Prenatal Brain Development: Nurturing Babies in an Healthy Environment
Track B – Child Health and Prenatal Services
17th Annual Virtual Birth to Three Institute

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Angie Godfrey: Hello. I'm Angie Godfrey, Infant and Toddler Program Specialist at the Office of Head Start.

Jennifer Boss: And I'm Jennifer Boss, Director of the Early Head Start National Resource Center. Welcome to the second week of the Virtual Birth to Three Institute. As a reminder, this is our 17th Annual Birth to Three Institute, being brought to you for the very first time completely online. All of vBTT will be archived on the ECLKC website after the Institute has concluded. Our hope is that you can use these training events on an ongoing basis to strengthen your work with children and families.

Angie: Last week, Track A focused on inclusive child development, and was a wonderful learning experience for all participants. I want to share three key messages from that track: 1) a baby's interactions with his or her primary caregiver influence everything within that child, including attachment, regulation, communication, and the ability to engage in cognitive learning and development experiences; 2) children are born with an intuitive knowledge of math, and parents and teachers can assist their child's understanding of math through daily interactions and routines; 3) parents know so much about their children. It is important to engage with parents in order to plan the most effective learning experiences for the child.

Jennifer: Now, to move on to this week, we have Track B, Child Health and Prenatal Services. All three sessions in this track focus on supporting pregnant women and their families. This week's plenary presenter is Dr. Joshua Sparrow, the director of strategy, planning, and program development at the Brazelton Touchpoints Center. Dr. Sparrow's presentation will focus on prenatal brain development, with an emphasis on how environmental and social-emotional factors influence the development of the brain.

Similar to the first week, the format for this webcast will be a 30- to 40-minute plenary address by Dr. Sparrow, followed by a 30-minute panel discussion with respondents. Then you're invited to join us for a live Q&A audio call with Dr. Sparrow. The call-in number for the Q&A will be given at the end of this webcast. So be sure you take notes while you watch and jot down any questions you may have.

Angie: This week also features two outstanding webinars. The first webinar, being held tomorrow, is "Prenatal Development: Laying the Foundation for School Readiness." The webinar will focus on important messages regarding prenatal care, education, and services that support strong beginnings and lead to school readiness. This webinar will be presented by Janet Schultz and Rachel Abramson. Janet works for Danya International and has 34 years of public health experience in the field of pediatric and maternal child health. Rachel is a nurse and international board-certified lactation consultant who has provided leadership for HealthConnect One since 1986. She has extensive experience in breast-feeding, maternal-child health, and supporting community-based health services.

Jennifer: The second webinar, which will be held on Thursday, is "Meeting the Unique Needs of Families through the Required Postpartum Visit." This webinar will be presented by Dr. Guylaine Richard and Nick Weschler. Guylaine brings more than 25 years of experience leading successful programs and providing training and technical assistance to various national and international organizations serving at-risk populations. She's held several positions in Head Start and has had the distinction of being recognized as a National Head Start Fellow. Nick is the director of program development at the Ounce of Prevention Fund in Illinois. There, he has developed and supported numerous program strategies to promote secure parent-child relationships in both home- and center-based programs.

Angie: Before we move on to today's plenary presentation, I'd like to remind you that Virtual Birth to Three is free, and you can still register at any time by visiting the vBTT page on the ECLKC. Now, let's listen to Dr. Sparrow.

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Dr. Joshua Sparrow: Hello. I'm Dr. Joshua Sparrow from the Brazelton Touchpoints Center at Boston Children's Hospital. And today, we're going to talk about prenatal brain development. Every child's brain prepares for learning long before birth. What happens to the developing brain before birth depends on what goes on inside and around the mother-to-be. In this talk, I'll start by briefly describing a few of the miraculous things that happen as the brain develops, long before the baby is born. Then, I'll turn to the effects on prenatal brain development of a mother's health, mental health, nutrition, environment, and the context and relationships that shape her everyday life.

I'll also talk about some of the fetal behaviors that help us see brain development as it occurs during pregnancy. These are also behaviors that can help parents bond with their babies before they're even born. Next, I'll focus on some of the strategies that Early Head Start program staff can use to build strong relationships with expectant mothers and fathers. These relationships will help them to engage parents-to-be with their unborn babies, and with the services and resources that they will need to ensure their baby's best possible prenatal brain development.

I'll conclude with a few comments about how the research on prenatal substance exposure has changed, and why this means that mothers can't put their baby's prenatal brain development on the path to school readiness all by themselves. And along the way, I'd like to share a few stories with you that I've heard pediatrician Dr. Berry Brazelton tell over the years that have helped so many of us to remember what he has taught us about babies and their parents, beginning in pregnancy.

Why is prenatal brain development so sensitive to a mother's health, nutrition and well-being? First, because the baby's brain is literally being constructed from the raw materials that the mother's body supplies. These raw materials come from what the mother eats, drinks, breathes, and absorbs through her skin. They also include the hormones and chemical signals that her body makes in response to stress and in response to her interactions with other people and her environment. Some nutrients and chemicals may act directly on the fetus' brain and body. Others may actually influence which genes are turned on and which ones are turned off as the fetus develops. This process, in which environmental signals alter the role of genes in guiding development, is called epigenetics.

Second, prenatal brain development is sensitive to the raw materials, hormones, and chemical signals that the mother supplies because building a brain is such a fantastically delicate and complex process. It is as close to a miracle as just about anything most of us could ever imagine. Why does nature set up

prenatal development to be so sensitive to expected mothers' experiences and environments? Nature's plan is to prepare and adapt the newborn for the particular demands and opportunities of its environment by exposing the fetal brain to these conditions before birth. This is one reason why babies are all unique and different at birth. They have been shaped in the womb by their own unique experiences and environments during pregnancy so that they will be better able to adjust to the specific setting that they are born into.

I would now like to show you a few animated video clips of just a few of the miraculous processes of prenatal brain development. Each of these processes will contribute to what makes each newborn babies' brain unique – a combined reflection of both the genes that the baby has inherited and of his or her experiences during the nine months of pregnancy. The first clip is a quick overview of the delicate processes of brain development.

[Video begins] Narrator: So here is an overview of fetal and neonatal brain growth and development, summarizing recent neuroscience and research. Around three weeks after conception, the embryonic brain and nervous system take a familiar if primitive shape. With a forebrain, midbrain, hindbrain, and optic vesicle, which later becomes the eye. The billions of neurons that make up our brains are created in a process called neural proliferation.

By about the sixth week of gestation, in an embryo that is less than half an inch long, the cerebral cortex begins to grow. Well into the second trimester, as many as 100,000 cortical neurons per day migrate in waves to their ultimate destinations in the brain. Some of the most critical brain development takes place in the third trimester. In early pregnancy, much of neurodevelopment is pre-programmed. But in the third trimester, the progress of brain growth is influenced significantly by the fetus' experience in the womb. [Video ends]

Dr. Sparrow: This clip shows us what brain growth looks like on the surface of the brain. When we look at the whole brain, we see that early in development, its surface is fairly smooth and flat. But over the next months, grooves and ridges emerge that expand the surface area of the brain to make room for the billions of brain cells that are being produced. In this clip, we'll see how the surface of the brain changes between 28 weeks and 40 weeks of pregnancy.

[Video begins] Narrator: So these, for example, are images of a preterm infant at 28 weeks gestation, a preterm infant at 32 weeks gestation, and a full term infant – so 40 weeks gestation. And you can see that the size, of course, is very different. What you can also see is that the morphology of this brain is really different. You have this very thin cortical rim that goes around the brain, which is completely smooth, has only one or two little indents, which will become sulci. Here you see that this cortical rim starts to in-fold slightly. But still, these in-folds are not very deep. Whereas, when you look at 40 weeks now, you have these indents, or sulci, that go very deep. They're tight, they're close; there is no CSF [inaudible] that's around the brain within these sulci. And that is the pattern of a normal, matured cortical development. [Video ends]

Dr. Sparrow: In this next clip, we'll see what skills and capacities these changes in the brain are preparing for.

