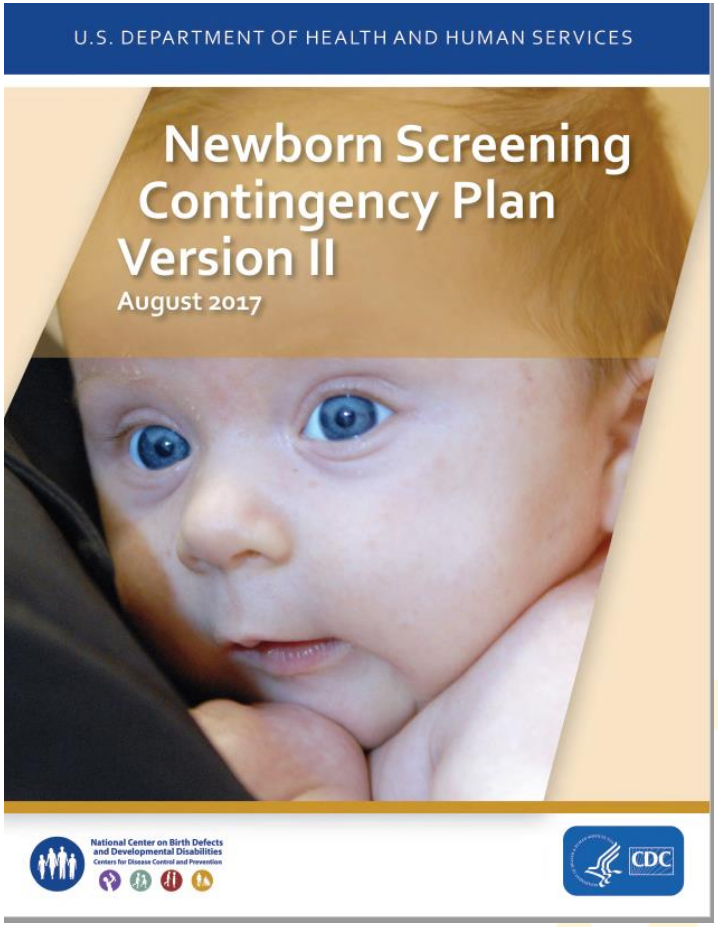
AHCCCS
Arizona Health Care Cost Containment System

Newborn Screening

8/8/18

Newborn Screening Part 1

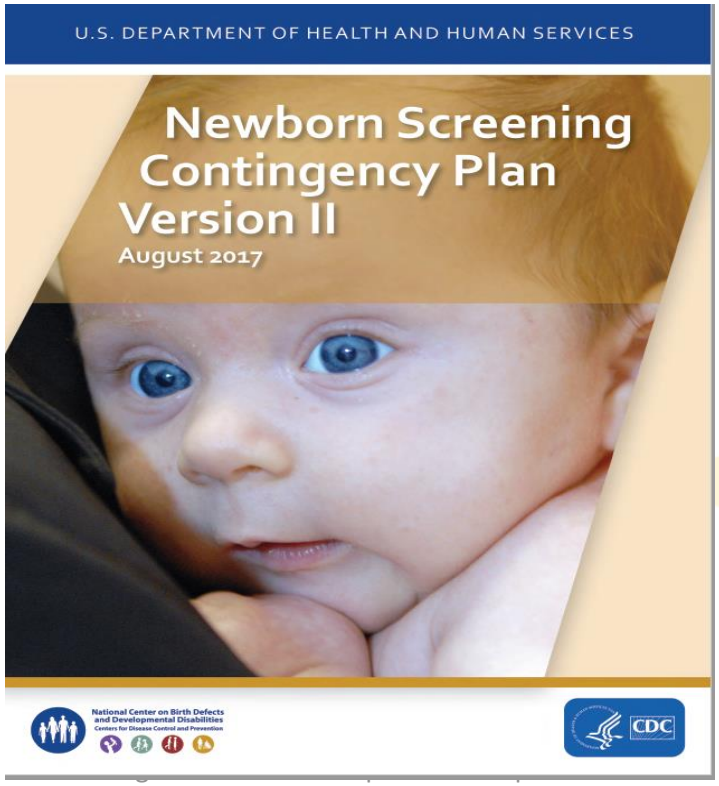


TA Opportunity

- Crisis Response Network and AHCCCS will be holding a joint TA session on the SMI eligibility system, including assessments, on Thursday, August 16th from 9-10am in the Gold room.

CDC

- https://www.cdc.gov/ncbddd/documents/Screening-Contingency-Plan-Version-II.pdf



Bloodspot Screening

ADHS

https://azdhs.gov/preparedness/state-laboratory/newborn-screening/#healthcare-providers-disorder-info

ARIZONA'S NEWBORN SCREENING PANEL OF 31 DISORDERS
Effective August 9, 2017

Endocrine Disorders (2) Congenital hypothyroidism (CH) Congenital adrenal hyperplasia (CAH)

Amino Acid Disorders (6)
Phenylketonuria (PKU)
Maple syrup urine disease (MSUD)
Homocystinuria (HCY)
Citrullinemia type I (CIT-1)
Argininosuccinic acidemia (ASA)
Tyrosinemia type I (TYR-1)

Fatty Acid Oxidation Disorders (5)
Carnitine uptake defect (CUD)
Medium-chain acyl-CoA dehydrogenase deficiency (MCAD)
Very long-chain acyl-CoA dehydrogenase deficiency (VLCAD)
Long-chain L-3-hydroxyacyl-CoA dehydrogenase deficiency (LCHAD)
Trifunctional protein deficiency (TFP)

Organic Acid Disorders (9)
Isovaleric acidemia (IVA)
Glutaric acidemia type I (GA-1)
3-Hydroxy-3-methylglutaric aciduria (HMG)
Multiple carboxylase deficiency (MCD)
Methylmalonic acidemia-cobalamin defect (Cbl A,B)
Methylmalonic acidemia-mutase deficiency (MUT)
3-Methylcrotonyl-CoA carboxylase deficiency (3MCC)
Propionic acidemia (PROP)
Beta-ketothiolase deficiency (BKT)

Hemoglobin Disorders (3)
Sickle cell anemia (Hb SS)
S, beta-thalassemia (Hb S/ß Th)
S, C disease (Hb S/C)

Other Disorders (4)
Biotinidase deficiency (BIOT)
Galactosemia (GALT)
Cystic Fibrosis (CF)
Severe Combined Immunodeficiency (SCID)

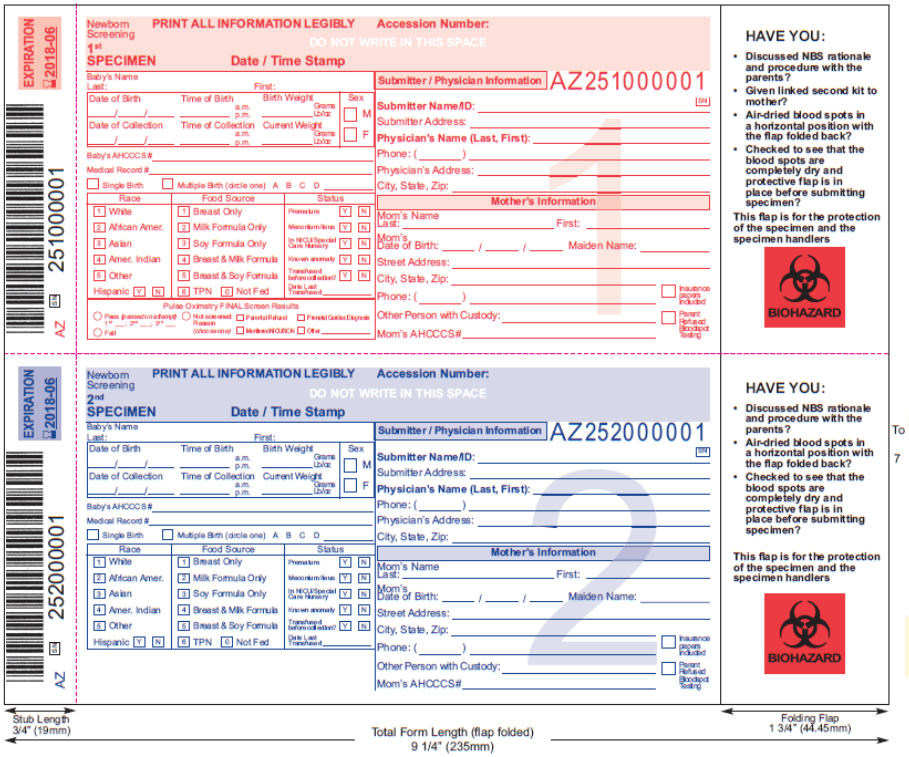
Disorders not detected by bloodspot screening (2)
Hearing Loss (HEAR)
Critical Congenital Heart Defects (CCHD)

