For Addi and Cassi, and Your Children Too

Many professionals who work in clinical research or with regulatory applications perform their responsibilities motivated by a desire to contribute to the world's health and well-being, but their professional obligations remain in the workplace after their workday is done.

But Chris Hempel, married mother of twin six-year-old girls Addison and Cassidy, never leaves her work. Chris's daughters Addi and Cassi have Niemann Pick Type C disease (NPC), a progressive neurological condition caused by cholesterol accumulating in cells (specifically the brain), often referred to as the "childhood Alzheimer's."

"Addi and Cassi were born with a double genetic defect in a critical cholesterol gene called NPC1 which is located on Chromosome 18," Chris explains. "Every person in the world is born with the NPC gene – it regulates human cholesterol metabolism at the cellular level. Both my husband and I are 'carriers' of genetic defects on the NPC1 gene. The twins inherited both genetic defects, causing their ultra-rare condition for which there is no FDA-approved treatment."

"I'd known for months that something was seriously wrong as Addi and Cassi started forgetting their ABCs and nursery rhymes (dementia) and were frequently falling down (ataxia). But I never imagined I would be faced with being told my precious toddlers were facing life of being bedridden and in a complete state of dementia."

"Soon after receiving this devastating diagnosis, I started reading medical journals and papers on NPC disease," Chris continues. "I came across one paper showing that a non-toxic sugar compound called cyclodextrin was having some success in NPC-afflicted mice. Cyclodextrin is used quite frequently in the food industry to extract cholesterol from products such as butter or salad dressings to make them 'fat free.' It is also used in the scientific research community to solubalize drugs."

"What if cyclodextrin could be given to Addi and Cassi? Would it extract cholesterol from their cells and possibly save their lives?" Chris wondered.

Earlier this year, Chris spoke of her irrevocably intertwined life and work with the DIA Regulatory Affairs Special Interest Area Community (SIAC); she continued to share her story in the following interview.

Q&A How did you come to speak with the DIA Regulatory Affairs SIAC, and what did you speak with them about?

For the past two years, our small team has been working tirelessly to move cyclodextrin research in humans forward. We created an entire cyclodextrin treatment protocol from scratch and filed Investigational New Drug (IND) applications with the FDA to request treating Addi and Cassi with cyclodextrin. In April of 2009, the FDA granted us permission to begin intravenous cyclodextrin treatment on the twins.

In February 2010, we filed an Orphan Drug Application for cyclodextrin with the FDA and will soon learn if our application has been accepted. Most recently, we have been working on an entirely new treatment protocol to change the delivery of cyclodextrin to a combination of intravenous and intrathecal routes of administration.

I learned about your group through one of your members, who does regulatory work. This past spring, I was asked to tell our family's story on one of the group's regular teleconferences and I shared what we are trying to accomplish.

On the call, I explained that as a lay person with no scientific or regulatory background, I find myself in a very challenging environment on a daily basis as I try and move cyclodextrin research and treatments forward. There is a confusing maze of regulatory issues that have to be managed and navigated. Since a pharmaceutical or biotech company is not driving this process, I need to seek advice from people who understand the process and can help save me time.

Q&A What's the most important thing that members of DIA and other organizations can do to help you in your own work?

I primarily need advice. I need people to tell me to go in a certain direction, or how to avoid known potholes. Sometimes I simply need encouragement to keep moving forward because there are days that the problems that exist in the system seem insurmountable.

I also need review of drafted materials. For example, our intrathecal protocol draft to deliver cyclodextrin into the brain is completed. I am circulating it to medical experts who have experience with intrathecal and intraventricular protocols for other conditions like cancer, and asking what they think.

Q&A What was some of the advice that you received from the Regulatory Affairs SIAC?

There are approximately 500 children around the world afflicted with NPC and I would like for other families to have the opportunity to try the compound on their children. One of the suggestions was to work with the European Medicines Agency because we could submit a lot of the data that we've already submitted to the FDA to that agency as well. As we move forward and capture critical human data on Addi and Cassi, we can make our annual report submission to both the FDA and the European agency. As a result of this suggestion, I am now working with a few NPC families in the EU to push this forward. This could speed up bringing treatments to other kids around the world.

Q&A What can groups like DIA do to help you and other families in your position?

How can your regulatory group help foster grassroots action that happens in smaller, rare disease communities? Trying to move a potentially life-saving compound forward is traditionally the role of a biotech or pharmaceutical company. But what if you're like me and you don't have that support? Many rare diseases have no treatments and a number of the patient populations are extremely small (under 2,000 patients worldwide). There are foundations and parent advocates like me who are trying to move forward on promising ideas. How can people with regulatory experience empower this massive group of patient advocates? Could groups like yours provide any sort of *pro bono* time to people like me?

In our case, it's a race against the clock. We're in an all-out sprint, with hurdles. We have to connect with people who want to sprint and hurdle with us, and a lot of people don't like sprinting. It's too much work.

Q&A What's the most important thing that you've learned from your circumstances, and from your daughters?

Through this process I have learned that anything is possible even if you are told it's not. While some people do give me advice, I don't always listen. Many people have discouraged me and told me I would never get the FDA approval to give cyclodextrin to my twins or that our insurance company would never help us. Some people are simply unable to envision successful outcomes. We are now facing new hurdles as we try to get cyclodextrin delivered through the blood brain barrier and into the twins' brains. This has never been done in humans before. But if there's a will, there is a way.

As far as Addi and Cassi are concerned, they have taught me about the meaning of life. I am reminded each day that life is very short. It does not matter how big your house is or what kind of car you drive or how much money you have in your bank account. In one hundred years, none of this will matter. I would give up everything I have if I could give Addi and Cassi good health and a normal childhood. People who have healthy kids should be so grateful.

Q&A What's the most important lesson that DIA can learn from you and your family?

The system needs to figure out a way to embrace people like me. I'll tell you, it's extremely difficult at times dealing with the scientific community and regulatory agencies. We need to figure out a way to utilize peoples' expertise and talents, even if they are "just a Mom." Science is set up in horrible silos and this is really slowing us down to find treatments and cures for people. We need a lot more collaboration and an "open science" and "open regulatory" world.■