GARTNER PEDIATRIC HISTORY CENTER

ORAL HISTORY PROJECT

Robert H. Usher, MD

Interviewed by James W. Kendig, MD

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PREFACE

Oral history has its roots in the sharing of stories which has occurred throughout the centuries. It is a primary source of historical data, gathering information from living individuals via recorded interviews. Outstanding pediatricians and other leaders in child health care are being interviewed as part of the Oral History Project at the Pediatric History Center of the American Academy of Pediatrics. Under the direction of the Historical Archives Advisory Committee, its purpose is to record and preserve the recollections of those who have made important contributions to the advancement of the health care of children through the collection of spoken memories and personal narrations.

This volume is the written record of one oral history interview. The reader is reminded that this is a verbatim transcript of spoken rather than written prose. It is intended to supplement other available sources of information about the individuals, organizations, institutions, and events that are discussed. The use of face-to-face interviews provides a unique opportunity to capture a firsthand, eyewitness account of events in an interactive session. Its importance lies less in the recitation of facts, names, and dates than in the interpretation of these by the speaker.

ABOUT THE INTERVIEWER

James W. Kendig, MD, FAAP.

Dr. James Willis Kendig received his MD degree from the Jefferson Medical College in 1970. He completed a fellowship in neonatal-perinatal medicine at the Milton Hershey Medical Center of the Penn State University. Between 1982 and 1999, he served on the faculty at the University of Rochester School of Medicine and Dentistry. In 1999, Dr. Kendig returned to Pennsylvania and was a professor of pediatrics in the Division of Newborn Medicine at the Penn State Children's Hospital and the Penn State College of Medicine in Hershey.

Interview of Robert H. Usher, MD

DR. KENDIG: It is November 10, 1998. I am Dr. James [W.] Kendig. I am here at the Royal Victoria Hospital [RVH] at McGill University in Montreal, Canada to interview Dr. Robert [H.] Usher for the American Academy of Pediatrics neonatology oral history program.

Dr. Usher, the American Academy of Pediatrics would like to honor you on your many contributions and most distinguished career in the field of neonatology. We are very pleased you are willing today to share some of your experience and wisdom with us. I thought maybe we could start by having you give us a little information regarding your own childhood and your family background.

DR. USHER: Well, first of all I'd like to thank you and the Academy for including me in that gallery of people who have been involved with the field for our lifetimes. I'm pleased to be able to describe my pleasure in working in the field for posterity.

I was born in Montreal in 1929. My father was a pediatrician, Saul [J.] Usher, who was, subsequent to his death 5 years ago, honored by the hospital he worked in and helped to found, The Montreal Children's Hospital, by an honorary lectureship in cardiology [Saul Usher Lecture]. My mother, a teacher, born in Sherbrooke, Quebec, unfortunately passed away 20 years before Dad. My brother is a physician as well, a family physician, in Hornby Island, British Columbia. I'm married to Anne Usher, Anne Conrod Usher, who trained as a nurse in this hospital. Her mother the same. She has been very active in Quebec and in Canada. She was one of the key people on the Quebec Council on the Status of Women. She was president of the Canadian Council on Social Development, and she continues to be very active in such activities, small "p" political. I have also 3 daughters here in Montreal. Heather, the eldest, who is a teacher and has two of my granddaughters. Susan is a medical writer and a senior editor with a medical publication here in Montreal and has my only grandson, Adam. And I also have my daughter Kathleen, whose daughter Emilie is now 3 years old. Kathleen is an environmental biologist and an outdoors woman. So, I have this rather rich background and rich family life which occupies Anne and me very happy hours of the week with the grandchildren.

DR. KENDIG: Would you tell us a little bit about your education?

DR. USHER: I'm Montreal educated, a public school, elementary school, high school graduate. Then I went on to McGill University in science, biological science, major in genetics, main interest political science. I was taught in genetics by [F.] Clarke Fraser, who has always been someone I honor very much for his very objective approach to research. I was also taught by N. J. Berrill, a zoologist, who also made sure we understood how to

evaluate research. In medical school, we had a superb faculty. Dr. [Frank Campbell] MacIntosh, the physiologist, probably geared me toward what I've done for the rest of my life, which is being, in fact, in a physiology laboratory of a newborn intensive care unit. My main interest in medicine is the physiological aspect of it.

DR. KENDIG: How were medical students treated in those days?

DR. USHER: Well, we were made to work hard. We were subject to intense competition to get into medicine. Coming from a Jewish family, at McGill University I was treated the same way women were treated. We had a quota of 5 Jews and 5 women who were allowed into medicine each year at McGill. No matter what your grades were, there was a limit. Thank heaven we now have a majority women, and I don't know what proportion Jews. The medical training was hard work, but, I felt, good. I thought the studies were appropriate. I even learned to like anatomy. With regard to my future career, I think Alan Ross, who as professor of pediatrics, was a very good model for what a pediatrician should be. He demonstrated caring for children, caring for people and looking at pediatrics as more than the physical and biological, but very much the emotional.

DR. KENDIG: What about your obstetrical professors?

DR. USHER: Well, obstetrics in those days was a very almost tyrannical specialty with people who insisted on their students, the residents, following whatever they felt was the right way to do things. There was little in the way of science. It was not a very attractive specialty at the level I was as a medical student. It's hard to believe that today, since I've developed a passion about obstetrics, about obstetric research and about working with obstetricians. The field has changed rather completely. It's also an oddity that the person whom I was most unhappy with as a professor became my main supporter and my mentor in my research career, Dr. George [B.] Maughan. To him I owe a great deal for being able to establish research in neonatology at Royal Victoria Hospital and for maintaining that support and encouragement over the years.

DR. KENDIG: When did you decide to pursue postgraduate training in the field, after completing medical school?

DR. USHER: Well, I went into pediatrics, I suppose, because my father was in pediatrics and I very much enjoyed working with children. I went off to Philadelphia to do an internship, and then a residency in peds [pediatrics], and then a residency in Boston in peds.

DR. KENDIG: Who were the people in Philadelphia who influenced your career the most?

DR. USHER: Well, [Joseph] (Joe) Stokes [Jr.] was the chairman, and he and Tom [Thomas R.] Boggs [Jr.] in neonatology, [Irving J.] Wolman in pathology, [C. Everett] Koop who became eventually Surgeon General. There was a Bob [Robert] Kaye. There were a lot of people in Philadelphia who were very active in research, who were using scientific method in their approach to pediatrics and who made me recognize what could be done scientifically in pediatrics. [Alfred M.] Bongiovanni in endocrinology is a good example.

DR. KENDIG: And how about then in Boston?

DR. USHER: In Boston, I spent one year. There [Charles A.] Janeway was away and [Alexander S.] Nadas was away. Abe [Abraham Morris] Rudolph was looking after the cardiology end of it. Dr. [Randolph] Byers in neurology was a great clinician. It was a year when Bob [Robert J.] Haggerty was just beginning his role as a faculty member and was a very stimulating person.

DR. KENDIG: And you spent some time at the Boston Lying-in [Hospital]?

