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**Helping Babies Breathe:
An Oral History**

William J. Keenan, MD

George A. Little, MD

Susan Niermeyer, MD, MPH

Nalini Singhal, MD

**Interviewed by
Beena Kamath-Rayne, MD, MPH**

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American Academy of Pediatrics

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PREFACE

The year, 2020, marks the 10th anniversary of the release of Helping Babies Breathe (HBB). Since 2010, the Helping Babies Survive (HBS) training programs have been taught to more than 850,000 providers in 80+ countries, helping to ensure health care workers in limited-resource settings have the necessary skills and competencies to provide life-saving care to newborns after birth. This oral history interview with 4 pioneers involved in the program's development documents and preserves its impact and contribution to global health.

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

This volume is the written record of one oral history interview. The reader is reminded that this is a verbatim transcript of spoken rather than written prose. It is intended to supplement other available sources of information about the individuals, organizations, institutions, and events that are discussed. The use of these 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.

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ABOUT THE INTERVIEWER

Beena Kamath-Rayne, MD, MPH



Beena Kamath-Rayne, MD, MPH, FAAP is currently the Vice President of Global Newborn and Child Health in the Division of Global Health and Life Support. She has been at the AAP since August 2019. Most recently, she was an Associate Professor of Pediatrics and neonatologist from Cincinnati Children's Hospital Medical Center and the Department of Pediatrics at the University of Cincinnati College of Medicine, with an affiliation with the Global Child Health Center. Before joining the AAP, she was a member of the AAP Helping Babies Survive Planning Group and was the Associate Editor for the 2nd Edition of Helping Babies Breathe. She also had editorial roles for other Helping Babies Survive Programs, including Essential Care for Small Babies and Improving Care for Mother and Babies Quality Improvement Workbook. She has also served as a member of the International Liaison Committee on Resuscitation Neonatal Delegation since 2016. In her role at the AAP, Dr. Kamath-Rayne is advancing AAP training programs, including Neonatal Resuscitation Program (NRP), Advanced Pediatric Life Support (APLS), Helping Babies Survive (HBS) and Pediatric Education for Pre-hospital Professionals (PEPP), among others. She and her team also provide technical assistance in newborn and child health, through grant funding from global partners such as Laerdal, Gates, USAID, UNICEF, among others.

Helping Babies Breathe: An Oral History

Interview of Drs William Keenan, George A. Little, Susan Niermeyer and Nalini Singhal

DR KAMATH-RAYNE: Today, I am excited to be speaking with 4 members of the [American] Academy [of Pediatrics] who played a large role in the development of *Helping Babies Breathe* (HBB), a global curriculum in neonatal resuscitation. We are excited to be celebrating the 10th anniversary of HBB this year, and privileged to be speaking with Bill Keenan, George Little, Susan Niermeyer, and Nalini Singhal, the 4 original editors.

First of all, thank you to the 4 of you for being willing to do this. We're really excited about the opportunity to document the history of *Helping Babies Breathe* and the journey that we've been on for the past 10 years in honor of this momentous anniversary. We mainly want this to be an interaction between the 4 of you, remembering what it was like to put HBB together, and the lessons that we've learned since that time.

The first question is: We know all of you were involved in the early years of the AAP [American Academy of Pediatrics] Neonatal Resuscitation Program (NRP), but what first made the global community aware of a need for a different approach in low resource settings?

DR SINGHAL: I think I requested that Dr [John] Kattwinkel, who served as editor of the first through sixth editions of NRP [*Textbook of Neonatal Resuscitation*], include some pages in the back of NRP that were more appropriate for the developing world, and he came back and said, "It doesn't really fit with NRP." And I thought, "All right, if it doesn't fit in here, where does it fit? A lot of babies are dying in those environments." That was about, oh, I'd say 16, 17 years ago.

DR NIERMEYER: And for me it was our experience in China around 2005-2006, where we were teaching NRP in hospitals much as we had done in South Africa and South America and Eastern Europe. But then it became so obvious when we got to the rural health posts in China that NRP was just not going to fill their needs. They told us that very clearly, and Bill [Keenan] and I were together on that visit. The global statistics were beginning to come in 2003, 2004 about the [United Nations] Millennium Development Goals, and it suddenly became really obvious that we were missing the real bulk of neonatal mortality.

DR KEENAN: Yes, on one of those trips to China I tried, with support from Chinese leadership, an abbreviated NRP without intubation, and it

had some appeal to them. And we tried it on a group in a relatively rural area and they did pick up the idea of ventilation as the objective. I'm not saying it was highly successful; it was an experiment that indicated we needed to do things differently in certain settings.

DR LITTLE: I think there was at the time a foreboding sense of inadequacy when trying to apply NRP in low-resource settings. I remember going on one trip, I think, Bill, you and I were there in South Africa. We were at the University of the Witwatersrand, Johannesburg, and the discussion went well. We could teach NRP at this unit, but it really didn't apply to the rest of South Africa; only in the places that had neonatal intensive care units. That's the first time that I kind of recognized what was a growing concern, that NRP was inadequate for low-resource settings. The other thing is to acknowledge the influence of the increase in publications between 2005-2010 that were drawing attention to the perinatal period, especially through articles being published in *The Lancet*. You know, that helped build up intellectual activity around global neonatal health and survival.

DR KAMATH-RAYNE: What do you feel were those critical gaps that were needing to be addressed? And what were people saying to you that they couldn't do with NRP?

DR LITTLE: This grew out of the work of what turned out to be HBB. The original situation, as I remember it, is this surfaced through NRP and I remember being at a meeting for the Global Implementation Task Force (GITF), where Wendy Simon, who was the director of Life Support Program at the AAP at the time, and other people spoke about this need. We got the original working group, the GITF, set up and established. This first GITF organizational meeting was held in August 2006 (see Table 1 for record of attendees). We continued to add collaborators through 2007, and by January 2008 we had a larger Global Collaboration Meeting (see Table 2 for record of attendees). But in the midst of that, as Bill can well document, there was an International Pediatric Association [IPA] meeting in Athens at the end of August 2007. Wendy and Errol Alden, prior AAP Executive Director/CEO and strong supporter of NRP, were there, and a program was put on to discuss the actual creation of what would eventually become HBB, which included a couple of international presenters, one from the UK [United Kingdom] etcetera. At this meeting, we presented on the work of the committee to-date and our goals for creating a simplified neonatal resuscitation program. And then right after this presentation, we were approached by a small group of global leaders in pediatric care, among them Vinod Paul and Zulfiqar Bhutta. Our presentation obviously stirred them up and they basically said, "It's too complicated, it won't work." That's what I came away with.

