



Highlights of the Pre-Participation Exam within a Comprehensive Annual Well Child Visit

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Sports participation continues to increase in the United States with more than 60 million children competing in organized sports each year. As healthcare providers we play an important role in promoting physical activity and safe sports participation. The primary role of the pre-participation physical evaluation (PPE) is to screen for life-threatening conditions and those that may put an athlete at increased risk of injury or illness. The Fourth Edition of the PPE Monograph¹ was authored by the American Academy of Family Physicians, American Academy of Pediatrics, American College of Sports Medicine, American Medical Society for Sports Medicine, American Orthopaedic Society for Sports Medicine, and American Osteopathic Academy of Sports Medicine and published in 2010. It provides a structured approach to this examination and serves as the standard of care for the PPE. This article will highlight certain aspects of the PPE though it will not be an exhaustive review of the entire topic.

Timing/setting

The PPE should be performed at least six weeks prior to the start of preseason practice. This allows for completion of additional treatment, testing, or referral if indicated. The evaluation should be completed in the athlete's medical home where the primary care provider has access to medical records, can adjust treatment, follow up on interventions, and the PPE can be completed as part of the comprehensive annual well child visit.

History

The medical history is the most important aspect of the PPE. Eighty-eight percent of medical conditions and 67 percent of musculoskeletal conditions detected during the PPE are diagnosed from the medical history alone.¹ The Fourth PPE Monograph offers a publicly available history form. Any positive answers on the form require further discussion between the athlete and provider. Parent involvement can be beneficial during this portion of the evaluation to supplement the history provided by the athlete.

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Examination

General: Vital signs including height, weight, blood pressure, and pulse should be taken. Hypertension is diagnosed based on age/height/gender based on normative values. The diagnosis of obesity is similarly based on sex/age specific BMI values for athletes aged two to 20 years. BMI calculation also allows for identification of underweight athletes who may need further evaluation. All athletes should be screened for stigmata of Marfan syndrome. The Marfan Foundation provides an online tool using the modified Ghent criteria to assist in the diagnosis of Marfan syndrome.

HEENT: Visual acuity should be assessed using a Snellen eye chart. An athlete with best-corrected vision <20/40 in one eye is considered functionally one-eyed. Protective eyewear is mandatory for these athletes with any sports participation.

Musculoskeletal: All athletes should undergo a brief musculoskeletal examination. An example of this examination is available through the AAFP website (<http://www.aafp.org/afp/2000/0501/p2696.html>). A more detailed examination is warranted for history of injury or symptoms associated with a specific body part. The athlete must demonstrate a full range of motion and symmetric strength and stability prior to full participation. A joint specific examination may be added for sport participation that places that joint at high risk. An example would be performing an elbow/shoulder examination in a throwing athlete.



Cardiovascular: Cardiac auscultation should be performed in both the supine and standing position to assess for changes in murmurs that may indicate dynamic left ventricular outflow tract obstruction. The murmur of hypertrophic cardiomyopathy is typically harsh, early systolic, and heard best at the right upper sternal border. It increases in intensity with activities that decrease cardiac preload, such as standing or Valsalva. This murmur is only noted in a minority of patients with hypertrophic cardiomyopathy.

Palpation of the femoral and radial pulse should be performed to assess for coarctation of the aorta. Delayed or diminished pulse at the femoral artery compared to the radial artery is concerning for this diagnosis.

Central Nervous System: Central nervous system abnormalities should be identified to determine safety of sports participation and to establish a baseline for comparison if post-injury testing is ever warranted. An athlete recovering from a concussion should be symptom free, including with school work, and have completed a graduated return to play progression prior to being fully cleared to return to sport. Further information for sport-related concussion can be found in the "Consensus statement on concussion in sport" from the 5th International Consensus Conference on Concussion in Sport held in Berlin in October 2016.

Genitourinary: Male athletes should be assessed for the presence of two descended testicles. Evaluation for inguinal hernia is not required unless indicated from the medical history. A genitourinary examination is not part of the routine PPE in female athletes.

Clearance

Clearance status for the athlete can be divided into four categories: cleared for all activities without restriction, cleared with recommendations for further evaluation or treatment, not cleared – clearance status to be reconsidered after completion of further evaluation/treatment/rehabilitation, or not cleared for certain types of sports or for any sports. The majority of conditions that prompt disqualification are cardiovascular in nature. They are outlined in the 36th Bethesda Conference guidelines.² Additional diagnosis that may affect participation are discussed in the AAP Statement on Medical Conditions Affecting Sports Participation.³

Periodicity Schedule Explanation 2017

Changes effective on October 31, 2017



Conclusion

The primary role of the PPE is to screen for life-threatening conditions and those that may put an athlete at increased risk of injury or illness. It should be completed with a structured approach such as that outlined by the Fourth Edition of the PPE Monograph. The PPE should also be done as part of a comprehensive annual well visit completed in the medical home. This allows the provider to address all medical conditions, screening, developmental and behavioral health, procedures including immunizations, and give age appropriate anticipatory guidance. Please see the next article for detailed information on what should be included in a comprehensive annual well visit.