[Video begins] Narrator: Recent research and advances in neuroimaging are shedding new light on exactly how brain structure and function develop in the critical third trimester. Grooves, called sulci, and ridges, called gyri, form in the cortex. These grooves and ridges serve to increase the surface area of the

cortex, where higher level processing can occur, such as memory, language, visual perception, reasoning, information processing, and voluntary movement. [Video ends]

Dr. Sparrow: This last clip shows the process that allows the brain cells, called neurons, to carry signals to each other. To communicate with each other, the neurons must be connected to each other. These connections are called synapses, and this process of hooking up the wiring from neuron to neuron is called synaptogenesis.

[Video begins] Narrator: Also during the third trimester, at the same time the expansion of the brain's surface area is in full swing, individual neurons begin to mature and organize themselves. Dendrites and axons start to interconnect, and as they do, some quintillion synapses are formed. At these critical junctures, impulses pass from one neuron to another and the intricate and complex circuitry of the brain is forming itself. [Video ends]

Dr. Sparrow: During pregnancy, genes play a major role in building the connections, or synapses, among neurons. But even before birth, experience matters too. The broth of nutrients, hormones, and brain chemicals that the prenatal brain is growing in also influence these connections. The ingredients in the broth of raw materials bathing the brain are an important way that the mothers experience and environment shape the fetus' developing brain For example, when expectant mothers are severely stressed, they secrete higher levels of stress hormones. When stress is severe and prolonged, fetal stress hormone levels may be higher as well, as if to prepare the fetus for a stressful environment.

Unfortunately though, when a fetus must be primed for severe stressful conditions in this way, there is a price to pay. Other aspects of brain development may be sacrificed when urgent measures must be taken to adapt to extreme situations. Some studies have shown that very severe maternal stress is associated with changes in fetal brain development that may affect learning and memory. Other studies have shown long term effects, such as learning disabilities and attentional problems. At this point, though, there is no evidence that ordinary, everyday stress can cause such problems.

Other studies have shown that, during pregnancy, the effects of depression, anxiety, and self-reported anger on mothers' brain chemicals can show up in changes in brain chemicals in the fetus. Some studies have shown effects of these maternal mental health conditions on newborn behavior; for example, increased irritability and less responsiveness to soothing when distressed.

Given this evidence, we know that babies will have a better start when expectant mothers' mental health challenges are identified and treated as soon as possible during pregnancy – or better yet, before. Studies have shown that getting a head start on treating health and mental health conditions before pregnancy begins can be the best protection of all for prenatal development. There are a number of potential threats to healthy pregnancies and prenatal development that can begin long before pregnancy begins. These include diabetes; high blood pressure; obesity; HIV infection and some other sexually transmitted diseases; alcohol and substance abuse; tobacco use; depression, anxiety, and other mental health challenges; domestic violence; social isolation; environmental toxins in the home, workplace, or neighborhood that can enter the mother's body and cross the placenta to reach the fetus.

Often it takes more than nine months to successfully treat health challenges like these, but prenatal brain development begins at conception. By partnering with Early Head Start and Head Start mothers to take care of themselves before they even plan to conceive again, together we can protect their next baby's fetal brain development. When health challenges are present that affect a current or future

pregnancy, extra support from Early Head Start staff can make a big difference. For example, when parents have mental health problems that by their very nature make it hard for them to seek and accept treatment, they may need help to keep track of appointments and help to get themselves there.

Early Head Start and Head Start programs can offer peer-to-peer parent groups that can help with parental depression, anxiety, and isolation. And community partnerships, for example with health care providers, housing offices, legal aid, landlords, and employers, can make a huge difference when access to treatment is limited or when environmental toxins are present in the home, workplace, or neighborhood that may pose hazards for pregnancy and prenatal development. Healthy fetal brain development depends not only on expectant parents' health, habits, and well-being, but also on the community and environments in which they live and work. Some effects of the environment on the fetus can be seen during the last three months of pregnancy, when the fetus begins to show us through its behavior that it is already responding to its environment.

We are learning more and more about prenatal brain development and fetal behavior from ultrasounds, MRIs, and other imaging studies during pregnancy, as well as studies of infants born prematurely – as early as 24 weeks. By the last three months of pregnancy, the fetus responds not only to the nutrients, stress hormones, brain chemicals, and other molecules that cross the placenta, but also to sounds, such as the mother's voice, and the father's and siblings'.

The fetus also responds to the mother's movements, often slowing its own movements when the mother becomes active and becoming more active when the mother tries to rest. Some researchers believe that the fetus can even taste some especially sour or bitter foods that the mother has eaten and will pucker up and frown in response. Some studies suggest that fetuses are also already learning by touching their own hands and faces. Some have even reported ultrasounds of twin fetuses touching each other with their hands, as if they were already learning about each other.

Dr. Brazelton tells the story of a mother of three boys who was participating in an ultrasound study of fetal behavior during the last trimester of her fourth pregnancy. She said, "I know this is just going to be another boy, so go ahead, do whatever you want." Soon after the ultrasound began, though, it became pretty clear that this time she was going to have a girl. Suddenly, she started paying attention. As part of the study, Dr. Brazelton took out a rattle and shook it gently to one side of her abdomen. The mother watched the ultrasound screen as the fetus slowly turned her head toward the source of the intriguing sound. Then Dr. Brazelton pressed a loud buzzer, and the fetus, startled, turned away and put her hand to her mouth to suck, as if to soothe herself. The mother said, "She's the smartest baby I've got!" So clearly, we can use fetal behavior to help parents connect to their babies before they are born.

We can also conclude, from studies of fetuses' responses to movement, sound, light, and even tastes, that the brain is already taking in information about the environment that comes through to the womb. Another study showed that when expecting mothers read the same nursery rhyme over and over during the last three months of pregnancy, at birth their newborns responded with greater interest to the rhyme they'd been listening to in the womb than to ones they'd never heard before. Studies like these show that the fetus is not only responding to its environment, but is also remembering and learning.

And now, I'd like to talk about how Early Head Start staff can use what we know to partner with expectant families, to prepare each unborn baby's brain for lifelong learning. This includes strategies for working with families to ensure quality health care before pregnancy. That includes pre-conceptual and inter-conceptual care; consistent and high quality prenatal care; healthy nutrition; healthy habits and

lifestyle; help with everyday stresses as well as mental health challenges; supportive relationships with families, friends, and neighbors; healthy housing and physical environments; family-friendly and pregnancy-friendly work environments that provide time off without penalty for prenatal care visits and work accommodations such as being allowed to be seated while working and protection from toxic materials and fumes.

Many of these areas to be addressed are specified in the Head Start Program Performance Standards. As is clear from this wide range of needs, expecting parents must focus not only on the pregnancy but also on the rest of their lives, on their other family members, and on their work, education, goals, struggles, and aspirations.

Dr. Brazelton tells a story about his research with pregnant women in Guatemala that shows what can happen when we focus only on the fetus and don't pay attention to the rest of expecting parents' lives. The research project was trying to improve fetal brain development by supplying malnourished pregnant Guatemalan women living in poverty with nutritional supplements. The women would dutifully show up to claim the supplements at the clinic, but their weight did not increase as expected during pregnancy. And at birth, their babies' birth weights were still as low as ever.

The researchers couldn't figure out what went wrong and finally asked the mothers what they though the explanation might be. "Oh," said the mothers, "I could never eat the supplement myself. I don't have enough food for my children who are already here. They need it more than I do." Then, when the researchers explained that the supplement was for their unborn babies' brain development, the mothers were happy to eat it. The point here is that we need to take into account the tension that expectant parents feel as they focus on the fetus on the one hand, and on the other hand, on their other children and other challenges, which may include survival.

