American Academy of Pediatrics
Section on Pediatric Pulmonology and Sleep Medicine

ORAL HISTORY INTERVIEW

Alan H. Jobe, MD, PhD

Interviewed by
Steven H. Abman, 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 for the Gartner Pediatric History Center of the American Academy of Pediatrics. The 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

Steven H. Abman, MD

Dr. Abman is Professor of Pediatrics and Director of the *Pediatric Heart Lung Center (PHLC*) at the University of Colorado Denver Anschutz School of Medicine and Children's Hospital Colorado. He obtained his undergraduate degree at Carleton College, attended Northwestern University Medical School, and completed his internship and residency in the Department of Pediatrics at the University of Colorado. After serving as Chief Resident, he completed a 3-year fellowship in Pediatric Pulmonary and Critical Care Medicine, joined the faculty of the University of Colorado in 1986, and was promoted to Professor in the tenure track in 1996. His interests in both clinical and laboratory research and patient care led to the launch the *PHLC* at Children's Hospital Colorado, for which Dr. Abman has served as Director for nearly 25 years. The *PHLC* provides inter-disciplinary clinical care, research, training and education related to diverse pediatric cardiopulmonary disorders. Along with research training for many fellows and junior faculty, the PHLC has developed novel clinical care approaches that include development of the *Pediatric Pulmonary Hypertension Program* and *Ventilator Care Program*. More recently, Dr. Abman founded and continues to serve as Director of the *Pediatric Pulmonary Hypertension Network* (PPHNet), a multicenter clinical research and care group consisting of 10 leading PH centers from throughout North America, and initiated and led a joint American Heart Association/American Thoracic Society working group to establish the first joint guidelines for the care of children with pediatric pulmonary hypertension. He also helped launch the *BPD Collaborative*, a group of major medical centers with multidisciplinary programs devoted to research and clinical care of infants with severe BPD. Dr. Abman has received several national awards, including the *Outstanding Investigator Award* from the American Academy of Pediatrics (1998), the *E. Mead Johnson Award* of the SPR (1999), and the *Distinguished Achievement Award* of the American Thoracic Society for outstanding contributions to fighting respiratory disease through research, education, patient care, and advocacy (2015). He was selected for the *Mary Ellen Avery Award* (2016) from the American Pediatric Society and Society for Pediatric Research *"to recognize the lifetime achievement of a pediatric investigator who has made important contributions to neonatal health through basic or translational research."* He was also honored by the *Bengt Robertson Research Award Lecture* at the European Academic Pediatric Societies International Conference and he received the *International Arvo Yllpo Medal Award*, which is given every 5 years in recognition of outstanding research of newborn and premature infants from the chairs of the Departments of Pediatrics at the 5 Finnish medical schools, the Finnish Foundation Pediatric Research, the Finnish Pediatric Association and the Mannerheim League for Child Welfare, Helsinki Finland, 2017. Dr. Abman has also been active as an educator and research mentor for numerous trainees, which was recognized by the *Career Teachers Scholar Award* (2012) from the University of Colorado and the *Maureen Andrews Mentorship Award* from the SPR (2015). Dr. Abman has also served or led numerous study sections and workshops of the ATS, American Heart Association and NIH, and currently serves as an Associate Editor for the *American Journal of Respiratory and Critical Care Medicine*. Dr. Abman served as President of the *American Pediatric Society* in 2020-2021.

Interview of Dr. Alan Jobe for the American Academy of Pediatrics Archives

SA: I am Steve Abman, Professor of Pediatrics at the University of Colorado and Children's Hospital of Colorado. It is my distinct pleasure to have the opportunity to interview Dr. Alan Jobe to discuss his career and many of his thoughts on a range of topics, including the evolution of neonatology, academic medicine in pediatrics, research, and training, and global health, but to especially to hear of that personal touch about his own life and career, major influences along this path, advice for us regarding advancing the health outcomes for preterm newborns. As you know, Dr. Jobe is Professor of Pediatrics at the University of Cincinnati School of Medicine and the Cincinnati Children's Hospital Medical Center. Alan has had an extraordinary career as a world-renowned leader in neonatology as well as throughout academic medicine more broadly. His research and insights regarding links between basic science, translational medicine, epidemiology and others have contributed to so many breakthroughs in the care and management of preterm infants, especially from his work on the use of antenatal steroids and surfactant therapies.

In addition, his impact and legacy extend well beyond his direct contributions to respiratory physiology and clinical care of preterm newborns due to his vision, thoughtful teachings and extensive leadership throughout the academic community. Alan has enriched the lives of so many of his colleagues in academic medicine, but most importantly, his work has saved the lives of so many children and gave greater quality of life and well-being to his patients and their families. We're very grateful for Alan's many contributions, and it's our pleasure to have him here today.

Before starting with our questions, I further wish to comment on how extraordinarily productive Alan has been throughout his career. He has been actively engaged in research from the days when he did his undergraduate work at Stanford and obtained his MD and PhD at the University of California San Diego. This was followed by launching his academic career at Harbor-UCLA before moving to Cincinnati in 1999. Based on his extensive contributions and leadership, Alan has received many outstanding awards, including the prestigious Virginia Apgar Award, the Mary Ellen Avery Award of the Society for Pediatric Research and American Pediatric Society, the Arvo Yllpo Award from Finland, the prestigious Drake Medal of the University of Cincinnati, and many other recognitions, including election to the National Academy of Medicine.

I could spend the whole hour talking about your achievements and legacy, but let's go ahead and start our chat with discussing your life, influences on your own career and your views on the changes in neonatology and academic medicine more broadly. Perhaps we could start by talking about your early background: where you grew up, what influenced you to seek a career in medicine and research and go from there... So, you're a Californian boy?

Alan Jobe (AJ): **Right, I'm a third generation Californian. I was born and raised in Los Angeles, where I grew up, went to high school and all that sort of thing. Very early on, I was interested in biology, did much scuba diving and snorkeling, and was initially hoping to do marine biology. I explored that when I was in college as an option for graduate school, but the problem is that most of marine biology is high-end physics and chemistry. So I thought that probably wasn't for me. So, after finishing Stanford, I went ahead and applied to medical school. I got into several medical schools,**

and then I decided I wanted to do a PhD instead of becoming a physician. So I ended up at UC San Diego and their new molecular biology program. Which was at the time when the molecular biology new word was just being invented? I worked initially just for the initial rotation in Mel Cohen's lab at the Salk Institute where there were all these Nobel prize winners walking around. Mel was very good to me because when I was a second year graduate student there. I started working in his lab doing molecular immunology, trying to figure out why, what, and how myeloma cells would express and secrete antibody and what it specificity of the preterm might be. It also turned out that I had a bad draft number and so Mel thought it wasn't a good idea for me to go to Vietnam to die. So, Clifford Grobstein had been a professor of mine at Stanford. He was the new Dean at UCSD. Mel Cohn called Clifford Grobstein and suggested that they look at me as a medical student in their first medical school class at UC San Diego. And so I got into the medical school class in May, whereas everybody else was admitted in February or something like that.

So, I ended up going to medical school after all in the first class at UC San Diego. And then I kept doing my PhD at the same time which nobody questioned at the time. There was no formal MD-PhD program; I just did it. I had a discussion with Mel about how to do this and to try to do mouse immunology while being in medical school was impractical. However, it just wasn't practical because of the breeding and the time involved with mouse based immunologic research. So, his wife, Suzanne Burgeois, PhD was working on the Lac operon in the early days of molecular regulation. She had a PhD from the Pasteur Institute. So I started working with her because I could work with E. coli, grow them up, put them in a freezer, go to medical school, come back that evening and do an experiment. So that's how I ended up working on E. Coli and the lac operon for my graduate school experience. And that was very profitable. I got lots of papers out of that and went to a lot of meetings. That was really good. It didn't hurt that Jacques Monod, the Nobel prize winner, was walking around the lab and talking with me.

And so that was great fun. I was basically doing physical chemistry because I was measuring how the lac operon (DNA) and the repressor protein actually bound to each other. So, I was isolating the DNA from phage viruses and then isolating the protein repressor and doing kinetic measurements. Afterwards, I did my two years of medical school clinical training, and during that time, I ran a clinic in Baja, California, for a group called the “Flying Samaritans.” We went down once a month. I had my own TB and leprosy patients, so that was a real learning experience and real life medicine. So, I have seen my career sort of go and complete circle, I never formally did international health or epidemiology until I started consulting with the Gates Foundation about antenatal steroids about five years ago. So, my exposures in Mexico probably influenced me for that activity. And then I had some decisions to make, such as “what was I going to do in terms of medicine?” I didn't like taking care of old people. I didn't like psychiatry. I liked development. So, pediatrics was the way to go because pediatrics is essentially developmental biology, and I liked the acute physiology of the NICU when I did a rotation there.

I talked to Lou Gluck, who was the Head of Neonatology at UC San Diego at the time, and I got a position and as a neonatal fellow. Just a couple of anecdotes: when I first went into the NICU as a medical student, the kids with RDS were intubated on anesthesia bags. The concept of CPAP had been discovered and published in 1972, There were no infant ventilators, which meant that if you put

a baby on ventilators in that era, all you did was kill him. So, at that time, what we were doing was to have the nurses give the infant with RDS a puff on CPAP every third breath, 24 hours a day. That is, the nurse was the ventilator. And by the time I got to the NICU as a first-year fellow, we had Baby Bird ventilators, the first infant ventilator, which was a fantastic ventilator. Actually, I think it would still work very well today. And it would be much cheaper and much easier to use than the ones with all the knobs that few know how to use.

So that, that was the evolution of ventilation at the time. I have just a comment on our current situation. It used to be that your license to be a neonatologist meant that you were a card-carrying expert on how to do respiratory care for babies. And my impression now is that the fellows wouldn't have a clue about how to set up a ventilator. It's all done by respiratory therapists and the therapists do much of the management. We used to have paper flow charts where you can look at the babies and see the flow chart and see what the hell was going on. Now, it's all built into the monitor and few routinely look at the time trends. I've certainly traveled a lot and done rounds in a lot of units, including different units are in very good units, and the team sit down around a table, look at the computer screen and don't walk around and look at the baby. And that's how they do their rounds. I think that's really misguided. And I think you have to look at how the baby's breathing, because you can have a hundred different combinations of ventilatory support with a baby having normal blood gases, although the ventilator isn't working optimally. I think it really pays off if you to actually go look at the babies, even in 2021. That's I think a real weakness now that these people don't actually manage babies by their clinical findings on the physical exam, by walking around and looking at the babies, then looking at the ventilator and trying to figure out what's going on. That's just a comment on the present modern times.

SA: You had a strong basic science background and then went to medical school. As we're talking bedside care and the application of respiratory physiology, how did you come to blend these things- the science and the care- together in ways to begin to problem solve about neonatal lung disease? What was it about your background, training and experience in that period that made it so natural for you to link these worlds together?

AJ: When I started my research at UC San Diego as a fellow, the fellow in Gluck's lab was Mikko Hallman from Finland using animal models, and he was doing pool size measurements and secretory rates of surfactant components at the time, the first person to do that. So I was influenced by him. And so I started to apply my knowledge of binding kinetics, secretory rates and pool sizes from the lac operon to the surfactant system. So for the first 15 years, that's what I did. And in those days you could set up your own lab and have one technique that you were using. You didn't have to collaborate with eight different labs with mass spec and NMR and everything else to actually publish in good journals. So I had a knack for animal models. We started using rabbit models and Bengt Robertson from Sweden was ventilating, preterm rabbits to study surfactant function.

So I got him to come over to Harbor UCLA and Bengt showed us how to ventilate preterm rabbits, which led us to build our own preterm rabbit ventilators. So we started doing that and were measuring tidal volumes and lung mechanics. This got me into the physiology and got me hooked on the physiology, which we actually weren't doing in the babies at that time. But you can tell a

baby's lung compliance by doing a physical exam to look at O_2 saturation monitor. So, you know, you can do these things even in babies. Now they're doing this in a much more sophisticated ways, but you can get that information. So that's how I moved from the laboratory to the physiology. And I must say the physiology. I mean, if you want to save lives, what you have to do is examine babies and match your therapy to their physiology, and don't worry about all the other stuff.