DR SINGHAL: At the IPA we, along with Jeff [Jeffrey M.] Perlman, were presenting HBB to try and make it simplified, and Vinod Paul and Zulfiqar

Bhutta got up and shot us down completely, saying, “You’re not addressing it; you’re not addressing meconium; you’re not addressing ventilation; this is not going to fly.” So this was actually when at least I thought, “Should we go ahead or not?” And then when we came back and decided we would try and do what we could, and we’d see if it would fly or not without intubation. The other issue, Beena, the question you asked was what were the gaps we were trying to address. It was because with NRP and the textbook, we were constantly being told by those in the field in low-resource settings that it was too complicated for people to read through. It was partly their level of reading, whether it was their own language or English. We needed something shorter; something that was more directed at what they were supposed to do and not as wordy. So I can remember Susan actually looking through to see if we could make it completely pictorial. And then we thought, “Well you can’t make it completely pictorial, but you could make it much more pictorial than NRP.”

DR KAMATH-RAYNE: You’re moving us to the next question, Nalini, which is: Once a critical gap was identified and you all decided to take those initial actions to move forward, how was this program going to be different to really reach the population that it needed to reach? Susan, you look like you were going to say something.

DR NIERMEYER: I was going to pick up where Nalini left off. As a committee, meaning the Global Implementation Task Force, we had tried to get a streamlined outline and text, and it was obvious that that was too complicated. So then we looked at going entirely pictorial and that wasn’t going to give enough detail. But I think looking even more broadly at the system as it was then, what struck me was that a lot of people were getting education, but had no equipment, and other people had equipment but had no education. So in addition to making this neonatal resuscitation education very accessible, we had to deliver it as a complete package with equipment. So that started the idea of a very different type of mannequin or simulator, and actually using clinical equipment for education and making them dual-purpose. And then the other really big difference was focusing on those initial steps up to ventilation, and really having the courage to prioritize those and drop out intubation, oxygen, medications, because: A) they weren’t available in the places we were really targeting; and B) they distracted educationally from our central goal. And I guess, finally, really shifting focus on the very first minute of life. I think it was Jeff Perlman who pointed out to us that in many of the units where he was working in sub-Saharan Africa, it could be 8 minutes, 11 minutes, 12 minutes, until the midwife was done tending to the mother and turned her attention to the baby, at which point it was often too late to bring that baby back from an asphyxial condition. So those were the really big things that I remember confronting and saying, “Whoa, this is really going to have to be structured differently.”

DR LITTLE: Susan, I think that's a great summary.

DR KEENAN: I was just going to add, there were some preceding events. One example was that the pediatrics disaster response curriculum meeting around 2005-2006, which was an initiative of Dr Steve Berman, past president of the AAP, where we helped put together a curriculum for emergency management in the *Pediatric Education in Disasters Manual*, which was in Spanish and English, to include neonatal resuscitation. Both Susan and I felt that the attempt was inadequate, but it did fit the previous experiences; it showed us that something more substantial would be required.

Around this same time, we got the go-ahead from Dr [Errol] Alden, former CEO of AAP, to at least pursue the idea of creating a simplified neonatal resuscitation curriculum, which then led to a meeting with the Academy NRP Steering Committee during their annual meeting at AAP headquarters in Elk Grove Village [Illinois]. As a result of this meeting, we sort of got an assent that we could move forward with considering an alternative teaching program for low-resource settings, which then led to getting this Global Implementation Task Force together. So there were some preceding steps within the American Academy of Pediatrics that took place before we began to move things forward externally.

DR KAMATH-RAYNE: Susan, you alluded to this being a full program with not only educational materials, but also the equipment for both training and clinical practice. So this obviously involved partners. Can you all talk a little bit about the other partners that brought different skills and expertise and resources? How did these partners come together to form the HBB Global Development Alliance [GDA], and what were the roles of those partners, and how did everyone work together towards this common goal of developing a global neonatal resuscitation curriculum?

DR SINGHAL: I think, Beena, we need to separate out the 2 a little bit, because the Global Development Alliance was formed after HBB was almost ready to be released. However, long before that, we formed the Global Implementation Task Force and Laerdal was helping out and trying to develop simulators and resources to use with the program that would be both affordable and effective. Prior to this, affordable simulators were not suited for effective practice, and those suitable were too expensive for low-resource settings. Also, at the time, Laerdal's bagging units cost 250 dollars apiece, and they were willing to bring down the price to make it more affordable for low-resource countries, and they were willing to devise a suction that was not electronic. So all that happened long before the HBB Global Development Alliance was formed.

DR KEENAN: It took time to develop an affordable, effective simulator to accompany this program. But each time we encountered an obstacle, Tore Laerdal, Chairman and CEO of Laerdal Medical, Executive Chairman of Laerdal

Global Health, came back with modifications and solutions. We realized the simulator was a problematic area from our experience in China in particular. And then we also talked about the contamination from suction, so 1 week later, Tore came back with a prototype of the simulator, and an idea about developing a suction bulb that could be cleaned and reused. From 1 meeting to the next, Tore solved some of the problems that were really bedeviling us, to conceive of how to move a wide education program forward in areas that had very few resources.

DR NIERMEYER: And I remember some amazing conversations with Tore as he sort of came to the realization of circumstances in the developing world. One of the remarks he made was that he, as the head of a family-owned company that had really developed very high-quality, high-fidelity mannequins and clinical equipment, and ventilation bags, thought that they had really achieved all that could be achieved. And a trip to Tanzania in 2007-2008 opened his eyes to the needs at the grass roots level for a simpler bag, one that could be easily cleaned and reused; for simpler training tools that were low-cost, high-fidelity, and very rugged under difficult conditions. And I think that was really a huge shift in his perspective, and shift in the direction of Laerdal Medical into Laerdal Global Health. And exactly what Bill says is true. He would come to development meetings and say, "What do you need?" And then would come back and there it would be. And I think we all remember the first time someone put NeoNatalie, the newborn simulator, in our arms and our stomachs dropped out because she felt so much like a baby who needed resuscitation. It was so realistic. That was a really astounding moment.