It isn't always easy for expectant parents to ask for the kinds of services and supports they need and care about most, or to talk about the strengths and supports they already bring to pregnancy and to their preparation for parenthood. Before they feel ready to share any of this information and to accept what Early Head Start staff have to offer, expectant parents often need to have the experience of strong, trusting relationships with Early Head Start staff. In relationships like these, where parents and program staff share power equally, parents are more likely to open up to information, ask for advice, share whatever challenges they encounter as they begin their relationship with their unborn baby, and discover all the strengths and resources they have within themselves to protect the fetus's development.

To establish and strengthen this kind of relationship, we'll start by looking at our own roles in these relationships in interactions called gatekeeping. Then, we'll look at the importance and limitations of giving information and advice. Next, we'll look one more time at fetal behavior and how it can strengthen parents' relationships with their unborn babies and with us. Then, we'll talk about how to individualize these approaches for expectant parents with different experiences and perspectives.

For all of us who care deeply about babies and young children, it can be both painful and exasperating to witness a pregnant woman or her partner engaging in activities that may interfere with the fetus' development. When we can't get them to stop, our sense of our professional identity and purpose are jeopardized. We may start to feel less sure of ourselves as professionals and to blame ourselves. When that becomes intolerable, it is understandable that we then look for someone else to blame; usually that someone else is the parent. This happens all the time with expectant families, and later on too. It is so

common and predictable that Dr. Brazelton has coined a term to describe this process: gatekeeping. Gatekeeping, he says, is the natural competition between any two adults who care passionately about the same child – mother and father, mother and mother-in-law, mother and home visitor or teacher.

To illustrate this, Dr. Brazelton likes to tell a story about a 3-year-old who had a rip-roaring temper tantrum just when her mother came to pick her up at the end of her day in preschool. The teacher looked at the child and then looked at the mother and said, "She never does that for us, dear." That is gatekeeping. Gatekeeping sometimes leads us to try to rescue the child from the family, rather than to strengthen the family and to more deeply connect the parents to the child. Sometimes there is no choice but to take a child away from parents, but this is always a tragic last resort and not an option during pregnancy. During this time, our only option is to work with expectant parents to strengthen their connection to their unborn baby.

To do this, we must strengthen our own connection with them. One way to do this is to look wherever we can find it for expectant parents' passion about their baby-to-be, and to let them know that we can see their passion even when their actions may pose risks for the fetus' development. They're bound to begin to trust us when we stop judging them and start supporting their strengths, no matter how fragile and hidden they may be. Unfortunately, few of us are taught specific strategies for creating positive, goal-oriented relationships with parents and expectant parents. Instead, many of us have been trained simply to give parents information and to tell them what to do, even though there is little evidence that this works.

Parents who are not ready for the information we give are unlikely to change their behavior. Yet, there are many parents who are hungry for information during pregnancy. Often, though, they aren't sure they can ask for it or trust it unless it is exchanged within a safe and trusting relationship. To earn and keep their trust, we need to think carefully about what information we offer and when we offer it. For example, telling an expectant mother who has decided not to breastfeed that "breast is best" can feel like a judgment of her as a future mother. Instead, we need to ask her about her decision in a way that says we know she must have important reasons and that we'll respect them. Then, she may be more open to learning about the advantages of breast-feeding and we can adjust what we tell her based on our understanding of her concerns.

Before we give information to expectant parents, it helps to learn from them what they already think and what they already know so that they can be sure to respect their views and knowledge. Ultimately, our goal is not for parents to be dependent on us for information, but for them to know that they know how to get the answers they need. To play our role in helping parents settle into this self-reliant stance, we can first invite them to share their expertise before we offer our own. Then, we can give information in a way that builds on the expertise we know they already have and affirms their capacity to develop it further.

Before giving advice, it can make a big difference to first ask whether the expectant parents actually would like any. When was the last time any of us took advice we didn't ask for? But when asked first if they want advice, parents rarely turn it down. When we take these steps to strengthen our relationships with parents, we're in a better position to help strengthen their relationships with their children – born or on the way.

One way to strengthen the parent-fetus bond is to listen to what expectant parents have to say about the experience of pregnancy. It's important to leave plenty of room for expectant parents to unload the

challenging parts of this experience. Morning sickness, mood changes, new worries, changes in their relationships with each other, and sometimes, too much unwanted advice from their parents, grandparents, aunts and uncles, not to mention people like us. It is often easier for parents to feel positively about the fetus when they can share the burdensome parts of pregnancy with somebody they trust to not judge them. They may then begin to share the ideas they've begun to have about who this unborn baby will be. Conversations like these can help parents hold the baby-to-be in their minds and to become conscious of the process of becoming a parent.

As I said earlier, the parent-baby bond can also be strengthened before birth by sharing the fetus' behaviors. Some parents, especially first time parents, may not know what to look for; yet they can begin to get to know their baby when the expectant mother feels the fetus' first movements, referred to as quickening. Some mothers may feel this when the fetus is between 13 and 16 weeks, but often first-time mothers don't feel movement until 18-20 weeks or later. By the end of the second trimester, fathers may also be able to feel the fetus' kicks and squirms with their hands when they place them on the mother's belly.

Another way to help build the parent-baby bond before birth is by asking about the ultrasounds of the fetus. Conversations about these may help you get a sense of the expectant parents' attitudes about prenatal care and what kind of experience they've had. Listening to what they have to say about seeing their baby on ultrasound will also give you a sense of how they're feeling about the pregnancy, about becoming parents, and about the baby-to-be. Some expectant parents discover that, when they see their unborn baby during the ultrasound, the whole idea of a new baby in their lives becomes real in ways they hadn't yet imagined, as in the story I told you about the mother who was surprised to learn she was not expecting a fourth boy after all.

But there is a range of reactions. Some parents find it hard to see much in the ultrasound images and some parents prefer to wait until the baby arrives. These differences are important to listen for and to respect. For expectant parents who have been stressed by the effects of poverty in their lives or by serious health or mental health challenges, it can sometimes be more difficult to focus on and strengthen the connection to their unborn child. It can be overwhelming to think about the added responsibility of being a new baby's parent. But it's less overwhelming when parents know that they are not alone. This is where their connection to us can help.

Our work with expectant parents creates a circle that connects us to them. When they feel less alone, it may be easier for them to connect to their babies-to-be. And it is through strengthening their connection to their unborn baby that we can help expectant parents mobilize all of the energy and resources that they'll need to protect the fetus' development every way they possibly can, including getting help to stop using cigarettes, alcohol, and other substances that may harm the fetus' development.

Obviously, expectant parents are not all the same. During pregnancy, there are specific reasons why some parents have trouble feeling a strong connection to their baby-to-be. There are also important differences in expectant parents' attitudes about even thinking about babies before they are born. As we've seen, many expectant parents are open to getting to know their baby before birth. But some expectant parents may be anxious about the fetus' development, for example, because of a previous miscarriage, a previous birth of a child with a severe malformation, or a long struggle to overcome infertility.

Different parents will handle and express these understandable concerns in different ways. Some may hesitate to begin their relationship to the baby before he or she is born. It's important to follow their lead as they figure out what they're ready for and when to face it. Expectant adolescent parents sometimes cannot fully grasp the reality of a baby inside of the mother, of the birth that is soon to happen, of the fact that their lives will be changed forever. One moment they want to believe that they can handle it all on their own without any help from another; a moment later, they wish they could be babies again themselves. Both feelings need to be expected and honored if we're going to make relationships with them in which we can work together toward the goal of healthy prenatal development.

Expectant mothers who are no longer involved with their unborn baby's father or who have been hurt in some way by him may experience a range of confusing and distressing feelings when they think about the baby and about being the baby's mother. Some expectant parents who have experienced severe trauma and loss in their own infancies or early childhoods may feel numb, frightened, or as if they just go blank when they try to imagine their babies or to imagine themselves as parents.