SA: Around that time, George Gregory's work with CPAP was coming around. Do you remember when that came out and how that influenced you're approach to RDS management?

AJ: It was first published in 1972, I believe, and the interesting thing about that is- and I just gave a talk on the history of neonatal respiratory therapy- is that Gregory got his idea from a paper in *Pediatrics* from 1968 from South Africa, where they were intubating babies with RDS. They found was that if you intubate a baby with RDS, their oxygenation decreases and their grunt disappears, which isn't surprising. And if you extubate them, their grunt comes back and their oxygenation improves. So from these observations, they just empirically made the observation that CPAP might be a way to go. And Gregory used that idea, and in an era when there wasn't such a thing as human use and experimental protocols, he just went down to the NICU at UCSF and used CPAP on babies.

I've actually interviewed George Gregory, who is a real interesting character, and CPAP was a major breakthrough- probably the most important breakthrough to improve oxygenation in babies. It causes less grief than ventilators - that's for sure. I'm not convinced that the fancy new ventilators and approach to ventilation has done anything very much, that you couldn't do with CPAP. I the early days, we would use tube CPAP and go up to 15 centimeters of water pressure, a sort of "super CPAP" like they use in ARDS patients. The problem in newborns was that you can get pneumothorax, but you can treat those with a chest tube if you can get the kid to oxygenate. So, at any rate that's how I got into that track. From there, I got interested in lung injury with oxygen and mechanical ventilation. So, we did lots of animal models in rabbits and in sheep looking at injury mechanisms in the premature lung.

I went from surfactant treatment, much of my early research was funded by Ross labs, who was at the time, was working with Survanta. We did the metabolic studies for FDA-approval of surfactant, which was very satisfying. So I've been in the right place at the right time. I was at the ground floor of surfactant research. I was at the ground floor for studies mechanical injury to the preterm lung with ventilators, and I've been on the ground floor with antenatal steroids more recently. So, these are three major interventions in neonatology that might be considered The Silver Bullet in Neonatal Care, and I was fortunate to be able to participate in the early days of research with all these key interventions.

SA: I think what you also brought to the field is the ability to integrate all these strategies and to try to figure out where these pieces fit together to really to tackle the physiology better, to better understand disease and provide better care.

AJ: My PhD training was really important because that taught me how to do science. Just as an aside, Lou Gluck was Professor of Neonatology at UC San Diego, where I trained as a fellow. He had this

view that if he had an "N of one," he had the answer. So that's why he pushed early PDA ligation, which was clearly a bad idea, but this was because he had a couple of babies who did well when PDA was ligated, but that's not how you do science. So we always worked on having adequate numbers and simple statistics. My view on statistics is if you can't see the result, it's probably not a very important result even today. I think that's true. I mean, you can over manipulate data and if you can't see the results in the experimental data, then I think you have to question the importance of the results.

SA : That's right. So when you started your career as faculty, you were at Harbor-UCLA and very early on, became Director of the NICU. What was unique in that environment that stimulated and supported your career in academic pediatrics?

AJ: Harbor UCLA in the '70s was a remarkable place. Joe St. Geme was Chair of Pediatrics then, and as you know, he later became the Dean at the University of Colorado. Mike Kubak was there and he's the one that discovered how to deal with Tay-Sachs disease. David Rimoin was there, who did a lot of work on collagen and dwarfs, as well as Larry Shapiro who worked on sulfatase deficiency, it was a remarkable place for genetics. George Emmanouillides was there in Cardiology, as well as Del Fisher, who basically described how the thyroid axis works in the fetus and the newborn which led to thyroid screening. Dr. Fisher was one of my major mentors in terms of science and getting things done because he basically said, "if you don't understand the physiology, you don't understand the disease and you can't do anything about it." He basically took the position that you can use animal models to understand disease, and he used sheep to understand the thyroid axis, and from that he could develop ways to screen for thyroid disease in humans. He was a pediatric endocrinologist, and is in his nineties now. I see him about once a year. But he was really formative to make me do things the right way. When I was starting in my own lab at Harbor, UCLA Harbor was an amazing place. Supposedly based on board scores, we had the best residency training program in the country at one time, it was a small training program with 10 individuals. I had some remarkable residents, like Nate Cooperman, who is in the National Academy and now at UC Davis.

I had a bunch of really good neonatal fellows, including Harris Jacobs and Steve Seidner, who did very well and were really good at pushing me to think outside the box. I also worked with Machiko Ikegami who was an anesthesiologist and stimulated my physiology a lot with the sheep model, which was already set up at Harbor, UCLA for Dell Fisher who was working with sheep on the thyroid axis. So we partnered with him for some of initial studies. And then one of his fellows was an OB guy at Cedars named John Newnham from Western Australia. I met John and after 20 years, I was asked to come down there as a visiting professor where I reconnected with John where he was trying to do studies in Perth with no support and no infrastructure, doing ultrasound and amniocentesis in sheep models, which was not going very well. So we cooked up an experiment where we would treat sheep using intra amniotic steroids and then study lung maturation. So we did that. We met one year and the next year I just went down there and did the experiment. I've worked down there now for about 35 years. In fact, my team is actually doing sheep studies that I helped design right now in Perth, but we can't get there because of COVID and the country's closed to travelers. So I had a remarkable run with the great colleagues in Australia, which has generated over a hundred papers.

SA: Can I ask you right around that window when you started thinking about antenatal steroids, a lot of that, of course, was based on Monte Liggins' early findings. How did that stimulated the evolution in your own thinking as you began to consider antenatal steroids with the other strategies you were studying?

AJ: Well, we were interested in lung maturation, so we were using steroids and doing studies with steroids that differed from how they were being used clinically. Monte had done infusion experiments in fetuses, so I e-mailed Monte and asked him why we couldn't just give the steroids to the ewe like we do to the mother, because we know that he had problems with preterm delivery when steroids are given to sheep. And he gave me advice about how to use the steroids to the ewe to be able to get away with that strategy, and that worked. I visited him down there (in New Zealand) and he was a delightful guy, and I have a story about him too, which I'll tell. During one of the early Hot Topics meetings that Jerry Lucey was organizing on surfactant, Monte was invited and came to the U S, I believe for one of the last times he came to the US before he died. Jerry asked me to pick him up for dinner to bring him to this club and then keep track of him because he was an old guy at that time. So I pick him up and it was one of those really cold days in Washington, DC in December, where it was wet, cold and the wind was blowing. When he came down to be picked up, he just had a sport coat on, and I said, "Monte, you'll freeze to death." And he said, "no, I won't. I just got back from studying diving seals in Antarctica." So, he had adjusted, and we had a lovely evening. We went to the Jazz club the "Blue Note" and saw Winton Marsalis. Wow. That was a spectacular evening organized by Jerry Lucey. Jerry used to do those sorts of things. I miss Jerry.

Monte helped me out with the sheep, and then we just kept working down under and then it became clear to us about 10 years ago that we were using the wrong dose of the wrong drug. and we've been doing it for 40 years because when you look back over the history of antenatal steroids, this is an unapproved FDA treatment that has been used for 40 years with no pharmacology ever being done about dose and how to minimize risk of treatment for women at risk of preterm delivery. So I got on that as an idea that needed to be fixed.

When Obama was President, they had a grant mechanism called the "Challenge Grants," so I wrote up this project for that, and it actually got a really good score, but it didn't get funded. Then about five years ago, I was interacting with Jeff Murray at the Gates Foundation, who was interested in antenatal steroids because it's the WHO's number one priority in low resource environments for decreasing mortality in preterm infants. I told him they were using the wrong dose of the wrong drug. So he said, "well, send me a proposal." So the Gates Foundation funded a sheep model study and then a monkey model study. We started doing fetal sheep experiments in Australia trying to find the minimum dose and found that the minimum dose is about one 10th of the dose we're presently using. The dose we are presently using in women is 24 milligrams of dexamethasone or betamethasone. That's even more than they use when they're trying to salvage COVID patients with Dex.

So it's clearly the wrong dose. With that funding, we did that in sheep and moved on to rhesus macaques with work with colleagues at UC Davis and showed that we could get maturation at much about the same low doses. I was then funded by Gates to go to India to do a very large clinical PK-PD

study in non-pregnant reproductive age women and found out how potentially toxic the present dose is. So, when you give a woman the clinical dose of these steroids, she's gets adrenal suppression for a week, right? When she's sitting in the hospital in preterm labor, she probably needs some stress support from steroids. So I think that's something that people don't realize. Furthermore, the betamethasone acetate component of the drug, we are using a depot slow-release form of betamethasone, it's in the maternal circulation for two weeks, as we measured in the maternal circulation. Thus, the fetus is exposed to steroids for a long period if preterm delivery does not occur.

So, the fetus has being exposed for weeks to really potent drugs. So if you're interested in developmental origins of a disease, what do you use as a model? You use steroids because it predictably interferes with all sorts of pathways and re-programs the fetus. So we're doing this to fetuses- giving a drug that is unregulated and unapproved by the FDA. There's an FDA meeting about this in October, which is a ZOOM meeting. Unfortunately, I'd like to go there and harangue them about this, but at any rate, my final contribution, I hope is getting women on the appropriate dose of antenatal steroids. And the good news is that the WHO and Gates Foundation are planning to fund a low dose trial, that is being designed presently. So, it's remarkably satisfying to have a concept, take it to animal models and have it converted to a 13,000 patient randomized controlled trial funded by somebody else. I don't have to get the funding for that. There's no way I could get the funding for that myself. So anyway, that's that, that will be the end of my career when I get that solved. Yeah.

SA: Another important topic is where are we going as an academic medical community in terms of how we train and teach and help develop the next generation of Alan Jobes? You talked about the bedside differences in management over the decades and how many aspect of training and research exposure have changed over time. You describe your remarkable experiences and exposures to such talented people from multiple disciplines, each of whom enriched your career and many successful impacts on neonatal lung disease. Where are we at now to re-grow this pool of clinician-scientists, who can re-engage and blend science with our clinical teaching and care?

AJ: From my perspective, there are a number of real difficult issues. One problem is that as we continue to search to try to support the smallest and most immature fetuses is not an achievable goal at some point. Much of that is misguided because our outcomes stink in the tiniest babies and it's very expensive and I'm not sure it's worth the effort. It is true that you'll never learn how to take care of these kids unless you try. But Bill Silverman, the ethicist at the heart of neonatology, addressed this 30 years ago by recognizing that when we take care of these kids, we at the margin of viability are doing experiments and that we ought to get IRB approval and parents' signatures to experiment on their babies. If we're going to take care of a 22 weeker, it's just an experiment, and we're not actually doing clinical care that is evidence based.

So I think that's something to think about and to worry about. The other thing is that if you're a neuroscientist today, what you believe everything about abnormal humans behavior is chemistry, right? So everything that happens in the brain is chemistry. So if you have a problem the solution is to figure out the mechanism. Eduardo Bancalari and I just put together a little one-page piece for Journal of Pediatrics with the thought that I'm sure you agree with, that it's misguided to try to

define BPD. We're all struggling with the definition of BPD because what we do is exclude all the babies, we call normal, but those normal kids, those 500-gram babies who were not on oxygen at 36 weeks, all have abnormal lungs at term and many have lungs with an abnormal growth trajectory in early adulthood toward the development of COPD. This presumably is related to programming and the developmental biology of the maturation of the organ systems. These kids also have abnormal hearts, abnormal kidneys, abnormal blood pressure. So if we knew what was causing those abnormalities in terms of the developmental pathways, perhaps we could do something about them and prevent these late sequelae. So we're actually generating a large number of babies who are surviving but are going to have a lot of trouble down the line. There was an editorial recently in *Chest* by adult pulmonologists who suggested that these tiny preterm infants should have a cardiologist, a pulmonologist, and a nephrologist as physicians, by the time they reached 20, because many will have problems and they need to be followed up.