DR. USHER: That's where we did our newborn work. I think I was there only 1 month, but it certainly was an interesting month. I can still remember the smell of ether in the nursery from the babies born to mothers who were given ether anesthetics. It was a kind of obstetrics which, thank heaven, has passed, with a lot of instrumentation and a lot of sedation and anesthesia. There Clem [Clement Andrew] Smith was very much a figure to admire. His book, *The Physiology of the Newborn Infant*, even as a resident, I was keen on reading. I had Stewart [H.] Clifford as the clinician, Jim [James E.] Drorbaugh in research and [Charles D.] Cook in some research. These were people whom I came in my later years to feel very happy I'd had the ability to get to know and could continue as my contacts as I went into the field.

DR. KENDIG: How did you select neonatology?

DR. USHER: Chance. Chance because I had decided I wanted to come back to Montreal for a year of work before going off to do developing country work as a career. I had had little contact with my family for 3 years and felt that if I was going to go to India, which is where I wanted to go, I'd like to get back home for a year first. While here in Montreal, Dick [Richard Ballon] Goldbloom informed me there was a fellowship in research that was going to be decided upon shortly and that I could put my name in for it. The fellowship in research happened to be in neonatology. Had it been in cardiology or respirology, I may never have gotten into this field. So, I

applied and, to my amazement, the obstetric professor I had found intolerable and who had found me extremely difficult was the person who decided to hire me. In later years, he said he had liked my independence. He never showed it when I was a student.

DR. KENDIG: What kind of work did you start doing then as a fellow in neonatology?

DR. USHER: Well, I came up to McGill at a time when our main problem was losing babies from hyaline membrane disease. I felt I had all of the skills a well-trained pediatric resident had in physical exam, interpreting x-rays, interpreting blood lab results, blood pressures, the kind of things that one could study, but I realized there had been nothing described about the natural course of respiratory distress syndrome [RDS]. I was single then with no distractions, so I could sit by the bedside of a baby in acute respiratory distress for many hours of the day making clinical notes — what was happening with the retractions, what was happening with the grunting, what was happening with the air entry, were rales developing? In those days, rales developed in the second, third day of life in most of the cases. I also documented the course of the edema that was going on. I was collecting blood samples, but didn't yet have a lab to test them in, so froze them. I was doing electrocardiograms [EKG] and blood pressures. As I did the electrocardiograms, I realized that at the beginning they looked normal, but as the disease progressed, they became abnormal. They became abnormal in a very simple way to assess — the PR interval was prolonging, the QRS was widening, the wave form was becoming less sharp. It wasn't until the lab results started to become available 6 to 9 months later that we were able to see this was completely related to elevation of serum potassium. So thereby, I discovered the disease was associated with catabolism, catabolism producing hyperkalemic cardiac defects. I knew as a pediatric resident how to treat hyperkalemia and glomerulonephritis, and that was to give glucose and insulin. So, I gave glucose and insulin, and bicarbonate also because they were acidotic. Lo and behold, the baby markedly improved. The baby was now 36 hours old, intense RDS, intense EKG abnormality, potassium of 9. As he improved in his potassium level, the EKG immediately returned to normal, baby's cardiac output visibly improved, and I thought, "Aahh, we have a key here to how to treat the disease." Well, we treated them that way for a few months, perhaps 15 infants or so, and realized, yes, we got transient improvement, but they reverted back to metabolic deterioration and they died at 60, 70 hours of age. So, I felt, well if that wasn't the approach, maybe what we should do is try to avoid the catabolism by using glucose and water and bicarbonate from the beginning, not insulin, and try to prevent the hyperkalemia. It was a medical student's baby we asked for permission to treat first.

From the beginning of the respiratory distress, we set up an intravenous —

in a minute I can talk to you about intravenous work in those days — and started to give glucose and bicarbonate, enough to control the acidosis, gradually. Lo and behold, the child was the only severe RDS I had monitored who never developed hyperkalemia and never developed any EKG changes, even though the respiratory distress was quite severe. The child survived and did well. So, with a 1 case background, I then started a prospective randomized control trial for who was going to get glucose and bicarb from birth and who wasn't. With that trial, we were able to see a two-thirds reduction in mortality in babies over 900 grams with RDS. We were able to show clearly the prevention of elevated potassium, nitrogen and metabolic acidosis that affected the babies who were not given intravenous fluids. It's still a question to this day how much we would have accomplished if we had skipped the bicarb and given only the glucose and water or glucose and electrolytes. But the Usher solutions, as they became known, became the most effective form of therapy we had in the early 1960s.

DR. KENDIG: The pre-ventilator days.

DR. USHER: This was until respirators became feasible. So that's where we started. That was very exciting. The International Congress on Gynaecology and Obstetrics was in 1958 in Montreal, the International Congress of Paediatrics was in 1959, and at both Congresses, we were reporting this work. For a man who had been in research 1 year and 2 years, this was pretty heady stuff.

DR. KENDIG: What other early projects did you take on?

DR. USHER: Well, it was pretty much all RDS for the first 2 years or so. We, thanks to John [Stewart] Henry in obstetrics, developed a perinatal — it was mainly obstetrical, 90 percent obstetrical — data collecting system for all of our births in 1961. That system was the Obstetrical Statistical Cooperative system from the states. We were the only Canadian hospital on the system and we used that for a lot of research. In 1962, we got an [R. Samuel] McLaughlin Traveling Fellowship so I could work with John (Johnny) Lind in Stockholm. I had recently married Anne, and we enjoyed that as our exciting pre having children marital career in Stockholm. I had a very enjoyable research fellowship with Lind.

DR. KENDIG: Can you tell us a little bit about Dr. Lind?

DR. USHER: Oh, he was a very gentle, warm man, extremely personable, very caring for his fellows, his people who were in his department, very rigorous scientifically. The studies we did on placental transfusion were some of the original ones and were exciting to be able to accomplish. He was with us all the time when we were doing the injections of iodinated albumin and doing measurements. I became technically extremely

proficient in femoral punctures because we had to get blood samples at exactly 5 minutes after our injection, and plus or minus 1 minute, I was able to obtain it 90 percent of the time. My wife worked as a research assistant with Johnny Lind and received as payment 2 beautiful birch chairs she sits on in our living room still. They are the Swedish design. So that was a very productive 6 months.

Then I came back to McGill. At McGill, I had left Ken [Kenneth E.] Scott, who was a research fellow with me at the time, in charge of the clinical, teaching and research end. He and I initiated a study in fetal malnutrition, we called it. Today it would be intrauterine deprivation, intrauterine growth retardation [IUGR]. We named it malnutrition to give a sense of deprivation. We recognized wasting was a major part of the manifestation and there were many complications that developed in babies who were suffering from it. We described them in the obstetric literature about 1963 or 1964, using the database as our main tool for keeping track of the clinical experience. I guess I should mention that before Ken, Charles Carrier, who was one of the main figures in perinatology in Quebec, neonatology in Quebec, was my fellow, and we did work in hyperbilirubinemia. We were wondering why the Greeks and Chinese and the breast-fed babies had higher instances. We never published that, and, of course, were very embarrassed when a few years later G6PD deficiency [glucose-6-phosphate dehydrogenase deficiency (G6PD def)] became well known, thanks to [Spyros A.] Doxiadis, and the breast milk jaundice became a clear concern. Five years earlier we had the data which very clearly showed both.