DR SINGHAL: I was going to say, all this took place long before the HBB GDA was formed. And actually, as Susan alluded, Tore formed Laerdal Global Health while we were developing these materials, recognizing the need to separate the global piece from his other business.

DR NIERMEYER: In addition to the development of the simulator and the clinical equipment, I also want to acknowledge our partners on the educational side of this: Harald Eikeland, who was the educational design expert at Laerdal Global Health, and Anne Jorunn Svalastog Johnsen, who was their graphic designer. These people deserve huge credit for their input into the curriculum and really envisioning a different way of facilitating learning, which was really Harald's mantra.

DR SINGHAL: Well, and Harald was the one who taught us, or taught me, the fewer words you can say it the better it is. People remember simple messages and need what is important for them to function. He would put up a slide that only had "word, word, word, word, word" on it 50 times, and he would say, "To understand the word, you do not need that many words." And each time we would put something down, he would say, "Can you say it in fewer words?" And that still rings with me when I review any of the materials we're looking at.

DR KEENAN: Another thing that I wanted to mention is that Tore's involvement with American Heart Association was focused on life support obviously. And he was also involved in our group, where he saw the data that we had about the potential of improving survival, which he realized, almost as an "Aha" moment, that the lives at stake and the lives to be saved were dramatically increased when it comes to the newborn. Tore got involved because Wendy, I think, suggested it and we invited him. So Wendy had something to do with it as well. It was an area that Laerdal hadn't really focused on previously, and it really propelled him to engage with us in this endeavor in a very dramatic and productive way.

DR KAMATH-RAYNE: George, you look like you want to say something.

DR LITTLE: Yes, there was that meeting in Stavanger, Norway. Susan, you and I went there from a meeting at the World Health Organization (WHO) Headquarters in Geneva.

DR NIERMEYER: Yes. This was in July of 2008. We presented our early outline of the educational program, including the concept of a pictorial action plan, learner workbook, and facilitator flipchart to WHO. Then we went on to Stavanger to work face-to-face with Harald and Anne Jorunn at Laerdal, with whom we had been collaborating long distance for several months – conference calls and pdfs across the ocean. That meeting really accelerated development of the Action Plan and the pedagogy of HBB.

DR LITTLE: And that was extremely significant, because if you look back at it, what that really did was to bring the academic clinical aspect of things together with the business world. There was a need to bring better communication. I can remember when we arrived in Stavanger that Tore was there and anxious to talk. He wanted to know what happened in Geneva. It was an amazing thing. And then he brought in Harald and Anne Jorunn and other people, and I just hope that we don't lose what happened there. This meeting expanded the group, the stakeholders, into a different constituency than it had under NRP – it really opened it up internationally, it opened it up into the Laerdal Foundation and business and engineering sector – and that was an extremely important meeting of the minds.

DR NIERMEYER: I think Bill has alluded to all the diplomacy we were doing then, and the reaching out to organizations. As George mentioned, he and I had been at the WHO in Geneva presenting our draft ideas and encouraging their continued participation in the development of this educational program. And we did have representation from WHO early on. Interestingly, we invited Hesperian Health Guides for example, to one of our early organizational meetings. Although they didn't become continuing partners, they contributed a lot of ideas

from their publications, like *Donde no hay Doctor, Where there is no Doctor*, about how to empower health workers and how to make education really fit the needs of these front-line workers so that it's useful and efficient for them.

DR KAMATH-RAYNE: So we now have HBB and I probably brought up the Global Development Alliance a little prematurely, but at this point now you have HBB and you have all these partners working together towards the implementation. Can you talk a little bit about the implementation phase, and what some of the challenges or lessons learned were from that process?

DR KEENAN: Well, let me go back just a little bit Beena, there was another seminal meeting that occurred. WHO and some of the other global groups got together previously and decided that neonatal resuscitation was not suitable for current investment. Susan and I made a trip to Washington DC that followed on some of these other meetings to talk to staff in Washington, in the [US] State Department. And Lily Kak, Senior Advisor for Global Partnerships and Newborn Health with USAID [US Agency for International Development], headed up that group. She had an "Aha" moment when we presented the concepts of HBB. The conversation was that USAID had previously decided that neonatal resuscitation was not suitable for current investment – it was too complicated, it required skills that were too difficult to teach. But as we talked with Lily about HBB as a concept, she had this realization and said, "You mean we could do something about this?" And our response was, "Yes," but that our adaptation of NRP required reconsideration of that strategic decision that was made in Geneva that neonatal resuscitation would not be pursued. So, USAID really had a very critical role in allowing HBB to move forward.

DR NIERMEYER: And Bill that just triggered another memory of how important LDS [Latter-day Saint] Charities was at this phase too, because they had already developed an adapted neonatal resuscitation curriculum to meet their end user needs. And so their experience in adapting that curriculum really informed our development efforts at the time too.

DR KEENAN: Yes, and before we get into the GDA, I want to mention that the Global Network for Women's and Children's Health Research under the [US] National Institutes of Health, which was headed by Dr. Linda Wright, a neonatologist, also undertook research to try out a simplified NRP curriculum with midwives. This research was led by Dr. Wally [Waldemar A.] Carlo and with Susan's help. The goal was to see if midwives and traditional birth attendants, in addition to physicians, could be effective with this kind of support. And the research showed that it could -- it was a proof of concept right in the middle of our development.

DR NIERMEYER: Yes, that was the First Breath Trial, published in the *New England Journal of Medicine* in 2010. That effort really was a simplified NRP curriculum. I remember cutting up photocopies of the line drawings in the *Textbook of Neonatal Resuscitation* and re-arranging them to tell a story in pictures about how to resuscitate a baby. We also learned a lot about making information relevant to the context in which birth attendants worked and about including elements of essential newborn care – hygiene and infection prevention, thermal control, early breastfeeding.

DR KAMATH-RAYNE: So, now are we ready to talk about the GDA or am I missing any other steps (laughter)?

DR KEENAN: Yes.

DR KAMATH-RAYNE: Tell me about the partners that came together for implementation of HBB, and who they were and how they worked together. You mentioned USAID and Laerdal.

