

# Why Establish Pediatric Reference Intervals?

Joely Straseski, PhD, DABCC, is ARUP's medical director of Endocrinology and co-medical director of the Automated Core Laboratory. She is also an associate professor of pathology at the University of Utah School of Medicine. She holds active committee appointments for the American Association for Clinical Chemistry and American Society for Clinical Pathology, is a fellow of the AACC Academy, and is the chair of the Board of Editors for *Clinical Laboratory News*.

Here she discusses the importance and unique challenges of establishing pediatric reference intervals. To read more on this topic, Straseski published an article last spring (April/May 2017) in *Clinical Laboratory International*.



## Expert Edge

**Joely Straseski, PhD, DABCC**  
Medical Director, Endocrinology  
Co-Medical Director, Core Laboratory

**Q: Why are reference intervals important?**

**A:** We can't interpret laboratory results without putting them into some type of clinical context. Reference intervals allow a comparison between an individual's result and a "healthy" population; thereby helping us define "disease" vs. "health."

**Q: Why is it important to have reference intervals specific for pediatric populations?**

**A:** A child's biology changes considerably as they grow and mature throughout the pediatric years. Laboratory measurements for markers associated with growth and puberty particularly require pediatric-specific reference intervals. Comparing laboratory results against a similar age or maturity cohort is essential for interpretation.

**Q: What makes establishing reference intervals for pediatrics particularly challenging?**

**A:** As stated, we need to compare an individual's result to a "healthy" population in order to interpret it. Specimens aren't routinely collected from healthy children, and parents are often reluctant to consent to a blood draw if it isn't required for medical care. This makes gathering specimens to establish healthy ranges in children particularly challenging. Research ethics boards are in place to protect our most vulnerable populations; therefore they often limit collections in pediatric patients and volunteers.

Any samples that laboratorians do have access to will often have extremely small overall sample volumes, which limits the amount of testing we can perform. Additionally, it can be difficult to define "healthy" in this population, and very young children aren't able to communicate their overall health status.

**Q: How has ARUP contributed in the area of pediatric reference intervals?**

**A:** In 2001, ARUP established a specimen repository from healthy children to address the paucity of pediatric samples available to determine reference intervals. The Children's Health Improvement through Laboratory Diagnostics (CHILdX®) repository includes more than 5,500 samples and is the largest of its kind in the United States. CHILdX samples have been used to generate pediatric reference intervals for almost 100 analytes at ARUP Laboratories. The CHILdX sample set includes children from 6 months to 18 years of age that were determined to be healthy via questionnaire responses and/or physical exam, which included Tanner staging by a single individual to eliminate variability. Tanner stage-specific reference intervals are useful for interpreting results in the context of pubertal growth.

“Reference intervals are essential diagnostic tools. They let us know if a patient's results fall within the parameters that we would expect for that particular test or analyte.”

**Q: How does the CHILdX sample repository help clients of ARUP Laboratories?**

**A:** Understanding the patient population that's being used to determine a laboratory's reference intervals is essential for accurate interpretation of results. Establishing a repository of this magnitude illustrates ARUP Laboratories' commitment to pediatric laboratory medicine. Children are unique—and this repository acknowledges that and helps our clients accurately interpret laboratory results in this population.