www.aznewborn.com

Current ADHS Program Overview

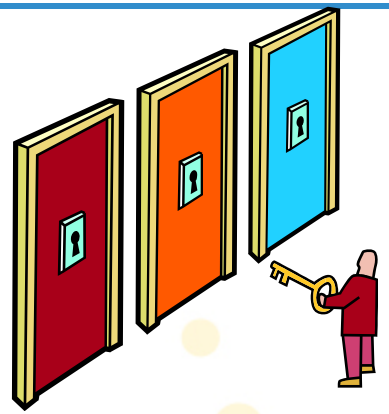
- AZ screens for 31 disorders, 29 from bloodspot collection and two point-of-care tests—Hearing and Critical Congenital Heart Defect (CCHD) screening – Severe Combined Immunodeficiency (SCID) screening was added in August 2017
- A fee increase on the 1st screen was approved Nov. 2017 to partially offset costs associated with SCID testing – 1st screen costs $36. – 2nd screen costs $65.
- Two bloodspot screens are required for all newborns/infants – The 1st one should be collected between 24-36 hours – The 2nd one should be collected between 5-10 days of life.
- The pulse ox screen should be collected at 24 hours and repeated up to 2 more times before discharge
- Initial hearing screening should be conducted at 24 hours of age or before discharge

Screening Card



Selecting Disorders for Screening

- Prevalence
- Cost effective and reliable testing
- Effective treatment/intervention
- No treatment = death /severe impairment
- Appears normal at birth



AZ Newborn Screening Advisory Committee: SB 1368

Newborn Screening Advisory Committee

Statutory Requirement ARS §36-694

Role	Position	Person
Endocrinologist—Physician #1	filled	Dr. Mark Wheeler
Pediatrician—Physician #2	NEW	Dr. Arturo Gonzalez
Neonatologist—Physician #3	NEW	Dr. Moira Richards
Family Practice—Physician #4	filled	Dr. Rachel Deatherage
Otologist—Physician #5	filled	Dr. Michael Fucci
Obstetrician—Physician #6	NEW	Dr. Laura Mercer-*tentative*
Metabolic Geneticist--Physician #7	Filled	Dr. Kirk Aleck
NNP	Filled	Deb Ledington
Audiologist	Filled	Lylis Olsen
Part C Provider	NEW	Jenée Sisnroy
Parent(s)	Filled (x2)	Deb Houck Monica Attridge
Insurance Industry	NEW	Dr. Leslie Paulus
AHCCCS	NEW	Dr. Eric Tack
Hospital/Healthcare Rep.	NEW	Debbie Johnston
Licensed Midwife	NEW	Olga Ryan

As of August, 2018

CDC RUSP

The Recommended Uniform Screening Panel (RUSP)
34 disorders recommended

Conditions listed on the RUSP are part of the comprehensive preventive health guidelines supported by HRSA for infants and children under section 2713 of the Public Health Service Act. Non-grandfathered health plans are required to cover screenings included in the HRSA-supported comprehensive guidelines without charging a co-payment, co-insurance, or deductible for plan years beginning on or after the date that is one year from the Secretary's adoption of the condition for screening. [1]