DR KEENAN: Yes, Lily had a mechanism available to her then, within USAID, for a public-private partnership which they termed a Global Development Alliance (GDA) and she proposed it to a little group meeting that we had over the telephone. At this point, we, along with various partners, were having a couple discussions every month related to HBB, and she proposed this idea of forming a GDA, which was enthusiastically accepted by the Academy and their volunteers. So she moved ahead with formalizing the HBB GDA, using the USAID Laerdal relationship as the model, and Johnson & Johnson became involved as well as others. So it was Lily's concept that transitioned us into the GDA.

DR LITTLE: It was a timely thing that happened here, because the GDA concept had been tried out by USAID in various settings. I happened to be involved in a small effort in Kosovo when this came along. I give most of the credit to Lily for taking this concept of public-private communication, where you actively engage the public, private, and of course the academic sectors together. And while the GDA concept had been used before, it hadn't really been, to the best of my knowledge, implemented with quite the vigor and broad future-oriented perspective that it was under Lily's strong involvement with HBB.

DR SINGHAL: I think the other partner that Lily had actually approached, which I think should be mentioned, is Save the Children. They were the implementing partners that helped with the initial rollout of HBB in different countries through the GDA. The NIH [US National Institutes of Health] Global Network also joined in to help with evaluation and implementation research.

DR KEENAN: And around this time, we were talking about the engagement with obstetrics, but particularly with midwifery. We made a couple failed attempts. Susan and I ran into some of the American College of Nurse-Midwives (ACNM) representatives on a street corner in Washington DC and talked about HBB. Looking back, we may have failed to communicate effectively, but it did lead to their later involvement in the GDA. It was later that we made good relationships, or effective relationships, with the International Confederation of Midwives (ICM) and the general midwifery community. And so that was one of the obstacles that we were sort of facing throughout this whole process, and without a good understanding how we might bridge that.

DR KAMATH-RAYNE: It sounds like that's potentially a lesson learned - how better to care for the mother and the baby together. Are there other challenges or lessons that you want to talk about as HBB started to become more implemented around the world? What are some of the important lessons that you feel like you've learned being involved in this process?

DR SINGHAL: I think one of the big lessons for me -- because I was sort of the technical advisor for Bangladesh for HBB for 5 years -- was what you do in the classroom, even with hands-on and simulation, doesn't really translate into the clinical setting. And you have to spend time with the clinicians, with the midwives, and actually see what they're doing to recognize all the gaps. And an example of that was, during the training when we had talked about bagging. We had talked about the bags needing to be cleaned, but we eventually realized that providers were continuing to put cleaned bag-masks in a plastic container mounted on the wall and the plastic container was not being cleaned between uses because we were not aware of that practice and did not specifically talk about it during the training. And you don't find out about these things until you actually go from facility to facility. Somebody really has to take the time to visit the facilities to actually recognize all of the nuances. We probably think of them a lot more now than we did at the beginning. It's been a learning curve, at least for me, for these last 10 years, seeing how different places have implemented these programs. But I think there's still a huge gap that needs to be filled when it comes to trained providers retaining their skills. But once we began implementing HBB, it was a huge lesson for me to visit Bangladesh multiple times to see what they were doing in the field with this program.

DR KEENAN: We also faced the problem of validation. We had, we thought, brilliant ideas. We had newly developed concepts in the instruments that could be used, and it required validation, or at least exploration of the validity of the educational method. And Nalini used her resources at her university, the University of Calgary, to really give that a boost and make that really feasible and doable. So the validation efforts I thought were really a key, key step in this that

actually kept the GDA alive, since they could see that there were data showing HBB was making a positive impact, and these data were communicated and accepted.

DR LITTLE: I agree, Bill. I would expand that a little bit beyond validation. I think it was a validation of the educational programs and everything HBB represents. The paper that I know was helpful, at least in some of the circles that I was traveling, was Nalini's paper, "Helping Babies Breathe: Global neonatal resuscitation program development and formative educational evaluation," published in *Resuscitation* in 2011. The value of the paper itself and the journal where it was published in conjunction with the emphasis by the committee, the oversight group, helped to maintain a continuous stream of evidence through the process of testing and peer review publication and so forth. It came together.

DR NIERMEYER: I remember that tension very well. I mean, every morning I would wake up and think, "We have to get this out because babies are dying. But we also have to make sure that this works, because we're only going to have 1 chance to roll it out and it's got to be good." That was a very real tension. So we were building the airplane as it was flying to some extent, with field testing going on in Tanzania. Nalini you were involved in teaching that, and I think George, you were too.

DR LITTLE: Right.

DR NIERMEYER: And we were making revisions on the fly and getting ready to formally launch HBB in the summer of 2010. But then we were so fortunate that we had these very organized implementing bodies in Save the Children, Jhpiego, and other USAID implementers. We had the Global Network sites that were using this and were conducting evaluation trials of it. And we had privately funded investigators, such as *SAFER Births* out of Stavanger. The really in-depth research that they provided around the pedagogical techniques and outcomes of HBB, that body of research that took it from educational methodology through to clinical outcomes, I think is really a shining example of success. It sure wasn't perfect, but people really latched onto this, made it their own, developed their own research projects. This wasn't centrally driven. But that body of information is just incalculable in its value for going forward.

DR LITTLE: There's another place, Susan, where information was applied, besides initially in the committee and implementing bodies, and that's in the area of, "You shouldn't do a damn thing unless you involve the local government and the local powers that be." Of course, that's always been a checkered course. I remember the fact that there were a few countries; Malawi, Tanzania, and others, that from the top down said that HBB was going to be the future. And by saying that, they actually had this established information-gathering publication stream to call on. So what you're talking about was really

applied in a few governments, which of course we tried to move along further. And at the same time in the faith-based side of it, you had LDS, a very active player, and we also developed an interaction with other bodies, not quite as energetic perhaps globally as LDS, but we certainly did build up a presence, an acceptance, within the faith-based organizations.

