And particularly with central lines. Same with urinary catheters. So, we found mechanisms to minimize their use as well as optimize their care. So that was some next step and some of it was documentation. Once you explain to providers if you document this, if there was a little purulence at it stitch site, sometimes we had to call it an infection, whereas clinically if you remove the stitch it resolved. It wasn't really a surgical site infection.

Our resistant organism was methicillin resistant *Staph aureus* [MRSA] and we did have an outbreak on our Burn Unit in which the burn patients and the employees were getting pustules, is what we were seeing. We were seeing it more commonly in the community also. And people come in with, they'd call it a bug bite. And it's a very pustular lesion, surrounding erythema and we'd go, "that's not a bug bite." It was frequently MRSA. So, we were seeing it in the Community also. So, we had to learn to put these people in precautions right away so that we wouldn't be spreading it and they wouldn't be spreading it from person to person. So, a lot of evolution of what we did within the infection prevention program. Some of it was lower tech such as hand hygiene, wearing your mask. And some of it was higher technology also.[11]

BENNETT: Yes, there were many, many interventions that we worked on to try to prevent infections. Counting the infections really helped us to see where we were, and we could see if we were reducing them.

So, during the years where we were working very hard on preventing hospital acquired infections, or healthcare acquired infections I should say, we were involved in many task forces. Can you talk about that a little bit, about your involvement with the State?

SIMPSON: We were involved in the State quality program called Safest in America and trying to evaluate hospital acquired infections and more by device than by resistance patterns. But many of our hospital acquired infections can be resistant organisms, as we mentioned. We were very fortunate here.

[11] More information on health care acquired infections, monitoring, and reporting can be found at https://www.cdc.gov/hai/index.html

We have had resistant gram-negative rod infections, but not nearly to the extent that some other facilities had and then vancomycin resistant enterococcus. So, we had seen those, but not nearly as many. We do take the precautions and as part of this, we were both involved in a statewide initiative for the prevention. Our first focus was central line associated bloodstream infections. So, we gathered groups of infection preventionists and some providers from each of these institutions to hear what others were doing for the prevention of infections and minimizing them as well as what we were doing. And it was very helpful. And I give the VA hospital credit that they developed national standards in the prevention of these infections. And some of it related to how many days has this device been in place. Something as simple as this, was part of their daily discussion of lines and then also, where was the line located. There are certain sites, particularly the groin area, we can think higher risk of bacterial infections, higher counts of bacteria in that region. And so, there is what we called the checklist for the devices and then an evaluation as a part of that. Do they still need this? Certainly, when we can address, we have a lot of patients with renal failure. Their urination, some still urinate a lot when they have renal failure, but some the amount of urination is very low and could be taken care of by inserting a catheter every day if you needed to. Just a straight cath and removal; or every few days. So, we addressed, do we need the device? And that was very educational as educational talking because this was at the same time that the criteria for reporting were being expanded and more defined, and the opinion as well as the information and what other institutions were doing with these. As well as getting the providers involved. I think it was a lot of work, but still very worthwhile to work and provide the literature to teams in different areas. One thing we found is that things happened in different areas for different reasons and in the ICU we might have to have a bit of a different focus than we would on the floor.

People thinking PIC[12] lines, or peripheral catheters that were longer, were they central lines? Well, they are considered central lines and so we need to monitor those and take care of them in the same way. Dialysis encountered the same thing for central catheters. Instead of placing other types of access and nationally the standards change for how long you would keep a central line in place for dialysis, versus placing a different type of access that didn't have the cutaneous exposure to the same extent.

So again, we would look at national literature, we were going to national meetings, learning things and at the same time, as you talk to providers, they were doing the same at their national specialty meetings. The intensivists, the surgeons, the people using urinary catheters and again some technology changes, so we wouldn't have to use them in the same way for as long.

BENNETT: I think there was a lot of information learned over those and probably we are still learning. But many infections were prevented and lives were saved, I'm sure.