https://www.hrsa.gov/advisory-committees/heritable-disorders/rusp/index.html

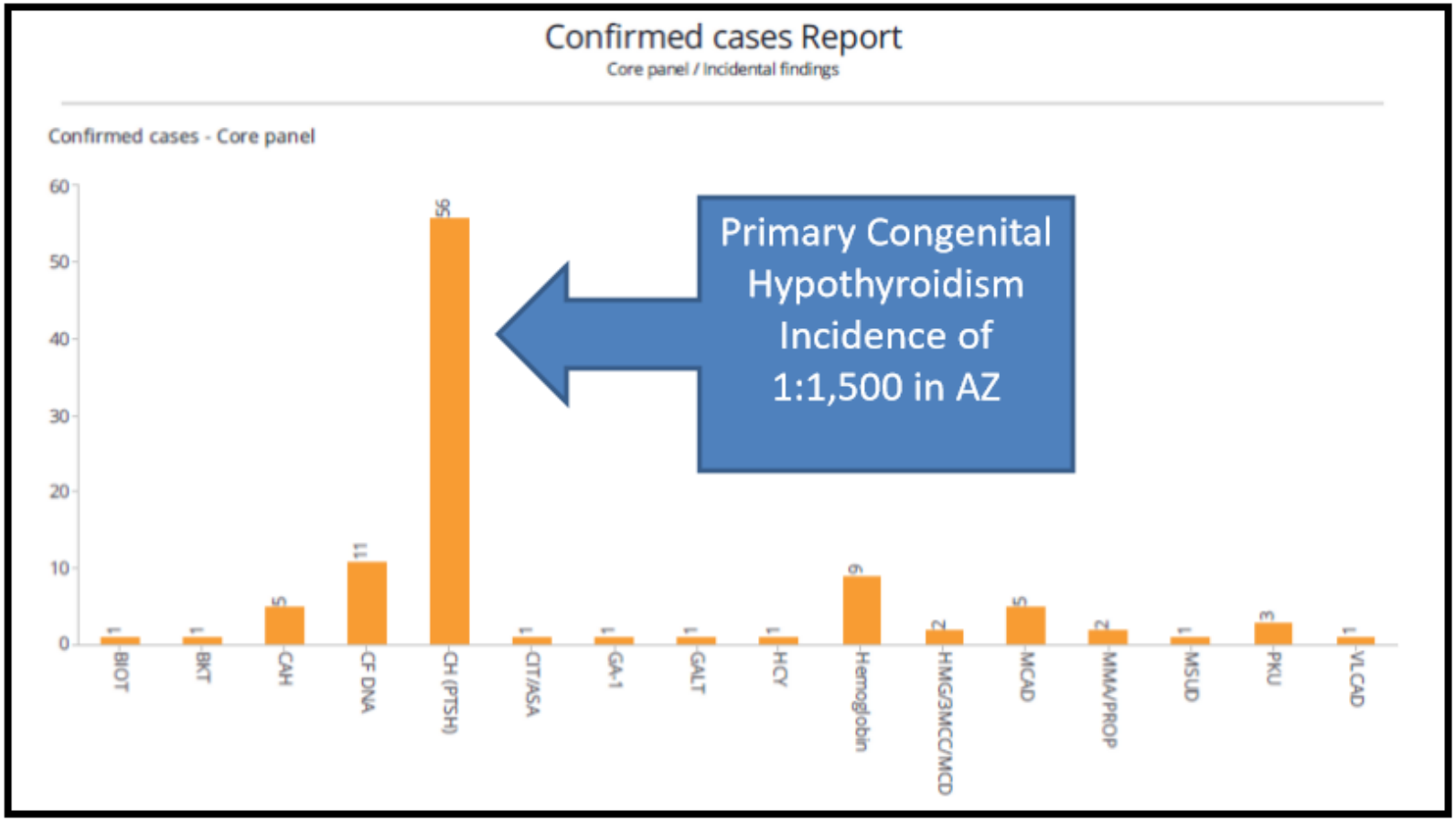
How to Nominate a New Condition

- https://www.hrsa.gov/advisory-committees/heritable-disorders/rusp/index.html

Data

- In 2017, > 155,000 bloodspot samples were processed in the lab, averaging about 13,000 per month representing about 84,000 babies – 101 babies were diagnosed with genetic/metabolic disorders – 282 (0.18%) samples were unsatisfactory for testing and repeat testing was necessary – Another 3000 (2%) samples had insufficient blood on the card to complete all screening and therefore repeat testing was required.
- A high number of these quantity not sufficient (QNS) samples were attributed to the addition of SCID screening, which requires another punch from the spot of blood.
- A CQI project is underway with hospitals to improve outcomes. The total number of QNS samples have been reduced from 3.2% to about 1.70% within 6 months.

Bloodspot Disorders for 2017



Future Additions

- SMA currently under review

AZ screens for 31 disorders and is missing

- ❑ Pompe
- ❑ X-ALD
- ❑ MPS-1

ADHS needs your help!

Follow up Activities

- Help close the loop when referrals are written by doctor
- If we can reach out to MCH Coordinators directly it would help
  - **Can we get current contact info for each health plan?**
- Arizona is mandated to screen every newborn twice but there is no mechanism in place to ensure that infants who receive only one screen *with normal results* receive the required second screen

What the Data Shows

In 2016

Bloodspot

- 97.13% of infants had at least one bloodspot screen;
- Of them, 21 babies had out of range (positive) bloodspot results but no additional testing

Hearing

- 98.02% had a hearing screen
- 259 or 29.80% were lost to follow-up

Audiologic Testing

- AABR - Automated Auditory Brainstem Response
- OAE - Otoacoustic Emissions
- Incidence is 2-3/1000 live births
- NIH Fact Sheet https://report.nih.gov/NIHfactsheets/ViewFactSheet.aspx?csid=104

Risk Factors

Risk factors for neonatal sensorineural hearing loss

Family history of permanent hearing loss

Craniofacial abnormalities including those involving the external ear

Congenital infections including bacterial meningitis, cytomegalovirus, toxoplasmosis, rubella, herpes and syphilis

Physical findings consistent with an underlying syndrome associated with hearing loss

Neonatal intensive care unit stay >2 days OR with any of the following regardless of the duration of stay:

- Extracorporeal membrane oxygenation
- Assisted ventilation
- Ototoxic drug use
- Hyperbilirubinemia requiring exchange transfusion

Hearing

- Newborn hearing screening is the standard of care in hospitals nationwide. The primary purpose of newborn hearing screening is to identify newborns who are likely to have hearing loss and who require further evaluation. A secondary objective is to identify newborns with medical conditions that can cause late-onset hearing loss and to establish a plan for continued monitoring of their hearing status (Joint Committee on Infant Hearing [JCIH], 2007). The EHDI guidelines include hearing screening completion by 1 month of age, diagnosis of any hearing loss by 3 months of age, hearing aid selection and fitting within 1 month of confirmation of hearing loss if parents choose that option, and entry into early intervention (EI) services by 6 months of age.
- In 2014, 96.1% of babies born in the United States had their hearing screened before 1 month of age (Centers for Disease Control and Prevention [CDC], 2016), and 6,163 infants were diagnosed with permanent hearing loss.
- Screening programs target permanent childhood hearing loss (PCHL) irrespective of type. However, some protocols are more effective at identifying types and degrees of hearing loss within different populations (i.e., well-baby nursery or neonatal intensive care unit [NICU]).
- Passing a screening does not mean that a child has normal hearing across the frequency range. Because minimal and frequency-specific hearing losses are not targeted by newborn hearing screening programs, newborns with these losses may pass a hearing screening. Because these losses have the potential to interfere with the speech, language, and psychoeducational development of children (Yoshinaga-Itano, DeConde Johnson, Carpenter, & Stredler-Brown, 2008), monitoring of hearing, speech, and language milestones throughout childhood is essential.

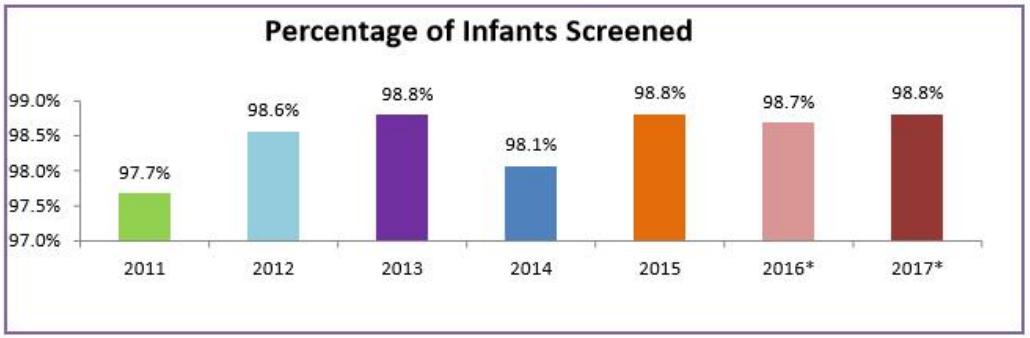
Principles

- All infants should have access to hearing screening using a physiologic measure before 1 month of age.
- All infants who do not pass the initial hearing screen and the subsequent rescreening should have appropriate audiologic and medical evaluations to confirm the presence of hearing loss before 3 months of age.
- All infants with confirmed permanent hearing loss should receive intervention services before 6 months of age. A simplified, single point of entry into an intervention system appropriate to children with hearing loss is optimal.
- The EHDI system should be family centered with infant and family rights and privacy guaranteed through informed choice, shared decision making, and parental consent. Families should have access to information about all intervention and treatment options and counseling regarding hearing loss.
- The child and family should have immediate access to high-quality technology, including hearing aids, cochlear implants, and other assistive devices when appropriate.

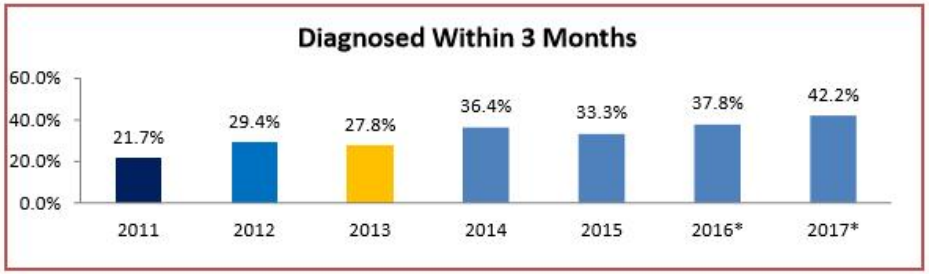
AMPM 430

- AMPM 430 B 10
- Contractors must ensure that the Bloodspot Newborn Screening Panel and hearing tests are conducted, including initial and secondary screenings, in accordance with **9 A.A.C. 13, Article 2.**
- Appropriate vision, hearing, and speech screenings are covered during an EPSDT visit. EPSDT covers eye examinations as appropriate to age according to the AHCCCS EPSDT Periodicity Schedule (AMPM Exhibit 430-1) and as medically necessary using standardized visual tools. Payment for vision and hearing exams, (including, but not limited to CPT codes 92015, 92081, 92285, 92551, 92552, 92553, 92567, 92568, 92285, 92286, 92587, 92588, 95930, and 99173) or any other procedure that may be interpreted as fulfilling the vision and hearing requirements provided in a PCP's office during an EPSDT visit, are considered part of the EPSDT visit and are not a separately billable services.