DR SINGHAL: I think the other thing we have to remember is the governments were actually ready. They were looking at something that they could say they would try to decrease the neonatal mortality. Because just before HBB was developed, countries had set these goals, the Millennium Development Goals, for 2015 and they didn't know how they were going to meet those goals. So it was really helpful to them, because I can remember when we were in Tanzania that was the reason the government of Tanzania wanted it, because they thought this would help them meet their neonatal goals. I think the timing of it was quite fortunate, so to say, when people were thinking about the feasibility and acceptability of HBB. So in terms of readiness, they were kind of ready to explore.

DR KAMATH-RAYNE: So, HBB, as Susan alluded to, has – there have been numerous publications documenting its success in decreasing early neonatal mortality and stillbirth rates. And from its success was born other programs that are underneath the Helping Babies Survive umbrella, and also then linkages to Helping Mothers Survive. Do you want to talk about the development of those subsequent programs and any other effects of the program in the countries, communities and facilities where it's been implemented?

DR NIERMEYER: Well just a very early recollection about how we could extend this to maternal care and perinatal care. That had really been some of our hope at the very inception of HBB but it was difficult, as Bill has alluded, with the current partners that we had. Although the AAP worked very closely with American College of Obstetricians and Gynecologists (ACOG), ACOG really wasn't at a point of thinking about global educational programs yet at that time. But really the decision to share the HBB trade dress with Jhpiego and then Jhpiego taking the format of the HBB educational package to develop the complementary Helping Mothers Survive series of modules around care of the mother in childbirth and specific medical conditions that were most life-threatening around childbirth, I think that was a huge step and really accomplished what we wanted of being able to twin this newborn program with a maternal care program that had the same philosophy.

DR KEENAN: All this was somewhat propelled by building and maintaining strong relationships. For instance, that meeting we had in Rome at the International Federation of Gynecology and Obstetrics (FIGO) Congress in October 2012, with the Jhpiego representatives; their respect for the AAP was tangible and really increased as a result of this meeting. And our respect for what Jhpiego

wanted to do and how it dovetailed into our bigger goal was really terrific, but it really was the result of the person-to-person relationships that were developed.

DR SINGHAL: Going back to Essential Care for Every Baby (ECEB), after HBB was developed, we were struggling with the fact that WHO had a 3-week essential newborn care program that was very didactic, and we had struggled with where we should limit HBB. And so then, without the Academy's involvement, some people started working on ECEB, and then Laerdal came along and supported it, and then finally the Academy bought in and supported it under the Helping Babies Survive (HBS) umbrella. But that took some time with ECEB. Essential Care for Small Babies (ECSB) was developed because GDA partners were requesting that we do something more for the small baby. ECSB was developed at the request of GDA partners, including AAP, who supported it from the beginning.

DR KEENAN: Do you want to talk a little bit about the obstacles that were encountered, for instance with WHO? We had a great partnership with Laerdal, but it was used as an image that was counterproductive and that they felt that the AAP had partnered with a commercial enterprise, and therefore was ineligible to contribute further.

DR SINGHAL: There were challenges, yes (laughter) because WHO sort of said they had an unwritten rule, which was not quite accurate, because they were accepting money from the Gates Foundation, and yet they didn't want Laerdal to be a partner. We did take Harald with us to some of the WHO meetings to try and get them to recognize the expertise that Laerdal brought to the table, but it's only recently, in the last 2 years, that they've accepted the fact that it's okay for Laerdal Global Health to be involved with WHO. And at the beginning, under the authority of AAP we could do things, but we couldn't do them with WHO in the same way; yet we knew we had to keep WHO engaged. Even though they never signed on to the materials, they were engaged in every step of the way with development of all 3 HBS programs.

DR NIERMEYER: I have a funny memory, because I took a sabbatical to be a full-time graduate student in public health during the year that I was editing *Helping Babies Breathe* and doing the development process. My practicum was actually the relationship with WHO and our formal integration process with WHO and the Academy and our steering group, and I was documenting all of this throughout the semester. But I remember my instructor reading my narrative notes from that and saying, "This reads like a mystery novel." (laughter) "And I was on the edge of my seat to learn what was going to happen."

DR SINGHAL: Now that's probably true, but it's a good thing you've got challenges with WHO now. They're a lot simpler than the challenges we've had prior. But the best you can say with them is it's kind of, you know, you're

darned if you do and you're darned if you don't. You've got to learn to live with them and you keep working with them in spite of the challenges.

DR LITTLE: You know we've sort of moved into an area of trying to identify some of the situational things that came up that didn't necessarily impede the success of HBB, but at least didn't help as well as they might. I think one of the things that has happened in this way is how we're functioning today under the aegis of the Academy of Pediatrics. I think HBB took its birth, if you will, from the Academy, but it also at times had an impact upon the Academy in terms of its global awareness and involvement, and its accentuated movement into global education. That was another dynamic process that we probably ought to at least document or acknowledge in this effort.

DR KAMATH-RAYNE: So I want to move on a little bit past HBB's inception. We know that it's been implemented in over 80 plus countries, and with over 850,000 providers. What lessons did you gain from the development and implementation of HBB that might help others working to address critical problems or gaps in the field of newborn global health, or global health overall?

DR KEENAN: Partnership, partnership, partnership.

DR NIERMEYER: And I was just thinking that what we did after HBB was released was gather the user experience, do deliberate surveys of users, look at the literature that had been published, and then revise the program into HBB's second edition, which took place in 2015. And some of the biggest changes we made in the HBB second edition were harkening back to what Nalini addressed about really taking the program out of a classroom, making it facility-based education, and absolutely incorporating quality improvement, data collection and then use of that data to make changes in care. So I think that has been a huge lesson taught to us by *Helping Babies Breathe*.

DR SINGHAL: I think we've all learned different things as we've implemented HBB in different places. In Tanzania they rolled out HBB in a big way, and then I went to the districts to see what they were doing because they'd all been given NeoNatalies. But the NeoNatalies were sitting packed in a cupboard. And so I learned that, you know what? We can do anything hands-on but unless we give them the skills and tools to practice, and explain to them how to practice, it's not going to happen. So then the skill decay is going to occur, so what HBB taught me was that because it was a skill-related program that we had to set up things that were different than just education. And when you go back to the literature, there's a lot of information about skills decay and knowledge in 3 months. But we really weren't addressing it, whether it's NRP or HBB at first, so I think the second edition tried to address this a little better. Now the work with WHO, I think, is actually going to close the loop and use what people have learned in simulation on how to

actually retain skills out in the community. This needs to be brought back into Canada, so that is part of our learning on how to do things better in our own countries; learning from the developing world.