Then our research activities through the 1960s, and from then on to 5 years ago, were done in collaboration with and supported by Frances (Francie) Helen McLean. That is the name one usually hears in reference to a growth chart of intrauterine growth she and I put together and published in 1969. She has a much better growth grid that I've been very dilatory about publishing for no sound reason, which is now based on ultrasound confirmed menstrual dates, and sex specific, and with adequate numbers of very early babies so as to be much more reliable than our other. But Francie was a co-author on the work on fetal malnutrition. She's co-authored much of our work, and she's certainly been a major force in having research productivity in the department.

DR. KENDIG: While you were building up the unit at the Royal Victoria Hospital, what was the role of the general practitioner in the city and the general pediatrician in newborn care? In other hospitals?

DR. USHER: Well, even here, my role until 1969, 12 years after I started here, was as a research fellow. Later I became a research associate of the Medical Research Council. But it was a research appointment primarily. I had no clinical authority. The nursery was nominally under the

jurisdiction of the pediatric department. We had a small pediatric department in the hospital. When babies were very sick, I was usually the one who was called on to do things to them, but they were never my patients. It was only in 1969, when the pediatric department moved out of the hospital, that I was asked to take over the clinical responsibility as well. We developed an approach to neonatal care where the patients were cared for by full-time neonatologists, no longer by pediatric part-time people, as they had been. At least nominally they had been. In fact, a lot of the treatment had been conducted by me in their name.

In the city as a whole and the province as a whole, home delivery ceased to be a significant proportion of deliveries during the 1950s, in the province of Quebec. Deliveries in the maternity departments of general hospitals were *de rigueur*. The family physician was not a factor to any degree in our own hospital, but in many of the hospitals in Quebec most of the deliveries were by family physicians. The pediatricians were not looking after babies the family physicians delivered, unless there was a problem, in hospitals where there were family physicians involved. Pediatricians were responsible for all degrees of illness in maternity services throughout the province. There were no examples of full-time specialists in newborn intensive care in the 1960s, except a developing program in [CHU] Sainte-Justine [Mother and Child University] Hospital [Center] in Montreal, which is combined pediatric and obstetric, and in the Royal Victoria Hospital, and later the Jewish General [Hospital] where I had some role prior to Dr. [Apostolos N.] Papageorgiou taking over in 1972.

So it was a time when we could start to compare the results being obtained when you had full-time specialists in newborn medicine in a maternity hospital with the results being obtained when you laxed that specialist and sent the children after birth to a children's hospital, to a third group of hospitals where there was no full-time intensivist. In this third group, they were not sending the babies, but treating them locally. If they made it fine, if they didn't make it, that was all they could expect to do. They were not using children's hospitals. The comparison became the subject matter of an analysis we made thanks to the Perinatal Mortality Committee [of the Province of Quebec].

I should spend a minute talking about it because it was one of the most exciting parts of my career when with the leadership of Roger Brault in Quebec City, and of Charles Carrier, obstetrician and professor of obstetrics and neonatologist in Quebec City, we were able to found, for the first time, a Quebec governmentally-sponsored committee reviewing every perinatal death in the province. How did this come about? Well, Charles, as I said, was a fellow with us. When he went back to Quebec City to practice, he started to review perinatal deaths there the way we did here. That was the way I think I was taught in Boston, doing a very careful review of all

obstetrical and neonatal factors and an open review in front of the whole department, involving pathology. We had almost 100 percent autopsy rate then, and we still have a very high level of autopsy rate today. As he was doing this, it became clear to his obstetrical chief, Dr. Brault, that a lot could be learned from it. Lots of practices could be recognized as outdated by reviewing the deaths. Brault happened to be the president of the political party in power in Quebec, therefore, he was able to convince the government to sponsor this activity. So, from 1967 until about 1982, under governmental funding, the Quebec Perinatal Mortality Committee reviewed every death. There was a period of 3 years where the medical certificate of childbirth we developed was in use to review every birth in quite some detail.

With the collaboration of doctors at the province, we had the information coming in. We were able to compare what was happening in different regions, different sizes of hospitals, but most importantly, in the larger hospitals, comparing those with intramural perinatal intensive care, with those with extramural neonatal intensive care, with those that used neither. For instance — I think I remember the numbers correctly — in the last group, the infants of 1 to 1.5 kilos had a 45 percent neonatal mortality. In the middle group where they sent infants to the children's hospitals, 25 percent neonatal mortality. And the first group where the care was intramural before and after birth, intensive care, 15 percent. So, you could see mortality rates 45, 25, 15, with enough numbers to be convincing. It didn't take much more than that, besides being published as it was in seminars in perinatology somewhere around the mid 1950s, to convince the Quebec obstetrical physicians, practicing obstetrics, whether family doctors or obstetricians, that they really should be sending to centers those women who were going to have a high-risk baby. In Quebec, ever since, without any government regulations, without any compulsion, there has been over 90 percent births within centers of babies under 1500 grams. It's something that was a remarkable testimony to the selflessness of the practitioner working in a hospital that didn't have an intensive care center. That he would recognize the importance for his patient to have that kind of care and not need to be forced into it, but to be convinced it was the right way.

DR. KENDIG: That's amazing. You can certainly be very proud of your role in that committee.

DR. USHER: Well, it was a very exciting time, and the co-workers on that committee worked hard. Dr. Bernard [H.] Doray from Montreal was a great worker. Leo Stern, my colleague here at McGill, did some work on it. Also, Paul [D.] Desjardins of obstetrics, as well as Dr. Brault. So, these were impressive accomplishments to be able to get people across the whole province to work on a program.

DR. KENDIG: And they continue until today?

DR. USHER: Well, I wish I could say it is. In the last 3 years, the College of Physicians and Surgeons of Quebec, which took over the program 10 years ago, has kind of lost interest, and I'm not sure the program is going to continue. I'm hoping it will. I'm working to try to convince people it should. But it may or may not continue.

DR. KENDIG: And did that include provisions for back transport?

DR. USHER: Well, one of the key things that made such a committee work was that we didn't only look at the mortality where babies are born, but we referred every baby back to the hospital of origin so that we could attribute deaths to those hospitals from which the patient population started, even though the birth was elsewhere. That was a complex system that worked rather well. Back transfer was not really something we were involved with when looking at mortality because back transfer implies the baby was healthy, and such babies didn't die. So no, we did not keep track of that. Back transfer is something we practiced very actively in order to keep our intensive care beds available for new intensive care patients, but not something we've done studies on.

DR. KENDIG: Were there any surprises in your analysis? Any pockets of particularly high mortality?

DR. USHER: Well, one of the surprises, because I came from training in the States, and because so much of the literature comes from the States, is that we found no pockets of high incidence of low birth rate or prematurity. Quebec society does not have the situation, which unfortunately one finds in so many [United States] American cities, of having areas of poverty where there are extremely high prematurity rates. This we do not have here. There are differences, but the differences are small. We have rural regions with marked poverty where the incidence of low birth rate and prematurity is the same as in the cities. So that was one surprise. It was no surprise the smaller hospitals delivering fewer than 500 babies a year had worse outcomes. One interesting feature, which can't be called a surprise, but a little bit shocking, was that in the years we had the medical certificate of childbirth, we looked at the diagnosis of Down syndrome and the diagnosis of congenital dislocation of the hip by size of hospital. We found very little difference, but we found very low rates, except in those hospitals where there was neonatal intensive care. It seemed odd that something not really diagnosed by the neonatologist was diagnosed 2 or 3 times more frequently, and with rates similar to the rates one would expect in hospitals where there was neonatology. I think this may have to do with the spin-offs that come from having academically oriented people working in the hospital. In addition, the use of phototherapy was markedly less in those hospitals that did not have a neonatologist. The diagnosis of hypoglycemia was markedly less. So, we

were rather concerned that, yes, we could show mortality rates among highest risk babies were lower with intensive care, but that wasn't the only difference. There were differences in all aspects of neonatal care that should make us feel uncomfortable, that neonatal care for full-term, reasonably healthy babies is not being practiced with as high a standard as one would like throughout the whole province.

