

Pediatric Age-Specific Reference Intervals in a Chinese Population

YANTAI YUHUANGDING HOSPITAL

Pediatric myocardial injury (PMI) although not common, can be serious and is thought to be underdiagnosed. Diagnosis and treatment of PMI is crucial for preserving cardiac tissue and improving outcomes for pediatric patients with PMI. The ability to safely diagnose and/or rule-out PMI is contingent on the use of appropriate pediatric reference intervals.

Understanding age-specific pediatric reference intervals helps to ensure high quality care for vulnerable patients. Thus, an integrated clinical care team at Yantai Yuhuangding Hospital, Yantai, China sought to determine pediatric reference intervals for hs-cTnI to enable more accurate rule-in and out of PMI. Determination of reference intervals in a pediatric population is inherently challenging due to difficulties in participants recruitment, collection of adequate blood volume, and the ability of the sample population to include healthy subjects. Given these difficulties, the team used an indirect data mining method known as the “Indirect Hoffmann Method which uses retrospective data, allowing large amounts of previously measured data to generate the most reliable reference range possible. Appropriate pediatric reference intervals were assessed by age and then integrated into the laboratory information system (LIS) for clinical reference, diagnosis and treatment planning. In conjunction, education was provided to clinicians to ensure adoption and enable by-in for widespread use.

Use of the pediatric reference intervals supported a 41% increase (from 55% to 96%) in the safe exclusion of myocardial injury in patients aged from birth to two days, which resulted in an 84% reduction in additional myocardial biomarker testing in the neonatology and pediatrics departments. This reduction in testing corresponded with an increase in clinical confidence, with 93.3% of surveyed respondents indicating their belief that the new pediatric reference intervals improve their confidence in making clinical decisions.



Pictured (from left to right): Guozhen Chen, Guangyu, Zhou, Chengming Sun, Yanjie Ding, Lei Cheng

The measurable success of this program has inspired other hospitals in China to initiate their own pediatric agespecific hs-cTnI reference intervals with Yantai Yuhuangding Hospital being awarded recognition of Achievement in association with the 2021 UNIVANTS of Healthcare Excellence Awards program.

THREE KEY TAKEAWAYS:

- Using pediatric age-specific biomarker reference intervals can enhance detection of myocardial injury.
- Safe rule out of myocardial injury (MI) in pediatric patients can mitigate the need for additional testing and unnecessary prophylactic drug therapies.
- Decreasing time to diagnosis can improve patient experiences, lower overall anxiety and minimize costs.

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