



## POLICY STATEMENT

# Endorsement of Health and Human Services Recommendation for Pulse Oximetry Screening for Critical Congenital Heart Disease

## abstract

FREE

Incorporation of pulse oximetry to the assessment of the newborn infant can enhance detection of critical congenital heart disease (CCHD). Recently, the Secretary of Health and Human Services (HHS) recommended that screening for CCHD be added to the uniform screening panel. The American Academy of Pediatrics (AAP) has been a strong advocate of early detection of CCHD and fully supports the decision of the Secretary of HHS.

The AAP has published strategies for the implementation of pulse oximetry screening, which addressed critical issues such as necessary equipment, personnel, and training, and also provided specific recommendations for assessment of saturation by using pulse oximetry as well as appropriate management of a positive screening result. The AAP is committed to the safe and effective implementation of pulse oximetry screening and is working with other advocacy groups and governmental agencies to promote pulse oximetry and to support widespread surveillance for CCHD.

Going forward, AAP chapters will partner with state health departments to implement the new screening strategy for CCHD and will work to ensure that there is an adequate system for referral for echocardiographic/pediatric cardiac evaluation after a positive screening result. It is imperative that AAP members engage their respective policy makers in adopting and funding the recommendations made by the Secretary of HHS. *Pediatrics* 2012;129:190–192

Delayed diagnosis of critical congenital heart disease (CCHD) can result in death or injury to infants. The current approach to detect CCHD in the United States relies on prenatal ultrasound examinations and the physical examination findings in the newborn nursery. Unfortunately, this approach fails to identify a significant number of cases of CCHD, which may lead to late diagnosis with significant morbidity, permanent injury of vital organs, and in some cases, death. A number of studies have revealed that adding pulse oximetry to the assessment of the newborn can enhance detection of CCHD. Pulse oximetry is a readily available, noninvasive, and painless technology that can be incorporated into the routine assessment of the newborn.

On September 21, 2011, the Secretary of Health and Human Services (HHS), Kathleen Sebelius, recommended that screening for CCHD be

SECTION ON CARDIOLOGY AND CARDIAC SURGERY EXECUTIVE  
COMMITTEE**KEY WORDS**pulse oximetry, critical congenital heart disease, recommended  
uniform screening panel, screening, newborn infants**ABBREVIATIONS**

AAP—American Academy of Pediatrics

CCHD—critical congenital heart disease

HHS—Health and Human Services

RUSP—recommended uniform screening panel

This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

[www.pediatrics.org/cgi/doi/10.1542/peds.2011-3211](http://www.pediatrics.org/cgi/doi/10.1542/peds.2011-3211)

doi:10.1542/peds.2011-3211

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2012 by the American Academy of Pediatrics

added to the recommended uniform screening panel (RUSP). This recommendation was based in large part on the Secretary's Advisory Committee on Heritable Disorders in Newborns and Children's recommendations and a 2-day comprehensive evidence review of screening strategies by national and international stakeholders. The American Academy of Pediatrics (AAP) strongly supports the decision of the Secretary of HHS to add screening with pulse oximetry to the RUSP. The AAP has been a vigorous advocate of early detection of CCHD to prevent childhood deaths or injury that might occur as a result of late detection.

There are a number of important issues that relate to the implementation of pulse oximetry into the routine care of the newborn. A detailed description of these issues has been published by the AAP.<sup>1</sup> This publication provides a detailed screening algorithm developed by the Secretary's Advisory Committee on Heritable Disorders in Newborns and Children. It also provides detailed recommendations regarding necessary equipment, personnel and training, and appropriate management of a positive screening result. The highlights of screening implementation are as follows:

- The screening is targeted toward healthy newborn infants in the newborn nursery.
- Screening should be performed with motion-tolerant pulse oximeters. It is appropriate to use either disposable or reusable pulse oximetry probes.
- Screening should not be undertaken until 24 hours of life or as late as possible if early discharge is planned to reduce the number of false-positive results. Separate consideration for home births is necessary.
- Oxygen saturations should be obtained in the right hand and one foot. Threshold for a positive screening result is detailed in the publication and relates to both the absolute reading by the pulse oximeter as well as the difference between the 2 extremities. Screening that has a pulse oximetry reading of  $\geq 95\%$  in either extremity with a  $\leq 3\%$  absolute difference between the upper and lower extremity would be considered a pass, and the screening would end. It is recommended that repeated measurements be performed in those cases in which the initial screening result was positive, again in an effort to reduce false-positive results. Infants with saturations  $< 90\%$  should receive immediate evaluation. It is important to note that the oxygen saturation thresholds for a positive screening result may vary at high altitude. Appropriate studies need to be performed at high altitude to establish reliable thresholds.
- In the event of a positive screening result, CCHD needs to be excluded with a diagnostic echocardiogram. Infectious and pulmonary causes of hypoxemia should also be excluded.

The AAP can play an important role in assuring the safe and effective implementation of screening for CCHD. This includes preparing members to implement screening; engaging pediatricians to participate in quality-improvement activities to ensure that newborn infants are appropriately screened with follow-up echocardiograms and specialty care, as required; partnering with public health agencies for surveillance of CCHD; and advocating for appropriate payment for all screening-related activities. In addition to promoting the implementation of pulse oximetry based screening

programs, the AAP supports widespread surveillance for CCHD. Such surveillance will yield several benefits, including documentation of any improvement in detection as well as identification of areas of weakness for this comprehensive screening strategy.