DR. KENDIG: Were you involved in the early exchange transfusions?

DR. USHER: Well, my training in pediatrics started in 1955. Exchange transfusions came in within the 5 years before. When I got back here as the research fellow, coming from Philadelphia and Boston with more experience in exchange transfusion than pretty much anybody else in the city, I was soon doing all the exchange transfusions. Of course, it's hard to believe today, but to do 10 to 12 exchange transfusions in 1 weekend —

DR. KENDIG: One weekend?

DR. USHER: — on 3 or 4 babies with Rh hemolytic disease.

DR. KENDIG: Multiple hospitals?

DR. USHER: No, from our own hospital.

DR. KENDIG: All here?

DR. USHER: Of course, we were getting referrals of Rh sensitized women. But this was a major time-consumer and a tedious job. We were very proud to have something like 1,000 exchange transfusions at 1 point in our time, with no deaths during them. And we recognized it was possible to do an exchange transfusion with very little rest. But there were procedures which we're absolutely thrilled we hardly ever see anymore. One of my prizes for accomplishment in my time is to the people who brought in phototherapy — [Lloyd I.] Kramer in England, the South Americans who noticed a difference between the sunny side and the shady side of the nurseries. They've done more good than most of the other fancy treatments we know of today.

DR. KENDIG: When did you first use phototherapy here?

DR. USHER: I believe we were using it around 1966 or 1967. As soon as it was described, we got into it. Now what we're finding is that the lamps we were using were rather weak. We can now use much stronger lamps and really control almost any hyperbilirubinemia. I guess in that area I'd like to comment because I've been very disturbed by the *laissez-faire* toward hyperbilirubinemia in the last decade. To my good friend Jeff [M. Jeffrey]

Maisels, I would attribute the beginnings of that laissez-fairism, but I think now he would not wish to claim any responsibility for it, because we certainly are still seeing kernicterus. We're seeing deafness. We're seeing brain damage associated with hyperbilirubinemia. I think what's sad is that it's so easy to prevent brain damaging hyperbilirubinemia without large costs, without exchange transfusion, simply by making sure we are cognizant of following that bilirubin, readmitting those who need readmission, using intense phototherapy before it's too late. The program here at our hospital has been very successful in accomplishing those ends. It does mean that you spend a fair amount of time on bilirubin as an attending pediatrician. Today you stood by me while I took a phone message of lab results. What lab results was I dealing with? CBCs, blood sugar, but most of them bilirubins. And making decisions — do they stay in the hospital, do they get phototherapy, if they go home do they need to come back for testing tomorrow? That program works with very few readmissions, no exchange transfusions, and nobody going over 350 SI units, which would be 20 milligrams percent.

Well, that was a diversion.

DR. KENDIG: Yes. Could you tell us a little [about] the church of parenteral nutrition?

DR. USHER: Yes. I was very concerned about nutrition in prematures, especially when we got concerned about fetal malnutrition. The name [Hans G.] Keitel may or may not mean anything to you. He was a Philadelphia pediatrician in charge of one of their newborn units, who in the International Congress of Paediatrics in 1959, showed very clearly that the very small premature, under 1500 grams, was not calorie-limited, but volume-limited in the amount of milk he would take. He showed that by giving the premature Similac at 30 calories per ounce instead of 20 or 24, he could get the babies up to full caloric intake much more quickly than by using the more standard concentrations. Well, that seemed to me something we should be testing right away. We did. We did a number of studies, not published, on human milk versus Similac 30. We found that until you reached 80 calories per kilo per day, the baby was able to tolerate equal volumes of Similac 30 as human milk. And obviously, you got weighty much faster with Similac 30. So, we've been using concentrated milk ever since. Similac 27 is available, so that's what we've been using. Occasionally, we use Similac 30, which we have to make ourselves, or Enfalac 30, whatever. However, as you very well know, many very little babies are not able to tolerate milk feedings well. All we were able to give them was glucose and electrolytes, and later, amino acids in the form of Epogen, which is a pretty primitive form of amino acid therapy.

It was with great relief that Ken Scott, my previous fellow, introduced me to

Intralipid in 1970, and I think put in a paper at the SPR [Society for Pediatric Research] that year. I don't think he ever published on his work, but he showed me it was tolerable. It was a much more tolerable IV fat than the previous IV fats we'd thrown out in the 1950s had been. We started to use it with Jeanne Duncan, then a fellow who'd been trained by Ken Scott first, who came to work with me in 1970, 1971. She, in a small series of babies, showed that when we gave 120 cals per kilo per day of IV fluids with at least 50 percent of the calories fat, we created great intolerance to fat and to sugar, and the babies added weight at an incredible rate. So, we realized what we should have realized to start with, that malabsorption of milk makes 110 or 120 cals per kilo necessary for milk, but that 85 to 90 is adequate for IV. When we cut back to 85 or 90, we avoided the intolerance and we got good growth. Bill [William A.] Cashore then came to work with us. As a fellow here, he showed you could get excellent growth of prematures using a flat Intralipid, amino acid and glucose and getting 85 to 90 cals per kilo per day. That was published somewhere in the early to mid 1970s. I think it was the first publication using IV fat in prematures to show what you could do with postnatal growth.

Subsequently, we've always continued with that approach. We've applied a new approach in the last 18 years, or 16 years, to IUGR babies where we've given some intravenous nutrition, about 50 percent of normal intake, around 40 calories per kilo per day, to babies who were severely growth-retarded at birth, in addition to full milk nutrition. I had tried to use very enriched milk nutrition to get catch-up growth in IUGR babies and found they were not gaining the weight appropriate to caloric intake and their stools were very bulky. They were obviously not absorbing a lot of it. So, we tried using only a normal milk intake, plus 50 percent normal in IV. We call it top-up IV nutrition. We're currently reviewing our cases of it. We have something between 150 and 200 infants we've treated over the last 16 years, and we are putting together our results which show a remarkable growth in weight and increase over intrauterine average growth in length and head circumference. We've shown catch-up from well below the third percentile to the third percentile by the time of discharge in most of the babies we're treating. We only use this when a baby is going to be in hospital at least 2 to 3 weeks after their birth, so we don't use it for a baby of 2 kilos. We don't hold them in a hospital to give it, but if we have a baby who's born at 1000 grams, at 32 weeks, and he's down 35 percent below, 40 percent below expected weight, 3 standard deviations or so, he's going to be in hospital anyway for a month or more, so why not try to use that time to get catch-up growth. We think because the brain is growing so rapidly at that time it may be useful for developmental growth, developmental improvement as well, but we've never tested that.