SIMPSON: Yes, I think we're really fortunate. I think by some of our earlier implementation and adherence to some of the guidelines such as universal precautions even, and hand hygiene, that we didn't have very many of the outbreaks seen at other institutions where it perpetuated afterwards, such as VRE, which is one that keeps popping up for some people. We didn't have as many exposures to TB as facility like ours could have. I think the infection prevention program working with the ED on minimizing risk and learning when to wear masks much more frequently to minimize exposure. And perhaps some of that, and again this is all pre COVID, in which the standards probably evolved even more. I retired and

[12] PIC line is a peripherally inserted central catheter

it was truly coincidental about three months before COVID became what it was, and that they determined it was a pandemic. Do you want to go to flu?

BENNETT: Yes. So much effort was spent convincing healthcare workers to take influenza vaccine each year. That's another big thing that we worked on together. And we were very successful. We actually had over 90% of the employees accepting the vaccine. So, do you have thoughts on how that program was so successful and why? And did it make a difference?

SIMPSON: I think it did. Influenza vaccine is complicated. People work very hard at it. But its efficacy is only 60%. And so that's where it's very difficult to promote. And we had naysayers, I called them, who were convinced. I think there were certain groups of physicians who would actually proudly go around saying "I've never had a flu vaccine, I've never gotten the flu." And so again, I think a lot of it related to education and being role models, as well as having leadership both in the physician level and nursing level, promoting the flu vaccine.

Also, in the early 2000s, we had the year where we had H1N1, which was not part of our flu vaccine. And in some parts of the world was a mortal disease in health care workers. I think it was Brazil in particular, where a lot of health care workers demised from H1N1. And I was quite anxious about this in health care workers. So here we have the regular flu vaccine and again, to me, it was phenomenal that within three months we had new flu vaccine that was H1N1. And there were pockets within nursing that again would say "I don't need to get the flu vaccine, I'm young, I'm healthy." And the extent of the disease wasn't quite as severe. People can get very sick with flu and we would see periodically children die of influenza. We brought forth from this, vaccine advocates. Some of them, Dr. Lupo in OBGYN, Dr. Maroushek and Dr. Martin in Peds, as well as other providers who were vaccine advocates, who would go around to their departments. And then we start measuring by department. Each department. And then we would go to those departments with lower rates. Mary Ellen did a lot of that work with employee health. And then we also said you can make a personal decision not to receive it, but you have to decline it. So, you have to sign something saying why you don't want it. And as role models, as providers, we need to be advocates or not speak to the situation. And so, people stopped saying things and wearing it like a badge that they did not get a flu vaccine. And then, I think having leadership promote these numbers to these different departments and go around and talk to these different departments. Then we had a lot of this with Mary Ellen's help as being a director over employee health, was converting this to online communication. And to the employees as well as department division heads saying, "here's your numbers, here's where we want to be." And then Joint Commission put out the statement we want to receive 90%. And the declination became more specific as to who could decline. We also delivered flu vaccine in different ways. There was the inhalational for those who didn't like shots, there was a non-pork derived for some who had religious beliefs, there were a lot of other things that went on. And I think it was all of it. I mean, do you think one particular tool was successful? I think going online with a lot of information and a lot of people received it from a private provider in which they could provide the information to us. Or went to a flu vaccine clinic with their kids or something like that.

BENNETT: It seemed as over the years that really it became more accepted after we were doing all these promotional events.

SIMPSON: I remember speaking at one of the unions and a woman said, "I'll never take it." And then I heard about two years later, "it's the only tool I had for prevention." We did have the oral medication [for exposure prophylaxis], but we found though, in using the oral medication, you could end

up treating some people all of flu season. And maybe we'll get there some day where employees don't get exposed. But 1) it is not perfect, and 2) people got tired of taking the medication. But an employee said "I'll never take it." I heard later that one of her children acquired it and got quite ill. And so, I think it's our family unit sometimes persuading the adults to change their behavior related to what happens to them. As well as again, it became promoted in the school system. So again, that's a hand in hand with what's going on in the community as well as here.[13]

BENNETT: So along with influenza vaccine and trying to prevent outbreaks and acquired infections in the staff and the patients, we had infectious disease emergencies, other ones over the years. We had measles and H1N1, pertussis, MRSA, scabies, Ebola.