DR LITTLE: Probably one of the most important things that we did was to commit to the same 5-year review and update rotation of the HBB curriculum, which is the schedule that I think was taken from NRP and other efforts elsewhere in the Academy. With that commitment to a 5-year second edition, we then had to deal with the challenges, such as what do you do with the first edition after the second edition comes out and so forth. What the second edition did was to really acknowledge, by review, that most of the science focusing on resuscitation from the first edition was valid and was working out okay. But it also acknowledged that we needed to do more in the area of becoming more sophisticated in implementation. And to me --and I've mentioned this to a couple of people who are on the call today -- if I had it to do over again, I'd go back and really look at the science of implementation and dissemination. I think it's weak. I found production by WHO going back 5 or 6 years. I've learned some lessons in the last couple of years, not working in HBB but working with positive pressure ventilation and bubble CPAP [continuous positive airway pressure] in Nigeria, that have taught me that the HBB process of implementation which we worked on very, very hard from the beginning, was only part way down the path. That endeavor needs to be strengthened.

DR KEENAN: Okay, people have talked about how their goals change and, in some ways, I think the group that got together had pretty big goals in terms of neonatal survival and well-being. To the credit of the effort, the goals were never set aside because of the obstacles. And the persistence of the efforts included taking on essential care and small baby programs as well as partnering with the midwives, etcetera, etcetera. That persistence and patience, while you're keeping your goals alive, probably helped with sharpening the goals. But I think that the goal kind of existed that then was responsible for the progress but also the patience that was required to enable progress.

DR KAMATH-RAYNE: What do you all see as the next challenge that we have to address within HBB? You know, this is an important anniversary, the 10th anniversary, and it's also a time when HBB is being adapted into a WHO-led essential newborn care program. What do you see as the program's role or impact over the next 5 to 10 years?

DR KEENAN: I'll say that I think, maybe for everybody, it's implementation.

DR SINGHAL: I think it's implementation, but not just implementation of HBB or newborn care programs, but implementation with

paying attention to retention, utilization; the whole bit, not just the education and training.

DR KEENAN: And quality.

DR SINGHAL: Yes, we focused a lot more on the education piece over the last 10 years -- and I think we've got the education piece, maybe not 100% down, but we've got it in good shape. Now we need to focus on overall implementation and the studies about implementation need to be conducted.

DR NIERMEYER: Instead of looking at it as what's left to do, we have to get to very high coverage and quality with our education still. So there still are a lot of providers at delivery who have not had a high-quality preparation in an education program. So making that coverage close to 95 or 100%, maintaining the quality, and then really institutionalizing this within country health systems so that it's not just an educational effort, it's part of pre-service training, and how you become a midwife or a neonatal nurse or a medical professional. And then you just continue this in your daily professional life. You know, that would be a wonderful goal.

DR KEENAN: I was just going to add that I think I'm speaking for the 4 of us, really we have this goal that's a big goal about improving newborn health in a very broad sense and for every baby born. This was incorporated into our goal statement right to begin with, but using resuscitation as the door opener helps dramatize the priority that newborn health should occupy within every community. And resuscitation is just one example, but it goes all through the spectrum of respectful care. And quality has been mentioned, persistence has been mentioned, socialization has been mentioned, but using everybody's attraction to newborn resuscitation and their need to have skills in that area as the door opener.

DR NIERMEYER: Steve Wall always talks about resuscitation as the catalyst, and I think that's a wonderful conceptualization of it.

DR LITTLE: I guess I'd go beyond that, since being a catalyst doesn't necessarily include being the change agent that HBB was. I mean you can stimulate things, but HBB really is a change agent. I think most of the change agent -- not most, a good half of the change agent came with education awareness and that aspect of it. So I would hope in the future that we don't lose sight of the duality of that aspect of HBB.

DR SINGHAL: I don't think we quite got what our goal was, what Bill was trying to say, which is no matter where a baby is born in the world, there should be an experienced provider who can help that baby breathe and be taken

care of. We haven't quite gotten there, so there's still a long way to go to our dream of getting every baby taken care of.

DR NIERMEYER: I think that's our hope with the World Health Organization, that by working together with them to get these kind of educational efforts under the aegis of the WHO formally, we can actually achieve this big overarching goal realistically.

DR KAMATH-RAYNE: Well I'll be counting on all of you to continue to work together with the AAP to do that. I want to conclude our interview today by asking each of you to share an impactful story related to your own personal experience through either the formulation or the implementation of HBB. And I'll start with Bill.

DR KEENAN: Okay, well most everybody's heard this story -- and it involves HBB, HBS actually in northwest India where we've done an implementation study which included quality improvement. So in this series of village clinics, which are 3 to 4 to 5 rooms sometimes; depends how it's divided, with the waiting room that's right in the center of everything. I asked the nurses there, "Well, if our study ends, what are you going to do?" And they responded, "Well, we're going to do what you guys taught us." I said, "Why's that?" And they say, "Because it works. We don't have as many sick babies; it improves our budget because we're not sending so many babies to the city." And I said, "Oh, well what about the quality improvement?" You know, they have run charts up, documenting whether they practice, whether the babies are placed skin to skin, whether the babies get cold; the variety of things in these little run charts. Not sophisticated enough for me in my practice or for a guru like Nalini, but pretty substantial. And I said, "Well what are you going to do about quality improvement?" They said, "Well, we're going to do exactly the same thing." I said, "Well, why would you do that? The study's going to end." They said "Well, the people come in, wait for care, wait for their appointment, and they're sitting there seeing the run charts up on the walls in the waiting room because those are the only walls that exist. And the respect that we're receiving in the village has gone way up, because the community knows we're trying to do a good job, and they can see the progress." So that was a story that really inspired me, and I have shared many times, and probably told Susan maybe the fourth or fifth time now. But anyway, it illustrates what can be done, and how people are waiting for a way to make things better. They really want to do a good job.

DR KAMATH-RAYNE: That's a great story. George?