So we're now putting together these cases and looking for metabolic intolerances associated or fluid overloads that need diuretics. What we've

found is in fact there's little or none in the way of metabolic intolerance. Even though we're giving 180 to 200 milliliters per kilo per day, there's no need for diuretics, the babies are not developing edema. As long as it goes into real growth, they can handle the fluids. So that's been an area of nutrition we're still quite actively involved in.

DR. KENDIG: Can we just shift gears a little while and focus on what's happening in neonatology in general? I'd like to get your views about how neonatology has differed in Canada versus the US [United States] over the past decade, and where you see neonatology going in the next decade.

DR. USHER: I don't know that I'm very qualified to compare 2 countries' forms of neonatology. I do think there are differences that are crisp and clear. Our neonatologists are working in institutions that have government health insurance, so there's no difference between the pay status of any individual. Millionaire's premature and welfare patient's premature are being treated side-by-side, always with no respect to the cost of the operation. We do not have the intense rivalry between institutions wanting to increase their practice because, I understand, in the States neonatology can be a fairly profitable enterprise, both for the neonatologist and for the hospital. Well, in Quebec and in Canada, it's a very costly enterprise and not one that anyone wants to increase in its volume. We work together rather than at odds with each other. There has been no incentive here as I think there has been in the States for smaller units to maintain neonatal intensive care programs. Rather the reverse, to close them down and concentrate the efforts in a few major units. So, I think we probably have many fewer units per tens of thousands of births than the Americans do, but I don't have the data on it.

DR. KENDIG: And what about the training of neonatologists? What are your personal feelings about where training should be going?

DR. USHER: Well, in Canada the training is, I think, similar to the States. It is full pediatric training going on into neonatal subspecialty training for at least 2 years. Right now, many are doing it for 3 years. We don't have a written examination in Canada, but most of our trainees take the American exam, and most of them pass it. So, I think our standards are fairly similar. We do have a Royal College [of Physicians and Surgeons of Canada] recognition that they have received the training, and there is meant to be an evaluation done in each training unit by the training unit. I have some rather unorthodox, perhaps, views on neonatology based on my experience with it. I don't know if the American Academy of Pediatrics is going to be pleased to hear them, but I think that even though my father was a pediatrician, I was a pediatrician, and I was trained in pediatrics, I think neonatology is best practiced in an obstetrical setting. That's when it does its greatest good. It can start influencing care before birth, can operate right at

delivery and can involve itself with patients the way I showed you this morning. Someone who had very premature triplets here was very involved with us 2 weeks before she delivered because we knew she was threatening. Then after birth, I think the degree of technology and aggressiveness in maternity hospitals is less than it is in children's hospitals. I think we don't have as much influence from a surgical confrere, we don't have as much influence from heroic medicine practice in PICUs [pediatric intensive care units] and we're more the successors of the approach to premature infant care than we are to intensive care. I think for many of us, certainly for me, the name neonatal intensive care still rubs my fur the wrong way. I don't like the idea that we should be considered as effecting improvement on the baby when we're doing only technologically invasive procedures. I think the most important thing is the soft touch, the nourishment of the baby, not only in terms of the feeding going in, but in terms of how we handle the child, how we handle the parents. I think it's a different approach. So, in training, I think pediatrics should obviously be part of one's training to be a neonatologist, but I don't see that much of what we learn in pediatrics as applicable to neonatology. I've said that wrong. I think there is much in pediatric training that is not applicable, there's much that is.

DR. KENDIG: Sure.

DR. USHER: I don't know if it's 50/50 or 60/40. But why we should be so involved with caring for leukemics and fibrocystics and temper tantrums in infants and children, and on and on, and emergency ward work, which we do a lot of in our training in pediatrics? This is not relevant to neonatology. I think we could have pediatric training for a neonatologist restricted to those areas, ward work, because in ward work you are seeing management of various systems in a pediatric sense. Cardiology, respirology, for sure, some neurology, yes, but I think it should be focused. I think it should be short, at most one year, then on into neonatology in a good 3-year program, so that someone who is trained in neonatology has had a lot of skills. And that neonatal training program should be at least two-thirds in a maternity based operation, not in a children's hospital. I am more and more sure that children's hospitals have a very short life to come. I think children's hospitals will become more and more part of general hospitals, and the pediatric nature of the care has to be closely guarded. There must be safeguards built in to make sure children get the same kind of child-oriented care in a general hospital they are now getting in a children's hospital. But in terms of neonatology, I think it's very important the work be done in a maternity center, which I think should be part of a general hospital. At McGill, what we're aiming for is one hospital for the whole campus, and our Royal Victoria will no longer be, nor will The Montreal General [Hospital], nor will the Montreal Children's [Hospital], nor will the Montreal Neurological [Hospital]. It'll be all the McGill University Health Centre. We already have a huge part of the city taken over to build it, now we need the

funds, a billion dollars Canadian — it's only $650 million American — to build the program. But I think it's going to come to pass, and I look forward very much in having obstetrics, neonatology and pediatrics side by side. I think that's the way they should be.

DR. KENDIG: Could you comment a little bit about the role of neonatal nurse practitioners in Canada?

DR. USHER: A larger and larger role. We're behind the States in that area, but more and more centers are developing them. The problem is not so much in their training, but in defining a payment role for them, and a responsibility role. Are they people who should be doing nursing care, as well as what we would call medical care, or should they be working on medical care with some background or backup from neonatologists? These are the issues I think have to be dealt with. Can one in future have a hospital running — Let me back step a little. Twenty, 30 years ago, before Eugene (Gene) Outerbridge at Montreal, every transport incubator that went out for a baby had a resident on it and a nurse. Now, it has no resident, but an RT [respiratory therapist] and a nurse. They're superbly trained. They can handle any kind of emergency they're dealing with. They have backup from the children's hospital physician by phone. Can we imagine a day when a newborn intensive care service can have no doctor in house and only practitioners, be they RT or nurse backgrounds, who have been trained to a degree where they can handle the problems that arise hour by hour in a newborn intensive care unit in a resuscitation center? Certainly, there will be need to call upon more highly trained physicians to come in for certain situations in the middle of the night. But right now, we come in for almost any situation because the trainee in the hospital has had so little training. I think the future is very bright for nurse clinicians. I think their role needs to be more carefully defined, and I look forward to a future where what used to be done by residents will now be done, probably better, certainly better, by nurse practitioners, and the residents are there for training and not for service.

DR. KENDIG: We were talking a little bit earlier about parents. What changes have you seen during your career in the role of the parents in the nursery?