Some parents who have emigrated from other countries may question their own expertise or be concerned that it will be questioned here. They may also feel urgently that their own cultures' practices will protect them from some of the things that they see happening in the U.S. that they consider undesirable. In different cultures, the fetus is thought of in distinct ways. For example, in some cultures, thinking about the baby before birth is considered taboo or is a risky thing to do that might interfere with a fetus' development. Beliefs like these should be expected, gently asked about, and respected.

As you think about how a baby's brain develops before birth, about what the fetus is already learning, and about the conditions that affect prenatal brain development, think about how this information affects you on a personal level. Then ask yourself how this information might be received by the different expectant families you know.

As you think about the different factors that may influence families' reactions to information about prenatal brain development, you can ask yourself: How can I introduce the topic of prenatal brain development in a way that will help me understand what it means to an individual family? What kinds of experiences and beliefs and hopes and fears might affect how expectant families approach this topic and how they make meaning of conversations about it? How can I individualize discussions about prenatal brain development to respect each expectant parents' individual culture and place on his or her path to parenthood?

Expectant parents' reactions to the information about prenatal development that you offer will depend on who they are, where they are in this pregnancy, and where they are in their own lives. These reactions will also depend on where you and they are in your relationship with each other.

Fathers, of course, like mothers, are not all the same either and our approach to them needs to be individualized too, taking into account factors like the ones I've just talked about. And yet, as is true for expectant mothers, there are some things that many fathers share in common too. For example, many expecting fathers feel left out of the pregnancy. They know that expectant mothers do the heavy lifting and may feel that they just don't matter that much. Sometimes they feel as if they're perceived by professionals as barely relevant, or worse, as an interference.

As a pediatrician, Dr. Brazelton was aware of this and always tried to start a relationship with mothers and fathers before the babies were born. He insisted on seeing expectant parents during the last three months of pregnancy. When a mother would call to make the appointment, he'd say that he wanted the father to come too. Mothers usually told him, "He won't want to come, he's busy." But he saw this as an early instance of gatekeeping, so he'd insist. "Tell him I said I want him to come, too." Later, she'd call Dr. Brazelton back and tell him, "Guess what? He wants to come."

When he saw the parents-to-be together, the mother would flop into the big armchair in the middle of the office while the father would usually try to hide behind the examining table. The mother would usually do all the talking. But he really wanted to draw the father out, so he always asked a question that he felt sure would do that. If it's a boy, he'd ask, "Have you decided whether you'll have him circumcised yet?" The mother would rush to respond, but Dr. Brazelton would hold out his hand as if to say, "Stop," and he'd turn to the father and say, "I want to hear what you have to say."

When he reached out for fathers in this careful and deliberate way, they'd tell him all about themselves, about what it meant to them to become a father, and about their dreams and hopes for their baby-to-be. Clearly, fathers are hungry for a role, for a way to be important to the mother and the future baby. Fathers may not realize how much their support and protection contribute to the delicate processes of prenatal brain development. Yet, everything they do to nurture their partner, to reduce stress around her, help her get to doctor's appointments, and to stay connected to her friends, family, and especially to them, can make a big difference.

When expectant fathers can provide a reliable and consistent presence for expectant mothers, they help prevent or reduce maternal depression, anxiety, and stress, and contribute to the healthy environment that fetal brain development thrives on. Some expectant couples find pregnancy-safe massage techniques to be a very helpful way to stay close, strengthen their relationship, and to reduce everyone's stress.

Fathers may also not realize how much they and the fetus are already influencing each other. They may be surprised to learn that, certainly by the sixth or seventh month of pregnancy, the fetus can hear their voice. At birth or shortly after, they'll be delighted to see that their baby will prefer their voice over other male voices.

In Dr. Brazelton's research on newborns' behavior, he discovered how much their responsiveness to their parents' voices in the first hours and days of life meant to parents. So he'd play a game with mothers in which he'd hold the baby in between himself and the mother, with the baby's head in one hand and the buttocks in the other – like this. He'd then ask the mother to speak to the baby in one ear while he called in the other. Of course, the baby would always turn to the mother's voice; and of course, every mother would grab the baby and say, "You know me already," like it was a miracle. But of course, the baby had been listening to the mother's voice in the womb for at least the past three months.

This proved to be so exciting for mothers that he began playing this game with fathers, too. Eighty percent of newborn babies would turn – turn to their fathers' voices. And for the other 20 percent, he'd tip their heads; and the fathers would do the same thing and grab the babies, and say, "You know me already!"

Expectant fathers are more likely to fulfill their new roles toward the baby-to-be and the mother-to-be when they themselves are connected to others who can help them see how important they really are

while also leaving them room to express their self-doubts without being judged. Like mothers, fathers need relationships that nourish them and help them discover their inner strengths as they face the challenges of these new roles. This can occur in relationships with Head Start and Early Head Start program staff, as well as with other fathers or fathers-to-be, in fathers' groups, or informal interactions.

I'd like to end this talk by emphasizing the fact that prenatal development is not just up to each parent on his or her own, because it depends on their broader connections to all of us and to the world at large. In conclusion, expectant mothers and fathers cannot control all of the factors that contribute to healthy prenatal brain development. They may have more direct influence over their own health and mental health, but even this depends on access to health and mental health care, to healthy food, air, water, housing conditions, and supportive workplaces and environments.

We can positively influence these social determinants of prenatal development through our own roles as educational and health providers, as connectors to community resources, and through our roles as advocates who help raise public awareness and mobilize the political will to start building healthy brains before babies are born.

The health and mental health that expectant parents need to create a healthy environment for prenatal brain development also depends on a web of supportive relationships in which strengths are recognized, resources are shared, stress is reduced, and hope is sacred. Friends, relatives, neighbors, other parents, as well as Early Head Start staff, other professionals, and community members all can weave this web together to help give every baby the best possible head start.

[Music]

Terra Bond Clark: Good afternoon. I'm Terra Bonds Clark, Director of Special Initiatives at the Early Head Start National Resource Center, and I want to thank you for joining us for today's webcast. We just heard a presentation from Dr. Sparrow about prenatal brain development, specifically focusing on how environmental and social-emotional factors influence the development of the brain.

Now, I'll be moderating a discussion about that presentation with two wonderful panelists who have graciously consented to join us today to share their considerable expertise on early childhood development. First, we have Amy Hunter, who directs the mental health section of the Office of Head Start's National Center on Health. And I'm so happy to also introduce Jennifer Boss, Director of the Early Head Start National Resource Center.

As we get started, I'd like to ask everyone to think about the information Dr. Sparrow presented: how what happens to the developing brain before birth depends on what goes on inside and around the mother-to-be and how the work that Early Head Start does with expectant families can have a strong, positive effect on prenatal development and later outcomes for both children and families. Pregnancy is such an emotional and vulnerable time for families. However, it is also a time when mothers- and fathers-to-be may be more open to developing relationships and engaging with programs around their own need for support during an experience that can be both exciting and full of uncertainty and anxiety.

Early Head Start provides a wonderful opportunity to connect with each family by building a trusting and supportive relationship. Through these relationships, programs can explore expectant families' hopes and dreams for their child and determine if they need or desire information on health and nutrition, mental health, environmental health, or economic health that might be useful to support their baby's

optimal development. In doing so, programs can provide needed support during this crucial window for impacting child and family outcomes.

As we talk about supporting expectant families and reflect on Dr. Sparrow's presentation, it is vital to remember the importance of individualizing support for each family based on their own interests, culture, beliefs, development, knowledge, and needs. To put it simply, not every family will need or want the same information or support, and it is critical that programs don't make assumptions about what families already know, what they need, or what they are interested in. As Dr. Sparrow mentioned, some families may experience stress or anxiety during the pregnancy for any number of reasons, or the pregnancy may even bring past traumas to the surface. For this reason, we need to be attuned to each families' circumstances and have open, two-way communication to support them and respond to them individually.