If you read the textbooks today, you'll see, it says that antenatal steroids induce surfactant, right? but that's wrong, it's very wrong. Antenatal steroids don't do anything to the type 2 cells. Although, there are receptors on the alveolar type 2 cell for steroids, but steroids modulate their mRNA expression, but not in a way that's specific for maturation, and there's research being done by Jim Bridges at the University of Colorado, who is now looking at the interstitial cells in the lung, and it appears that the fibroblast lineages in the developing lung actually are the targets for antenatal steroids. they generate the lineages that become alveolar type 1 and type2 cells and then you get surfactant once you get that accomplished. So actually the molecular biology of lung maturation is much more complicated than we have appreciated. We understand presently it has to do with interstitial cell maturation. And I guess just as an aside, we knew that many years ago, because when we treated sheep with steroids, we got maturation of lung function within 12 hours or 24 hours, yet surfactant did not increase for five days. So, clearly, I believe that something else is going on at the structural level of the lung. We just missed that in terms of understanding that what we were seeing is that lung maturation was really primarily initially a structural phenomenon in the lung, probably resulting from selective apoptosis, which was giving you a bigger total lung capacity before you ever increase production of surfactant.

One of my final goals hopefully is that we have been working for years on two pathways to maturation of the neonatal lung that are clinically relevant. One is antenatal steroids. The other is lung exposure of the fetus to inflammation, which is a more potent and more consistent maturational signal than the antenatal steroids. So, my dream is that there's are a convergence of pathways someplace in this process of interstitial cell maturation, where a single simple molecule can trigger maturation much more effectively with far less collateral damage than steroids. And then we can get off steroids and that we'll have a single pathway to maturation that incorporates both the steroid signaling and the inflammatory signaling. So, I don't know if that actually exists well, time will tell, but we're getting close to having that answer.

SA: Yes, and in addition, there is certainly a lot of very exciting work regarding progenitor cells which is evolving as playing key physiologic roles as well as becoming potential therapies.

AJ: It's all part of the same, same story. Yeah.

SA: That's exciting. So, getting back to what you and Eduardo just wrote, for example, how should we think about BPD definitions in a pragmatic way, in terms of how do we make care easier in the NICU or do what we can to modulate specific outcomes of our premature babies, short of knowing how they're going to look 10, 20, or 30 years down the road? how does one organize a clinical trial that can have clinical impact in this space?

AJ: Well, the growth industry in BPD now, as you know, as in Colorado, at CHOP and at CCHMC, is to essentially develop a severe BPD clinical unit for these chronically sick babies and try to then develop multi-disciplinary strategies for how you can try to understand their physiology. Their physiology is incredibly complicated, and we have a guy named Jason Woods at CCHMC here who is using the lung MRI unit that is in the NICU to try to image their lungs and find out what the variability of the injury is. And by understanding what the lungs looks like, maybe give us insight into how to ventilate them. It's not going to be practical to do MRI on all our babies that might have BPD. The way I see technology progressing that may be practical because companies will try to sell all the NICU and MRI use for their babies.

I'm sure that's happening right now. I see ads for it already, but I think the problem with it is actually understanding it at the level that Jason Woods does. You need to have a physicist on your staff who can fine tune this to make it into something useful. Maybe doing three dimensional reconstructions of the airways can be done by most anybody with the appropriate software, but much of the other stuff has to be fiddled with at a very sophisticated level to get the pixilation right so you can actually see what you need to see. So I don't think we can, I don't, I know people are trying to, but I don't think we can make a better surfactant. I mean, I think that commercial products are so effective in terms of improving oxygenation. I don't think we can make a better surfactant that's going to prevent BPD. I don't think the surfactant treatments are causing BPD. So, while people are trying to do that, improve surfactants, the problem with surfactant is that we need to have a cheap surfactant that is stable and can be used in the developing world. That's just not realistic now. And then you use CPAP, so you treat a baby with surfactant and then use CPAP and you do not need a ventilator in the developing world. The ventilator is just a recipe for disaster because first, they won't work without maintenance. They won't be sterile. And people won't be able to do blood gases to know what's actually going on. So the major advances that need to be made in terms of saving lives is not in Denver or Cincinnati or Philadelphia, but it's in the developing world. We need to get COVID under control, and then we can return to the other issues. I mean, I'm really impressed. I recently read in *Lancet* that there are now several vaccines that seem to be working for malaria, which is a major advance in the developing world. So, people are beginning to understand how you can make RNA vaccines that may turn out to be a major plus for a lot of diseases in the developing world where the infections disease still frequently kill infants.

SA: So any rate, so Alan, throughout your career, you have emphasized the importance of linking science, clinical care, FDA, government funding and private foundations and pharmaceuticals. How does one in academic medicine best navigate this or bring these worlds together to really get to where you're suggesting we need to go to truly impact the adverse effects of prematurity worldwide.

AJ: Well, that's, of course the big issue. You can prevent everything by preventing prematurity, but there's been no progress on that. The estrogen that they're giving now, there's pretty good data on that it is not very effective. So at the end of the day, we don't have any therapy for prematurity, particularly in the developing world. It's hard to see how we're going to make any progress until we understand prematurity in our environment. The major charities have worked together in the past few years, Burroughs Wellcome, Gates, and the March of Dimes have programs to work on causes of prematurity. But to my knowledge, none of that has been very productive yet.

SA: I also wanted to touch base with you on the huge issues that have been on unmasked by COVID in terms of racial disparities, health inequities, and related issues, which really reminds us, as you mentioned, of the perinatal origins of disease, including allostatic load, multiple antenatal stressors and environmental factors from pollutants, especially cigarettes.

AJ: The thing that is most interesting about cigarettes to me is if you look at pre conceptional exposure, conceptional exposure, and postnatal exposure, the only one that tracks across all those domains is cigarettes.

SA: That's right. I think I think that's been consistent from your work with the NIH PROP study and other cohorts, but that's one early signal that you can help identify who's at risk for late respiratory complications even beyond the label of BPD. Exposure to maternal smoking is probably the tip of the iceberg for so many other adverse exposures.

AJ: Like alcohol and drug use and other things. I'm not a sociologist and I'm primarily interested in molecules and pathways, so I'm not very philosophically engaged in the whole issue of breastfeeding, psychosocial well-being and all this sort of stuff. I must say, though, that I think that there's pretty good evidence. There's a lot of people around the world that are wringing their hands because they see in Europe and in the U S that all the new neonatal units are single room neonatal units, which I think have as many upsides as they have downsides. So when I talked to people from medically disadvantaged countries like I did in Salzburg, about two weeks ago from all over the world who don't have the resources, I tell them "don't use your resources building single bed and ICUs. Rather use your resources, your care strategies, your nurses, and your ventilators, and you know, that kind of stuff. Don't spend millions of dollars building a care strategy that you can't staff, because you don't have the nurses.

SA: You walk in the room, you can't see which bed has the crash cart next to it.

AJ: Tucked away. You can't. And you walk in the room, you can't see the baby. And we are building a new single bed NICU nursery here at CCHMC, but we have a guy named Richard Lang who is a vision molecular biologist. He has interesting data on which opsins regulate eye development. He has a paper in PNAS commenting on myopia. Many preterm infants end up having myopia and you can prevent myopia in mice by exposing the eye to a particular wavelength of light. So, our new single room NICU, we will have tuned light in wave lights to test the hypothesis that myopia is preventable. I think it's completely misguided to put babies in darkness. We know what happened if you did that in Romania in the orphanages people become blind. This whole issue of developmental care of

putting babies in isolation so that they can't move very much, and they are in the dark and they don't hear the human voice is anti-developmental. Each of those things is against what developmental biology tells us to do. So I think we can, I think one thing that happens too often is that nurses are doing the best they can, but what they do is they think what the baby would like. So they think the baby would like quiet and not moving around all the time. I don't know if that's an exaggeration or not, but they hear sound a lot from the mother. So I think isolating these babies from sensory stimulation is actually a really bad idea. That's contra to the concepts of development biology.

So anyway, the world's pretty messed up right now. We have to get COVID under control and we have to get our own country under control. And then we have to attack prematurity at the mechanistic level as best we can, yet we don't really know how to do that. I think we also have to accept limitations of what's possible in terms of human biology. I mean, there is a limit below which you're not going to be able to support an infant. And the other thing is that we know that human reproduction is actually really wasteful. Most of the early terminations have chromosome anomalies and a lot of the late terminations may also have associated abnormalities. Some of these losses probably shouldn't be prevented. So is fetal surgery going to decrease infant mortality? No, it's not going to occur frequently enough to get us off the hook for most of those things. The fetal surgery stuff is interesting and it's worth pursuing as an intellectual challenge, but it's not going to change our overall infant mortality, right?

SA: Alan, you've provided a lot of wonderful insights of the future and what it could look like and certainly understanding the past and the evolution enriches our understanding of how we could get better as we move forward as the template for the future. I want to really end by talking about where we're going with the next generation of trainees and scientists to solve these problems in an integrated world of the best of medical care. And so, how should we think now about renovating our training programs, our subspecialties in ways that could really enrich the bigger goals of solving these big problems? Is there something philosophically or something you think we could do right now to be good to challenge these things?

AJ: I think the base problem here is that most of the people coming for neonatal fellowship that I've seen in the last 10 years are not interested in science. They're interested in touchy-feely things of how the parents are responding and what the baby's doing and stuff like that, so they're interested in doing clinical trials of those things. It's not that those things shouldn't be done. It's just that the clinical trials are usually bad and underpowered clinical trials aren't a good way for fellows to build an academic career with a scientific edge to it. I'm not sure how you get people to be trained in science sufficiently to make a contribution at basic mechanisms and lung development or heart development or whatever to be able to make a contribution and compete with the PhDs who are doing similar work. I just sort of think that's perhaps not realistic now, I don't know.

SA: Yes. I wonder if academic medical centers have the resources to sustain careers in basic science to promote that aspect which becomes yet another barrier to so many of our junior scientists. There seems to be a growing emphasis in these other career paths that aren't used as, as challenging, or as in terms of risk risky for sustaining successful careers, challenging intellectually in many ways and rewarding in different ways. But the barriers we seem to throw in the paths of those who really want to blend science in the laboratory with what they're doing clinically has become immense

AJ: **Well, everything's time limited. These people don't have enough time to develop the skills they need to compete at an effective level. I mean, I did a PhD and I don't know where you got your science training, but you just probably picked it up.**

SA: Another long story in its own right. I was a late bloomer. I had never even imagined the excitement and creativity of science, especially as related to the rewards of understanding and applying science to patient care. I think that you really embody the problem-solving skills that link bench and bedside, and what it takes to really go after vital clinical problems that need to be solved, which takes a diversity of talents and backgrounds to be successful. Right?

AJ: **Absolutely.**

SA: Well, Alan, it's been an absolute pleasure to have some time to catch up a bit and talk. I really appreciate having the opportunity to discuss your career and many contributions to academic medicine, which have improved the outcomes of preterm infants throughout the world. I know that that this discussion will be very well received by the AAP and will enrich their archives. Thank you very much.

CURRICULUM VITAE
ALAN H. JOBE, M.D., Ph.D.