DR. USHER: Power. [laughs] Power, which they deserve, and power which we have certainly been very instrumental in making sure they have. From the first time, we are involved with them, and we're involved with them as in most neonatal, perinatal centers. As soon as they threaten to deliver early or a high-risk baby, we start our review with them of how the baby's going to be, and show the dad at least around the NICU and the mom if she can come. And then where there are questions of how far to go in therapy, we certainly must make sure they are with us. If we feel a baby who runs a high risk of brain damage should be treated aggressively, that should

only **be done if the parents understand what the risks are in the short-term and the long-term, and they understand the alternatives. The alternative, as far as I'm concerned, is not to treat aggressively. What's aggressive? Aggressive is putting an endotracheal tube in a child's trachea and attaching him to a ventilator if that child has a very high risk of dying and a very high risk of brain damage. Because as soon as we do that then we're setting the stage for intervention after intervention all the way down the line. It's very hard to stop once you start. So here none of us will go ahead with intubation and ventilation in a baby who is below 24 weeks gestation before we've reviewed the whole reality with the parents — the high risk of simply prolonging death, the significant risk of damage later — and have their ok to go ahead. And what we do at times, and I'm sure is done everywhere, is to get from parents the ability to assess the strengths of the baby at birth before finally deciding not to treat. So, a baby at 23 weeks may be one, believe it or not, who comes out with an Apgar of 6 — it happens at times — who's really vigorous, who responds to bag and mask beautifully. That situation is different from a baby who comes out limp, hypotonic, heart beat of 10, ashen grey, at 23 weeks gestation. We submitted a study a year and a half ago to SPR looking at the outcome of extreme prematures with good and bad Apgars. A world of difference in mortality rate. So yes, parents are very involved with decision making. Not decision making that needs medical judgment. There's no way of leaving that to a parent to authorize. We do have them authorize or certainly be aware we're going to give blood. We're extremely conservative about giving blood. There are many of our babies who have lowest hematocrits of 20 percent, but the baby is fairly stable, so we ride it through.**

DR. KENDIG: Sure.

DR. USHER: Of course, when we give blood, our [Canadian] Red Cross has, for many years now, provided the divided pack approach where from 1 donation, we get 4 transfusions from 1 donor. There's a time in some babies' lives where a catastrophe has happened, and you want to have at least a do not resuscitate [DNR] order in, but removal of ventilator care is sometimes indicated with any common sense. We would never do that without the parents' approval and almost invariably the parents' presence. The room I showed you, the nicely decorated parents' room for discussions, that's the place we bring the incubator with the respirator when we're going to extubate. We've had 1 baby recently where the baby continued gasping and breathing on and off for 18 hours or so, and I thought, "What a horrendous thing for parents to live through." That family is so thrilled with that last 18 hours of their baby's life, a baby with a very bad brain hemorrhage, with the neurosurgeon pointing out what was going to be needed for the hydrocephalus, and the parents, and I can see why, saying, "No thanks." The best thing was removal of care. But they were thrilled, they were holding that child for the first time against their breast, and the

child was alive and warm and breathing on and off. So, yes, parents have a role in these extreme situations. Parents have a major role the nurses are trying to give them, in care. Certainly, as soon as a child can suck, the parent is involved with a bottle feeding. The parent is holding her baby. The parent has the baby against her breast as soon as the baby can be put against the breast. Bonding is much easier now than it was when I started when the parents were not allowed in the unit ever. It was 10 years before a mother was allowed in. It was 15 years before a sibling was allowed in. Some of our most delightful shots now are of siblings touching their little baby sister's or brother's face and arms in the incubator.

Another parent role, parents play a role in supporting each other. There's always a collegiality about the visiting. There's no visiting hour, visiting hour is 24 hours a day. There are often 2, 4, 6 sets of parents there at a time.

DR. KENDIG: Spontaneous support groups.

DR. USHER: There's a lot of spontaneous support. We used to have a counseling group once a week and that proved a bit artificial and hard to sustain, and so now it's very informal. We do have primary nurse attachments to each of our babies, and they play a large role in making sure the parents feel they're playing a major role.

DR. KENDIG: What other ancillary services have developed to benefit the small babies you've seen, as changes over the past decade?

DR. USHER: Well, we rely on respirology, [G.] Michael Davis here, to guide us through some of the torturous courses, especially the chronic lung diseases. We rely on respiratory therapy now as a real backup to aid us in intubations and in monitoring blood gases. And now we're hoping to do what Montreal Children's Hospital has done, which is to train respiratory therapists so they can handle any intubations on their own if there is no neonatologist available quickly. We're not quite at that stage, but we do have 5 of our RTs who are quite competent at incubation. One department not to forget is the instrument repair department [laughs] who serve great purpose in keeping us going. You never have much extra equipment, and there's always equipment that needs repair. That's become a very important part of our lives. Pharmacy is now, for 17 years, a key part of our operation. We developed an in-house neonatal pharmacy, one of the first, I think, in North America, in 1981. They've paid their way ever since in savings on drugs, never mind savings on babies, because their dosages are always right. And the choice of treatments are with their consultation. The intravenous nutrition program is totally under their supervision and guidance. We find them a remarkable part of the system. And nicely, we not only have the one pharmacist, Louis Charbonneau, for the last 9 years or so, but there are another 5 or 6 pharmacists who are trained and able to replace him for

illness, vacations, or when Louie feels he needs upgrading in the other areas of pharmacy, periodically.

END OF TAPE ONE, SIDE B

DR. KENDIG: I know you're involved in many clinical research projects at the present time. Could you tell us a little bit about your current projects and where they're heading?

DR. USHER: Well, we have a paper we've just submitted I hope sees the light of day, in which Ruth [C.] Fretts, now in Boston at Harvard, Michael [S.] Kramer, an enormous aid in epidemiology here and co-author of much of our recent work, Diana [Y.] Huang, the obstetric chief resident who is senior author of the paper, put together an analysis based on the very detailed reviews we do of all of our perinatal deaths, looking at the unexplained stillbirth. There's very little literature on what factors are associated with babies who die for no good reason in utero. Most of the papers that refer to the topic at all do not distinguish the baby who is growth-retarded from the well-grown baby. We consider growth retardation a cause of fetal death and we look at it separately. This paper looked at some 200 babies who died over my 30-year period here where a very detailed review I've been doing on every death since 1961 showed no cause of death. No maternal illness, no baby abnormality. But we did find some very interesting things, things that sometimes have been alluded to before, but rarely clearly shown. One of the biggest factors is women who are overweight when they get pregnant. One of the most surprising negative factors is the role of post-term birth. The role of maternal age doesn't play as much of a factor as we thought it would. The role of borderline IUGR is, in other words a third to the tenth percentile, quite a major factor. And the role of borderline LGA [large for gestational age] is a similarly important factor. The babies who are in between the 10th and 90th percentiles have a much lesser chance of dying in utero than the babies at either end. So that was something we've worked on for a long time and are glad to see finished.

I've been trying to finish a study I did in report for SPR 3 years ago where I looked at 30 years of neonatal intensive care, looking at changing survival rates, causes of death, disease incidences, disease specific survival rates since 1960 to 1980. We now have data up to 1995. We'd like to be able to finish that up and get it out. I think it gives a birdseye view of what's gone on in our field through actual clinical results. The work I've been doing the last 3 years and talking on is on extreme prematurity. There we've analyzed our outcomes at our hospital below 28 weeks. And there are a few things that were interesting. One is that there's been almost nothing in the literature looking at which babies at the borderline of viability are being treated with intensive care, which babies are being let to die, and what are the factors involved with that. We here had a series of some 40 babies who were let go.

We could see what gestational ages they were, and obviously all below 25 weeks, but what was the proportion at each week, what was the relationship to their Apgar score at a minute, and so forth. A second thing, rather shattering to me, is that when Dr. Synnes, Anne [R.] Synnes who runs the developmental pediatric program here looked at the results of these babies in follow-up, the handicap rate from 22 weeks to 27 weeks was about 30 percent. It was 30 percent at 22, 23 weeks. It was 30 percent at 24, 25 weeks. It was 30 percent at 26, 27 weeks. It didn't change. Now mind you, at 25 to 27 weeks, we were treating everybody, and survival rates were high. At 22 to 23 weeks, we were very selective about who we were treating. But given that selection, we didn't have a higher damage rate. I'm waiting to see what the last 4 years have done. That study ended 3 years ago in terms of data collection because now we're much more active in our treatment of the 23-weekers and even 22-weekers. I will be concerned until I see data that relieves my concern that we may be seeing a higher damage rate now as we're treating more actively.