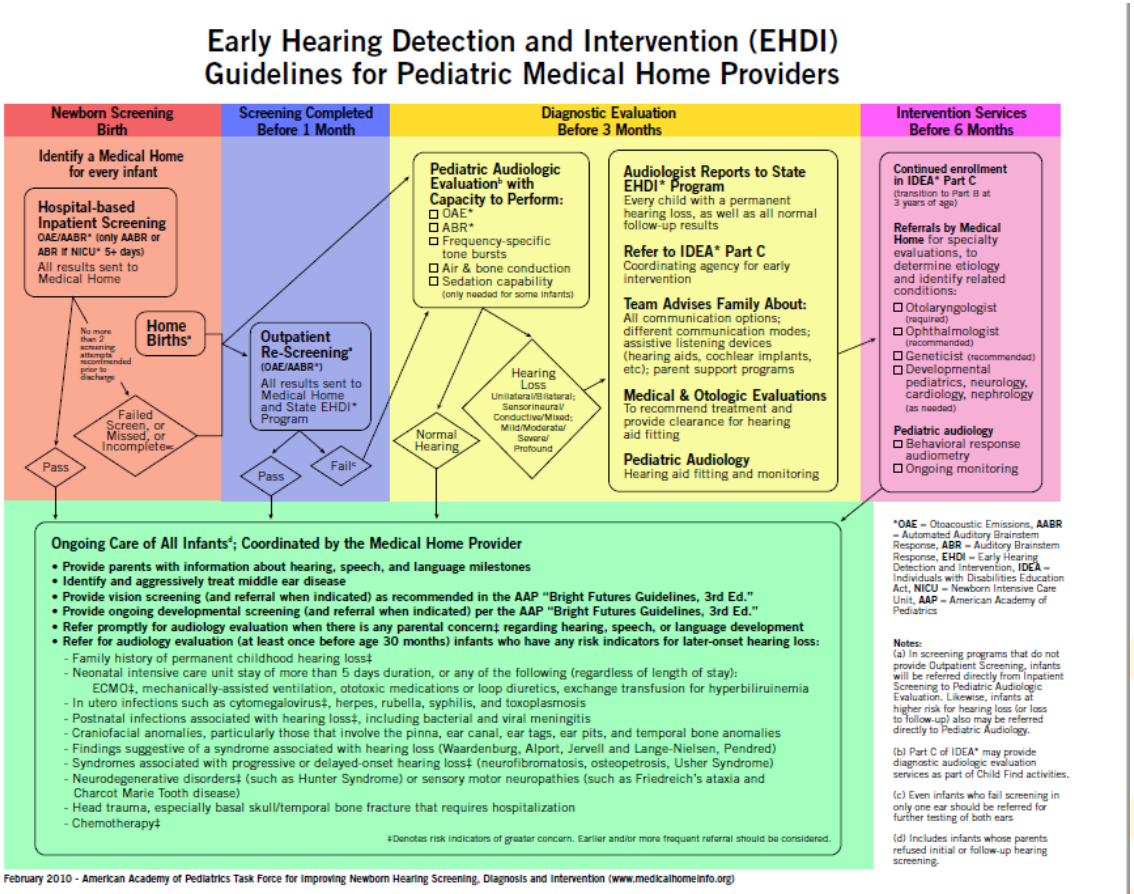
Hearing Screening AZ Data



CALENDAR YEAR 2017	Total Screened: 82,035
Total with Permanent Hearing Loss (Initial Diagnosis)	162
Permanent Hearing Loss ID Before 3 Months of Age	125
Permanent Hearing Loss ID After 3 Months of Age but Before 6 Months	23
Permanent Hearing Loss ID After 6 Months of Age	14



Hearing Screening Flow



Early Hearing Detection and Intervention (EHDI) Guidelines for Pediatric Medical Home Providers

Newborn Screening Birth

Identify a Medical Home for every infant

Hospital-based Inpatient Screening
OAE/AABR* (only AABR or ABR if NICU* 5+ days)
All results sent to Medical Home

No more than 2 screening attempts recommended prior to discharge

Home Births*

Failed Screen, or Missed, or Incomplete[c]

Pass

Screening Completed Before 1 Month

Outpatient Re-Screening* (OAE/AABR*)
All results sent to Medical Home and State EHDI* Program

Pass

Fail[c]

Diagnostic Evaluation Before 3 Months

Pediatric Audiologic Evaluation[b] with Capacity to Perform:
- ☐ OAE*
- ☐ ABR*
- ☐ Frequency-specific tone bursts
- ☐ Air & bone conduction
- ☐ Sedation capability

(only needed for some infants)

Normal Hearing

Hearing Loss
Unilateral/Bilateral; Sensorineural/ Conductive/Mixed; Mild/Moderate/ Severe/ Profound

Audiologist Reports to State EHDI* Program
Every child with a permanent hearing loss, as well as all normal follow-up results

Refer to IDEA* Part C
Coordinating agency for early intervention

Team Advises Family About:
All communication options; different communication modes; assistive listening devices (hearing aids, cochlear implants, etc); parent support programs

Medical & Otologic Evaluations
To recommend treatment and provide clearance for hearing aid fitting

Pediatric Audiology
Hearing aid fitting and monitoring

Intervention Services Before 6 Months

Continued enrollment in IDEA* Part C
(transition to Part B at 3 years of age)

Referrals by Medical Home for specialty evaluations, to determine etiology and identify related conditions:
- ☐ Otolaryngologist (required)
- ☐ Ophthalmologist (recommended)
- ☐ Geneticist (recommended)
- ☐ Developmental pediatrics, neurology, cardiology, nephrology (as needed)

Pediatric audiology
- ☐ Behavioral response audiometry
- ☐ Ongoing monitoring

Ongoing Care of All Infants[d]; Coordinated by the Medical Home Provider

- **Provide parents with information about hearing, speech, and language milestones**
- **Identify and aggressively treat middle ear disease**
- **Provide vision screening (and referral when indicated) as recommended in the AAP "Bright Futures Guidelines, 3rd Ed."**
- **Provide ongoing developmental screening (and referral when indicated) per the AAP "Bright Futures Guidelines, 3rd Ed."**
- **Refer promptly for audiology evaluation when there is any parental concern‡ regarding hearing, speech, or language development**
- **Refer for audiology evaluation (at least once before age 30 months) infants who have any risk indicators for later-onset hearing loss:**
  - Family history of permanent childhood hearing loss‡
  - Neonatal intensive care unit stay of more than 5 days duration, or any of the following (regardless of length of stay): ECMO‡, mechanically-assisted ventilation, ototoxic medications or loop diuretics, exchange transfusion for hyperbiliruinemia
  - In utero infections such as cytomegalovirus‡, herpes, rubella, syphilis, and toxoplasmosis
  - Postnatal infections associated with hearing loss‡, including bacterial and viral meningitis
  - Craniofacial anomalies, particularly those that involve the pinna, ear canal, ear tags, ear pits, and temporal bone anomalies
  - Findings suggestive of a syndrome associated with hearing loss (Waardenburg, Alport, Jervell and Lange-Nielsen, Pendred)
  - Syndromes associated with progressive or delayed-onset hearing loss‡ (neurofibromatosis, osteopetrosis, Usher Syndrome)
  - Neurodegenerative disorders‡ (such as Hunter Syndrome) or sensory motor neuropathies (such as Friedreich's ataxia and Charcot Marie Tooth disease)
  - Head trauma, especially basal skull/temporal bone fracture that requires hospitalization
  - Chemotherapy‡

‡Denotes risk indicators of greater concern. Earlier and/or more frequent referral should be considered.