References:

1. Bernhardt, David T., and William O. Roberts. *PPE: Preparticipation Physical Evaluation*. Elk Grove Village, IL: American Academy of Pediatrics, 2010. Print.
2. Maron, Barry J., Benjamin D. Levine, Reginald L. Washington, Aaron L. Baggish, Richard J. Kovacs, and Martin S. Maron. "Eligibility and Disqualification Recommendations for Competitive Athletes With Cardiovascular Abnormalities." *Journal of the American College of Cardiology*. 66.21 (2015). Web.
3. Rice SG, American Academy of Pediatrics Council on Sports Medicine and Fitness. Medical conditions affecting sports participation. *Pediatrics*. 2008;121(4):841-848.

Prenatal visits: Recommended for first-time parents, high risk, or if requested. The prenatal visit includes anticipatory guidance, review of family history, and discussion of the benefits of breast feeding and plans for feeding. These visits are not reimbursable.

Birth exam: Every infant. Encourage breast feeding (<http://pediatrics.aappublications.org/content/129/3/e827.full>) and provide information (<https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Breastfeeding/Pages/Resources-to-Support-Breastfeeding-Families.aspx>).

Two-to-five day visit: Every infant should have an evaluation between two-to-five days of age and within 48-72 hours of discharge to include assessment for feeding and jaundice. Healthy infants discharged before 48 hours of age should be seen within 48 hours of discharge.

Thirty-month visit: A 30-month visit is strongly recommended for developmental screening. This is a good age to promote family routines, review and promote language and social development, review any concerns about behavior and/or preschool, and promote safety. Medicaid will reimburse for this visit.

Older children and adolescents: Annual screening exams are recommended by the American Academy of Pediatrics (AAP) and by Iowa Medicaid.

Physical Exam

An unclothed/undressed and draped physical exam is required, and should include an assessment of:

1. Growth:

- Use the **WHO growth charts** (https://www.cdc.gov/growthcharts/who_charts.htm) to monitor growth for infants and children ages 0 to two years of age in the U.S.
- Use the **CDC growth charts** (https://www.cdc.gov/growthcharts/clinical_charts.htm) to monitor growth for children age two years and older in the U.S.

2. All organ systems

Blood Pressure: Blood pressure should be checked annually beginning at three years of age. Infants and children with risk factors should have blood pressure checked before three

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years (<http://pediatrics.aappublications.org/content/pediatrics/early/2017/08/21/peds.2017-1904.full.pdf>). Access **NHLBI/NIH blood pressure charts** (https://www.nhlbi.nih.gov/files/docs/guidelines/child_tbl.pdf).

Nutrition/Obesity: Assess (https://ihcw.aap.org/Documents/Assessment_and_Management_of_Childhood_Obesity_Algorithm_FINAL.pdf) and provide **anticipatory guidance** (<https://ihcw.aap.org/Pages/default.aspx>) at every visit. Provide **intervention** (<https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/HALF-Implementation-Guide/Pages/HALF-Implementation-Guide.aspx>) as needed.



Sensory Screening

Vision screening:

Assess risk at every visit. (<http://contemporarypediatrics.modernmedicine.com/contemporary-pediatrics/news/modernmedicine/modern-medicine-feature-articles/aap-updates-guides-pedi?page=full>) Vision screening should start at four years of age and in cooperative three year olds. Consider instrument screening at 12 and 24 months

and at three, four, and five years of age. Iowa law requires that the parent or guardian of a child enrolled in kindergarten or third grade ensure that evidence of a child vision screening be submitted to the school in which the child is enrolled. This may be submitted in electronic form or hard copy, or electronically through Iowa Immunization Registry Information System (IRIS). Vision screening can be performed in several settings, including the healthcare provider's office. The vision screening can be done up to one year prior to the child's enrollment in kindergarten or third grade, or no later than six months after enrollment. Find more information from the **Iowa Child Vision Screening Program** (<http://idph.iowa.gov/family-health/child-health/vision-screening>).

