Making rare disease drug development personal

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The statistics regarding rare diseases speak for themselves: one of two patients diagnosed with a rare disease is a child; three of 10 children with a rare disease won't live to see their fifth birthday; more than 400 million people suffer from a rare disease globally — greater than the population of the U.S. Fortunately, the drug development landscape for rare diseases is increasing exponentially. However, there are many challenges in conducting rare disease clinical trials, including small populations often spread across the globe, limited opportunities for study participation and replication of results in larger trials, and heterogeneous manifestations of disease and phenotypic presentations. The clinical manifestations are often not easily connected to a specific disease — on average, a rare disease patient visits seven specialists, and a correct diagnosis can take as long as six to eight years — and a lack of consensus on clinical outcome measures and poorly defined endpoints.

Sarah Glass, Ph.D., Global Head of Rare Diseases, Parexel, and Shipra Patel, M.D., Global Head of Pediatrics at Parexel, strive to overcome these challenges on a daily basis. The development of a comprehensive customized clinical trial solution that incorporates a sound clinical, scientific, regulatory, and market access strategy allows their Rare Disease and Pediatric teams to overcome these challenges. Most importantly, a deep understanding of the patient and caregiver journey is at the center of every successful clinical development program. As the number of effective treatments for rare diseases grows, the industry will continue to adapt to changing clinical trial models, regulations, technologies, and reimbursement landscapes to meet the needs of rare disease patients.

"We are looking at how to make the trial process easier for the patients and families," Shipra says. "We look to see how we could make some of the

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These facts show the impact of rare disease

1 in 10
people are affected by rare disease

1 in 2
rare diseases don't have a foundation or research support group

1 in 2
patients diagnosed with a rare disease is a child

3 in 10
children with a rare disease won't live to see their 5th birthday

400
million people suffer from a rare disease globally (greater than the population of the U.S.)

8 in 10
rare diseases are caused by a faulty gene

6-8 Years
average time to get an accurate rare diagnosis

95%
of rare diseases lack an FDA approved treatment

RARE
diseases impact more people than cancer and AIDS combined

7000
distinct types of rare and genetic diseases

Source: Global Genes

assessments work in a decentralized clinical trial setting. Is it possible to do some evaluations at home? Is it possible to reduce the time spent at the site while still preserving the quality of the trial? These are just a few of the questions we ask ourselves all of the time."

"In addition to a focus on decreasing patient and caregiver burden in a clinical trial setting, Parexel ensures data is embedded to drive decisions throughout the clinical trial and development program," Sarah says. "This data may include natural history data as comparator arms, pharmacokinetic/pharmacodynamic data to understand mechanism of action, or biomarker and genomic data to understand drug response."

Parexel is embarking on a new era of rare disease and pediatric drug development, founded upon:

- **Precision medicine concepts** — every population is unique and we leverage medical and scientific expertise to treat every rare disease program using a precision medicine approach through enhanced understanding of the patient characteristics and applications to drug development.
- **Protecting the endpoints** — data integrity is at the core of a successful clinical trial and it is critical to ensure the delivery teams have this enhanced appreciation and relevant training.
- **Embedding patient insights** — Not seeking input only but translating patient input into actions.
- **Optimizing trial design to focus on the needs of children and their families** — to shorten trials, increase efficiencies, and leverage real-world data/ natural history studies.
- **Hybrid trials** — optimizing every protocol and clinical trial design by ensuring patient-centric sampling and schedule of assessments, and exploring the possibility for decentralized or home-based options for some visits and assessments when it is appropriate in each indication.
- **Patient support services** — Providing travel, childcare, lodging, patient, and family concierge services as the disease pathway and patient necessitates.

Sarah says Parexel is innovating to address these goals by understanding the whole patient journey. "We strive to seamlessly align the clinical trial solution with the patient journey, which often starts many years prior to diagnosis," she says. "It is our obligation to understand the patient journey, including specialty care, referral pathways, and support groups to ensure that every patient is aware and if their indication warrants, given the opportunity to participate in a clinical trial if he or she chooses to do so."

Beyond mapping the patient journey, the Parexel team is also helping to pave the path of what happens outside of the clinical trial through knowledge sharing, working with sponsors, and providing support.

"Awareness campaigns are often an important component of patient identification and recruitment efforts to make sure that the physicians or the people who are going to interact with those patients and those families at the earliest part of their journey are aware of a particular study and why a study might be beneficial to that patient population," Sarah adds. "We strive to ensure broad and effective knowledge-sharing regarding a clinical study, to ensure patients and caregivers can make timely decisions regarding clinical trial participation, which can have a meaningful impact on their disease prognosis."

Shipra adds this is why it's so important to know the standard of care for these diseases by working with and having relationships with key opinion leaders in the rare disease space. In this way, she notes, she and her team have a better sense as to the point at which they can recruit patients and the best way to do so.

"Engagement with key opinion leaders is critically important because they already have experience in the disease space," she says. "These KOLs are often field-leading medical experts in rare disease who have intimate knowledge of the disease and they know the patients and their families by name. These investigators are key to recruiting pediatric patients given the trust each patient and caregiver has in them."

Shipra and Sarah highlight the importance of rare disease and pediatric clinical trial solutions that address not only the needs of the patient but also the entire family unit. "Our Patient Innovation Center is a dedicated group focused solely on embedding components that will decrease the burden and optimize the clinical trial experience," Sarah says.

"This is especially critical in many rare diseases when the treatment under investigation is the only hope these families have." These components may include transportation and lodging, child care, or facilitating specialty visits, so that families can also continue with other aspects of their lives outside of the clinical trial.

"While collectively rare diseases affect hundreds of millions of individuals worldwide, the reality is that every single individual affected by a rare disease is precious and unique," Sarah says. "For us at Parexel, this means that even within an indication where the clinical trial landscape is robust, we must customize that trial solution based on the specific characteristics of those amenable to treatment with that drug. We embed patient insights into our broader trial solution and strategy, as well as into indication-specific clinical trial solutions. Part of our remit is to ensure that we are embedded in the rare disease community and not operating in isolation. We are in a unique and advantageous position to be a neutral party between the patients/families/physicians and the sponsors are able to embed key scientific and medical knowledge as well as patient perspectives across clinical trials in an unbiased manner."

Every clinical trial solution developed and run by Parexel is done with the intent to support a sponsor through to drug approval. This ensures the highest level of data integrity and ability to be audit-ready. "At Parexel, not only have we contributed to more than 15 rare disease drug approvals, but we also have dozens of former regulators as part of our organization," Shipra says. "Early insights from former regulators in a rare disease program can put the sponsor one step ahead and mitigate significant risk for delays. This is also important in having regulatory buy in for the endpoints to be used for trial registration."

"Every patient, every data point, every sample is precious and unique," Sarah says. "Because we have the privilege to develop these clinical trial solutions for the rare and pediatric populations, it is our obligation to ensure every aspect of the clinical trial solution is developed with someone in our mind who we know and love and ensure that the solution would be suitable for them."

It is with that mission in mind that Sarah and Shipra at Parexel strive to accelerate the development of treatments for rare disease and pediatric patients, with heart.

With Heart

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