I think I'd like to say a word now, at this point, about the thoughts I've had about the ethical issues of treating at the borderline of viability. When I was a resident in Boston, I worked for a month in the North Shore [Medical Center] hospital in Salem, Massachusetts, where a wonderful pediatrician, whom I'm blocking on the name at the moment, had been keeping records for years about their premature survival rates. But I could see there what I was soon to find in the province of Quebec, that half the babies born between 1,000 and 1,500 grams were dying. Today, it's 5 percent. The work of [Cecil M.] Drillien and others showed that two-thirds of the survivors of that weight group in the 1950s were handicapped. Today it's more like 5 percent to 10 percent. So, in those days, to do a cesarean section at 28 weeks for fetal salvage was considered irresponsible, endangering the mother for nothing. Well, if you have that historical perspective, where we were then at 28 weeks, we are now at 23 weeks.

DR. KENDIG: Exactly.

DR. USHER: Nothing has changed. All we've done is move the goal post. And the ethical issues are the same. So, I don't think one should ever say that below a certain week it's ethically improper to give intensive care. I think it depends on the results at that particular time in history and the particular type of intensive care that can be provided. You must recognize we're always going to have the borderline. We're always going to have the problem with this. We're never going to beat it. We're never going to have the situation where below a certain point in gestation everybody dies and above a point in gestation everybody survives intact. There's always going to be this uncomfortable borderline. I now have 4 grandchildren living, and I have 1 in utero. The 1 in utero just reached 25 weeks this week. I am breathing much easier. And I'm sure every neonatologist feels that way

about his patients or his family. Nobody wants to handle deliveries at the borderline of viability, but they exist. I think the problem is with us, and we've got to find a way of dealing with it. And it's not a new problem.

What else are we working on? Well, at the present moment, we're trying to write up the top-up IV nutrition for the intrauterine growth retarded. We've had a very favorable case experience with cisapride for intestinal motility, not to prevent gastroesophageal reflex, but to deal with the bowel that won't move. The baby who keeps being distended and has gaseous residuals, and you can't advance the milk. After several weeks of failure to advance the milk, we've tried cisapride in some 20 different cases, mainly under a kilo. The results seem to have been very favorable, but we're now looking at that and feeling it. The remarkable thing is that other than one paper out of Belgium 10 years ago, there's literally nothing published on the intestinal motility aspects of cisapride in the premature. And that's something else we're working on.

We've got a study group that's almost finished preparing a paper on the work we've done on the delivery of the macrosomic baby. Dr. Mark [E.] Boyd, who has been one of my research colleagues in obstetrics for the last 15 years, said to me 15 years ago, "Bob, all you're paying your attention to is these little, little babies. And you know, for us in obstetrics, that's not a concern. Our concern is with the baby who is too big. Why don't you look at that area?" So, we did, and we found that the problem had not improved with the 1980s compared to the 1960s. We had a much higher [cesarean] section rate, but we still had as many factors and policies as we had before. So, we suggested in the paper that maybe the answer might be to induce labor before the baby got too big. If he's an LGA baby, maybe induce at 37, 38 weeks. We showed that babies born at 37, 38 weeks were almost never over 4 kilos. So, our obstetricians, something they don't usually do, took our research to heart and went ahead and acted on it quickly. We now have several hundred babies who were delivered by induced labor, following induced labor for macrosomia. Not because the babies were too big, but because they were LGA, for age. When we looked at those babies who were induced before term, where the baby really was big, we found the outcome was very favorable compared with babies of similar LGA status at birth who had been allowed to go on to deliver a week or 2 later. So, we're putting that together in a paper.

As I told you, we have the new growth curves with Francie McLean we've got to get published. Mike Kramer is working on it with us. The main work in progress here is to produce the framework for future research here. Our research has been productive in the last 30 years, largely by using clinical database management. We first used the Obstetrical Statistical Cooperative in 1978. On a sabbatical year, I designed the McGill Obstetrical and Neonatal Database called MOND, which has been the basis for some 25

major publications in the last 15 years. It's now time for MOND to be revised, for the computer program to be rebuilt using modern software, database software. Bob [W. Robert J.] Funnell who designed the original program and maintained it all these years is going to supervise a new programmer who is going to totally revise it. So, the main efforts on our part these past few months have been to design what goes into that revision from a medical standpoint. God help me, I would never try to do it from a computer standpoint.

DR. KENDIG: What do you view as the most urgent needs, in general, in terms of neonatology research over the next decade or 2?

DR. USHER: I guess the 2 areas I'm most concerned about are the intestine, and chronic lung disease. I think it's horrendous we've gotten to 1998, and we still don't have the foggiest idea how to improve intestinal motility. This is why I'm excited about cisapride. It's for me the first successful intervention I've seen. But whether it's that or many other things, we need to know a lot more. It's very distressing to me that one cannot open up the literature and see good data on what are the expected time intervals from birth to full milk feedings for different categories of babies. What factors go into effecting that? There's nothing on this. I think we really need a lot of good clinical work on the intestine, and let's hope some good basic work will come out to help us, or good pharmacological work. But the clinicians have not been there. We really do not have the clinical data we need to know the standard of results with milk feeding. We have a lot of, I think, very circumstantial evidence about breast feeding having some value, using breast milk for prematures. But here we've not used that. We've fought against the current because of our interest in concentrated feedings, because of our concern about contamination of milk, because of our desire to have a standard formula the baby is receiving, rather than the very variable breast milk compositions. We've continued to use, mainly, not solely, concentrated milk formula. We were perhaps the first to, in the 1970s, recognize the lack of calcium and phosphorus adequacy in milk intake. Studies with Ross Labs [Laboratories, Inc.] about supplementation of calcium and phosphorus led to the special care Similac formulation in 1981, which I was very pleased to see the other milk companies immediately copy. The work was done by Ross Labs in many labs, but ours, I think, was the first. We were working then with Duane [A.] Benton of Ross Labs to organize the research. Now, of course, you use breast milk, but you use it fortified with calcium, phosphorus, calories and protein. I'm not exactly sure we have evidence it's giving us any better results than formula alone can give us.

DR. KENDIG: Is there any specific advice you would want to give to a young person starting out in the field of neonatology?

DR. USHER: It's exciting. [Laughs] I think as long as you're doing research, it's exciting. I think as long as you love working with people in stressful situations, as these parents are, it's very rewarding. If you go into it because of your interest in invasive technological procedures, please stay out. I think we don't need more of that. I think we do need people who are very competent in handling complex procedures, such as putting in a percutaneous, spaghetti central line, but it's not the be all and end all or the most important part of neonatology.