DR LITTLE: I've got a couple of stories about good outcomes and successful HBB application to individual babies on a clinical level. Rather than mention those, I think I'll get at something a little different. I was assigned to Malawi for several years as an AAP HBB consultant when the HBB national

program first started there. We had a teaching session for a large group of midwives. The midwifery profession in Malawi was strong and active but hadn't yet found its collective footing. I was participating as a facilitator including scenarios in a large training. The woman who was ushering me around, who was a staff pediatrician from the Ministry of Health, told all of us a story during group discussion about her as a pediatrician and a grandmother going to the birth of one of her grandchildren. She saw the baby be delivered in apparent distress and then put aside so the midwife could deal with the maternal perineal issues. She related what a difficult time she had in seeing that before she finally intervened. Her tearful, emotional way of expressing her experience in front of this training session for a large group of midwives, I think, was enhanced by the highly personalized HBB learning approach in Malawi. Discussions about the relationship between the population of providers to the system's inability to change occurred. I really remember that the breadth of the impact of the discussion was both individual and systemic.

DR KAMATH-RAYNE: Nalini?

DR SINGHAL: I've got lots of stories, but I'm going to tell one from Tanzania. About 3 years ago we were trying to implement HBB in a district and we were told by the government that there were too many education programs. So I convinced the government that this was not an education program, this was a hands-on practice only. And so they agreed, "Okay you want people to practice, I guess you're allowed to do that." At the training one of the attendees is a lady who's in charge of maternal and newborn health for the district, and the first day she, Cecelia, comes in at about noon instead of 9:00. She arrives and complains about how she's been asked to attend yet another program and I said, "All right, come join the group." So she looks at us doing hands-on practice and joins. The next day she comes in at about 10:00. At the end of the second day, she looks at me and she says, "Naleni," (Africans can't say Nalini), "it's the first time somebody has shown me how I can teach my midwives in the district how to save babies." And she said, "You have no idea how many WHO programs I've gone to, 3 weeks, 6 weeks, sat through lectures and everything else, but this is the first time I can teach." The next week we were going to teach in the community. I hadn't put her name down, and she said, "How come you're not taking me?" And I said, "Well, you're busy." And she says, "No." And she taught with me for the next week, was there 8:00, on time, teaching her 6 students. And she was the biggest proponent in Tanzania about having to change to hands-on, simulation-based practice, peer learning and she set up stations for practice in the main district hospital.

DR NIERMEYER: Beena, before I tell my story, I want you to tell your story from Belgaum about your small group participant and his comment.

DR KAMATH-RAYNE: (laughs) Well, Susan and I were both facilitators at the Global Network implementation trial in India, and I had a particularly challenging guy at my table that I think was a little bit resentful about being pulled from clinical duties to be there for training. And by the end of the training, he had done a complete 180 turnaround, and was just fully converted to the methodology, and just felt very excited, similar to what you're talking about, Nalini. He became a real believer in the program and was just an absolute 100% proponent of it. And I think we've all had those experiences where, you know, non-believers come in and sit through the course and get engaged with the hands-on practice and then really become proponents of HBB.

DR NIERMEYER: I remember him standing up and looking at you and saying, "You have changed my life. You have shown me a way of teaching and learning that I have never experienced before."

Well, I have so many stories, but I think my favorite is still from Uganda. I had just finished a facilitator workshop that was twinning *Helping Mothers Survive Bleeding at Birth* training, that occurred earlier, with *Helping Babies Breathe* training several months later. So we had trained district midwives from across Uganda, and then we actually got to go out with those newly formed facilitators as they taught their first courses in their home facilities. So we were in a health post in Rukungiri, Uganda. We had 5 other midwives from that health center in our *Helping Babies Breathe* course, which was actually on the postnatal ward, right on the other side of the delivery room. And one of the midwives had slipped out to deliver a patient who'd been in labor all night. And then we heard this rap on the door, "Come quick, the baby's not breathing." She had stimulated the baby, nothing. That facility did not actually have a newborn mask before we were doing the HBB course that day. So I wiped off the mask, while Monicah, who was the facilitator, got the bag and got the baby situated, and began to ventilate him. And she ventilated for 15 seconds, 30 seconds, 45 seconds, and then he cried. And that whole room was really transformed. So all those midwives saw that and they saw their colleague do it, and they knew they could do it too. And I thought, "Oh my God, surely nobody has ever had an experience like this before during a workshop." And then when we got back to the capital city and there were 2 or 3 other people who had virtually the same experience that because of delivering the training in the facility, either they witnessed an event, or an event had happened that night or the next day, and a baby's outcome had been changed because of the training, immediately. So I think it makes a difference.

DR SINGHAL: I wonder whether, because you've got quite a few of the stories like that, it'd be worthwhile capturing a lot more of them. We said we would do it for the AAP website, but we've never really got around to doing it. Because when people hear the real stories, I mean like the one that Tore's got with that child in Bangladesh, who's now about 7 years old and was a delight to meet when she was 4 years old.

DR NIERMEYER: Right. This is Tayeebah, who picture is on the front of the Survive and Thrive Global Development Alliance report

DR SINGHAL: I met the family with the midwife in Dhaka. The midwife said, "I had been trained in HBB and helped Tayeebah breathe. She was not breathing and with my help started to breathe and cry". The father said, "Our daughter is alive because of HBB." It's powerful messaging. We haven't really spent the time and effort to capture these stories.

DR KEENAN: Yes, there are a lot of stories.

DR KAMATH-RAYNE: Well I thank you for sharing your story about the development of HBB. I think this anniversary interview is going to be a very special part of the things that we'll be celebrating at the NCE. I want to thank the 4 of you for taking the time to talk today, and for sharing your experiences, and for all the work and dedication that you've put forth into making this program what it is. And leading the rest of us. You've all been my mentors in this whole journey, and I can speak personally and say that I've really appreciated working with all of you. I know that the AAP staff has also really appreciated that. So thank you for being our mentors and teachers as well and sharing your experiences today.

SUSAN NIERMEYER: Thank you.