Hearing screening: Iowa law requires universal hearing screening of all newborns and infants in Iowa (<http://pediatrics.aappublications.org/content/124/4/1252.full>). Confirm initial screen was completed, verify results, and follow up as appropriate. Follow **guidelines** (<https://idph.iowa.gov/ehdi/best-practices>) from **Iowa's Early Hearing Detection and Intervention Program** (<http://idph.iowa.gov/ehdi>). Recommend in-office screening using audiometry, beginning at four years. Screen at least once between the ages of 11 and 14 years, once between 15 and 17 years, and once between

18 and 21 years, using audiometry to include frequencies between 6000-8000 HZ.

Oral Health

An examination of the oral cavity and dentition, and teaching about oral/dental health care should occur at every visit. Refer to dental home by 12 months or within six months of eruption of first tooth. Ask about dental home at every visit.

Iowa law requires that children under the age of 12 years who receive Medicaid must have a dental home. The **I-Smile Dental Home Initiative** (<https://ismile.idph.iowa.gov>) was created to assist with locating, training, and matching children, particularly young children, with dental providers in Iowa. They use dental hygienist care coordinators to assist physicians and families in finding dental homes.

AAP recommends fluoride varnish (https://ismile.idph.iowa.gov/Portals/11/Files/Varnish%20Flyer%20Combined_RHC_FQHC_FINAL.pdf). See AAP Dentistry Policy on the **use of Fluoride** (http://www.aapd.org/media/Policies_Guidelines/P_FluorideUse.pdf) and prevention of **early childhood caries**. (http://www.aapd.org/media/Policies_Guidelines/P_ECCClassifications.pdf). Once teeth are present, fluoride varnish may be applied to all children every 3-6 months in the primary care or dental office. Indications for fluoride use are noted in **Fluoride Use in Caries Prevention in the Primary Care Setting** (<http://pediatrics.aappublications.org/content/134/3/626>). Smiles for Life National Oral Health curriculum has CME-eligible training modules for Caries risk assessment, fluoride varnish, and counseling (<http://www.smilesforlifeoralhealth.org/buildcontent.aspx?tut=584&pagekey=64563&cbreceipt=0>).

Find water system information for Iowa counties on the **CDC My Water's Fluoride** website (https://nccd.cdc.gov/DOH_MWF/default/CountyList.aspx?state=Iowa&stateid=19&stateabbr=IA&reportLevel=4).

Developmental and Behavioral Health

Developmental Surveillance: Required for every health maintenance visit and is not separately reimbursable. Developmental surveillance consists of reviewing family and child strengths and risk factors, eliciting caregiver concerns, reviewing developmental milestones, observation of the child, monitoring, and anticipatory guidance. Any child who is identified as having a developmental concern should undergo developmental screening using a standardized screening tool. If potential developmental concern is noted, child should be referred immediately for more in-depth diagnostic evaluation.

Developmental Screening: Screen at nine, 18, and 24-30 months (<http://pediatrics.aappublications.org/content/>

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pediatrics/118/1/405.full.pdf). **ASQ-3** (<http://agesandstages.com/products-services/asq3/>) is the suggested tool. Medicaid will reimburse for a standardized screening tool (billing code 96110).

Autism Screening: Screen at 18 and 24 months (http://mchatscreen.com/wp-content/uploads/2015/09/M-CHAT-R_F.pdf). **M-CHAT R/F** (https://www.m-chat.org/_references/mchatdotor.pdf) is the suggested screening tool. Medicaid will reimburse for a standardized screening tool (billing code 96110). Any child suspected of autism spectrum disorder should be referred immediately for services, diagnostic evaluation, and receive an audiological evaluation.

Family Risk Factor Screening: The **Bright Futures intake form** (http://www.brightfutures.org/mentalhealth/pdf/professionals/ped_intake_form.pdf) assesses for family risk factors as does the Social History part of the **Iowa Child Health and Development Record** (<http://www.iowaepsdt.org/iowa-child-health-development-record/>).

Caregiver Depression Screening: Patient Health Questionnaire 2 (PHQ-2) ([https://brightfutures.aap.org/BrightFutures/Documents/PHQ-2 Instructions for Use.pdf](https://brightfutures.aap.org/BrightFutures/Documents/PHQ-2%20Instructions%20for%20Use.pdf)) & **Patient Health Questionnaire 9 (PHQ-9)** (<http://www.phqscreener.com>) or **Edinburgh Postnatal Depression screen** (<https://www.beyondblue.org.au/who-does-it-affect/pregnancy-and-early-parenthood/edinburgh-postnatal-depression-scale>). Medicaid will reimburse for using the PHQ-9 or the Edinburgh. PHQ-2 is not a separately reimbursable service.

Depression Screening: AAP/Bright Futures recommends screening of children and adolescents for depression beginning at 12 years of age. The Patient Health Questionnaire-2 (PHQ-2) is a brief and practical tool to use. If screening is positive on the PHQ-2, the PHQ-9 should be administered. Medicaid will reimburse for the PHQ-9 or other standardized tool. The PHQ-2 is not a separately reimbursable service.