SIMPSON: Lice

BENNETT: Yes, bed bugs.

SIMPSON: Bed bugs, yes, that was your expertise.

BENNETT: So maybe you could talk about and just emergency preparedness a little bit in your role because you took a major role in in these things.

SIMPSON: Certainly. Dr. John Hick, I think has to be the expert in emergency preparedness at our hospital. But when it was infections, I was a component of it. And over these periods of time sometimes we had lots of hospitals independently doing what they were doing. And so, the messages could be a little different. I think one of the things that came out of this is to save time and effort, lets collaborate. Let's understand what each of us are doing. Sometimes let's focus on, certain patients go here or there. That was mostly Ebola. But there was a lot more collaboration among the institutions than it used to be. And so, I think that the infection prevention organization did a lot of that work. I think a lot of it is having a good plan. And following an incident command process. And I think an expertise for our program and particularly Mary Ellen, was the development of plans and step by step process. And we would talk to somebody, and sometimes it could be in an area. So, if someplace was having an outbreak like sometimes it was norovirus. Very easily spread. But it would take down a lot of people in a unit. Literally a health care worker would come to work feeling, "oh my stomach's a little upset." Then three hours later, having to go home because they were so sick. And, so sometimes you just develop it because you know you change staffing, you need to kind of find a source, at least clinically. Now we can test for it. In the old days, we couldn't test for it. And so, it's having a plan and instituting and taking information, both what's happening on that unit or throughout the hospital. H1N1 is interesting in that we started suggesting if H1N1 were to occur here, then we might have to talk about elective surgeries being cancelled. Some of the things that we saw did happen with COVID. And there are pluses and minuses, but the governor declaring "we aren't going to do elective surgeries" is almost easier for a facility to accept than we deciding when. And that we would have 10 different hospitals deciding 10 different types and facility. So again, sometimes the leadership comes from outside, but sometimes you have to identify your own thresholds and when your hospital is full. I would be on call for receiving patients from other facilities, you have to decide when and has to be collaborative, because it's usually going to be multiple departments deciding what types of patients they would take and finding ways to

[13] More information on influenza vaccine can be found at https://www.cdc.gov/flu/professionals/vaccination/index.htm

do as much outpatient as you could, versus inpatient. And that was done, actually done during the nursing strike quite a few years ago, that Oncology was driven to find how they can do some of their protocols as outpatient. A lot more of oncology medications and things are done as an outpatient than before. It was not only that, it's the evolution of payment and other things.

I think the one I found most, was most concerned about. was Ebola. We didn't have any cases here and it was a collaboration because we didn't think the volume would be very high. But it was one where CDC kept changing its isolation precautions and increasing the amount of precautions we needed to utilize for a patient. And that there are so many people, and it was such a severe disease, and mortal, and had some long-term effects, that that is the one I was concerned about for our health care workers. And we did a lot of preliminary work. But then it was decided that units in different states and different parts of the country were going to be centralized to receive the Ebola patient because we did not think it was going to be a major outbreak in this country. And fortunately, it wasn't. But I found that when we were going to have to be monitoring people and their performance of how they took off their personal protective equipment, to be particularly concerning for our health care workers.[14]

BENNETT: Yes, it was an interesting experience and I think with all these diseases that we worked on, that Incident Command was a key in dealing with them. And we do that well here at this hospital. We can make it big or small and it was very adaptable and helped us with our planning and implementation.