So let's take a closer look at a few of the key points Dr. Sparrow discussed. To start, I'd like to focus on what we know the research says about the impact Early Head Start has on expectant families, and as a result, later outcomes for both children and families. Jennifer, can you talk a little bit about this?

Jennifer: Sure, I'd be happy to. So you know, as you said, during this sort of really crucial window of time for families while they're pregnant, Early Head Start programs have just this great opportunity to really make a connection with families, and the Early Head Start national research has really shown us that Early Head Start programs do make a difference in the lives of pregnant women and families. And so, a few things that came from the research that I think are important for programs to know about is that the research showed that Early Head Start programs had a real strong pattern of positive impacts for children and families when they enrolled during pregnancy.

We know that when – when women are enrolled during pregnancy, they tended to breast-feed more often than women who were enrolled later. We know that families who were enrolled early in the program tended to stay longer in the program. So when programs really had an opportunity to connect and engage with pregnant women and their partners early, then those families stayed in the program longer and then they benefitted from a longer period of services.

And we know that when Early Head Start program families were enrolled in the program that they had real, strong, positive impacts on children's cognitive and social-emotional outcomes. So, a lot of really important findings from the research about the impact on children, the impact on children's outcomes, and the impact on families. And I think generally, we just know that the research shows us that Early Head Start programs can really make an important contribution to families and to their outcomes.

Amy Hunter: You know, one of the things I was thinking about when you were talking is I know Dr. Sparrow mentioned the idea of not only supporting women when they're pregnant, but trying to support them before they even get pregnant. And so, it makes me think about families that are in our Early Head Start program with one child and the services that we provide to that family to meet their needs, how helpful those services can be when a family becomes pregnant so that those services are already in place and we're sort of maximizing the environment and the social services to meet their needs already. It's, in many ways, sort of that idea of primary prevention. You know, setting things up before things even happen.

Terra: Thank you, Amy and Jennifer. Now, let's move on to talk specifically about the impact a mother's health and nutrition, mental health, and environment can have on her baby's prenatal brain development and overall health. Jennifer, would you like to start us off here?

Jennifer: So, one of the things that struck me, that I really loved the way that Josh talks about in his presentation, is he talks about how the baby's developing brain is really sensitive to the raw materials that – that the mother puts into her body, or the mother ingests into her body. So, you know, thinking about what the mother is eating, what the mother is drinking, the air that she's breathing, and also her own sort of internal raw materials, the – the hormones that her body is producing, the chemicals that her body is producing influenced by stress and other things. So, those raw materials that are going in really can have an impact on that baby's developing brain. And so, you know, you think about – programs have a real opportunity here to talk with the parents about really sort of being cognizant, being very aware of what those raw materials are that mom is ingesting into her body and the impact on the baby's brain.

So programs have an opportunity here to really – to talk about things like making sure that the mother has access to healthy food and food sources so that she has good nutrition; making sure that they talk with the family about the mother's own oral health and her oral health needs and making sure that, you know, she's keeping her body healthy; talking with the family about things like exposure to environmental hazards like cigarette smoke or household chemicals, things in the house like cat litter or pesticides or lead, or – you know, all of those things in the environment that can have – that mother can ingest into her body that can have an impact on the baby's brain development. So, there's a lot of things that programs have an opportunity to talk to families about to help them really be thoughtful about the nutrition, the baby's developing brain, the physical health.

Amy: Absolutely. Yeah, and I guess I'll jump in, thinking about the mental health of families, and pregnant moms specifically. I think there's a misperception sometimes that depression occurs primarily in the post-partum months, when in fact research is showing us more and more that it peaks during pregnancy; and particularly, some research is showing that around the eighth month – so, in the last trimester – the rates of depression are particularly high. And you know, I think most of us are well aware of the impact of depression on parenting and on child development once the child is born and growing.

But recently, research is really pointing to – that these effects can be detrimental in utero. And so, the stress hormones and the experience that mom has with depression is actually translating to the baby, so that when babies are born, we're seeing outcomes such as prematurity or low birth weight. There's been some research that's pointed to children are sort of less cuddly or – you know, I think Dr. Sparrow talked about children being more difficult to soothe, more irritable. There's even some research that looks at hand-mouth coordination of the babies.

So, we're really seeing some – and particularly high levels of stress hormone once the baby is born. So that's been translated, sort of, in utero. And you know, Early Head Start can do a number of things during this time, and one of the things that I think is critically important is to think about a depression screening tool. And coming soon on the Early Childhood Mental Health Consultation website, there will be a list of screening tools. But one screening tool is only two questions, and those two questions have been just – found to be just as effective as having a whole list of questions at identifying depression. So I think it's very important to think about screening.

There's also some other really great tools that Early Head Start can use that are on the ECLKC. And those materials are under the headline of "Family Connections." The Office of Head Start funded the Family Connections Project to develop materials to help staff and parents build their capacity around addressing depression. So those resources include training for staff – training modules. They include sort of short research papers – or not research but resource papers, I would say, for parents and for staff with the idea of really raising awareness around depression and how to address depression effectively.

And we know, and you've mentioned this, that pregnancy is a time of, you know, varied emotions – you know, anything from great excitement and hopes and dreams that families have to – you know, it's possible they have certainly ambivalent feelings, or feelings of uncertainty or even feelings of sadness about the pregnancy. And I think it's really critical that in Early Head Start we pay attention to the nuances of those feelings and really ask moms and their partners how they uniquely feel about this pregnancy so that we can provide the appropriate supports.

You know – I mean, just one other thing that I'll mention about this is that there are interventions that can actually prevent depression in pregnancy. One of my colleagues at Georgetown, Deb Perry, has been involved with a project called Mothers and Babies, and it's a course that includes components related to how moms think and how they cope with stress. And it has actually been shown with low-income families to be able to reduce depression really – or prevent it, I should say, before it even occurs.

Jennifer: One thing you made me think about, Amy, as you were talking, about minimizing stress for families was another way that Early Head Start programs can be really helpful with expectant families is helping them to think about what are some of the other sources of supports for the pregnant mom and for the family at this time. And thinking about engaging with fathers or life partners or – how can they be brought in to help support that pregnant woman and – or are there extended family members – and to provide some supports to minimize some of those – some of the stress that pregnant women feel during this time.

Amy: Absolutely. And we know that those, you know, partners and dads can have great impact on how a mom feels about both the pregnancy and her own emotions. You know, another piece that's often associated with mental health and that the Standards actually call out is a piece around substance abuse. And so, you know, we really want to think about how Early Head Start is screening for – for substance abuse, but particularly around the use of alcohol during pregnancy. And we know that alcohol consumption during pregnancy can cause a whole host of very serious birth defects that may last a child's lifetime.

And so, I think there's great opportunity for Early Head Start to think about how they, through a trusting and safe and secure relationship, ask parents about their – moms, specifically – about their alcohol use during pregnancy. And you know, how they ask the question really can impact the answers they get, you know. And so, sometimes we've seen screening, with the best of intentions, saying things like, "You don't drink, do you?" And you know – right... Leading questions or closed questions you know, versus asking families, you know, "How much do you know about the impact of alcohol on pregnancy?" Or, "Would it be okay if we shared some information with you about alcohol and pregnancy?" Or even to drill down a little more specifically around, "How often have you used alcohol in the past week?" You know?