UNIVERSITY ADDRESS: Children's Hospital Medical Center
Division of Pulmonary Biology
3333 Burnet Avenue
Cincinnati, Ohio 45229-3039

EDUCATION:

1963 - 1967	Stanford University Biology	B.A. - Biology
1969 - 1973	University of California, San Diego	M.D.
1967 - 1973	University of California, San Diego	Ph.D. - Cell Biology
1973 - 1974	University Hospital, University of California, San Diego	Pediatric Internship
1974 - 1975	University Hospital of California, San Diego	Pediatric Residency
1975 - 1977	University of California, San Diego Division of Perinatal Medicine	Neonatology Fellowship

PROFESSIONAL APPOINTMENTS:

07/1977 - 06/1980	Assistant Professor of Pediatrics Harbor-UCLA Medical Center
07/1980 - 06/1983	Associate Professor of Pediatrics Harbor-UCLA Medical Center
07/1980 - 06/1986	Director, Neonatal Intensive Care Unit Director, Pulmonary Research Laboratory Harbor-UCLA Medical Center
07/1983 - 06/1997	Professor of Pediatrics Harbor-UCLA Medical Center
07/1991 - 06/1997	Director of Perinatal Research Laboratories and Walter P. Martin Research Center
07/1995 - 06/1997	Joseph W. St. Geme, Jr. Professor of Pediatrics UCLA School of Medicine
07/1997 - Present	Professor of Pediatrics University of Cincinnati
07/2016 - 12/1/2017	Consultant for Maternal and Infant Mortality for Bill and Melinda Gates Foundation

PROFESSIONAL SOCIETIES & POSITIONS:

1977	Western Society for Pediatric Research, Council of WSPR, 1990-1993
1979	Society for Pediatric Research, Council Member, 1984-1987 Vice President, 1987-1988, President Elect, 1988-1989, President, 1989-1990
1980	American Academy of Pediatrics
1982 - 1985	American Thoracic Society, Program Committee
1986 - 1987	Chairman - Pediatrics Assembly, ATS
1989 - 1993	Member - ATS Pediatric Pulmonary Long Range Planning Committee,
1992 - 1995	Chairman - ATS Research Fellowship Review Committee
1993 - 1995	Member - ATS Research Coordinating Committee
2003 - 2005	Member - ATS Publications Policy Committee
2007 - 2008	Member - ATS Publications Policy Committee
1986	American Society for Clinical Investigation
1988	American Pediatric Society
1989	President - Faculty Society; Harbor-UCLA Medical Center

PROFESSIONAL SOCIETIES & POSITIONS (continued):

1993 - 1994	Secretary - Board of International Pediatric Research Foundation
1993 - 1998	Member - Clinical Research Grant Review Committee for the March of Dimes
2002 - 2008	Review Committee for Basil O'Connor grants for March of Dimes
2003 - 2009	American Pediatric Society, Secretary-Treasurer

LICENSE AND BOARD CERTIFICATIONS:

1978	California License - G 2788
1978	Board Certified - Pediatrics - 021660
1979	Board Certified - Neonatology - 706
1997	Ohio License - 72418

APPOINTMENTS:

1983 - 1987	NIH Study Section-Human Embryology and Development
1987 - Present	NIH Reviewer for Program Projects, Grants, Special Projects
1993 - 1994	Member - FDA Pulmonary-Allergy Drugs Advisory Committee
1995 - 1996	Member - Maternal and Child Health Research Committee - NICHD
1996 - 2005	Chair - Steering Committee for NIH-NICHD Neonatal Network
1998 - 2003	Steering Committee for Perinatal and Developmental Medicine Symposium – Mead/Johnson Nutritionals
2000 - 2004	Selection Committee – E. Mead Johnson Research Award
1999 - 2002	American Board of Pediatrics – Sub-board of Neonatal-Perinatal Medicine
2002 - 2004	Chair - Sub board of Neonatal-Perinatal Medicine, American Board of Pediatrics
2004 - 2008	Member of NICHD Council
2009 - 2016	Chairman, Steering Committee for NICHD Global Research Network

HONORS AND RESEARCH AWARDS:

1967	Honors in Biology, Stanford
1967	Phi Beta Kappa, Stanford
1980	Voted Best Teacher by Pediatric House staff, Harbor-UCLA Medical Center
1982	Richard E. Weitzman Award in Research, Harbor-UCLA Faculty Society
1984	Ross Award in Research, Western Society for Pediatric Research
1986	E. Mead Johnson Award for Research in Pediatrics, American Academy of Pediatrics
1986	Voted Best Teacher by Pediatric House staff, Harbor-UCLA Medical Center
1999, 2000	Mead Johnson Excellence in Teaching Awards – CHMC
2002	Awarded Arvo Ylppo Medal – Pediatric Academic Societies of Finland
2005	George Simbruner Lecture Award at New Frontiers in Neonatology
2007	Elected to Institute of Medicine USA - National Academy of Medicine
2007 - Current	Clinical Professor - University of Western Australia
2009	William Silverman Lectureship, American Academy of Pediatrics
2010	Thomas Hazinski Distinguished Service Award from Society for Pediatric Research
2011	Legend for Service to Harbor UCLA/LA Biomed
2011	Virginia Apgar Award from AAP
2012	Founders Award from Midwestern Society for Pediatric Research
2017	Legend in Neonatology - Neo Conference
2017	Mary Ellen Avery National Research Award - American Pediatric Society and Society for Pediatric Research
2018	Legend of Respiratory Care - American Association of Respiratory Care

EDITORIAL APPOINTMENTS:

1984 - 1988	Associate Editor, Pediatric Research
1997 - 2015	Associate Editor, J. Pediatrics
1986 - 2005	Editorial Board, Biology of the Neonate
1992 - 1994	Editorial Board, Journal of Applied Physiology
1993 - Present	Editorial Board, American Journal of Respiratory and Critical Care Medicine
1994 - 1998	Editorial Board, American Journal of Physiology-Lung Cellular and Molecular Physiology
1995 - 1997	Editorial Board, Pediatrics
2016 - Present	Editorial Board, J. Pediatrics

RESEARCH GRANTS:

1975 - 1977	Individual Postdoctoral Fellowship
1975 - 1977	Young Investigator Pulmonary Research Grant, PI
07/1978 - 06/1979	California Lung Association Grant - Surfactant Secretion, PI
09/1979 - 08/1981	March of Dimes, Birth Defects Foundation - Surfactant Turnover in Premature and Term Newborn Lambs, PI

07/1978 - 07/1983	NIH-NICHD Research Career Development Award
10/1986 - 01/1990	Metabolism of Surfactant-TA; Ross Labs
01/1987 - 07/1989	Clearance of Liposomes from lungs: Liposome Technology Inc.
10/1977 - 07/2003	NIH-NICHD Research Grant - Lung Phospholipid Appearance and Stability, PI
10/1985 - 12/1996	NIH-NICHD Research Grant - Corticosteroid and Thyroid Effects on Lung Maturation, PI to 1993; Co-Investigator subsequently
04/1993 - 03/1998	NIH-NICHD PERC - New Strategies for Fetal Maturation, Program Director
09/1993 - 09/1998	NIH-HL PI of sub-project of Center for Gene Therapy for CF and other Lung Diseases (Jeffrey Whitsett, Program Director)
07/1994 - 06/1999	NIH-NHLBI PI of R10 Project - Fetal Maturation of the Baboon as part of Resource Center Grant (Jackie Coalson, Program Director)
04/1979 - 03/2000	NIH-NICHD Research Grant - Developmental Lung Phospholipid Metabolism - PI
07/1999 - 06/2004	NHLBI Program Project – Surfactant Homeostasis in Health and Disease – PI and project leader for Project 1
08/ 1999 - 06/2004	NHLBI Role of Surfactant Protein D in Surfactant Homeostasis – Co-Investigator
09/ 2000 - 08/2008	NHLBI RO1 – New Mediators of Lung Maturation PI
12/ 2000 - 11/2010	NICHD RO1 Antecedents to Lung Injury in the Preterm – PI
07/ 2001 - 06/2006	NICHD Neonatal Training Grant – PI
07/ 2002 - 06/2007	NICHD Pediatric Departmental Training Grant to CHMCC - Program Director
07/ 2006 - 06/2008	NIAID-R21 Postnatal Consequences of Fetal Inflammation, PI
03/ 2006 - 04/2011	R01-HD 012714 – Neonatal Resuscitation and Preterm Lung Injury, PI
02/ 2009 - 02/2013	R01-HD 057869 – Mechanism of Fetal Inflammatory Response Syndrome Induced by Chorioamnionitis, PI – Kallapur, Investigator, Jobe
09/2009 - 07/2013	R01-HL 097064 – Late Preterm Birth, Ureaplasma Species and Childhood Lung Disease, Co-PI's Jobe and Kallapur
10/2010 - 07/2014	Consultant (5% salary) to Mandate Contract to Research Technologies, Inc. from Bill and Melinda Gates Foundation to quantify causes of Infant Mortality and Identity Technologic Solutions in Developing World.
04/2010 - 03/2015	U10-HL101800 – Prematurity and Respiratory Outcomes Program, Co-PI's Jobe & Chougnet (Extended to 2016)
09/2013 - 08/2016	Burroughs-Wellcome Fund: Chougnet PI, Jobe Co-PI, Host: Microbial Cross – Talk and Pregnancy Outcomes.
07/2012 - 06/2017	R01-HD072842 – Initiation and Progression of Preterm Lung Injury with Ventilation. PI – Jobe

CURRENT RESEARCH GRANTS:

12/2015-04/30/19	OPP1132910 – Bill & Melinda Gates Foundation. Antenatal Steroid Treatments in Low Resource Countries. PI - Jobe
02/2018-07/31/19	OPP1189571 - Bill and Melinda Gates Foundation Dosing of Antenatal Steroids - Phase 1 in Nonpregnant Females

ORIGINAL ARTICLES

1. Jobe, A. A study of morphologic variation in the limpet Acmaea Pelta. The Veliger 11:69, 1968.

2. Shulman, H.M. and Jobe, A. The inhibition of heme and globin synthesis by cobalt in rabbit reticulocytes and bone marrow. Biochim. Biophys. Acta. 169:241, 1968.

3. Schubert, D.A., Jobe, A., and Cohn M. Mouse myelomas producing precipitating antibodies to nuclei acid bases and/or nitrophenyl derivates. Nature 220:882, 1968.

4. Bourgeois, S. and Jobe, A. Super repressors of the lac Operon, in the Lactose Operon, eds. J. Beckwith and D. Zipser. Cold Spring Harbor 325, 1970.

5. Jobe, A. Medical students bring monthly care to isolated Baja California. California's Health 29:6, 1971.

6. Jobe, A., Riggs, A.D., and Bourgeois, S. Characterization of super and pseudo-wild type repressors. J. Mol. Biol. 64:181, 1972.

7. Jobe, A. and Bourgeois, S. The natural inducer of the lac Operon. J. Mol. Biol. 69:397, 1972.

8. Jobe, A. and Bourgeois, S. A repressor with unique binding properties: The x 86 repressor. J. Mol. Biol. 72:139, 1972.

9. Jobe, A. and Bourgeois, S. Lactose is an anti-inducer of the lac operon. J. Mol. Biol. 75:303, 1973.

10. Jobe, A., Sadler, J.R., and Bourgeois S. The binding of lac repressor to operators containing O^C mutations. J. Mol. Biol. 85:231, 1974.

11. Bourgeois S., Barkley, M.D., Jobe, A., Sadler, J.R., and Wang, J. Effect of alteration in lac operator DNA on repressor binding. Proceedings of Symposium on Protein-legand Interactions, Konstanz, H. Sund and G. Blauer, Eds., New York, pp. 253-269, 1974.

12. Barkley, M.D., Riggs, A.D., Jobe, A., and Bourgeois S. Effector ligand of the lac repressor. Biochemistry 14:1700, 1975.

13. Jobe, A. The labeling and biological half-life of phosphatidyl-choline in subcellular fractions of rabbit lung. Biochim. Biophys. Acta. 489:440-453, 1977.

14. Jobe, A., Kirkpatrick, E., and Gluck, L. Lecithin appearances and apparent biological half-life in term newborn rabbit lung. Pediatr. Res. 12:669-675, 1978.

15. Jobe, A., Kirkpatrick, E., and Gluck, L. Labeling of phospholipids in surfactant and subcellular fractions of rabbit lung. J. Biol. Chem. 253:3810-3816, 1978.

16. Jobe, A., Mannino, F, and Gluck, L. The labeling of phosphatidylcholine in the alveolar wash of rabbits in utero. Am. J. Obstet. Gynecol. 132:53-58, 1978.