SIMPSON: It was good for getting a large group of people together in multidiscipline. Sometimes we had to communicate when we were concerned about measles. There are aspects that were being placed at a Children's Hospital which are absolutely appropriate, but for our hospital which is inpatient and heavily adult oriented that we could focus it on the Pediatrics department and some peripheral nearby departments or consulting departments, but didn't have to do the same throughout the hospital. And we might not always agree, but we could sit and talk about it and come to an agreement usually.

BENNETT: Wrapping up here, I just want to ask you what was your favorite thing about working at Hennepin County Medical Center?

SIMPSON: I came here for the teaching and the spectrum of patient population. And that, as I say, the world came to me. I didn't have to go out in the world for my travel medicine. We see a lot of different kinds of patients, a lot of different dilemmas. It was fascinating. I like collegiality, and by and large, collaboration. At times there were challenges. But I still could go eat with the same people who challenged me and have lunch with them. They weren't you know, they might be angry, sometimes you just had to be careful with your message. There are things now that I wish I had done differently then. But the focus on teaching, the residency programs were thoroughly enjoyable. The faculty, by and large for here to teach and work with residency programs. And I hope it's something we can maintain for the future. Working with a micro lab that wanted to technologically advance as things became available. Us having to learn about techniques such as within the surgery department and what they did and the collaboration. I remember after one root cause analysis the physician, that provider said, "well it might not have exactly gone how I wanted it but I'm glad I got to say something." We agreed. You have a right to say something, you have a right to listen, you have a right to provide your perspective, and we may

[14] More information on emergency preparedness in healthcare can be found at https://emergency.cdc.gov/planning/index.asp

have to walk away disagreeing. But we can still talk to each other and walk down the hall and take care of patients together.

BENNETT: Do you have anything else that you would like to share with us regarding your work at HCMC? Anything that you forgot to mention, or you think is important?

SIMPSON: I think medicine is changing and it has to change. But it's increasingly complicated. We need to work with teams instead of individuals doing everything themselves. I hope the philosophy of that we are a teaching hospital, that we want to be leaders in fostering the best care we can give and keep our standards high as we look at all the challenges that are coming. We had people concerned with some of the risks of taking care of AIDS patients, or hepatitis C patients, or TB patients, for themselves. And then now we hear the term is “burnout” that we need to provide the clinicians ability and the numbers of people needed to properly take care of our patients. We also need to respond in a public health way to prevent infections. Wear our masks when we need to or receive our vaccines as we need to. To assist ourselves first. But also, to assist the health care systems and be collaborative, work together. If you're angry about wearing a mask, the health care is the highest risk situation. I was so gratified when I was taking care of AIDS patients and they would tell me that the lab was not wearing gloves. They should be wearing gloves to protect themselves. Think of that when you're in the healthcare setting with a mask. I know it is not easy or fun. It’s hard wearing a respirator for 5 hours straight. I understand that, but if you are wearing a mask, it’s a start. Be cautious with your secretions and know what's going on with yourself. We want to help; we want to provide the right care for you. So, talk, ask your questions, present your concerns so that we can answer them. But I think maintain a role as a teaching hospital, and a leader in technology, and taking care of patients. As in the personal as well as the technological arena.

BENNETT: Your career has spanned, in my opinion, some of the most interesting years in infectious disease and infection prevention. Of course, I may be biased in this topic, but this was a time of new and significant disease. This presenting monumental response by healthcare, increased regulation and improvement in patient care and regards to healthcare associated infections. You've had a wonderful career here and have made tremendous contributions to clinical patient care, employee occupational health, and infection prevention practices at Hennepin County Medical Center. I am proud and honored to have worked here with you for so many years in this amazing institution. So, on behalf of Hennepin County Medical Center and the Hennepin Medical History Center, I want to thank you for the years spent at Hennepin and all the many contributions you have made to the institution and the patients you have served.