*OAE – Otoacoustic Emissions, **AABR** – Automated Auditory Brainstem Response, **ABR** – Auditory Brainstem Response, **EHDI** – Early Hearing Detection and Intervention, **IDEA** – Individuals with Disabilities Education Act, **NICU** – Newborn Intensive Care Unit, **AAP** – American Academy of Pediatrics

Notes:
(a) In screening programs that do not provide Outpatient Screening, infants will be referred directly from Inpatient Screening to Pediatric Audiologic Evaluation. Likewise, infants at higher risk for hearing loss (or loss to follow-up) also may be referred directly to Pediatric Audiology.

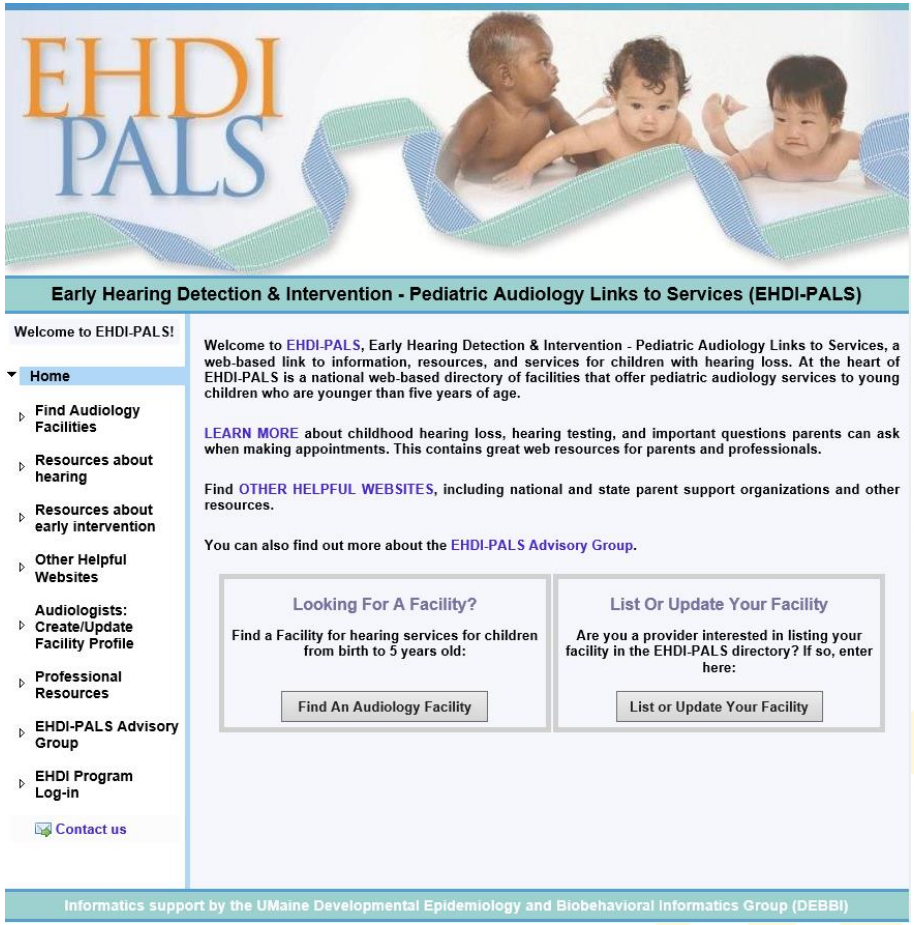
(b) Part C of IDEA* may provide diagnostic audiologic evaluation services as part of Child Find activities.

(c) Even infants who fail screening in only one ear should be referred for further testing of both ears

(d) Includes infants whose parents refused initial or follow-up hearing screening.

February 2010 - American Academy of Pediatrics Task Force for Improving Newborn Hearing Screening, Diagnosis and Intervention (www.medicalhomeinfo.org)

Resources


EHDI
PALS
Early Hearing Detection & Intervention - Pediatric Audiology Links to Services (EHDI-PALS)
Welcome to EHDI-PALS!
Home
Find Audiology Facilities
Resources about hearing
Resources about early intervention
Other Helpful Websites
Audiologists: Create/Update Facility Profile
Professional Resources
EHDI-PALS Advisory Group
EHDI Program Log-in
Contact us
Welcome to EHDI-PALS, Early Hearing Detection & Intervention - Pediatric Audiology Links to Services, a web-based link to information, resources, and services for children with hearing loss. At the heart of EHDI-PALS is a national web-based directory of facilities that offer pediatric audiology services to young children who are younger than five years of age.
LEARN MORE about childhood hearing loss, hearing testing, and important questions parents can ask when making appointments. This contains great web resources for parents and professionals.
Find OTHER HELPFUL WEBSITES, including national and state parent support organizations and other resources.
You can also find out more about the EHDI-PALS Advisory Group.
Looking For A Facility?
Find a Facility for hearing services for children from birth to 5 years old:
Find An Audiology Facility
List Or Update Your Facility
Are you a provider interested in listing your facility in the EHDI-PALS directory? If so, enter here:
List or Update Your Facility
Informatics support by the UMaine Developmental Epidemiology and Biobehavioral Informatics Group (DEBBI)

Resources

- https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589935234&section=Key_Issues from the American Speech-Language-Hearing Association.
- https://www.cdc.gov/ncbddd/hearingloss/recommendations.html from the CDC

CCHD

- https://www.cdc.gov/ncbddd/documents/Screening-Contingency-Plan-Version-II.pdf
- HB 2491 (enacted April 2014)
- Incidence = 1% (~40,000) of all live births in US
- VSD most common
- ~4.2 % of neonatal deaths due to CCHD

CCHD Screening For

CHDs & CCHDs

Critical Congenital Heart Defects

- Hypoplastic Left Heart Syndrome
- Pulmonary Valve Atresia and Stenosis
- Tetralogy of Fallot
- Transposition of the Great Arteries
- Tricuspid Valve Atresia and Stenosis
- Total Anomalous Pulmonary Valve Return
- Common Truncus/Truncus Arteriosis

Congenital Heart Defects

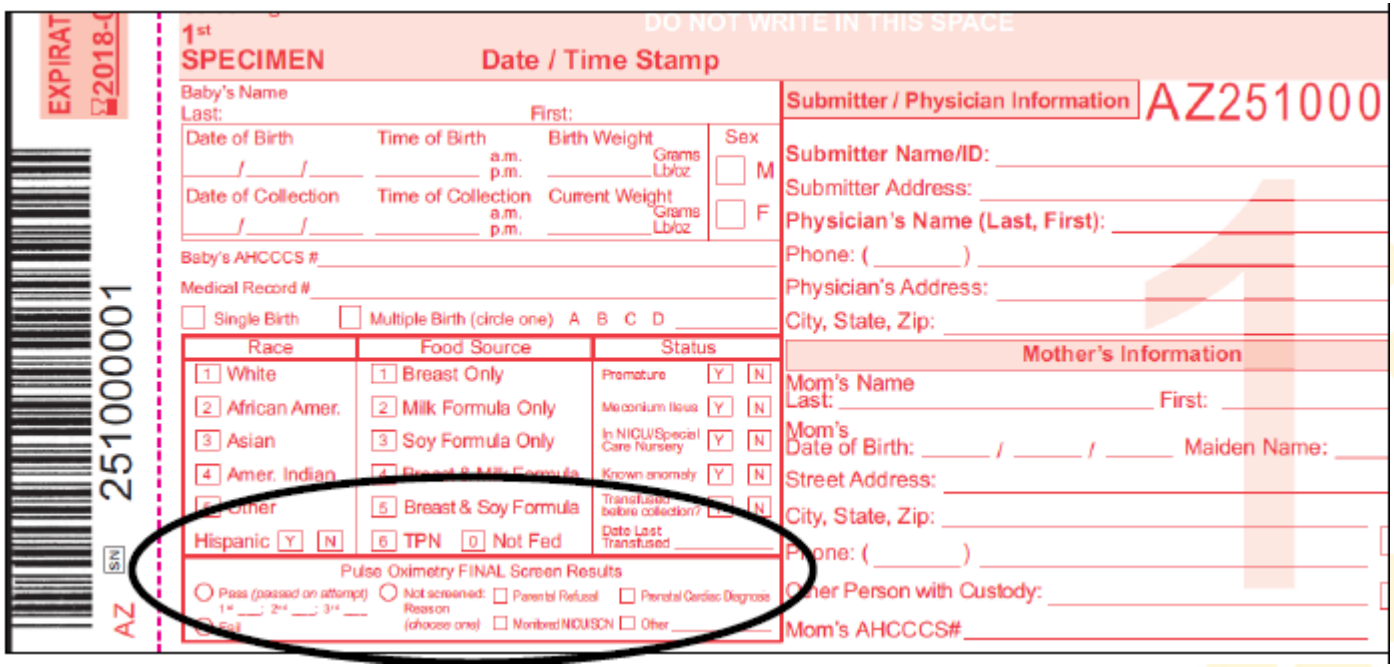
- Coarction of Aorta*
- Ebstein Anomaly*
- Endocardial Cushion Defect/Atrioventricular Canal Defect
- Interrupted Aortic Arch
- Single Ventricle
- Aortic Valve Stenosis