17. Jobe, A. and Gluck, L: The labeling of lung phosphatidylcholine in premature rabbits at birth. Pediatr. Res. 13:635-640, 1979.

18. Jobe, A. An *in vivo* comparison of acetate and palmitate as precursors of surfactant phosphatidylcholine. Biochim. Biophys. Acta 572:404-412, 1979.

19. Jobe, A. Kinetics of the *in vivo* labeling of the acyl groups of rabbit lung phosphatidylcholine and desaturated phosphatidylcholine. Biochim. Biophys. Acta 574:268-279, 1979.

20. Jobe, A., Ikegami, M., and Nathanielsz, P.W. The labeling of pulmonary surfactant phosphatidylcholine in 19 to 31 day old lambs. J. Dev. Physiol. 1:245-259, 1979.

21. Jobe, A., Ikegami, M., and Sarton-Miller, I. The *in vivo* labeling with acetate and palmitate of lung phospholipids from developing and adult rabbits. Biochim. Biophys. Acta 617:65-75, 1980.

22. Jobe, A. Surfactant phospholipid metabolism in 3-day and 3-day post-mature rabbits *in vivo*. Pediatr. Res. 14:319-325, 1980.

23. Jobe, A., Ikegami, M., Sarton-Miller, I., and Barajas, L. Surfactant metabolism of newborn lamb lungs studied *in vivo*. J. Appl. Physiol. 49:1091-1098, 1980.

24. Jobe, A., Ikegami, M., Glatz, T., Yoshida, Y., Diakomanolis, E., and Padbury, J. The duration and characteristics of treatment of premature lambs with natural surfactant. J. Clin. Invest. 67:370-375, 1981.

25. Ikegami, M., Jobe, A., and Nathanielsz, P.W. The labeling of pulmonary surfactant phosphatidylcholine in newborn and adult sheep. Exp. Lung Res. 2:197-206, 1981.

26. Jobe, A., Ikegami, M., and Jacobs, H. Changes in the amount of lung and airway phosphatidylcholine in 0.5 to 12.5 day old rabbits. Biochim. Biophys. Acta 664:182-187, 1981.

27. Ikegami, M., Jobe, A., and Glatz, T. Surface activity following natural surfactant treatment of premature lambs. J. Appl. Physiol. 51:306-312, 1981.

28. Glatz, T., Ikegami, M., and Jobe, A. Metabolism of exogenously administered natural surfactant in the newborn lamb. Pediatr. Res. 16:711-715, 1982.

29. Ikegami, M., Jobe, A., Jacobs, H., and Jones, S. Sequential treatments of premature lambs with an artificial surfactant and natural surfactant. J. Clin. Invest. 68:491-496, 1981.

30. Jobe, A., Ikegami, M., Sarton-Miller, I., Jones, S., and Yu, G. Characterization of phospholipid and some phospholipid synthetic and subcellular marker enzymes in subcellular fractions from rabbit lung. Biochim. Biophys. Acta 666:47-57, 1981.

31. Ikegami, M. and Jobe, A. Phospholipid composition of fetal lung fluid and amniotic fluid during late gestation in sheep. Am. J. Obstet. Gynecol. 141:227-229, 1981.

32. Jacobs, H., Jobe, A., Ikegami, M., Glatz, T., Jones, S., and Barajas, L. Premature lambs rescued from respiratory failure with natural surfactant: Clinical and biophysical correlates. Pediatr. Res. 16:424-429, 1982.

33. Clyman, R., Jobe, A., Heymann, M., and Ikegami, M. PDA with surfactant replacement therapy. J. Pediatr. 100:101-107, 1982.

34. Jacobs, H., Jobe, A., Ikegami, M., and Jones, S. Surfactant phosphatidylcholine source, fluxes, and turnover times in 3 day old, 10 day old, and adult rabbits. J. Biol. Chem. 257:1805-1810, 1982.

35. Ikegami, M., Jacobs, H., and Jobe, A. Surfactant function in the respiratory distress syndrome. J. Pediatr. 102:443-447, 1983.

36. Jacobs, H., Jobe, A., and Ikegami, M. The significance of reutilization of surfactant phosphatidylcholine in 3-day-old rabbits. J. Biol. Chem. 258:4159-4165, 1983.

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38. Jobe, A., Ikegami, M., Glatz, T., Yoshida, Y., Diakomanolis, E., and Padbury, J. Saturated phosphatidylcholine secretion and the effect of natural surfactant on premature and term lambs ventilated for 2 days. Exp. Lung Res. 4:259-267, 1983.

39. Jobe, A., Jacobs, H., Ikegami, M., and Jones, S. Cardiovascular effects of surfactant suspensions given by tracheal instillation to premature lambs. Pediatr. Res. 17:444-448, 1983.

40. Jobe, A., Ikegami, M., Jacobs, H., and Jones, S. Surfactant pool sizes and severity of RDS in prematurely delivered lambs. Am. Rev. Respir. Dis. 127:751-755, 1983.

41. Jobe, A., Ikegami, M., Jacobs, H., Jones, S., and Conaway, D. Permeability of premature lamb lungs to protein and the effect of surfactant on that permeability. J. Appl. Physiol. 55:169-176, 1983.

42. Jacobs, H., Jobe, A., Ikegami, M., Jones, S., and Miller, D. Route of incorporation of alveolar palmitate and choline into surfactant phosphatidylcholine in rabbits. Biochim. Biophys. Acta 752:178-181, 1983.

43. Jobe, A., Ikegami, M., Jacobs, H., and Jones, S. Surfactant and pulmonary blood flow distributions following treatment of premature lambs with natural surfactant. J. Clin. Invest. 73:848-856, 1984.

44. Jacobs, H., Jobe, A., Ikegami, M., Miller, D., and Jones, S. Reutilization of phosphatidylcholine analogues by the pulmonary surfactant system - the lack of specificity. Biochim. Biophys. Acta 793:300-309, 1984.

45. Ikegami, M., Jobe, A., Jacobs, H., and Lam, R. A protein from the airways of premature lambs that inhibits surfactant function. J. Appl. Physiol. 57:1134-1142, 1984.

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47. Jobe, A., Jacobs, H., and Ikegami, M. Lack of correlation of severity of lung disease with the phosphatidylcholine concentration in fetal lung fluid from premature lamb at 133-136 days gestational age. J. Devel. Physiol. 6:417-421, 1984.

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51. Jacobs, H., Jobe, A, Ikegami, M., and Jones, S. Accumulation of alveolar surfactant following delivery and ventilation of premature lambs. Exp. Lung Res. 8:125-140, 1985.

52. Oguchi, K., Ikegami, M., Jacobs, H., and Jobe, A. Clearance of large amounts of natural surfactant and DPPC from lungs of 3-day-old rabbits following tracheal injection. Exp. Lung Res. 9:221-235, 1985.

53. Jacobs, H.C., Ikegami, M., Jobe, A.H., Berry, D.D., and Jones, S. Reutilization of surfactant phosphatidylcholine in adult rabbits. Biochim. Biophys. Acta 837:77-84, 1985.

54. Baylen, B.G., Ogata, H., Ikegami, M., Jacobs, H., Jobe, A., and Emmanouilides, G.C. The contractile state and performance of the preterm left ventricle before and after early patent ductus arteriosus occlusion in surfactant treated lambs. Pediatr. Res. 19:1053-1058, 1985.

55. Robertson, B., Berry, D., Curstedt, T., Grossmann, G., Ikegami, M., Jacobs, H., Jobe, A., and Jones, S. Leakage of protein in the immature rabbit lung; effect of surfactant replacement. Respir. Physiol. 61:265-276, 1985.

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LECTURES / VISITING PROFESSORSHIPS

2010

Feb. 7-8, 2010	**Am. Acad. of Pediatrics – Neo Prep, Newport Beach, CA**
Invited Speaker	Pulmonary Development, Bronchopulmonary Dysplasia
Feb. 17-19, 2010	**Bangkok Int. Neonatology Symposium, Bangkok, Thailand**
Invited Speaker	Strategies to Minimize the Development of BPD Lessons from Neonatal Clinical Research
Mar. 5, 2010	**CCHMC Course on Development & Disease**
Lecture	The Barker Hypothesis
Mar. 12-14, 2010	**Ipocrates Symposium – New Delhi, India**
Invited Speaker	Neonatal Pulmonary Critical Care Antenatal Corticosteroids – The Good Stuff Lung Injury in the Delivery Room The Clever Fetus: Coping with Chorioamnionitis Miracle Babies, Surfactant, and RDS

Thoughts about the Pathophysiology of BPD
Clinical Research in Neonatology

Mar. 17, 2010 — **Repeat 4 of the lectures in Nagpur, India at Indira Gandhi Gov. Medical Center**
Invited Speaker

Mar. 25, 2010 — **President's Distinguished Lecture – 57th Annual Meeting of the Society for Gynecological Investigation Orlando, FL**
Invited Speaker
Miracle VLBW Babies: Examples of Developmental Plasticity

Apr. 21, 2010 — **Solutions in Obstetrics in Rural Counties – Blue Cross Health Found, Chattanooga, TN**
Invited Speaker
Antenatal Steroids: Risks, Benefits and Treatment Options

May 1-4, 2010 — **Pediatrics Academic Societies, FOPO Symposium on Academic Pediatrics Vancouver, Canada**
Lectures
Residents and Research
J. Pediatrics Workshop – How to Write as Paper
Thomas A. Hazinski Distinguished Service Award from SPR

May 4-6, 2010 — **2nd Neonatal Resuscitation Research Workshop, Vancouver, Canada**
Moderator/Lecture
Summary Talk – Send Us Away Wiser

May 20-23, 2010 — **Southern Association of Neonatologists, Marco Is., FL**
Invited Speaker
Antenatal Corticosteroids
Difficult Questions about Clinical Research in Neonatology
Newborn Implications of Immune Modulation in the Fetus

Sep. 18, 2010 — **European Respiratory Society Symposium, Barcelona, Spain**
Invited Speaker
Managing the Lung of the ELBW in the Delivery Room
Mechanisms of Early Lung Injury

Oct. 2, 2010 — **American Academy of Pediatrics – Fall Meeting, San Francisco, CA**
Invited Speaker
Ventilation Strategies in ELBW Infants

Oct. 19, 2010 — **Save the Children/USAID/MCHIP, Washington, DC**
Speaker/Participant
Workshop: Improving Survival of Preterm Births in Developing Countries
State of Maternal Steroid Use in Developed Countries

Oct. 24-29, 2010 — **Salzburg Columbia Seminar in Maternal and Infant Health, Salzburg, Austria**
Invited Speaker
Antenatal Steroids: A Perinatal Success
Pathophysiology and Treatment of RDS
History and Current Use of CPAP
The Clever Fetus: Coping with Infection

Nov. 15-17, 2010 — **2nd Int. Congress of Union of European Neonatal and Perinatal Societies, Istanbul, Turkey**
Invited Speaker
Perinatal Inflammation and Lung Development
Injury and Inflammation for Resuscitation of the Preterm
Challenges in Clinical Research in Neonatology

Nov. 19-20, 2010 — **Ipocrates 30th Anniversary Celebration, Kos, Greece**
Invited Speaker
Neonatal Clinical Research: from Innovation to the End of Progress