SIMPSON: Thank you very much. I think you led a wonderful program, and I perhaps could not have survived this without you. But we collaborated. And that's one of the things; the physician cannot be a silo anymore. We need to collaborate and work with each other. One of the things I hope I did, and I look forward to seeing what happens, at least for a few of the next few years, with the next generation of infectious diseases and what it brings. And certainly, it brought COVID right after you and I were not as directly involved.

BENNETT: Yes. They had a very big challenge, and they did an amazing job.

SIMPSON: And look at that technology-wise. Having a diagnostic testing rapidly available, having therapy rapidly available, I mean all in less than a year having a vaccine available. I think it's phenomenal

what we can do now and a lot of it was collaboration with industry. But it really helped the healthcare system. There's still certainly issues that need to be solved but amazing that this could happen within a year.

Thank you. Appreciate your time.

BENNETT: Thank you. I appreciate your time and all of the years that you contributed to Hennepin County Medical Center and the infection prevention program.

Chronology

1976 West Virginia University, Medical School, Morgantown, West Virginia, MD

1972 West Virginia University Morgantown, West Virginia, BA

Research Fellowships:

1980-1981 Fellow in Medicine, Infectious Diseases, University of Minnesota Affiliated Hospitals, Minneapolis Minnesota

Internship and Residencies:

1976-1979 Resident in Medicine, Hennepin County Medical Center, Minnesota

ACADEMIC APPOINTMENTS

1987-1993 Clinical Research Associate, University of Minnesota, AIDS Clinical Trial Unit, Minneapolis, Minnesota

1983-2019 Assistant Professor, Department of Internal Medicine and Infectious Disease, University of Minnesota, Hennepin County Medical Center, Minneapolis, Minnesota

1982-1983 Instructor, Department of Internal Medicine and Infectious Diseases, University of Minnesota, Minneapolis, Minnesota

CLINICAL / HOSPITAL APPOINTMENTS

2011-2012 Medical Director, Case Management, Hennepin County Medical Center, Minneapolis, MN

2011-2012 Associate Medical Director, Hennepin County Medical Center, Minneapolis, Minnesota

2009-2010 Data analyst, Utilization Management, Hennepin County Medical Center, Minneapolis, Minnesota

2008-2010 Member, Utilization Management Advisory Committee, Hennepin County Medical Center, Minneapolis, Minnesota

2011-2019 Co-Chair, Utilization Management Advisory Committee, Hennepin County Medical Center, Minneapolis, Minnesota

2008-2009 Utilization Management, Physician Adviser, Hennepin County Medical Center, Minneapolis, Minnesota

2007-2010 Vice-chair, Member, Medical Staff Quality Committee, Hennepin County Medical Center

2005-2015 Member, Pharmacy and Therapeutics Committee, Hennepin County Medical Center, Minneapolis, Minnesota

2005-2015 Chairperson, Antibiotic Subcommittee, Hennepin County Medical Center, Minneapolis, Minnesota

2001-2018 Medical Director, Employee Occupational Health and Wellness Services, Hennepin County Medical Center, Minneapolis, Minnesota

1997-2014 Director, Performance Measurement and Improvement, Department of Internal Medicine, Hennepin County Medical Center, Minneapolis

1998-1999 Member, Quality Council, Hennepin County Medical Center, Minneapolis, Minnesota

1996-1997 Acting Director, Microbiology Laboratory, Department of Pathology, Hennepin County Medical Center, Minneapolis, Minnesota

1995-2005 Member, Residency Selection Committee, Department of Medicine, Hennepin County Medical Center, Minneapolis, Minnesota

1993-2017 Chairperson, Infection Prevention Committee, Hennepin County Medical Center, Minneapolis, Minnesota

1986-1990 Member, Residency Selection Committee, Department of Medicine, Hennepin County Medical Center, Minneapolis, Minnesota

1986-1996 Director, Infectious Disease Clinic, Hennepin County Medical Center Minneapolis, Minnesota

