

Improving Childrens' Health Through Better Lab Medicine



What are Pediatric Reference Intervals (PRIs) and why are they important?

Most laboratory tests generate a numeric value that is used to diagnose and treat patients. Physicians need to know the appropriate range of values for a healthy child to interpret results. This range of values in a healthy child may change drastically with patient age, sex, and potentially ethnicity/race. Using the incorrect reference population may result in misdiagnosis, mistreatment, and potentially patient harm.

Why do PRIs need to be improved?

The wide availability of samples from adults makes it easy for laboratories to establish quality reference intervals for this population. However, the establishment of quality reference intervals for pediatric groups has been a major challenge. Many laboratories are forced to set their own ranges because national intervals do not exist. One limitation is the lack of specimens from healthy children needed to describe reference intervals.

What is being done to improve PRIs?

There is currently no national US-based initiative to develop better reference intervals for children. Such an effort is needed to reduce the misdiagnosis of young patients and improve treatment decisions. New PRIs must address test result variation based on age, stage of development, and sex. The Centers for Disease Control and Prevention (CDC) has the infrastructure and expertise to develop better PRIs, but additional funding from Congress is necessary to achieve this goal.

What PRIs are among the most critical to ensure quality patient care?

Examples include thyroid testing, biomarkers relating to kidney function, alkaline phosphatase (an enzyme relating to liver, bones, kidneys, and digestive system function), and steroid hormones (especially during puberty). Reference intervals for neonatal patients are especially critical. Normal ranges are hard to develop for newborns, as samples from healthy newborns are particularly hard for laboratories to obtain.

How can the development of better PRIs lead to downstream savings in healthcare costs and better patient outcomes?

Better PRIs will improve the accuracy of diagnoses. Children will be treated immediately and appropriately, reducing the likelihood of follow-up testing and/or treatment for a medical condition that is not present.

Do PRIs change for different demographics?

The evidence is clear that age and sex differences exist. There are indications that differences in some PRIs exist for ethnicity and race, although additional research is necessary. Laboratory practice recommends setting reference intervals for the provider's specific patient population. Established intervals, particularly if they are harmonized, would allow researchers compare patient populations and better tailor care for all demographics.

Has Congress acted on this Issue?

Yes. In the FY 2020 appropriations, Congress directed CDC to develop a plan to improve pediatric reference intervals (PRIs). FY 2022 report language further urged CDC to enhance the accuracy of PRIs and provide information on required funding. Congress has reiterated this goal in several subsequent budget reports. Recently, both the House and Senate appropriations committees reiterated support for PRI development and directed CDC to include the necessary funding in its FY 2027 budget request.

Questions?

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