Dec. 6-7, 2010 — **Hot Topics in Neonatology, Washington, DC**
Planner/Moderator

2011

Jan. 16, 2011 Participant	**Workshop: Federation of Pediatric Organizations, Houston, TX** Crafting the Successful Clinical Scientist
Jan. 28, 2011 Lectures	**Children's Hospital, Columbia Univ., New York, NY** Pediatric Grand Rounds: The Challenges of Clinical Research Research Talk: The Clever Fetus – Immune Adaptations to Infection/Inflammation
Feb. 17-18, 2011 Lectures	**Visiting Professor, University of Illinois, Chicago, IL** Pediatric Grand Rounds: Miracle VLBW Babies – Survival with Altered Development Clinical Talk for Residents: Why Surfactant Works for RDS Research Talk: Innate Immune Responses of the Fetus
Feb. 24, 2011 Invited Speaker	**Neonatal Frontiers, Orlando, FL** Markers of BPD – Cytokines and Early Detection
Mar. 4, 2011 Invited Speaker	**California Association of Neonatologists, San Diego, CA** Chorioamnionitis and BPD
Mar. 24-26, 2011 Invited Speaker	**Advances and Challenges in Neonatology, Lisbon, Portugal** Respiratory Adaptations to Birth Why Surfactant Works/Why Many Surfactants do not have BPD
Mar. 31, 2011 Invited Speaker	**28th Conference on High Frequency Ventilation, Snowbird, UT** 14th Robert de Lemos Memorial Lecture: CPAP – Where We Have Been and Where We are Going
Apr. 14-15, 2011 Invited Speaker	**Non-Invasive Respiratory Care in the Newborn and Infant, Bologna, Italy** Minimizing Lung Injury with the Initiation of Ventilation The Pathophysiology and Treatment of BPD
Apr. 18-20, 2011 Teacher	**Preventing and Protecting Brain and lung from Injury, Ipocrates – Rome, Italy** Can CPAP Preserve the Developing Lungs and Brain BPD – Opportunities to Injure the Lungs and Brain Miracle VLBW Babies – Plasticity and Survival
Apr. 30 - May 3, 2011 Invited Speaker	**Society for Pediatric Research, Denver, CO** Acute Lung Injury: Pathophysiology and Intervention Targets
Apr. 12, 2011 Recipient of Award	**Legends, Harbor UCLA/Biomedical Research Institute** Legend – Distinguished Service Award
May 15-18, 2011 Invited Speaker	**American Thoracic Association Annual Meeting, Denver, CO** BPD: Development and Progression in the NICU
May 26-27, 2011 PhD Defense Symposium Speaker	**Karolinska Institute, Stockholm, Sweden** PhD Defense: Maria Altman – Moderately Preterm Infants Lecture: Survival Adaptations of VLBW Infants and Implications for Outcomes
Jun. 3, 2011 External Reviewer for Training Program	**Rainbow Babies and Children's Hospital, Cleveland, Ohio** Lecture: The Clever Fetus: Responding to Inflammation
Jun. 15-17, 2011 Invited Speaker	**Perinatal Medicine – 2011, Harrogate, UK** 15th Peter Tizard Lecture - Who are these Miracle Babies?
Aug. 30-31, 2011 Participant and Speaker	**NIH Workshop: developmental Origins of Asthma, Bethesda, MD** Strategies for Primary Prevention Talk: Prematurity and Other Perinatal Risks for Asthma and Airway Disease

Sept. 12-13, 2011
Invited Speaker
Festschrift for Feizal Waffam: How Surfactant Revolutionized the Care of Preterm Babies
Lecture: Chorioamnionitis and Fetal Inflammation

Sept. 18-20, 2011
Lectures
34th Mid-Atlantic Conference on Perinatal Research, Charlottesville, VA
Conundrums in Clinical Research in Neonatology
Jerry Elliott Memorial Lecture: Miracle Babies – Why Tiny Babies Survive

Sept. 28, 2011
Invited Speaker
European Respiratory Society, Amsterdam, The Netherlands
Symposium: From Chronic Lung Disease in Childhood to COPD
Chronic Lung Disease of Prematurity – An Overview

Oct. 2-4, 2011
Invited Speaker/
Session Chair
VI – Recent Advances in Neonatal Medicine, Wurzburg, Germany
Workshop: How to Write a Successful Grant Application
Lecture: Chorioamnionitis and Neonatal Morbidity: A Casual Relationship or Myth?

Oct. 6, 23011
Invited Speaker
Symposium for Inauguration of Boris Kramer as Professor, Maastricht, The Netherlands
Thoughts about Lung Injury with Resuscitation of Infants

Oct. 15, 2011
Honoree
AAP – National Conference, Boston, MA
Acceptance of Virginia APGAR Award from the Section on Perinatal Pediatrics

Oct. 22, 2011
Lectures
Korean Society of Neonatology, Seoul, Korea
BPD: Past, Present, and Future
New Therapeutic Options in BPD

Nov. 8-10, 2011
Lectures
10th World Conference of Perinatal Medicine, Punta del Este, Uruguay
New Guidelines for Delivery Room Resuscitation
Risks and Outcomes of Late Preterm Deliveries
Symposium: Ventilatory Support – Lung Injury
Respiratory Support in the NICU – CPAP vs. Ventilation Strategies

Nov. 14, 2011
Lecture
4th Day of Clinical Investigator of Maternal – Infant Health, Buenos Aries, Argentina
Clinical Research Networks

Nov. 29- Dec. 1, 2011
Visiting Professor
University Texas Southwestern – Department of Pediatrics, Dallas, TX
Prematurity, Inflammation, and Fetal Response
Who are these Miracle VLBW infants?

Dec. 4-6, 2011
Moderator
Hot Topics in Neonatology, Washington, DC

2012

Jan. 23, 2012
Invited Speaker
AAP NeoPrep, New Orleans, LA
BPD
RDS and Surfactant Physiology

Jan. 27, 2012
Invited Speaker
University of Miami, Miami, FL
Ureaplasma and the Preterm Infant

Feb. 8-10, 2012
Invited Speaker
Bangkok International Neonatology Symposium: 2012
Translating Scientific Observations into Clinical Practice
Pre and Postnatal Factors that Enhance Survival of VLBW Infants
Panel Presentations: Strategies to Prevent Neonatal Lung Injury

Mar. 30 – Apr. 1, 2012
AAP Workshop on Perinatal Practice Strategies, Phoenix, AZ

Invited Speaker	L. Joseph Butterfield Lecture: Why Research Matters, or Conundrums in Neonatal Research Imprinting the Blueprint: The Role of Epigenetics in Neonatology
Apr. 9-10, 2012 Invited Speaker	**Adverse Events and Safety in Neonatal Intensive Care, Tallinn, Estonia** Newborn Resuscitation and Lung Injury Miracle VLBW Infants – Why they Survive Why CPAP May Protect the Preterm Brain A View of RDS in 2012 Conundrums in Neonatal Research
Apr. 18, 2012 Invited Speaker	**U.C. Davis Lung Research Day, Davis, CA** Inflammatory M0odulation of Lung Development
Apr. 28 - May 2, 2012 Invited Speaker	**Pediatric Academic Societies, Boston, MA** Experimental Models of Inflammation: Effects on Lung
May 17-19, 2012 Visiting Professor	**UCSF Tooly Lecture, San Francisco, CA** Miracle Lungs in Tiny Infants The Future of the VLBW-BPD Lung Review of Fellowship Program
May 24-26, 2012 Invited Speaker	**3rd International Conference on Clinical Neonatology, Torino, Italy** Chorioamnionitis and Fetal Immune Modulation What is RDS in 2012? What is BPD in 2012 and what will BPD Become?
Jun. 13-16, 2012	**13th Perinatal Medicine: European Association of Perinatal Medicine, Paris, France** Nonventilatory Strategies for Prevention of BPD
Aug. 4-5, 2012 Invited Speaker	**Society of Gynecologic Investigation Satellite Symposium: Prematurity and Stillbirth, Brisbane, Australia** Fetal Immune Tolerance as a DOHaD
Aug. 6-8, 2012 Invited Speaker	**Ipocrates Seminar: Neonatal Pulmonary Critical Care, Singapore** Surfactant Administration: Current Concepts Why CPAP Works in VLBW Infants The New BPD: Its Definition, Pathophysiology, and Management Antenatal and Postnatal Steroids: A View from 2012
Sept. 13, 2012 Visiting Professor,	**Grand Rounds, University of Chicago-Pediatrics, Chicago, IL** The New BPD – Definition, Pathophysiology, and Management
Sept. 17-18, 2012 Invited Speaker	**Keynote Speaker: University of Giessen and Marburg Lung Center Symposium on Developing the Lung, Waldeck, Germany** What is BPD?
Oct. 4-5, 2012 Invited Speaker	**Midwest Society for Pediatric Research, Columbus, OH** Founders Award: From Lung Maturation to FIRS
Nov. 7-9, 2012 Invited Speaker	**International Seminar on Extremely Premature Newborns, Mexico City, Mexico** Miracle Babies – Why do they Survive? What is RDS in the Extremely Premature Neonate? BPD: Why is it Such a Big Problem in the Extremely Premature Neonate?
Nov. 12, 2012 Invited Speaker	**Perinatal Symposium, Puebla, Mexico** Antenatal Corticosteroids – Standard of Care and Remaining Questions

Nov. 15-17, 2012 — **21st Brazilian Congress of Perinatology, Curitiba, Brazil**
Invited Speaker
New Perspective in Antenatal Corticosteroids
Lung Club: From Surfactant and Lung Maturation to FIRS
Strategies to Reduce Neonatal Mortality from RDS

Nov. 19-20, 2012 — **Review of Research Programs of Fundasamin, Buenos Aires, Argentina**
Consultant

Dec. 3-5, 2012 — **Preventing Prematurity: Establishing a Network for Innovation and Discovery, Newport Beach, CA**
Participant

2013

Jan. 25, 2013 — **Resident Teaching Conference: University of Miami**
Invited Speaker
Lung Maturation and RDS

Feb. 21-23, 2013 — **Emperical Bioethics: Emerging Trends for the 21st Century**
Invited Speaker
Publishing in Emperical Bioethics

Mar. 21, 2013 — **Chiesi Expert Panel Meeting on BPD – Ancona, Italy**
Invited Speaker
an Overview of BPD

Mar. 22, 2013 — **One Day on the Neonatal Lung – Ancona, Italy**
Invited Speaker
Inflammation and Injury from Initiation of Ventilation

Apr. 17-19, 2013 — **International Seminar #15: Advances in Neonatal Pediatrics**
Invited Speaker
Antenatal Corticosteroids for More Mature Fetuses
Respiratory Distress Syndrome – 2013
Surfactant and Treatment Strategies
Bronchopulmonary Dysplasia – 2013

Apr. 30 – May 2, 2013 — **3rd Neonatal Resuscitation Research Workshop, Washington, DC**
Invited Speaker
What is Lung Injury?

May 3-7, 2013 — **Pediatric Academic Societies, Washington, DC**
Invited Speaker
Chorioamnionitis and the Pathogenesis of Preterm Labor

May 9-12, 2013 — **9th Asian SPR and 20th PSM Annual Congress**
Invited Speaker
The Golden Minute of Resuscitation – Kuching, Malaysia
Surfactant in Reducing lung Inflammation
Prenatal Corticosteroids and Maturational Effects on the Preterm Lung
Chorioamnionitis

May 13, 2013 — **Lectures at KL University and for Malaysian Neonatologists**
Invited Speaker
Lung Problems in Prematures – Kuala Lumpur
Antecedents and Outcomes – Malaysia
Surfactant for RDS – Why it Works

May 15, 2013 — **Philippine Society of Newborn Medicine, Manila**
Invited Speaker
Antenatal Steroids and Surfactant:
Then Roles in Resource Limited Environments - Philippine Islands

May 17, 2013 — **Lecture for Neonatologists – Saigon, Saigon, Vietnam**
Invited Speaker
Surfactant for RDS: Clinical Cases and Treatment Strategies

May 22, 2013 — **Trans-Canada Neonatal Conference, Ottawa, Canada**
Invited Speaker
Miracle Babies: The Past and Future of Neonatology

Jun. 3, 2013 — **Retirement Symposium Honoring Mikko Hallman, Oulu, Finland**
Invited Speaker — Inflammatory Effects on the Fetal Lung

Jun. 9-15, 2013 — **Salzburg/Columbia Univ. Seminar in Maternal and Infant Health, Salzburg, Austria**
Invited Speaker — BPD: Pathogenesis and Inevitability
Why Surfactant Treatments Work
Conundrums in Perinatal Research
Chorioamnionitis and Fetal Inflammatory Response

Sept. 18-19, 2013 — **Grand Rounds & Schiff Symposium, Stollery Child Hospital, Edmonton, Canada**
Invited Speaker — Practical Aspects of Fetal and Neonatal Lung Development
BPD – Initiation and Progression

Sept. 25-28, 2013 — **Current Concepts in Neonatal Care, Napa, CA**
Invited Speaker — RDS – 2013
CPAP vs. Surfactant Treatment
BPD – Initiation and Progression
Miracle VLBW Babies: Why They Survive

Nov. 1-3, 2013 — **17th Hellenic Congress of Perinatal Medicine, Athens, Greece**
Invited Speaker — Unanswered Questions About Antenatal Steroids
Pathophysiology and BKD Outcomes – Better Than We Might Expect?