1985-1993 Chairperson, AIDS Patient Care Task Force, Hennepin County Medical Center, Minneapolis, Minnesota

1984-2015 Director, Sexually Transmitted Disease Clinic, Hennepin County Community Health Department, Minneapolis, Minnesota

1983-1987 Chairperson, Hepatitis B Vaccine Task Force, Hennepin County Medical Center, Minneapolis, Minnesota

1983-1986 Member, Pharmacy and Therapeutics Committee, Hennepin County Medical Center, Minneapolis, Minnesota

1983-1986 Chairperson, Antibiotic Subcommittee, Hennepin County Medical Center, Minneapolis, Minnesota

1983-1984 Acting Director, Section of Infectious Disease, Hennepin County Medical Center, Minneapolis, Minnesota

1982-2017 Member, Infection Control Committee, Hennepin County Medical Center, Minneapolis, Minnesota

1982-1987 Director, Section of Undergraduate Medical Education, Department of Internal Medicine, Hennepin County Medical Center, Minneapolis, Minnesota

CERTIFICATION AND LICENSURE

1982 Subspecialty Certification, Infectious Diseases

1979 Specialty Certification, American Board of Internal Medicine

1978 Minnesota Medical License

1977 Certification, National Board of Medical Examiners

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

Member, Hennepin County Medical Society
Member, Minnesota Medical Association
Member, Infectious Diseases Society of America
Member, Society of Healthcare Epidemiology Association

OFFICES AND COMMITTEE ASSIGNMENTS IN PROFESSIONAL SOCIETIES

2004-2005 Consultant – Prevention of Nosocomial Infections – Safest in America Institute for Clinical Systems Improvement

1999-2001 President, North Central Chapter, Infectious Disease Society of America

1998-1999 Co-Chair, Sexually Transmitted Disease, Subcommittees, MDH-AIDS-STD

Prevention Task Force
1997-1999 Member, Minnesota Department of Health AIDS and STD Prevention Task Force
1997-1999 Secretary, Treasurer, North Central Chapter, Infectious Disease Society of America
1994 Member, Advisory Committee – HIV/Hepatitis B Rules of the Boards of Practice
1991-1995 Member, Committee on Public Health, Minnesota Medical Association
1991-1995 Chairperson, Minnesota Medical Association AIDS Task Force
1991 Member, Minnesota Board of Dentistry AIDS Task Force
1991 Member, Minnesota Board of Medical Examiners AIDS Task Force
1990-1994 Member, House of Delegates, Minnesota Medical Association representing Hennepin County Medical Society
1987-1995 Member, Minnesota Medical Association AIDS Task Force
1987-1992 Chairperson, Hennepin County Medical Society AIDS Task Force
1986-1995 Chairperson – Research Subcommittee, Hennepin County AIDS Task Force
1985-1995 Member, Hennepin County AIDS Task Force

RESEARCH INTERESTS

HIV Patient Care
Sexually Transmitted Infections
Infection Control/Prevention of Infection for Health Care Workers
Utilization Management

PUBLICATIONS

1. Simpson ML. Resources for persons with AIDS and related illnesses. Minn Med. 1986;69:520.
2. Davies, SF, Rohrbach MS, Thelen V, Kuritsky J, Gruninger R, Simpson ML, De Remee RA. Elevated serum angiotension-converting enzyme (SACE) activity in acute pulmonary histoplasmosis. Chest. 1984;85:307.
3. Khan MY, Gruninger RP, Nelson SM, Simpson ML. Comparative in vitro activity of Sch 29,482 a new oral penem, against Neisseria gonorrhoeae. Antimicrob Agents Chemother. 1983;23:481.
4. Obaid SR, Khan MY, Simpson ML, Gruninger RP, Wigren DI. Comparative efficacy of cefmenoxime versus penicillin in the treatment of gonorrhea. Antimicrob Agents Chemother. 1983;23:349.
5. Simpson ML, Khan MY, Siddiqui Y, Gruninger RP, Wigren DI. Comparison of piperacillin and penicillin in the treatment of uncomplicated gonorrhea. Antimicrob Agents Chemother. 1982;21:727.
6. Khan MY, Siddiqui Y, Simpson ML, Gruninger RP. Comparative in vitro activity of cefmenoxime, cefotaxime, cefuroxime, cefoxitin and penicillin against neisseria gonorrhoeae. Antimicrob Agents Chemother. 1981;20:681.
7. Simpson ML, Khan MY, Siddiqui Y, Gruninger RP, Wigren DI. Treatment of gonorrhea: comparison of cefotaxime and penicillin. Antimicrob Agents Chemother. 1981;19:798.