Although the Secretary of HHS has recommended that screening for CCHD be added to the RUSP, it will be up to states to determine how they wish to incorporate this into their own screening programs. This may be accomplished by legislation, regulation, or adoption as a standard of practice. The majority of disorders identified on the RUSP are adopted by most states, but there is variability among the states. A number of states have already incorporated routine screening for CCHD into the statewide panel. These states can serve as a paradigm for subsequent implementation by other states.\* It will be critical that AAP chapters work with state health departments to implement the new screening strategy for CCHD in a manner that is adequately financed, cost-effective, and practical; that ensures screening and for echocardiographic/pediatric cardiac evaluation and therapeutic intervention as indicated with provision for follow-up for all newborn infants within the framework of the medical home; and that ensures that related payment issues for technical and professional services are addressed. It is hoped that through these collaborative efforts, the burden of delayed diagnosis of congenital heart disease will be reduced and the health of children will be enhanced for years to come.

\*For more information on your state law, please contact the AAP Division of State Government Affairs at [stgov@aap.org](mailto:stgov@aap.org).

## RECOMMENDATIONS

- Pulse oximetry screening for CCHD should be performed by using evidence-based guidelines such as those reported by the Secretary of HHS Advisory Committee Work Group, as detailed in the algorithm in the special article on screening for congenital heart disease.<sup>1</sup>
- AAP members should encourage incorporating pulse oximetry screening into routine newborn care and the development of effective systems to allow for timely and accurate diagnostic assessment with echocardiography and to ensure a medical home for those found to have CCHD.
- AAP chapters, AAP members, and local advocates should engage their respective policy makers at the

federal and state legislative and regulatory levels in considering, adopting, funding, and implementing the recommendations made by the Secretary of HHS to ensure the development of the educational materials; training; equipment, including echocardiography and telemedicine needs; system development; and support with access to funding ensured for all components of medically necessary care.

- The AAP will actively engage other stakeholders and the American Medical Association to develop appropriate *Current Procedural Terminology* codes for pulse oximetry screening with appropriate relative value units and should advocate for appropriate payment for CCHD screening-related activities.

## LEAD AUTHORS

William T. Mahle, MD  
Gerard R. Martin, MD  
Robert H. Beekman, III, MD  
W. Robert Morrow, MD

## SECTION ON CARDIOLOGY AND CARDIAC SURGERY EXECUTIVE COMMITTEE, 2011-2012

W. Robert Morrow, MD, Chairperson  
Geoffrey L. Rosenthal, MD, PhD  
Christopher S. Snyder, MD  
L. LuAnn Minich, MD  
Seema Mital, MD  
Jeffrey A. Towbin, MD  
James S. Tweddell, MD

## FORMER SECTION EXECUTIVE COMMITTEE MEMBERS

Robert H. Beekman, III, MD, Immediate Past  
Chairperson  
Thomas S. Klitzner, MD, PhD, Past Chairperson

## STAFF

Lynn Colegrove, MBA

## REFERENCE

1. Kemper AR, Mahle WT, Martin GR, et al. Strategies for implementing screening for

critical congenital heart disease. *Pediatrics*.

2011;128(5). Available at: [www.pediatrics.org/cgi/content/full/128/5/e1259](http://www.pediatrics.org/cgi/content/full/128/5/e1259)

**Endorsement of Health and Human Services Recommendation for Pulse Oximetry Screening for Critical Congenital Heart Disease**  
SECTION ON CARDIOLOGY AND CARDIAC SURGERY EXECUTIVE COMMITTEE, William T. Mahle, Gerard R. Martin, Robert H. Beekman III, W. Robert Morrow, Geoffrey L. Rosenthal, Christopher S. Snyder, L. LuAnn Minich, Seema Mital, Jeffrey A. Towbin and James S. Tweddell  
*Pediatrics* 2012;129;190  
DOI: 10.1542/peds.2011-3211 originally published online December 26, 2011;

<b>Updated Information &amp; Services</b>	including high resolution figures, can be found at: <a href="http://pediatrics.aappublications.org/content/129/1/190">http://pediatrics.aappublications.org/content/129/1/190</a>
<b>References</b>	This article cites 1 articles, 0 of which you can access for free at: <a href="http://pediatrics.aappublications.org/content/129/1/190#BIBL">http://pediatrics.aappublications.org/content/129/1/190#BIBL</a>
<b>Subspecialty Collections</b>	This article, along with others on similar topics, appears in the following collection(s): <b>Cardiology</b> <a href="http://www.aappublications.org/cgi/collection/cardiology_sub">http://www.aappublications.org/cgi/collection/cardiology_sub</a>
<b>Permissions &amp; Licensing</b>	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: <a href="http://www.aappublications.org/site/misc/Permissions.xhtml">http://www.aappublications.org/site/misc/Permissions.xhtml</a>
<b>Reprints</b>	Information about ordering reprints can be found online: <a href="http://www.aappublications.org/site/misc/reprints.xhtml">http://www.aappublications.org/site/misc/reprints.xhtml</a>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

**Endorsement of Health and Human Services Recommendation for Pulse  
Oximetry Screening for Critical Congenital Heart Disease**

SECTION ON CARDIOLOGY AND CARDIAC SURGERY EXECUTIVE  
COMMITTEE, William T. Mahle, Gerard R. Martin, Robert H. Beekman III, W.  
Robert Morrow, Geoffrey L. Rosenthal, Christopher S. Snyder, L. LuAnn Minich,  
Seema Mital, Jeffrey A. Towbin and James S. Tweddell

*Pediatrics* 2012;129;190

DOI: 10.1542/peds.2011-3211 originally published online December 26, 2011;

The online version of this article, along with updated information and services, is  
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/129/1/190>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2012 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