Nov. 13-16, 2013 — **37th Miami Neonatology – 2013, Miami Beach, FL**
Invited Speaker — Antenatal Corticosteroids – Remaining Questions and Concerns
Chorioamnionitis and Ureaplasma: Are They Threats for the Neonate?

Dec. 10-11, 2013 — **Hot Topics in Neonatology, Washington, DC**
Moderator — Oxygen Targeting

2014

Jan. 13, 2014 — **AAP Neoprep – San Diego, CA**
Invited Speaker — RDS and Surfactant Physiology
Bronchopulmonary Dysplasia

Jan. 24, 2014 — **University of Miami – Neonatology – Oxford, OH**
Visiting Professor — Staff Conference: The NICU Environment – What is Good for the Preterm Brain?
Neonatal Conference: Thoughts on Implications of Oxygen Trials

Feb. 26-28, 2014 — **Bangkok International Neonatology Symposium – 2014**
Invited Speaker — The Inevitability of BPD in Some Infants
What to do About Optimizing Oxygen?
Why VLBW Infants can Survive

Mar. 21, 2014 — **Department of Pediatrics - Columbia University, New York, NY**
Visiting Professor — Grand Rounds: BPD – Inevitability and Outcome
Neonatal Teaching: Chorioamnionitis

Apr. 29, 2014 — **Department of Pediatrics – UC Davis, Sacramento, CA**
Invited Speakers — The NICU Environment – What is Good for the Preterm Brain

May 9, 2014 — **Abbvie Advisor Committee - Chicago, IL**
Consultant — Lecture: Surfactant Administration - Formulation

May 17-21, 2014 — **American Thoracic Association – San Diego, CA**

Invited Speaker
Postgrad Course: BPD
Year in Review: Neonatal Lung Disease
Poster Symposium: Moderator – What is New in Lung Development and Early Life Infection?

May 22-25, 2014
Southeastern Association of Neonatologists – 28th Conference - Marco Island, FL
Invited Speaker
Why do ELBW Infants Survive?
NICU Environment: What is Good for the Preterm Infant?
Why BPD May be Inevitable in Some ELBW Infants

Jun. 10, 2014
Advisory Board for Sobi on KGF for BPD – Stockholm, Sweden
Consultant
Patient Journey, Current Treatment of BPD, and Unmet Medical Needs

Aug. 15, 2014
The 1st 5 Minutes – Symposium honoring Ruth Deddish – Northwester, Chicago, IL
Invited Speaker
Early Lung Protection

Sept. 17-20, 2014
The Best of Ipocrates: An Update in Neonatology – Leaven, Belgium
Invited Speaker
The Changing Incidence and Diagnosis of RDS
Miracle VLBW Babies – Why and How they Survive
BPD – Pathophysiology and Outcomes

Oct. 15018, 2014
VIII Pan American Congress of Neonatology – Cartegena, Columbia
Invited Speaker
What is RDS in 2104?
BPD – Pathophysiology and Longer-Term Outcomes
The Known and Unknown about Antenatal Steroids

Oct. 28-29, 2014
FDA/CIP – 1st Annual neonatal Scientific Workshop – Washington, DC
Participant
Pulmonary Biomarkers in Neonates
Clinical Pulmonary Outcomes

Oct. 30, 2014
Harbor – UCLA Medical Center – Torrance, CA
Invited Speaker
Antenatal Steroids – Surprising Knowledge Gaps
Seminar for Neonatal Fellows

Nov. 12-14, 2014
Cure Intensive in Pediatria: L'urgenza Formativa – Padova, Italy
Invited Speaker
The Fascinating History of CPAP
BPD – What is It/Can It be Prevented?
Lung Injury from Resuscitation of the Preterm
The NICU: Risks of Overstimulation or Sensory Deprivation

Dec. 7-10, 2014
Hot Topics in Neonatology – Washington, DC
Moderator
BPD – Therapies and Outcomes

2015

Jan. 21-22, 2015
University of Alabama, Birmingham, AL
Visiting Professor
Peds. Grand Rounds: BPD – Inevitability and Outcomes
Perinatal Grand Rounds: The Fascinating History of CPAP
Fellows Research: Fetal Infection/Inflammation and Newborn Outcomes

Jan. 23, 2015
University of Miami – Coral Gables, FL
Visiting Professor
Knowns and Unknowns about Antenatal Steroids
Strengths and Weaknesses of Animal Models of BPD

Jan. 26 2015
NICHD Workshop on Chorioamnionitis – Bethesda, MD
Participant
Chorioamnionitis, Definitions, Colonization vs. Infection – Benefits & Risks

Feb. 18-19, 2015
Loma Linda University/Children's Hospital – Loma Linda, CA
Visiting Professor
Neonatology Joint-Fellowship Conference

Update on Bronchopulmonary Dysplasia
Evening Lecture: Conundrums in Neonatal Clinical Research
Perinatal Seminar: Knowns and Unknowns about Antenatal Corticosteroids

Mar. 6, 2015 — **CCHMC 2015 Neofest: Neonatal Resuscitation, Cincinnati, OH**
Lecture — Lung Injury During Resuscitation

Mar. 15, 2015 — **Chiesi – Parma, Italy**
Lecture — BPD into the Future

Mar. 20-22, 2015 — **Jakarta, Indonesia**
Invited Speaker — Symposia: Challenges I Neonatal Care
Knowns and Unknowns about Antenatal Steroids
What is RDS in 2015?
Conundrums in Neonatal Clinical Research
BPD: Treatment and Prevention
The Value of Neonatal Networks

Mar. 24, 2015 — **Dr. Sardjito Hospital, Yogayakarta, Indonesia**
Invited Speaker — Antenatal Corticosteroids in At-Risk Pregnancies

Mar. 27-29, 2015 — **22nd Perinatal Society of Malaysia Congress – Johor, Malaysia**
Invited Speaker — Plenary: The Preterm Lung – What is RDS in 2105?
The use of Steroids and Knowledge Gaps
Neonatal Outcomes of Chorioamnionitis
Special Lecture: Conundrums in Neonatal Research

Mar. 30, 2015 — **University Hospital – Kuala Lampur, Malaysia**
Invited Speaker — BPD & RDS

Apr. 28-30, 2015 — **4th Neonatal Resuscitation Research Workshop – San Diego, CA**
Invited Speaker — Why CPAP does not Prevent BPD

May 7-9, 2015 — **IPOCRATES: Care of the Extremely Preterm Infant – Oporto, Portugal**
Invited Speaker — Effects of Chorioamnionitis on the Developing Fetus
The Fascinating History of CPAP
What is RDS in ELGANS?
Antenatal and Postnatal Steroids in ELGANS
Sensory Exposures and Brain Development

May 14-15, 2015 — **Children's Hospital of Michigan – Detroit, MI**
Invited Speaker — 7th Dr. Sophie Womack Lectureship:
Chorioamnionitis/Inflammation and Neonatal Outcomes
Conundrums in Neonatal Research

May 16-19, 2015 — **American Thoracic Society – Denver, CO**
Invited Speaker — PROP – NHLBI: BPD in the Era of the Modern NICU

Jun. 4-5, 2015 — **Mid-Atlantic Neo Forum – 2015 - Morristown, NJ**
Invited Speaker — The NICU Environment – What is good for the Preterm Brain?
Fetal Inflammation and Newborn Outcomes

Jun. 8-9, 2105 — **Pediatrics and Newborn Medicine, Brigham & Women's Hospital, Harvard University**
Invited Speaker — The Knowns and Unknowns about Antenatal Steroids
The Ventilator – BPD Dilemma

Aug. 7, 2015 — **25th Annual Meeting for Sheep Research – Pemberton, Western Australia**
Organizer — 25 Years of Research . . . and Still Loving It

Sept. 2-3, 2015
Moderator/ Participant
Antenatal Corticosteroids Research Webinar, Washington, DC
Summary of ANS Research

Sept. 4, 2015
Invited Speaker
Millers Children's Hospital at Long Beach Memorial, Long Beach, CA
CPAP/Ventilation/BPD
The NICU Environment - What is Good for the Preterm Brain?

Sept. 9-10, 2015
Invited Speaker
International Conference for Evidence-Based Neonatology
Antenatal Steroids: evidence Limits to Contemporary Clinical Practice

Sept. 18-20, 2015
Moderator/Speaker
2nd Annual Neonatal and Cardiopulmonary Biology Young Investigators Forum, Chicago, IL
Reflections of a Career: Advice for the Next Generation

Oct. 1-2, 2015
Organizer/Speaker
NHLBI Workshop: Prenatal/Postnatal Determinants of Lung Health and Disease in Early Life
Overview: Perspective and Goals

Oct. 7-8, 2015
Invited Speaker
Global Experts Meeting 13: Rome, Italy
Fetal and Neonatal Exposures that Effect Lung Outcomes Workshop:
When to Intubate and Extubate

Oct. 15-17, 2015
Invited Speaker
6th International Seminar in Neonatology – Acapulco, Mexico
Fetal Infections that Affect the Newborn
Lung Injury During Resuscitation

Oct. 24, 2015
Nominator & Introducer
Presentation of Virginia Apgar Award to Dr. Jeffrey Whitsett, MD

Oct. 29, 2015
Invited Speaker
2015 Bowman Symposium on Neonatal Research – Winnipeg, Canada

Nov. 27-28, 2015
Invited Speaker
Cool Topics in Neonatology – Royal Women's Hospital, Melbourne, Australia
Antenatal Steroids – the Unknowns
The Fascinating History of CPAP
Pathophysiology of Chorioamnionitis and Newborn Outcomes

Dec. 3, 2015
Invited Speaker
Memorial Symposium – Columbia University, New York, NY
BPD

Dec. 6-9, 2015
Organizer/Moderator
Hot Topics in Neonatology
What Oxygen Saturation Should We Use?