Non-Peer-Reviewed Publications, Reviews, Book Chapters, Editorials

1. Recto RS, Montalban AM, Mendoza RM, Soriano RMG, Dy AU, Garduce VP, Simpson ML. Mycobacterial Infections of Bones and Joints. In: Current Concepts in Management of Musculoskeletal Infections. Gustilo R, Tsukayama D (eds), W.B. Saunders Company, Philadelphia, 1989.
2. Simpson ML. Septic arthritis in adults. In: Current Concepts in Management of Musculoskeletal Infections. Gustilo R, Tsukayama D (eds), W.B. Saunders Company, Philadelphia, 1989.
3. Simpson, ML, Peterson PK, Gaziano E, Lupo V. Bacterial infections during pregnancy. In: Ferris T, Burrow J (eds), Ardomore Medical Books, Philadelphia, 1988.
4. Simpson ML. Gonorrhea. In: Conn's Current Therapy, Rakel RE (ed), W.B. Saunders Company, Philadelphia, 1986.
5. Simpson ML. Sexually transmitted conditions other than gonorrhea and syphilis. In: Clinical Medicine, Spittell J.A. (ed), J.B. Lippincott Company, Philadelphia, 1985.

Abstracts

1. Simpson M, Steinmann K, Bennett ME, Pfeiffer J. Nosocomial Outbreak of Methicillin Resistant Staphylococcus aureus (MRSA-USA 300) in a Burn Unit. Society for Healthcare Epidemiology of America, April 9-12, 2005, Los Angeles, California (Abstract 216).
2. Hanson K, Klicker R, Simpson M, Deike M, Rauen N. A comparison of ligase chain reactions with Gen Race 2 for the Detection of Chlamydia and Gonorrhea in an STD Clinic. American Society for Microbiology, May 4-8, 1997, Miami, Florida (Abstract C-392).
3. Rauen N, Nelson S, Simpson M, Deike M. Review of the number of respiratory specimens received and the number with positive smears in an AFB laboratory. American Society for Microbiology, May 4-8, 1997, Miami, Florida (Abstract C-447).
4. Deike M, Nelson S, Simpson M, Rauen N. Comparison of smear results to days to positivity in M. tuberculosis complex (MTB) cultures. American Society for Microbiology, May 4-8, 1997, Miami, Florida (Abstract C-448).
5. Badley A, Dockerell D, Holtz-Heppellmann CJ, Simpson M, Lynch D, Paya CV. HIV infected macrophages specifically kill CD4 lymphocytes from HIV seropositive persons through both FAS and TNF. International AIDS Conference, July 7-12, 1996, Vancouver, British Columbia (Abstract We.A. 260).
6. Fletcher CV, Rhame F, Simpson M, Chinnock B, Chace B, DeMiranda P, Balfour HH. Zidovudine pharmacokinetics in normal, AIDS/ARC, and AIDS patients with hepatic disease. 90th Annual American Society for Clinical Pharmacology and Therapeutics, March 8-10, 1988, Nashville, Tennessee.
7. Danila RN, Schultz JM, Osterholm MT, MacDonald KL, Henry K, Simpson M. Minnesota counseling and testing sites: analysis of trends over time. Third International Conference on AIDS, June 1-5, 1987, Washington, D.C. (Abstract MP 193).
8. Klicker R, Gruninger R, Nelson S, Simpson ML. Herpes simplex virus type 1 and type 2 detection by rapid slide method, using direct fluorescent antibody. Annual Meeting of the American Society of Microbiology, March 23-28, 1986, Washington, D.C. (C287).
9. Simpson ML, Pfeiffer J, Gruninger R and Peterson P. Single-lumen versus multi-lumen central venous pressure catheter-related sepsis in critically ill adults. Annual Meeting of the American Society of Microbiology, March 23-28, 1986, Washington, D.C. (L28).