END OF AUDIO FILE

Table 1:

First Global Implementation Task Force Meeting Participants

August 2006

Attendee	Organization	Focus/Product
Wally Carlo Linda Wright	NICHD Global Network	First Breath
Rob Clark	Latter Day Saint Charities	Simplified NRP curriculum
Martin Weber Jelka Zupan	World Health Organization	Basic Newborn Resuscitation Guidelines and Integrated Management of Pregnancy and Childbirth (IMPAC)
Jeff Perlman Nalini Singhal	International Liaison Committee on Resuscitation	Neonatal evidence evaluation to meet needs of resource-limited settings
Susan McCallister	Hesperian Foundation	Donde No Hay Doctor/A Book for Midwives
William Keenan Susan Niermeyer George Little Dharmapuri Vidyasagar Jonathan Spector	NRP/AAP Section on Perinatal Pediatrics	Global NRP dissemination
Tore Laerdal	Laerdal Medical	Neonatal resuscitation mannequins/simulators and ventilation devices

Table 2:
Global Collaboration Meeting

January 2008

Attendee	Organization
Wally Carlo	Global Network and NRP
Lily Kak Neil Brandes Troy Jacobs	USAID
Indira Narayanan	BASICS
Rajiv Bahl Hedwig van Asten (representing Jelka Zupan)	WHO
Jeff Perlman	ILCOR
Alex Lule Karen Lim Wendy Simon Eileen Schoen Brad Hutchins	AAP
Other Members:	
Bill Keenan Nalini Singhal George Little Susan Niermeyer Jonathan Spector Linda Wright Rob Clark Dharmapuri Vidyasagar Tom Wiswell	

Biographical Information on Interviewees



William J Keenan, MD, FAAP

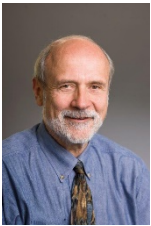
Professor, Division of Neonatal-Perinatal Medicine
Saint Louis University

Biosketch:

Dr. Keenan is a Professor of Pediatric and Obstetrics/Gynecology at Saint Louis University. As a longtime member of the AAP, Society for Pediatric Research, and American Pediatric Society, he has served as faculty member at the University of Cincinnati, Director of Global Affairs at the AAP, and Executive Director at the International Pediatrics Association. Other involvement with the AAP includes past chair of the Section on Neonatal-Perinatal Medicine, past chair of Neonatal Resuscitation Program (NRP) Steering Committee, past Chair of the NCE Planning Group, and past chair of *Helping Babies Survive* (then *Helping Babies Breathe*) Planning Group.

HBB involvement/special memory:

As one of the founders of the Neonatal Resuscitation Program, I had the opportunity to teach NRP in Romania, Laos, Thailand, Brazil, China, Egypt, etc. While there, I became very aware of the need for standardized curricula addressed to saving newborn lives with critical learnable elements for resource-limited conditions.



George A. Little MD FAAP FACOG (Hon)

Active Emeritus Professor of Pediatrics and of Obstetrics/Gynecology
Geisel School of Medicine at Dartmouth College

Biosketch:

Dr. Little completed his Bachelor of Science at Wesleyan University, his medical degree and pediatrics residency at University of Vermont, and neonatal/perinatal fellowship at the University of Colorado. He served as a U.S. Public Health Service physician assigned to the Peace Corps in Nigeria, Malawi and the Africa desk in Washington. He is currently an active emeritus Professor of Pediatrics and Obstetrics/Gynecology. He subsequently joined the medical faculty at Dartmouth College in 1972 where he served as an academic clinical neonatologist and emeritus chair of Maternal Child Health. He has served with committees and boards of many organizations including the AAP where he has been chair of the Section of Neonatal-Perinatal Medicine and the Committee on the Fetus and Newborn.

HBB involvement/special memory:

My special memory is actually a cascade of memories associated with developing and teaching HBB over 10 years. Starting with HBB original roll-outs in the U.S. and Tanzania through trainings in Africa, Middle East, Balkans, Europe and North America, there has been a common denominator attributable to the educational methodology. My HBB fun has not been with “talking heads” looking down on rows of people in seats arranged linearly; it has been dynamic interactions involving dyads and scenarios with diverse special people.



Susan Niermeyer, MD, MPH, FAAP

Professor of Pediatrics, University of Colorado School of Medicine, Section of Neonatology
Senior Scientist, Colorado School of Public Health, Center for Global Health
Senior Medical Advisor for Newborn Health, United States Agency for International Development

Biosketch:

Dr. Niermeyer's clinical and educational areas of emphasis include neonatal resuscitation, cardiopulmonary physiology in infancy at high altitude, and global neonatal survival. She served as co-chair of the American Academy of Pediatrics Neonatal Resuscitation Program (NRP) Steering Committee and editor of the ILCOR (International Liaison Committee on Resuscitation) neonatal resuscitation guidelines in 2000. She was editor-in-chief for *Helping Babies Breathe*, continuity editor for the suite of *Helping Babies Survive* programs, and a member of the *Helping Babies Survive* Planning Group.

HBB involvement/special memory:

Next to my biological and matrimonial family, my HBB "family" of colleagues are my deepest and dearest friends. What a remarkable group of people – AAP volunteers and extraordinarily dedicated staff members as well as frontline health care providers – who are all working together with the motto, "It's for the babies!" One of the most profound experiences in my professional life was watching a midwife, newly trained as an HBB facilitator, successfully ventilate a newborn – right in the middle of leading her first HBB workshop in her own health center in Uganda. In that moment, she and her fellow midwives realized they could transform the outlook for newborns.



Nalini Singhal, MD, FRCPC

Professor of Pediatrics, University of Calgary

Biosketch:

Over the past 10 years, Dr. Singhal served on the editorial groups that developed *Helping Babies Breathe*, *Essential Care of Every Baby* and *Essential Care of Small Baby*. She served as the technical advisor for Bangladesh during its implementation of HBB and how it made a difference to the lives of babies. She has also implemented *Helping Babies Survive* and *Helping Mother Survive* programs at scale in 2 Districts in Tanzania and Uganda.

HBB Involvement/special memory:

As the original 4, we kept trying to make HBB completely pictorial to a modified version of NRP. There was a moment when it dawned on all of us to walk down on an entirely new road which led us to the current HBB. After attending HBB program, I will never forget how a midwife in charge of Maternal Newborn Care in a large district in Tanzania with high newborn mortality said: "I have attended multiple newborn training programs, sat through lectures and multiple slides. This is the first time I feel I can help my midwives learn how to save babies." I also remember meeting a 4-year-old girl in Bangladesh with her parents and the midwife who saved the little girl's life using the skills learnt from HBB.