- Atrial Septal Defect
- Ventricular Septal Defect

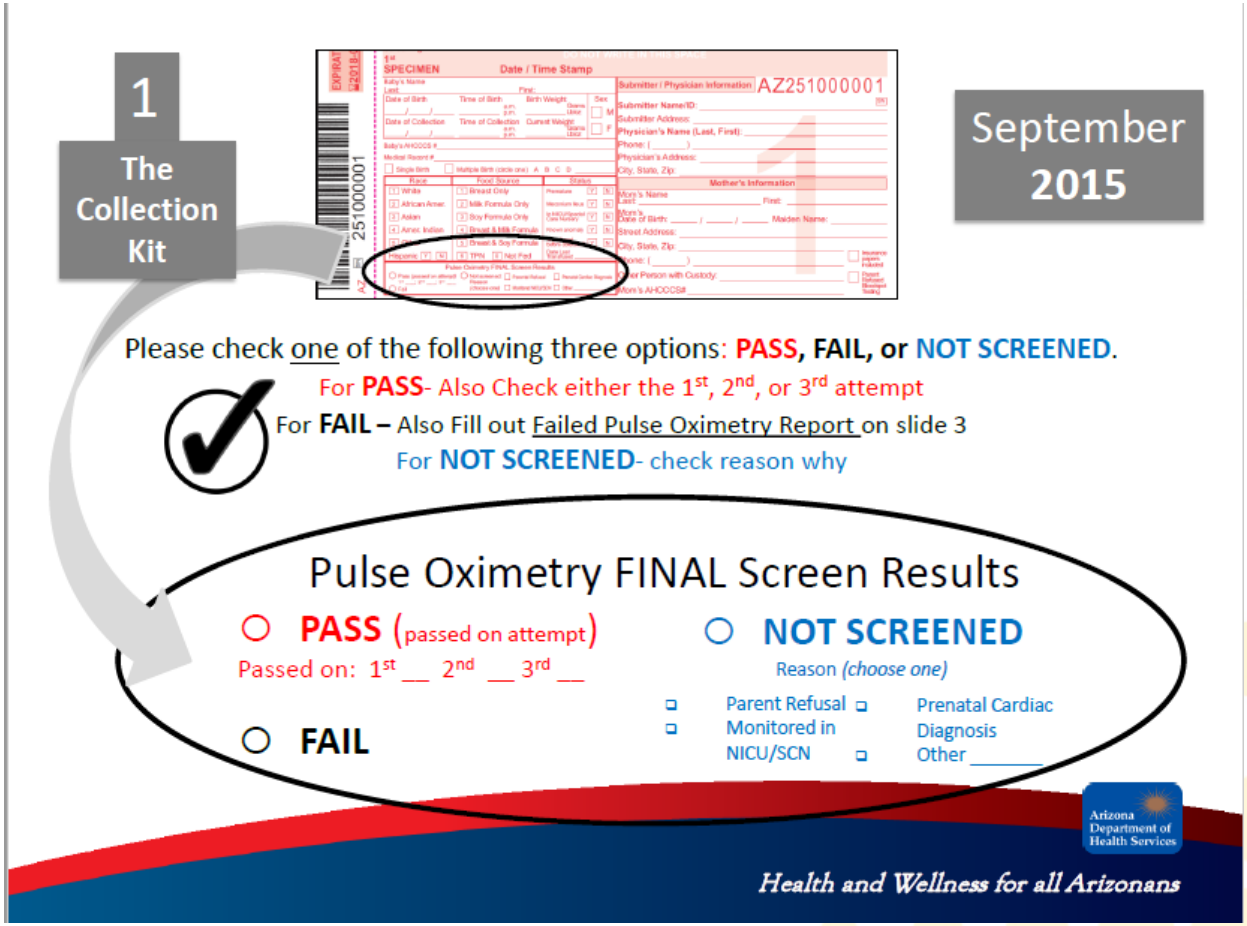
Arizona Department of Health Services

Health and Wellness for all Arizonans

Bloodspot Collection Form



Documentation

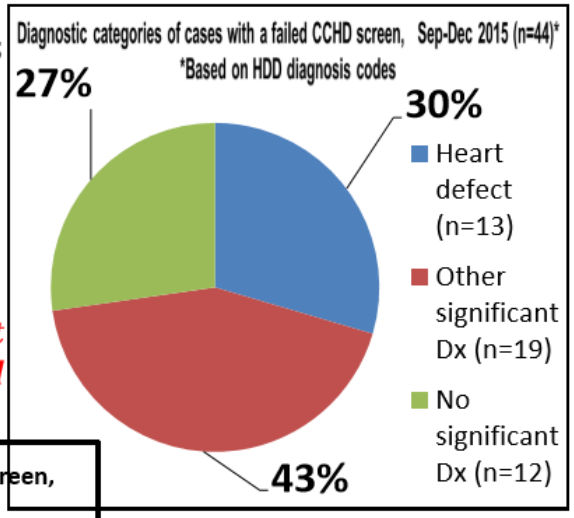


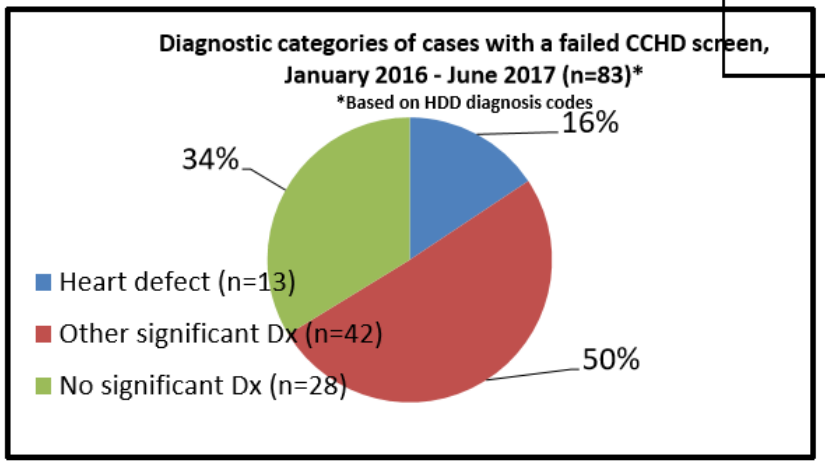
CCHD Screening Results

Year 1 (07-2015/06-2016) data analysis from 44 babies who failed the screen by diagnostic categories:

- 30% with heart defects;
- 43% with other clinically significant Dx;
- 27% false positive—no clinical findings

A noted limitation for both years was that about 10% of babies have no documented screen

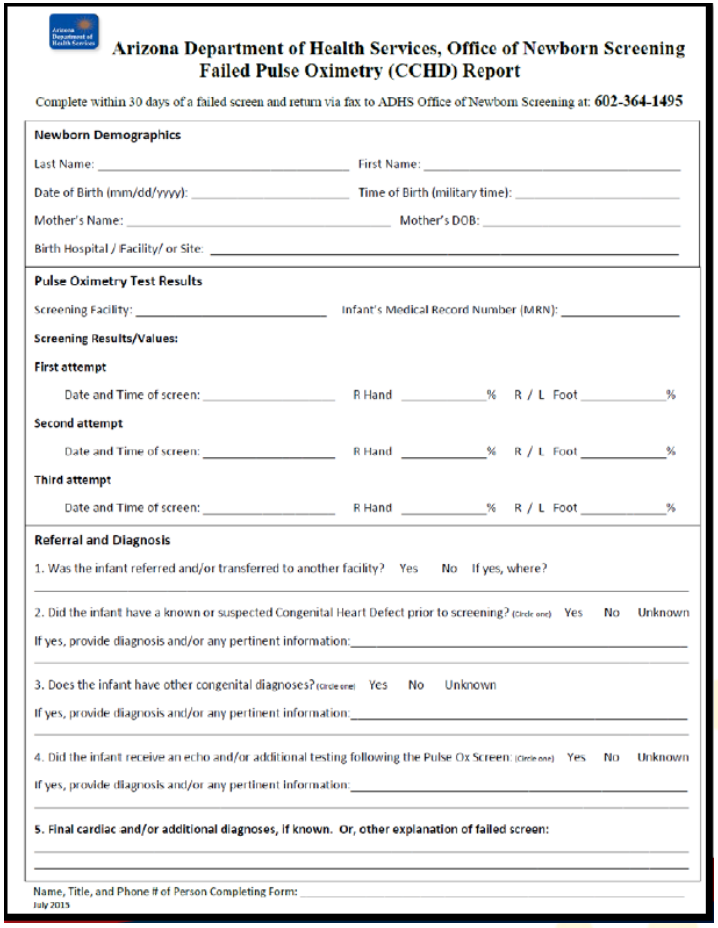




Year 2 data from 83 babies who failed the screen by diagnostic categories:

- 16% with heart defects;
- 50% with other clinically significant DX;
- 34% false positive—no clinical findings

CCHD Flow



Arizona Department of Health Services, Office of Newborn Screening
Failed Pulse Oximetry (CCHD) Report

Complete within 30 days of a failed screen and return via fax to ADHS Office of Newborn Screening at: **602-364-1495**

Newborn Demographics

Last Name: _____ First Name: _____

Date of Birth (mm/dd/yyyy): _____ Time of Birth (military time): _____

Mother's Name: _____ Mother's DOB: _____

Birth Hospital / Facility/ or Site: _____

Pulse Oximetry Test Results

Screening Facility: _____ Infant's Medical Record Number (MRN): _____

Screening Results/Values:

First attempt

Date and Time of screen: _____ R Hand _____% R / L Foot _____%

Second attempt

Date and Time of screen: _____ R Hand _____% R / L Foot _____%

Third attempt

Date and Time of screen: _____ R Hand _____% R / L Foot _____%

Referral and Diagnosis

1. Was the infant referred and/or transferred to another facility? Yes No If yes, where?

_____

2. Did the infant have a known or suspected Congenital Heart Defect prior to screening? (Circle one) Yes No Unknown

If yes, provide diagnosis and/or any pertinent information: _____

_____

3. Does the infant have other congenital diagnoses? (Circle one) Yes No Unknown

If yes, provide diagnosis and/or any pertinent information: _____

_____

4. Did the infant receive an echo and/or additional testing following the Pulse Ox Screen: (Circle one) Yes No Unknown

If yes, provide diagnosis and/or any pertinent information: _____

_____

5. Final cardiac and/or additional diagnoses, if known. Or, other explanation of failed screen:

_____

_____

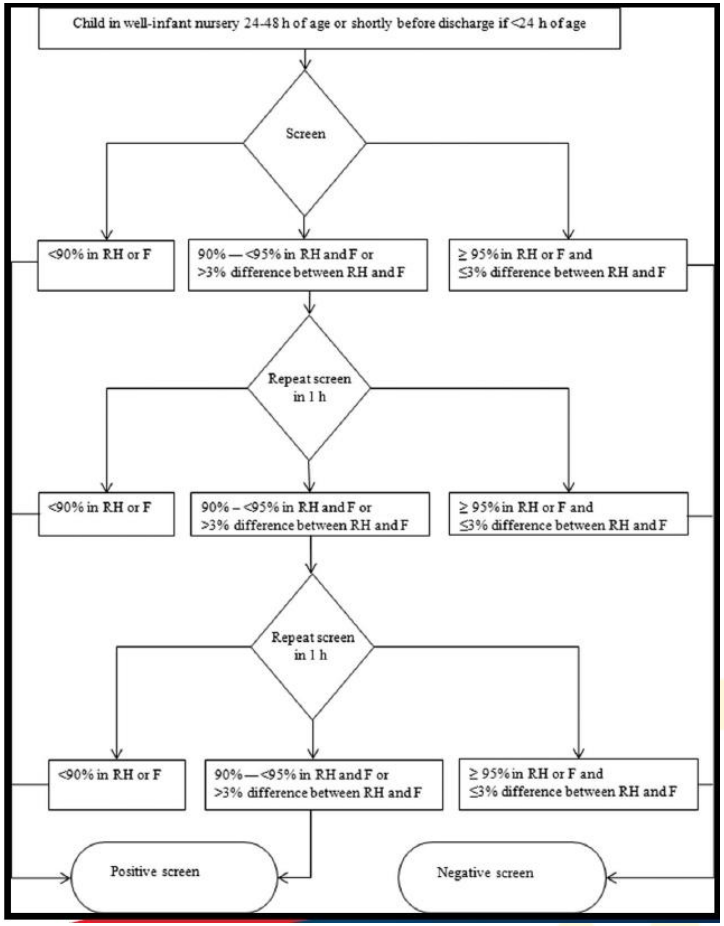
Name, Title, and Phone # of Person Completing Form: _____

July 2013

AHCCCS
Arizona Health Care Cost Containment System

Reaching across Arizona to provide comprehensive quality health care for those in need

CCHD Flow


Child in well-infant nursery 24-48 h of age or shortly before discharge if <24 h of age
Screen
<90% in RH or F
90% — <95% in RH and F or >3% difference between RH and F
≥ 95% in RH or F and ≤3% difference between RH and F
Repeat screen in 1 h
<90% in RH or F
90% – <95% in RH and F or >3% difference between RH and F
≥ 95% in RH or F and ≤3% difference between RH and F
Repeat screen in 1 h
<90% in RH or F
90% — <95% in RH and F or >3% difference between RH and F
≥ 95% in RH or F and ≤3% difference between RH and F
Positive screen
Negative screen

Raising Arizona Kids Demonstration

- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=11&cad=rja&uact=8&ved=2ahUKEwjch8Hwmq7cAhUnrlQKHVf2C6sQwqsBMAp6BAgEEBY&url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3D098PUs2WxGg&usg=AOvVaw2BcrunhMY5dDwWCxfvk7ww

Vision Screening Ages 3 – 6 Years

- WHO data:
- 19M worldwide have some sort of vision impairment:
  - 12M with a refractive error
  - 1.5M irreversible blindness

Early Signs and Symptoms

Most **babies** start to focus on faces and objects by 4-5 weeks of age. By about 6-8 weeks, most babies will start smiling at the familiar faces and things they see. But if a baby has vision impairment, you might notice she has trouble doing this.