10. Simpson ML, Gruninger RP, Klicker RE, Nelson SM. Clinical laboratory correlation of Chlamydia trachomatis in a sexually transmitted disease clinic. International Society for STD Research, July 31 - August 2, 1985, Brighton, England (Abstract P154).
11. Kaplowitz LG, Vishniausky N, Evans A, Vartrivarian S, Simpson M. Norfloxacin compared to ampicillin and probenecid for the therapy of gonorrhea. International Society for STD Research, July 31 August 2, 1985, Brighton, England (Abstract P111).
12. Simpson ML, Klicker RE, Gruninger RP. Comparison of culture independent direct monoclonal fluorescent antibody with culture dependent polyclonal and monoclonal antibodies in the diagnosis of chlamydia trachomatis. Annual Meeting of the American Society for Microbiology, March 3-7, 1985, Las Vegas, Nevada (Abstract #378).
13. Simpson ML, Khan MY, Gruninger RP, Nelson SM. Inoculum effect of Neisseria gonorrhoeae against selected antimicrobial agents. International Conjoint Sexually Transmitted Disease Meeting, June 17-21, 1984, Montreal, Canada, (Abstract #143).
14. Gruninger RP, Klicker RE, Simpson M. Detection of bacteremia during antibiotic treatment: a comparison of two resin-containing blood culture systems (ARD and Bactic 168). Annual Meeting of the American Society for Microbiology, March 4-9, 1984, St. Louis, Missouri (Abstract C330).
15. Simpson ML, Khan MY, Gruninger RP, Obaid SR, Nelson SM. Inoculum effect of Neisseria gonorrhoeae against eight antimicrobial agents, including temocillin. 23rd Interscience Conference on Antimicrobial Agents and Chemotherapy, October 24-26, 1983, Las Vegas, Nevada, (Abstract #475).
16. Simpson ML, Khan MY, Gruninger RP, Obaid SR, Nelson S. In vitro activity of selected new B- lactam antimicrobial agents against Neisseria gonorrhoeae. Fifth International Meeting - International Society for STD Research, August 1-3, 1983, Seattle, Washington (Abstract #133).
17. Khan MY, Simpson ML, Gruninger RP, et. al. In vitro activity of cefodozime (HR 221), a new cephalosporin against Neisseria gonorrhoeae. 1983 National Conference - Sexually Transmitted Diseases, March 8-11, 1983, Dallas, Texas.
18. Gruninger RP, Simpson ML, Klicker RE, Khan, MY. Detection of bacteremia: a comparison of blood culture results obtained by routine methods and by using an antibiotic removal device 1982, Miami Beach, Florida (Abstract #412).
19. Khan MY, Simpson ML, Gruninger RP, Wigren DI. Perihepatitis in young women: An analysis of patients with or without genital gonorrhea. 31st General Assembly of International Union Against Venereal Diseases and Treponematoses, June 25-29, 1982, Dublin, Ireland.
20. Simpson ML, Khan MY, Siddiqui Y, et. al. Comparison of piperacillin and penicillin in the treatment of uncomplicated gonorrhea. 21st Interscience Conference on Antimicrobial Agents and Chemotherapy, November 4-6, 1981 Chicago, Illinois, (Abstract #613).

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