2016

Jan. 22, 2016
Invited Speaker
Visiting Professor – University of Miami Neonatology – Miami, FL
Antenatal Associations with BPD
The Fascinating History of CPA

Jan. 23-29, 2016
Invited Speaker
2016 NeoPrep for AAP – Atlanta, GA
RDS and Surfactant Deficiency
Choric Lung Disease
Expert Panel: Resuscitation of ELBW infant

Feb. 1-2, 2016
Invited Speaker
Course the Recently Born Preterm – Soociedad Cubana de Pediatria Havana, Cuba
How Surfactant Works

Use of CPAP in the Recently Born Preterm
Fundamentals of Use of Antenatal Steroids
Clinical Outcomes after Chorioamnionitis

Feb. 24-26, 2016 — **International Neonatology Symposium Bangkok, Thailand**
Invited Speaker
Challenges for Clinical Research in Neonatology
The New Face of RDS

Mar. 30 – Apr. 1, 2016 — **The Neonate: An International Symposium for Asia – Shanghai, China**
Invited Speaker
How to write a successful grant
BPD: Inevitability and Outcomes
Chorioamnionitis, the Fetus and the Newborn

May 23-27, 2016 — **2016 Salzburg Columbia Maternal and Infant Health Seminars - Salzburg, Austria**
Invited Speaker
Remaining Questions about Antenatal Steroids
Conundrums in Neonatal Clinical Research
Chorioamnionitis – A Most Complex Disease

Jun. 24-25, 2016 — **XI Congress of the Dominican Society of Perinatal Medicine**
Invited Speaker — **Punta Cana, Dominican Republic**
BPD: Pathophysiology and Outcomes
New Results and Remaining Questions about Antenatal Steroids

Sept. 22-24, 2016 — **6th ICCN International Congress on Clinical Neonatology – Turin, Italy**
Invited Speaker
Mechanisms of Lung Injury and BPD
When to Intubate

Sept. 29-30, 2016 — **4th International Neonatal Conference "NEONATUS 2016" – Poznan, Poland**
Invited Speaker
Antenatal Associations with BPD
Conundrums in Neonatal Clinical Research

Nov. 5-8, 2016 — **Miami Neonatology 2016 – Miami, FL**
Invited Speaker
Postnatal Steroid to Prevent/Treat BPD
Evidence Based Neonatology
Clinical Chorioamnionitis – Neonatal Perspectives

Nov. 14-17, 2016 — **The Best of Ipocrates: Singapore**
Invited Speaker
Evidence in Neonatal Medicine
Uncertainties about Antenatal Steroids

Dec. 4-7, 2016 — **Hot Topics in Neonatology – Washington, DC**
Moderator
Goals for Oxygen in the Preterm

2017

Feb. 1-4, 2017 — **Fideracion Nacional De Neonatologia de Mexico - Merida**
Invited Speaker
What will RDS be in 2017?
Neonatal Evidence-based Medicine

Feb. 23-26, 2017 — **NEO Conference - Orlando, FL**
Invited Speaker
Can You Prevent BPD? Pro and Con
Award
Legend in Neonatology Award

Mar. 24-25, 2017 — **11th Samsung Neonatology Symposium - Seoul, South Korea**
Invited Speaker
Evidence based medicine in neonatology - our limits
Postnatal Steroids: A brief history and new strategies

Mar. 31, 2017 — **Chiesi: AKSTEM Advisory Board - Parma, Italy**

Consultant	Present and Future Definitions of BPD
May 6-9, 2017	**Pediatric Academic Societies - San Francisco, CA**
Invited Speaker	Perinatal Risk Factors for BPD
Awardee	Acceptance of Mary Ellen Avery Neonatal Reseach Award
	Abstract presentations by research collaborators (3).
May 9-10, 2017	**5th Neonatal Resuscitation Workshop - Napa, CA**
Invited Speaker	Primary Outcomes vs. Surrogate Measures
May 31, 2017	**Building Better Babies Symposium - Univ. of Colorado, Denver**
Invited Speaker	Chorioamnionitis: A Complex Confounder of Perinatal Outcomes
June 9, 2017	**Academic Scholarship Conference - Children's Mercy Hospital, Kansas City, MO**
Invited Speaker	Antenatal Steroids: Old Data and New Concerns
	Neonatal Research: My Perspective
July 31-Aug. 1, 2017	**Fisher & Paykel - Auckland NZ**
Invited Speaker	Neonatal Lung Development and Physiology
	Neonatal Resuscitation Workshop
Aug. 2-3, 2017	**Liggins Institute - Auckland NZ**
Invited Speaker	Antenatal Steroids: Compelling or Concerning
Sept. 4-7, 2017	**The Best of Ipokrates: An Update in Neonatology - Amsterdam, The Netherlands**
Invited Speaker	RDS: Where have we been and where are we going?
	Chronic Lung Disease: The New BPD
	Breakout session on mechanical ventilation
Sept. 7-9, 2017	**Summer Conference on Neonatology - Avignon, France**
Invited Speaker	Antenatal Associations with BPD
Oct. 1-5, 2017	**Gates Grand Challenges - Washington DC**
Poster Presentation	Strategies to Develop Oral Dosing for Antenatal Steroids
Oct. 13, 2017	**Stanford - Pediatric Grand Rounds - Palo Alto, CA**
Invited Speaker	Antenatal Steroids: Old Data and New Concerns
	Fellows Conference: Approaches to Better ANS Treatment
Oct. 28, 2017	**Vermont Oxford Network Quality Conference - Chicago, IL**
Invited Speaker	Translating the Evidence into Practice: Antenatal Steroids
	BPD: Why are we failing to move the Big Dot?
Nov. 27-Dec. 1, 2017	**Perinatology Institute of Mexico - Mexico City**
Visiting Professor	Daily lectures on: Antenatal steroids, RDS, BPD, Chorioamnionitis, Postnatal steroids
Dec. 5, 2017	**50th Anniversary of BPD Symposium - Stanford School of Medicine - Palo Alto, CA**
Invited Speaker	What is BPD: Then and Now
Dec. 10-13, 2017	**Hot Topics in Neonatology - Washington DC**
	Moderator and Program Committee

2018

Feb. 14-17, 208	**Canadian Perinatal Association – Banff Canada**
Invited Speaker	Keynote: Antenatal Interventions: Neonatal Stress and Resilience – Lasting effects of ANS
March 7-10, 2018	**9th International neonatal Symposium – Bangkok**

Invited Speaker	The Evidence: How do ANS measure up? Do Postnatal Steroids have a New Future? The BPD Conundrum Clinical Case Management: Neonatal Fellows
March 20, 2018	**Robert Cotton Memorial Lecture, Department of Pediatrics, Vanderbilt University**
Invited Speaker	Evidence for a Standard of Care: ANS
May 9-10, 2018	**Symposium for Retirement of Barbara Schmidt and Haresh Kirpalani**
Invited Speaker	Children's Hospital of Philadelphia Pitfalls of Applying Evidence in Different Environments
May 13-19, 2018	**Salzburg – Columbia Maternal and Fetal Seminar – Salzburg, Austria**
Course Faculty	Rational Use of Postnatal Steroids What is RDS? New Concepts about Fetal Inflammation Antenatal Steroids: Research Study Designs
May 20-24, 2018	**7th International Conference on Neonatology – Torino, Italy**
Invited Speaker	Less Surfactant and Less Intubation: Discussion with Nestor Vain
June 20-24, 2018	**Best of Ipokrates – Rio de Janeiro, Brazil**
Faculty	Lung Maturation and RDS – 2018 Antenatal Steroids: Limitations of Evidence for Standard of Care Unanticipated Mortality in Neonatal RCT's BPD – Injury/Repair Paradigm and Prevention Strategies (with Rich Polin)
Sept. 5, 2018	**McGill University – Usher Memorial Lecture – Montreal, Canada**
Invited Speaker	Antenatal Steroids: What is Evidence Base Neo group 1: The Conundrum of Solving BPD Neo group 2: Unanticipated Deaths of ELBW Infants in RCT's: Why?
Sept. 20-21, 2018	**Bangalore India**
Invited Speaker	IGICH Hospital - Respiratory Distress Syndrome Bronchopulmonary Dysplasia Neonatology/Ob, Bangalore - Antenatal Corticosteroids Chorioamnionitis
Oct. 1, 2018	**Bill and Melinda Gates Foundation - Seattle**
Stockholders Meeting	Outcomes of PK studies with sheep and monkey
Oct. 31, 2018	**Department of Pediatrics - University of Oklahoma - Oklahoma City**
Invited Speaker	Grand Rounds: The Conundrum of Solving BPD Neonatal Program: Unanticipated deaths in ELBW infants
Nov. 8, 2018	**Children's Hospital of Orange County: 10th Annual Academic Day for Neonatology**
Invited Speaker	Unexplained ELBW deaths in RCTs
Nov. 9, 2018	**UCLA Department of Pediatrics - Los Angeles, CA**
Invited Speaker	Grand Rounds: Antenatal Steroids: Changing Evidence for Standard of Care
Dec. 5, 2018	**Hot Topics in Neonatology - Washington DC**
Invited Speaker	ANS: Which Drug and Dose
Dec. 13, 2018	**Oregon Health Science – Portland, OR**
Invited Speaker	Fellows Lecture: Unanticipated Deaths in RCT's of ELBW infants

2019

Jan 4, 2019	**CCHMC Combined Pulmonary – Neonatal Research – Cincinnati, Ohio**
Invited Speaker	Postnatal steroids in sick preterm infants

Jan 7-8, 2019	**Gates Medical Research Institute – Boston, MA**
Invited Speaker	ACS – Dosing and Risks – Review for protocol development.
Jan 15, 2019	**CCHMC BPD Symposium / Pediatric Grand Rounds**
Invited Speaker	A past, present and future perspective on BPD
Feb 14, 2019	**Neonatal Grand Rounds – Cincinnati, Ohio**
Invited Speaker	The conundrums of solving BPD
Feb 27-Mar 1, 2019	**10th International Neonatology Symposium – Bangkok, Thailand**
Invited Speaker	The amazing lung
	Unanticipated deaths in ELBW infants in clinical trials
	CPAP: History and current uses
	Case Discussion with Faculty, Fellows and Residents
Apr 4-6, 2019	**2nd World Congress – Maternal Fetal Neonatal Medicine – London, UK**
Organizer & Moderator	Infections in the perinatal and newborn period. – Symposium
	Hot Topics in Neonatology: Antenatal Steroids – Benefits and Risks
Apr 27-30, 2019	**Pediatric Academic Societies – Baltimore, MD**
Invited Speaker	The conundrums of solving BPD
Apr 30-May 2, 2019	**6th Neonatal Resuscitation Conference – Bolger Center - MD**
Moderator & Speaker	Optimizing lung aeration – the current landscape
	Surfactant – Where to next for surfactant?
June 9-10, 2019	**10th International Conference on Clinical Neonatology – Venice, Italy**
Invited Speaker	Neonatal Lung – Talk given by Video Conference
June 13-14, 2019	**27th Annual International Neonatal Conference – Middlesbrough, UK**
Invited Speaker	What is BPD? Do we have an answer?
Keynote Speaker	Evidence Based Antenatal Steroids: The Future
Aug 10-13, 2019	**Innovations in Neonatal Care: The Future is Now! Conference- Austin, TX**
Invited Speaker	Unanticipated Deaths in the ELBW Infant in RCTs
Invited Speaker	What is BPD in 2019?
Aug 27-29, 2019	**WHO/Gates Foundation ACTION Trial Meeting Istanbul; Turkey**
Invited Speaker	A Review of the Animal Model for Antenatal Corticosteroids.
Sept 17-21	**Joint European Neonatal Societies- Maastricht, The Netherlands**
Invited Speaker	Robertson Memorial Lecture- Miraculous Lung Maturation.
Sept 28- Oct 1	**European Respiratory Society**
Invited Speaker	Fetal and Neonatal Lung Development: The Impact of Multiple Pre and Postnatal Exposures
Oct 25	**Neonatal Day- University of Iowa**
Invited Speaker	Grand Rounds: Bringing Antenatal Steroids from the Past into the Future
Invited Speaker	Neonatal Division: Unanticipated Deaths in RCTs of ELBW Infants
Nov 9	**Children's Hospital of Wisconsin- Milwaukee WI**
Invited Speaker	Grand Rounds: Bringing Antenatal Steroids from the Past into the Future
Invited Speaker	Neonatal Division: Unanticipated Deaths in RCTs of ELBW Infants
Nov 11-13	**Miami Neonatology 2019- 43rd International Conference- Miami Fl**
Keynote Speaker	Keynote: Making Better Babies
Invited Speaker	Lecture: What is BPD in 2019?

Invited Speaker	Workshop with Augusto Schmidt: Postnatal Corticosteroids
Nov 16	**Millenium Neonatology: Building a Better Pathway for Premies- Women and Infants Providence, RI**
Keynote Speaker	Keynote: Making Better Preterm Babies
Nov 19-22	**The Best of IPOKRaTES: an Update in Neonatology- Naples, Italy**
Invited Speaker	History of CPAP
Invited Speaker	Antenatal Steroids and Surfactant
Invited Speaker	Unanticipated Deaths of VLBW infants in Clinical Trials
Dec 2	**Chiesi Pharma- Parma Italy**
Invited Speaker	BPD and Future Perspectives
Dec 9-11	**Hot Topics in Neonatology- Natonal Harbor, Maryland**
Invited Speaker	Unanticipated Deaths of ELBW Infants in RCTs.