

Oxygen test has potential to detect some critical congenital heart defects in newborns

6 July 2009

A test that measures oxygen levels in newborns can detect "critical" congenital heart disease, but there are variables involved with the test that require more study before it is adopted for universal newborn screening, according to a new joint statement from the American Heart Association and the American Academy of Pediatrics.

The scientific statement is published online today in *Circulation: Journal of the American Heart Association* and in *Pediatrics*.

A critical congenital heart defect is one a child is born with that requires surgery or catheter intervention in the first year of life, such as tetralogy of Fallot and coarctation of the [aorta](#), among others. The benefits of the oxygen test, called a pulse oximetry screening, outweigh the risks, but the best way to implement pulse oximetry screening is not well established by research.

Thus, the organizations affirm that the test can be used at a physician's discretion, and call for more research to determine whether the test should become part of the routine assessment of all newborns in the United States.

In the research reviewed, the test's ability to detect critical [congenital heart disease](#) varied widely, from zero to 100 percent.

According to the statement, most studies that have analyzed pulse oximetry in newborn screening were relatively small, and screening protocols differed with respect to both age at screening and cutoff levels for an abnormal screen.

A normal oxygen reading is between 97-100 percent.

Because oxygen levels in healthy newborns can vary considerably in the first 24 hours of life, the authors note that testing after 24 hours would

appear the best strategy. False positive rates were just .035 percent in infants screened after 24 hours.

"The statement is important because there hasn't been any strong guidance so far regarding the use of pulse oximetry as a diagnostic technique in newborns," said William T. Mahle, M.D., FAAP, chair of the writing committee and associate professor of pediatrics at Emory University School of Medicine in Atlanta. "Some hospitals across the country have adopted it and others haven't, so we wanted to review the available evidence and offer a consensus opinion on the topic."

The test potentially can identify significant or life-threatening heart defects that may otherwise go unnoticed or at least unnoticed before a newborn is released from the hospital, Mahle said. Early identification of certain defects is important, and can allow doctors to begin appropriate treatment or transfer to a specialty hospital.

Pulse oximetry was developed in the early 1970s, based on the fact that red blood cells that carry oxygen absorb different wavelengths of light vs. those that don't carry oxygen. Oxygenated blood cells absorb infrared light, while deoxygenated cells absorb red light. The test measures how much oxygen is in blood that flows through the arteries.

Arterial blood oxygen levels are measured by a device with a thin wire, tipped by a small red light. The wire is taped to an infant's foot for a few minutes to obtain a reading. In older children and adults, pulse oxygen is often measured by a device clipped on a finger.

The overall cost of the test is reasonable, and is about the same as the cost of other newborn screening tests.

As of 2002, the prevalence of congenital cardiovascular defects in the United States is about

9 per 1,000 live births Mahle said.

Source: American Heart Association ([news](#) : [web](#))

APA citation: Oxygen test has potential to detect some critical congenital heart defects in newborns (2009, July 6) retrieved 12 October 2022 from <https://medicalxpress.com/news/2009-07-oxygen-potential-critical-congenital-heart.html>

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