The belief neonatology is exhausting — here I am at my age of 69, usually feeling more exhilarated at 8:00 a.m. after a 24-hour call than I was at the beginning of the call time. Not finding at all that it is impossible to exert oneself as long as the need is there, but recognizing there needs to be teamwork. This is a field that can't operate as a solo operation, ever. There needs to be people who can replace you on a 1 for 1 basis so there's no question that whoever is on call is as competent and has as much authority as the person before or the director of the unit. This is true particularly for women in neonatology, which is now a larger and larger proportion, thank heaven, of the neonatology manpower, womanpower. It must be made possible to fit the care of the family members she's got at home, the children at home, with her professional life. There have to be ways for her to take periods of time off, for not only childbirth, but other child care needs, ways in which she can get the relief she needs for the particular age and type of children she has. Eventually those children won't need that care, and she's going to become a most valued member of the team at age whatever, 40, 45, 50, with maybe 20 years ahead of her of very full-time productive involvement, which she will enjoy very much. So, I think we've got to find ways of adapting neonatology to women's lives, who, if those women have children and have outside obligations — and of course men, such as older men — to have lesser involvement. I am now doing one-third as much clinical work as I was doing in my heyday, which now gets me down to the US. average. [Laughs] Kidding aside. It's possible to do neonatology in spite of having other desires in life. I hope people who are being turned off it because all they can see is the workload in the middle of the night can realize the guy there in the middle of the night is only on call once in 3 or 5 nights. The other 3 or 4, he's having a lovely time, with no responsibilities at all, no patients of his own to be worried about. Somebody else will look after them all perfectly.

DR. KENDIG: Dr. Usher, you have received a number of very special awards. I was wondering if you could tell us a little bit about the various awards you have received.

DR. USHER: I must say I was incredulous at the end of my career — it isn't ended.

DR. KENDIG: No.

DR. USHER: Toward the end, to be recognized. You know, when you spend your first 7 years as a research fellow, recognition is not something you could say ever had a very clear definition. The main hope was that my research grants would be renewed for not only me but for Francie McLean, my research nurse, etc. To come to the point where I feel, "Ok, I've done my stuff, I'm through, nobody's interested in what this old geek has to say anymore," and then to have 1 of the most heartwarming recognitions here in the province of Quebec. Here I am talking down on pediatrics, saying that neonatology should be quite separate, with 80 percent of the population French-speaking, with a fair amount of linguistic sensitivity going on. When I was notified a few years ago I'd been awarded the [Le Prix] Letondal of Quebec Prize for having made the most major contribution, one prize awarded per year, I was really thrilled because there are no people like your own home territory whom you feel don't appreciate you. [Laughs] You can be awarded all kinds of awards from far away, but that one has meant the most.

DR. KENDIG: Certainly very well deserved.

DR. USHER: I think it came largely from the work of the Perinatal Mortality Committee of Quebec, the development of regionalization here. The Canadian Paediatric Society followed about 2 years later, about 3 or 4 years ago, with a new award they had just developed where, I think, the Neonatal-Perinatal Medicine Section of the society developed an award for achievement for neonatology in Canada. I was very thrilled that when the award was developed the first year, they named 3 people. All of us people who'd started at the same time, Sid [Sydney] Segal in Vancouver, unfortunately now who has died, Paul [R.] Swyer in Toronto, me in Montreal, to receive the initial award. It was a real thrill to be together that night. They had a special dinner with most of the neonatologists in Canada there. [Dharmapuri] Vidyasagar was the guest speaker. We heard our lives presented in interesting ways while there.

In the foreign field, I've had a funny relationship with Latin America. Even though I tried, I don't speak enough Spanish to get along at all, Portuguese even less. But some of the work I did originally was published in *Pediatric Clinics in North America*. *Pediatric Clinics in North America* had a Spanish edition, as you may know, and that made me very well known there. One thing I haven't mentioned is the work I did with Francie McLean on gestational markers. The creases on the soles of the feet were our specialty, and breast size that others had shown, and so forth. But we reported how you tell the gestational age if you don't have a map. That was published, the RDS treatment with glucose and bicarb [bicarbonate], was published as something called the "The role of the neonatologist," about 1970. These

things made me very well known there, so we started to get invitations in Peru in 1972, where I met the Latin Americans, and from then on one after the other. I've probably been down there at least 10 times for 1 to 3 weeks at a time, speaking, meeting, touring, getting to know them, and many of them have come up to work here with me for either observational or short research periods. I consider many among my best friends in the field. So, when the Argentina Society of Pediatrics honored me by a special award 3 years ago, I guess, I was quite amazed. Then the Brazilians 2 years ago. Their perinatal society, which is huge, several thousand Brazilian perinatologists, holds a big meeting every 2 years. At that meeting, I was the 1 non-Brazilian awarded recognition.

The British awarded me their perinatal society first visiting lectureship award. So, I feel well and truly recognized. I will be able to feel as though whatever I've done has made a dent elsewhere. I've certainly enjoyed, and my wife has enjoyed thoroughly, the fact that we are now feeling at home in so many parts of North America, and so many parts of the world where people are doing what we're doing and feel a collegiality with us.

DR. KENDIG: Well, on behalf of the American Academy of Pediatrics, I'd like to thank you for sharing your thoughts, your wisdom and your experience with us today. We wish you well. Thank you very much.

DR. USHER: Thank *you* very much.

END OF INTERVIEW

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July 28th, 1997

Curriculum Vitae
Dr. Robert H. Usher

Personal: Born June 19, 1929, Montreal, Canada
Married to Anne Usher with three daughters,
a son-in-law, and three granddaughters and one grandson.

Education: Public schools in Montreal
B.Sc McGill University 1950
MDCM McGill University 1954

Residency and fellowship training:
Philadelphia General and Children's Hospitals, 1954-56
Children's Medical Center, Boston 1956-57
Royal Victoria Hospital, Montreal 1957-61
Karolinska Institute, Stockholm 1962

Activities: Medical Research Associate, MRC Canada, 1963-68
Director Neonatology, Royal Victoria Hospital since 1969
Professor, Pediatrics and OBS/GYN, McGill University since 1983
Founding member Quebec Perinatal Committee, 1967
Founding member Quebec Neonatal Society, 1988
Clinical and epidemiological research 1957 to the present

Research output:

Respiratory distress syndrome: clinical studies, description, biochemical management.
Fetal malnutrition: definition, causes, fetal and neonatal disorders associated, proportionality.
Fetal growth: Normal values, limits of normal body proportions.
Placental transfusion: blood volume studies, effects on the neonate.
Symptomatic neonatal plethora: volume studies extending the polycythemia syndrome, causes, effects.
Intravenous alimentation: introduction of lipids into IV nutrition of prematures.
Regionalisation: use of Quebec experience to demonstrate value of high risk antenatal referral.
Obstetric: Prevention of asphyxia/trauma; induction of labor; breech presentation; multiple pregnancy; perinatal mortality; postmaturity; abruptio placenta; causes of stillbirth; elderly mothers.

Current research:

Extreme prematurity
Meconium aspiration
Fetal growth using confirmed-date pregnancies
Evolution of neonatal care
Unexplained fetal death

Recent Honors:

First overseas lecturer, honorary member, British Perinatal Society, 1992
Prix Letondel, the 1993 Quebec Pediatric Association Annual award for remarkable contributions to care of premature and newborn infants
First award of the Canadian Pediatric Society for outstanding contributions to Neonatal Perinatal Medicine in Canada, 1995
Honorary member of Argentine Perinatal Society, 1995