Terry: And I think you've mentioned screening a couple of times, Amy, as a tool – as tools that programs use when they're engaging with families. And I think an important piece to understand around that is

that those are tools, and as we equip staff with the knowledge around – and sharing with families – what are some of the outcomes when we find out these things, but knowing that programs don't have to have all the answers and that they will be able to certainly refer families and link them up with the appropriate services to really receive the support that they need in the community. So even though you're doing these screenings, you're using the tools – whether it's substance abuse or really finding out about the environment that the family is engaged in – then you really have an opportunity to make those more in-depth referrals for services for those things.

Amy: Absolutely. Absolutely.

Terra: So thinking about this, I know we've talked some – a little bit about economic health and touched maybe a little bit in past conversations on domestic violence and the impact of that, and I know we spent quite a bit of time talking about maternal depression and how that impacts the fetus, but do you want to talk a little bit more about some of those other factors as well?

Amy: Absolutely. I think, when we think about, sort of, the environment and the context in which the mom is in – you know, this idea of the environmental health, you know, it's critical that we think about domestic violence. We talked about pregnancy being a vulnerable time, and unfortunately, it's a very vulnerable time related to domestic violence. There are higher rates of domestic violence during pregnancy. And the impact of domestic violence can be severe, both for the mom and the baby, in terms of injury and even, in its worst case scenario, death.

And particularly at risk, I want to sort of mention teen moms because the outcomes related to domestic violence and teen moms are even more severe; and so I think that's something that we really need to keep in mind. And, you know, women involved in an abusive relationship may be incredibly embarrassed and may feel ashamed, and there are very real safety issues in terms of them talking about this. So it's an incredible, sensitive topic, but I think one in that Early Head Start needs to pay attention to and find ways through their, again, trusting relationship that families can use Early Head Start as a resource to share their concerns and their experiences.

And you know, on a somewhat related note, but, you know, a little different, I think another issue that's related to health – you mentioned economic health – is really a critical, important piece for Early Head Start to consider. Poverty itself brings a whole host of other adversities. And I think in previous Birth to Three presentations, there was a woman who talked about poverty – poverty being the "great dis-equalizer." That, you know, in some ways – I think if Early Head Start focuses their resources on addressing issues related to poverty and affordable housing and access to affordable medical care, prenatal care; helping families with their goals, specifically around increasing their income related to maybe training programs, education programs, seeking employment; you would really see a large bang for their buck in terms of the investment for prenatal services.

Terra: Go ahead Jennifer. Did you want to say something?

Jennifer: Yeah. I was just going to underscore that. And Dr. Sparrow does talk about that in his presentation too, and the impact of all of these sort of environmental kinds of issues on families, including their economic health. And I mean, we just – as you said, poverty is the great dis-equalizer. We just – we know that to be true.

Terra: I know, as we talk about this, I'm really struck by both the power and opportunity that we have in Early Head Start to inform and support parents during this vulnerable time. And at the same time, there's so many things to consider and so much work to be done. And I know we talked a little bit about – Dr. Sparrow gave an example of the Guatemalan family – and I know, Jen, you wanted to maybe say a little bit about that – and I think that that sort of resonates. So the opportunity, balancing that with the hope and potential that lies there in this – in this important timeframe.

Jennifer: Yeah. I think that that story that he told really was Dr. Brazelton's research – that project that he was doing with women in Guatemala. But that story was just so powerful because it really underscored the importance – for me, underscored the importance of really knowing the family story and having a full understanding of what the context is for the family when you're going and working with the family. So not only sort of knowing the full family story, but also the importance of helping that pregnant woman to make the connection between her own health and what she's, you know, put in – again, sort of what she's putting in her own body and how she's taking care of her own health – her own health needs and her growing baby's health and development.

And when she nourishes herself, she's nourishing her baby. And when she is taking care of herself and is healthy, her baby is more likely to be healthy and more likely to have healthy, optimal brain development, which leads later to continued healthy optimal brain development when the baby is here; which leads to, you know, better outcomes for growth and development of the child; which leads to better outcomes in school readiness and readiness for life and beyond. So when programs can really work with families and help them make that connection, I think that they just – it goes such a long way towards the type of services that they can provide and the type of relationship that they can build with those families.

Terra: Absolutely. Thank you so much. You both brought up so many important ways that a baby's development is influenced and impacted by the expectant mother's health and surroundings. As we move on, I'd like to focus on how programs can work to build trusting relationships and really engage with expectant families and also how community partnerships can come into play here. Amy, can you talk a little bit about this?

Amy: Sure. I think one of the things we can really do in Early Head Start is think about how we connect parents to their natural support networks. Some families, I think, that come to us in this time may have lost their connection with some of their natural support networks, or some are maybe in a new area or need to just develop new support networks. And these support networks would include things like extended family, friends, neighbors, community members, community organizations, faith communities.

Terra: Jen, did you want to add anything?

Jennifer: Well, I just wanted to add onto that that Dr. Sparrow really took the time and was very intentional about talking specifically about the father's involvement in the pregnant woman's life and in the support of the – and in the program, in the support of the pregnant woman. And so, I just wanted to take a few moments to talk a little bit about that, too, because I just – I feel like that's such an important piece.

And in talking about these sort of extended support systems and, you know, in thinking about fathers or life partners, one thing I think is important for programs to keep in mind is that we're not really talking about sort of a separate little initiative over on the side that's not really a part of an interwoven – into

just the fabric of how the program operates, but really thinking very thoughtfully about sort of the fundamental ways that the program operates and how they're bringing in the extended support families, and particularly thinking about father's role or life partner's roles and how to engage with them in a way that's meaningful during this time period. Because this is an emotional time period for the pregnant mom and it's also an emotional time period for the partners as well, and so – and it's a critical window.

Amy: It can be a unique – I mean, it is a unique experience for the dads, you know, that's very different than for the moms, and so really understanding and giving opportunity and voice for the dad to talk about his experience in going through this, which I think Dr. Sparrow talked about. It can be very lonely and very isolating, you know, not really understanding and being part of that physical experience.

Jennifer: Right. And when programs can really thoughtfully and genuinely engage with fathers during this time and really help fathers to see that they play such a critical role in this time period and in the support of the pregnant mom, and that they actually have an impact, too, on the pregnancy and they can have an impact on, you know, supporting this mom to do things like breast-feed, which, you know, can be hard. And research has shown, when that life partner is there to support that happening that women are more likely to do it.

So, you know, programs have a real, just sort of unique opportunity here. And some things that I think are just really fundamental for the program staff to really think about when they're doing this work is to make sure – I mean, in any work that we do where it involves building relationships with other people, it's important to really be thoughtful and reflective on your own, sort of, beliefs that are rooted in culture, rooted in your experience.

And so, you know, in this case, talking about engaging with dads, it's important for programs to really be thoughtful about what are our beliefs. Our staff – what are our beliefs about you know, the role of fathers in the lives of their children or the role of other people in the lives of the children? So starting there, really being thoughtful about what are our sort of fundamental beliefs, fundamental ways that we engage with fathers and with life partners, and being deliberate.

The other thing that Dr. Sparrow talked about was the story of when Dr. Brazelton was very, very deliberate about bringing fathers in to those visits, and he talked about how sometimes mothers can be what he called gatekeepers and, you know, and prevent the involvement of the father. And so, Dr. Brazelton was very deliberate about bringing the father in. I think programs have to be, you know, just as deliberate about how we're engaging with other people, keeping in mind that it's important to understand the full story of the family, again. And you really have to understand: What is that relationship? What are the nuances around that relationship? What don't we know about the relationship? And how can we support the family to be – to have all of those players engaged in a way that makes sense for the family?

Terra: And what's really best for the child. As Early Head Start program staff, we are really concerned about babies, we care about babies, and we know that babies come in the context of their families and families look very different. And I think you've talked a little bit about that, Jen, but various families look very different, so if we come from a place of respect for the family in understanding that. So there's many people who are waiting, excited and anticipating the arrival of this new child. So all of those people, wanting to engage them as program staff and making sure that they feel welcomed and that they're involved in supporting the mom and supporting her health and nutrition and all of those things,

and helping create an environment that will be welcoming and inviting for the baby, certainly prenatally as well as when the baby arrives. So, I think that's a really important point.