Other signs that a baby might have a problem with his vision are if his:

- eyes move quickly from side to side (nystagmus), jerk or wander randomly
- eyes don't follow your face or an object, or he doesn't seem to make eye contact with family and friends
- eyes don't react to bright light being turned on in the room
- pupils seem white or cloudy rather than black
- eyes don't line up but look towards his nose or turn outwards.

Older Children

An older **child** might:

- hold things up close to her face
- rub her eyes a lot
- turn or tilt her head or cover one eye when looking at things up close
- get tired after looking at things up close – for example, reading, drawing or playing handheld games
- seem to see better during the day than at night
- say she has tired eyes
- seem to have misaligned eyes or a squint
- seem clumsy – for example, she might knock things over or trip often.

AMPM 430 B 10

- Ocular photoscreening with interpretation and report, bilateral (CPT code 99177) is covered for children ages three to five as part of the EPSDT visit due to challenges with a child's ability to cooperate with traditional vision screening techniques. Ocular photoscreening is limited to a lifetime coverage limit of one. This procedure, although completed during the EPSDT visit, is a separately billable service.
- **NOTE:** Automated visual screening, described by CPT code 99177, is not recommended for or covered by AHCCCS when used to determine visual acuity for purposes of prescribing glasses or other corrective devices.
- Vision CPT codes with the EP modifier must be listed on the claim form in addition to the preventive medicine CPT codes for visit screening assessment. With the exception of CPT code 99177, no additional reimbursement is allowed for these codes.

Not State-of-the-Art

Ocular Photoscreening

- Photoscreening is a form of vision screening for children. It uses a camera to take images of a child's undilated eyes. By looking at the configuration of the crescents of light returning after a flash (red reflex). The devices can estimate refractive error and determine which children are at risk of amblyopia (lazy eye). These images can be analyzed by a human interpreter, or by software incorporated into the equipment to evaluate the alignment of the eye and estimate refractive error. If significant refractive error or a misalignment appears to be present it can indicate amblyopia risk factors. If amblyopia risk factors are felt to be present a referral should be made for the child to be seen by a pediatric ophthalmologist for a cycloplegic examination. Photoscreening has advantages to more traditional eye chart acuity screening, and is particularly useful on younger (age 3-5), preverbal children (under age 3) and non-verbal children. Photoscreening usually takes less than a minute to obtain the necessary images on a child. The only cooperation required is for the child to briefly look at the camera.

Ocular Photoscreening

- **iScreen** – The iScreen photoscreener was first introduced in 2006. The first generation of the device was an off-axis binocular photoscreener taking one image, which is electronically transmitted for remote interpretation. The first generation iScreen was a tabletop device in which the child rests their head against a chin rest. The iScreen 3000, introduced in 2011, has been significantly redesigned and miniaturized[5]. It is now a hand-held device, which takes 2 photos in rapid succession in 2 axes with a separation of 90 degrees. Aiming beams placed on the child's forehead focus the camera. A blinking fixation light, and sound attract the child's attention. The images are then taken in such rapid succession that the child perceives just one flash prior to a blink. This is an improvement over the analog MTI photoscreener which required lens rotation prior to taking the second photo, and prevents differential accommodative effort between photos. The photo can be reviewed immediately on the device and if the child is not fixating properly can be re-taken. The final image is sent electronically to the company for interpretation, which provides the advantage of a consistent, expert interpretation of the images. A report is emailed securely which shows the results of the test and reason for the referral and also includes a picture of the child's eyes.

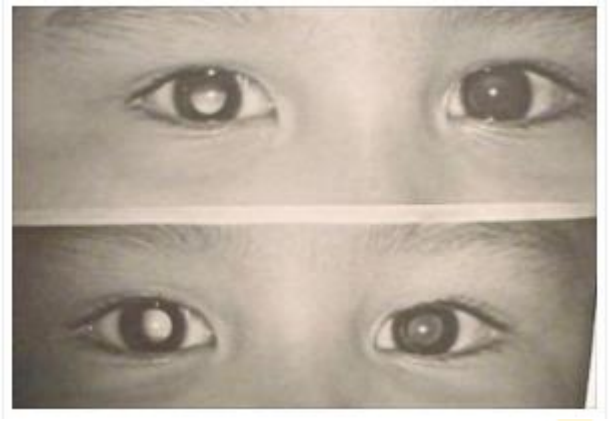
iScreen

Demonstration

Equipment - MTI

- **MTI** – The MTI photoscreener was first introduced in 1995(5)[4]. The camera uses special high resolution black and white polaroid style instant film with an off axis flash which rotates 90 degrees between images. Focus and fixation are similar to the iScreen with aiming beams and a flashing fixation target and noise to attract the child's attention. Two consecutive photos are taken on each patient resulting in a photograph showing the first image on the top and the second image on the bottom printed on a special high-resolution instant film. Based on the shape, size and location of the crescents, a determination can be made as to whether the child has significant refractive error or strabismus. The MTI is no longer being manufactured but is still in use.

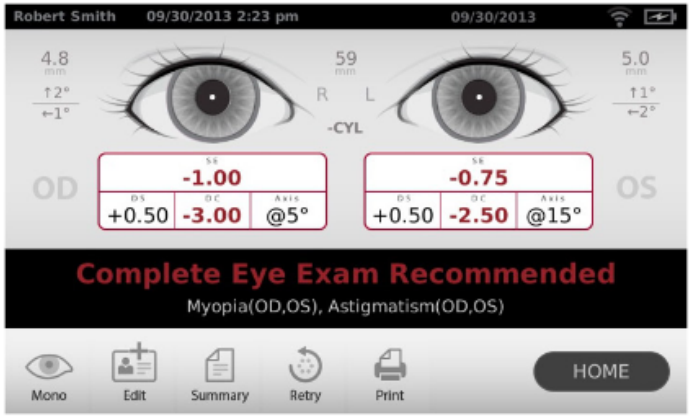
Documentation



Equipment - Spot

- **Spot** – The Spot is a new hand-held infrared digital photoscreener developed and marketed by Pediavision. It functions similarly to the plusoptiX, but has been significantly miniaturized. Rather than having the infrared elements on the face of the unit flanking the camera aperture, the Spot places the infrared elements below and in front of the camera aperture. The infrared light is then reflected off of a 45% two-way mirror. The design allows for eye tracking. The device creates a diagram with the location of the eyes, demonstrating any strabismus present as well as an autorefractive reading. Spot creates a report giving referral criteria based on preset criteria which can be printed. Visiscreen – The Visiscreen is a 35-mm camera with a databack recorder attached to a 500-mm telephoto lens. There is an electronic strobe light located below the lens and a flashing light-emitting diode located above the lens. The camera is mounted on bars ensuring it is exactly 8 feet and 3 inches away from a headrest the patient places their chin in.

Demonstration



Accurate detection

Spot accurately* detects the potential indication of these common vision problems:

- Myopia (nearsightedness)
- Hyperopia (farsightedness)
- Astigmatism (blurred vision)
- Anisometropia (unequal refractive power)
- Strabismus (eye misalignment)
- Anisocoria (unequal pupil size)
- *Accuracy refers to the sensitivity and specificity of the screening referral recommendation.

Advantages/Disadvantages

- Most accurate
- Patient Friendly
- Quantitative Results
- Training/Usage
- Cost Issues

Reminder:
NO Back To Basics
8/15/18

Thank You.