

*Revised July 2009*

As a result of ongoing research, much progress has been made in recent years at understanding what happens when a baby dies of SIDS. As a result of this research, experts have also been able to determine proactive steps that parents and caregivers can take to help reduce their baby's risk. While more and more parents are learning what these steps are, they don't always understand why they are important, or how they make a difference. The following information will provide a basic understanding of this research and how it is allowing us to save lives.

The research study that has been the most significant to date in the fight against SIDS is the brainstem research being done out of Harvard by Dr. Hannah Kinney. After years of studying the brainstems of infants that have died of SIDS, Dr. Kinney was able to identify an abnormality in the area of the brainstem that controls all of a baby's major bodily functions such as breathing, heart rate, temperature and ability to arouse from sleep. While this abnormality is not enough to cause death in and of itself, it does put a baby at higher risk to die of SIDS.

This abnormality (defect) is the first part of what we call the "Triple Risk Model" to explain what happens to a baby that dies of SIDS. The second part of the model is the knowledge the majority of babies that die of SIDS are in the "critical growth period," a time in that first six months of life where they are growing and developing very rapidly (the peak incidence for SIDS is 2-4 months – 90 percent of SIDS babies die before 6 months.) To a baby predisposed to SIDS with this brainstem abnormality, this rapid growth causes their system to become "unstable."

The third piece of the puzzle is that this defect, along with the rapid growth, makes these babies unable to deal with challenges in their environment. These challenges can be anything from rebreathing carbon dioxide, to second hand smoke, overheating, or something as simple as a cold or virus. Challenges that a normal, healthy baby can overcome can trigger sudden death in babies predisposed to SIDS. Using tummy sleeping as one example, this would explain why some babies do perfectly fine on their tummies, while for others it may be the challenge that triggers them to die suddenly and unexpectedly. It also sheds light on the fact that a great many babies that die of SIDS have some sort of upper respiratory virus or infection.

So, in a nutshell, our risk reduction recommendations revolve around removing as many of these "challenges" from your baby's environment as possible during that critical first year of life. Experts feel that if we can get them developmentally "over the hump" so to speak, their brain eventually takes over these bodily functions that are controlled by the arcuate nucleus (region of the defect) in an infant's brainstem.

I would also like to address another issue that is commonly misunderstood – and also has to do with the brainstem abnormality. As I mentioned earlier, the arcuate nucleus controls all of the baby's major bodily functions – not just breathing. When something triggers a baby to die of SIDS their entire body shuts down, they don't just stop breathing. We liken it to a light switch – once the switch is flipped, there is no going back. These babies cannot be resuscitated, even if there is immediate intervention. Occasionally, when the baby is in the care of someone that begins CPR immediately, they can keep the baby's heart beating and restore breathing by artificial means (respirator), but within 24-48 hours that baby is determined brain dead and has to be removed from life support.

Despite our knowledge about the brainstem and the triple risk model, we know that this does not shed light on all sudden, unexpected infant deaths. We know that a small number of babies die suddenly and unexpectedly before one month of age and after one year of age. We know that many babies seem to have no known risk factors, and others survive even with many risk factors. So, while we are making progress, there is still so much to do.

Until we can understand more about the mechanisms of death, until we can identify which babies are at risk, and/or until we have achieved widespread saturation of safe sleep practices across all populations and socio-economic strata, we must continue to do research and continue to deliver these life-saving messages, in hopes of saving as many lives as possible.