Amy: And I'd like to add this piece around: we're not in this alone. And we shouldn't be. And when I say we, I mean Early Head Start; you know? There are many, many Standards that talk about the importance of cultivating our community partners. And when we're talking about services to pregnant women, there are very unique partners that we want to make sure we're really cultivating those relationships. And those might include those who provide prenatal care, OB – obstetricians, nurses, midwives, doulas, hospitals. And we might want to think about inviting some of those folks onto our Health Services Advisory to really maintain and really have those folks have a valid role in our program and have that, you know, sort of back and forth relationship.

The other – a couple other pieces around this community partnership that I think is unique in the pregnancy period is we in Early Head Start can really help facilitate moms to have access to their prenatal care services, which are vitally important to maintaining and assessing the ongoing health of the pregnancy. There are many, many prenatal visits, and, you know, for any person, those can be hard to access. And so I think in Early Head Start, we can really help to be a support to get mom the ability to access those appointments. And then the frequency of those appointments can be a support to continually to assess not just the health related to the pregnancy, but also some of the other social and emotional aspects of the pregnancy that we talked about. And those prenatal care services are really in a prime position to help make some of the referrals that we talked about.

Jennifer: Another community partner I think I would add into there that I think is important for programs to consider are the business partners – business people in the community. What can programs do? Who can they reach out to in the business community who may be able to provide supports in terms of real, concrete kinds of things – materials, donations of materials for families – supporting, you know, families after the baby comes with materials and goods. So I think that's also another critical, I think, community partner for this time period.

Terra: Thank you both. These are some very helpful points about parent and family engagement, including the importance of recognizing the critical role that fathers play during the pregnancy and, of course, throughout the baby's life, As well as ways that we can work with community partners to support expectant families.

We're almost out of time. But before we end, I'd like to revisit a few of the key points made today. First, I want to emphasize the exciting opportunity we have in Early Head Start to support a baby's brain development prenatally. As Dr. Sparrow explained and our panelists discussed, there are truly miraculous things happening in the baby's brain long before the baby is born. The neurons are making connections based on the mother's experiences and environment during her pregnancy.

So, we have a key role to play as we help shape those experiences and ensure a positive, nurturing environment. It's also important to remember that Early Head Start programs are wonderfully well positioned to offer information and help link the expectant families to resources in the community, but that this can only be done successfully in the context of a program-family relationship that is built on safety, trust, and respect.

As we've mentioned before, pregnancy is a time of great hope and expectation but can also be a time of worry and concern for many families, particularly when their lives are touched by poverty and other

challenging circumstances. Only the building a strong relationship that is characterized by two-way communication, recognition of the family's knowledge and experience, and respect for the family's home language, culture, background, and traditions, can be truly supportive and ultimately help the baby grow and thrive.

There's so much more that we can all learn about the fascinating topic of prenatal development. And to that end, I want to call your attention to the two webinars we will have later this week and encourage you to tune in.

As we conclude today's discussion, I want to thank Amy and Jennifer for being here with me in the studio. And of course, I also want to thank all of you for joining us and to remind you that the live audio call question and answer session with Dr. Sparrow is about to begin. If you have a question for Dr. Sparrow, you can access the call internationally by dialing 719-325-4844. In the United States, you can call toll-free at 800-967-7154. For both numbers, the participant passcode is 779041. The audio for the question and answer session will be broadcast right here, so if you don't have a question yourself but want to hear what others have to say, you can simply stay right here and listen in. And until next time, take care.

[Music]

Welcome to the Virtual Birth to Three Institute live question Dr. Sparrow's first presentation, "Prenatal Brain Development: Nurturing Babies in a Healthy Environment." My name is Terra Bonds Clark. And while we're waiting for our first caller, I'd like to thank Dr. Sparrow for that wonderful presentation and for joining us for this live question and answer session. I'd also like to thank our guests who have joined us on the call today, Jennifer Boss from the Early Head Start National Resource Center and Angie Godfrey from the Office of Head Start. Thank you both and thank you so much, Dr. Sparrow, for being with us. Operator, do we have our first caller yet?

Aaron: We have no questions at this time.

Terra: Great. So I'll take advantage of this opportunity to just welcome you, Dr. Sparrow. And I'd like to ask you a question, if you don't mind. Dr. Sparrow, are you there?

Dr. Sparrow: I'm here. Yes. Of course I don't mind, Terra. I wanted to thank you and Jennifer Boss and Amy Hunter for the really wonderful panel discussion that you did, and Angie Godfrey as well for her help, and everybody who watched and listened for everything you do to help families through pregnancy and to bring about the best possible brain development for babies when they're born. So sure, of course, ask me a question, Terra.

Terra: Sure. Well, I was just going to ask you, last week in the Track A plenary, Dr. Lally spoke about the importance of the prenatal period of development, and certainly you've really elaborated on this in your presentation today. So I'd like to ask you, will you please speak a little bit more about what you shared in your presentation and can you make some connections for program staff around children's school readiness and the importance of this developmental period?

Dr. Sparrow: Sure. Yes, I – I really feel passionately about this topic of prenatal brain development and about all of the opportunities that we have before a pregnancy and between pregnancies and during pregnancies to optimize a family's well-being and health, to optimize the conditions for the baby's

development and brain development before birth, and to do everything that we can to assure that [inaudible] and development move forward as smoothly and safely as possible because all of these things really have everything to do with what kind of brain a newborn baby starts out with. And the better the conditions are during pregnancy and even – even before pregnancy, the better start a baby will get.

You know, I think – as I may have said, babies are born with 100 billion neurons. There are a thousand trillion connections between brain cells, and to get all of that set up is a really very complicated business and it depends highly on the mother's health and well-being and her environment. And I just think we have every reason to do everything we can to maximize the health of prenatal brain development because everything that happens afterward will just be so much more successful if we start off with the best possible baby's brain that we can.

Terra: Absolutely. Jennifer, would you like to add anything to that?

Jennifer: Sure. As Dr. Sparrow was talking, I was reminded that both he and Dr. Lally last week really emphasized the importance of relationships toward healthy development. And you know, whether you're talking about relationships between the adults and children and really creating the kind of environment that allows children to grow in a healthy way and develop and learn, or you're talking about during pregnancy, creating the kinds of relationships with the pregnant mother and the father or the other significant adults in that unborn baby's life, that that really – that healthy development happens through those nurturing relationships. And I think that that sort of theme resonates throughout much of what we're talking about. And you know, I thought it was great the way that both Dr. Lally and Dr. Sparrow emphasized the importance of those relationships.

Terra: Absolutely. Angie, did you want to add anything?

Angie: Just briefly. I agree so much with what Jennifer just said and with what Josh said in his presentation. Our programs really need tools for working with families, and I think that they have so many challenges about working with expectant families and with pregnant women, and I really loved how this presentation brought that to life. That it is a relationship with everyone, including the unborn baby And you know, I think that that's what we really want staff to understand.

And what we do – as was said earlier in the panel, know that the research has shown us that the earlier we began to work with families, the greater the outcomes. And I like to always think that we're growing the numbers of pregnant women that we serve; and I think that the benefits of being in an Early Head Start for a family when you're pregnant is – can just be tremendous. So this was a great reinforcement for me, and I really do appreciate the presentation and the panel today.

Terra: Thank you, Angie. Aaron, do we have anyone on the line?

Aaron: Yes, we do. We'll take our first question. Caller, please state your name and the state that you're calling from. Your line is open.

Marla Lohmeyer: Hi. I'm Marla Lohmeyer. I live in Utah. And I have a question about when Amy Hunter was talking about depression screening tools and she talked about Family Connections on a website to get some tools for… See, I don't even know. I just remember Family Connections on a website.

Dr. Sparrow: I know.

Marla: Okay. [Laughter]

Dr. Sparrow: Yes, Family Connections started out as a therapeutic intervention for families in which a parent was struggling with a mental health challenge, and then was adapted to our early education settings to support program staff in working not only with families but also with staff, because we're all human and depression is so common. And they developed a series of really simple, clear brochures and tools that are on the ECLKC website. And I am not sure, but I think if you just go to ECLKC and search for Family Connections, you probably will turn those up. Maybe Angie or – or Jennifer or Terra knows exactly where those are on the website.

And then the two questions – the questionnaire basically asks, "Over the past two weeks, how often have you been bothered by: 1) little interest or pleasure in doing things, and 2) feeling down, depressed, or hopeless?" You can – you can do a search for the Patient Health Questionnaire Two – it's called the PHQ-2 – on the Internet and you'll find that tool on how to use it.

Marla: What is it called? PHQ?

Dr. Sparrow: PHQ-2.

Marla: Hyphen two?

Dr. Sparrow: Yes.

Marla: Okay.

Dr. Sparrow: Dash two, yes.

Marla: What – what website is it on?

Dr. Sparrow: You can find it at cqaimh.org.

Marla: Okay, cqaimh.org.

Dr. Sparrow: .org, yes.

Marla: Okay.

Jennifer: This is – this is Jennifer. And if you go onto the Early Childhood Learning and Knowledge Center website, the Office of Head Start's website, and do just like Josh said, just search Family Connections, the materials will come up.

Marla: Oh, okay. Okay. Thank you so much.

Terra: Thank you very much. I appreciate it. Thank you, Jennifer and Josh. Aaron, do we have another call waiting?

Aaron: Yes, we do. Caller, your line is open.

Caller 1: Thank you. I'm calling because I was asking a question about… You haven't mentioned medications or drugs during pregnancy and I was thinking about psychotropic medications and how that affects brain development?

Dr. Sparrow: Well, that is a great question, and there are many different drugs and there is not one answer to the drugs in general. And also, I think the answer depends not only on just which drug but when during the pregnancy and the severity of the mother's challenge during pregnancy. So there are some psychotropic medications that are – are not used during pregnancy because the risks are too high. And one example is Lorazepam or Ativan, which is known to cause birth defects. There are others at the other spectrum – end of the spectrum which are thought to be justified when the severity of the mother's illness warrants it. But really, it's really a question that needs to be answered for each mother individually.

I think what we can do with regards to the general question is to be really clear that sometimes specific medications given a situation can be very helpful and worth it, and that a psychiatrist who's an expert in working with mothers during pregnancy and is familiar with the risks and benefits really needs to assess the mother to answer the question. But one of the things, I think, to remember is that in addition to the risks of some of the medications during pregnancy, there are also risks to not treating a severe mental disorder during pregnancy. And so, you've got to balance both of those out.

And then I suppose the final thing I would say is that there are also a number of non-medication treatments for mental health challenges. And when we know before a pregnancy occurs that a mother has struggled with a mental health challenge in the past, many of those have a tendency to recur. Certainly depression can recur. So one of the reasons why I said it's really important, if possible, to start before pregnancy is that you can start working on non-medication kinds of treatments before pregnancy, like, for example, connecting parents to other parents since we know that when parents are isolated they're more prone to depression. Another are the different kinds of cognitive behavior treatments or relaxation techniques or self-soothing techniques that don't involve medication but that take some practice and some time to get the hang of, which would be great to get going before pregnancy begins.

Terra: Thank you for that response, Dr. Sparrow. That's very helpful. And it reminds me that certainly as program staff are working with families that this would be a piece where the family partnership, as well as the community partnerships, will be absolutely critical in working with individual families based on their specific needs around medications during pregnancy – to work with the family and their physician or their psychiatrist as well.

Dr. Sparrow: I would just add that there is – for all medications there is a rating – an ABCD rating for level of risk. And that can be a starting point. But there are some drugs that are sort of in a gray zone and that's why it's so important to have those community partnerships with psychiatrists who have the experience and can look at the research. The other thing is, unfortunately, for many of the drugs we just don't have enough information to go on. And so, it's preferable when raising that possibility of considering the drugs that have been widely used for long enough to have as broad experience as possible in the research literature on what the – what some of the effects have been of the use of those drugs during pregnancy.

Terra: Okay. Thank you, Dr. Sparrow. Do we have another caller on the line?

Aaron: Yes, we do. Caller, your line is open.

Clara: Hello, my name is Clara [inaudible]. I'm calling from Florida. And my question is about interventions. Can you talk a little bit more about what kind of interventions remediate or make better the impact of the stress and the lack of nutrition on brain development? Would you talk about how it can have a negative impact? What can we do to remediate after the fact when we know that this situation already happened?

Dr. Sparrow: And so, let – may I ask a clarifying question? Are you talking about what to do after the baby has been born or are you talking about...

Clara: Right.

Dr. Sparrow: I see.

Clara: Or even before – or even before born.

Dr. Sparrow: Yes, so before the baby's born – this may sound silly and obvious, but I really mean it. The intervention for malnutrition during pregnancy is food. Sometimes there are additional challenges, like severe morning sickness, and sometimes pregnant women need to have their nutrition supported while being hospitalized when they're really unable to keep anything down. But that, fortunately, is rare. So food and prenatal vitamins, and certainly including folic acid. And when you say it's already begun, I would say better late than never in terms of beginning those kinds of things.

In terms of non-medication interventions, in the presentation, which I think you'll be able to access on the Web archive, I included the Centering Pregnancy Group because they provide prenatal group experiences for expectant parents. And the intervention there is really to connect them to each other as a way of reducing their isolation and using their connections and relationships with each other to prevent – to reduce the risk of depression or the severity.

The other resource that I included on the, I think it was the second-to-last slide, if you could go back on the Web archive of this presentation, was the Touch Institute, which is also based in Florida, I believe. And the Touch Institute provides DVDs to instruct expectant parents in massage during pregnancy. And they've shown that it can be quite helpful in reducing anxiety and depression during pregnancy.

And I think Amy Hunter's point was really important, that we often talk about post-partum depression when we really ought to be talking about perinatal depression since it certainly also does occur during pregnancy as well.

Clara: What about after the baby is born?

Dr. Sparrow: So for babies born, I guess the first thing I would say is not to make any – not to draw conclusions prematurely about what kinds of problems might be there if there were challenges during the pregnancy. We're talking about risks during pregnancy, but we're not talking about absolute causes in all cases. So before talking about intervention after the baby is born, the first thing is to get a really good assessment of where the baby is in his or her development and where the challenges are.

And – and then the interventions would really need to be targeted very specifically to what those findings are. And then I would just add that if the pregnancy was a challenging one, even if in the first early assessments there weren't any findings, it would make sense to repeat those assessments over time because some of the challenges – and I mentioned some of them, for example, learning disabilities – may not emerge until later on in the development.

Terra: Thank you, caller. Well, time flies when you're having fun and when you're learning so much. Dr. Sparrow, you've been wonderful, but it appears that we are out of time this afternoon. But I definitely want to thank Angie Godfrey for joining us, and Jennifer Boss as well. And a special thank you to you, Dr. Sparrow. You have been absolutely wonderful and we're glad you could be here with us today.

Dr. Sparrow: Well, thank you, Terra. You all have been absolutely wonderful in making this all happen. Thank you all.

Terra: I'd like to also remind the audience that on Tuesday we have a webinar on "Prenatal Development: Laying the Foundation for School Readiness," as well as this Thursday, "Meeting the Unique Needs of Families for the Required Postpartum Visit." And I really want to extend a warm thank you to all of our participants today. And we just thank you for joining us for the Virtual Birth to Three Institute. Have a wonderful afternoon.