The CMS Center for Medicaid and CHIP provides information about prevention and early identification of mental health and substance use conditions. **Learn more** (<https://www.medicaid.gov/Federal-Policy-Guidance/Downloads/CIB-03-27-2013.pdf>).

Tobacco, Alcohol, and Drug Use Screening: AAP/Bright Futures recommends screening for alcohol, tobacco, and substance use annually beginning at 11 years of age by asking directly about usage or experimentation (<http://pediatrics.aappublications.org/content/early/2011/10/26/peds.2011-1754?rss=1>). The **CRAFFT screening tool** (<http://www.>

ceasar-boston.org/CRAFFT/) is helpful for identifying problem use and is a suggested tool. Medicaid will reimburse for the use of the CRAFFT or other standardized tool.

More information and resources are available on our **Developmental Care** (<http://www.iowaepsdt.org/developmental-care/>) and **Mental Health Care** (<http://www.iowaepsdt.org/mental-health-care/>) pages.

Procedures

Newborn Screening: Note that newborn screening includes blood spot, bilirubin, hearing screening, and screening for critical congenital heart disease by pulse oximetry after 24 hours of age and before discharge. Confirm initial screen was accomplished, verify results, and follow up as appropriate (<http://www.babysfirsttest.org/newborn-screening/states/iowa>).

Immunizations: For age-appropriate immunizations, follow **CDC immunization guidelines** (<http://www.cdc.gov/vaccines/schedules/easy-to-read/child.html>). Every visit should be an opportunity to update and complete a child's immunizations.

Hemoglobin/Anemia: Test at 12 months. Assess risk at four months, 15 months, and at every visit afterwards. Menstruating females are at risk for iron deficiency anemia (<http://pediatrics.aappublications.org/content/pediatrics/126/5/1040.full.pdf>).

Lead Testing: Determine a child's level of risk for lead poisoning by administering the IDPH lead questionnaire in **English** (<http://www.iowaepsdt.org/wp-content/uploads/2015/03/Questionnaire-English1.pdf>) and **Spanish** (<http://www.iowaepsdt.org/wp-content/uploads/2015/03/Questionnaire-Spanish1.pdf>). When you have determined the child's level of risk, administer blood lead level testing:

- For all children: test at 12 and 24 months.
- For children at higher risk: test at time high risk is determined and at 12, 18, and 24 months, then annually up to age of six years.
- Blood lead tests: a blood lead test result equal to or greater than 15 ug/dl obtained by capillary specimen (finger stick) must be confirmed using a venous blood sample.
- Since 2012, the Centers for Disease Control and Prevention has considered a blood lead level of 5 mcg/ml elevated.

If you have questions, please contact the **IDPH Childhood Lead Poisoning Prevention Program** (<http://idph.iowa.gov/lpp/blood-lead-testing>).



Lipid Screening: Test all children once between nine and 11 years and once between 17 and 21 years. For universal screening, non-fasting non-HDL cholesterol can be used. Assess for high risk at 24 months, and at four, six, eight, and 12-17 years of age. Children at a significant risk should be screened with a fasting lipid profile (http://pediatrics.aappublications.org/content/128/Supplement_5/S213.full).

STI/HIV Screening: Adolescents should be screened for sexually transmitted infections as per recommendations in the **AAP Red book** (<https://redbook.solutions.aap.org/chapter.aspx?sectionId=88187057&bookId=1484&resultClick=1>). The AAP recommends HIV screening for all 15 to 18 year olds. Those at **high risk** (http://www.cdc.gov/healthyouth/sexualbehaviors/pdf/hivtesting_adolescents.pdf?Bitly=drdeancdc-bit-00025) should be tested annually. In Iowa, the minor must give written consent for HIV testing and treatment. The minor also needs to be informed that the legal guardian will be informed if the test is positive. (See **state law:** <https://idph.iowa.gov/Portals/1/userfiles/110/Minor-Consent-Iowa-April-2015.pdf>.)

Tuberculosis: Assess risk. Test high risk. Annual testing is recommended for **high-risk groups** (http://pediatrics.aappublications.org/content/pediatrics/114/Supplement_4/1175.full.pdf), which include household members of persons with TB or others at risk for close contact with the disease; recent immigrants or refugees from countries where TB is common (e.g., Asia, Africa, Latin America, Pacific Islands, and former Soviet Union); migrant workers; residents of correctional institutions or homeless shelters; persons with certain underlying medical disorders. Children with HIV and incarcerated adolescents should be tested yearly. Visit the IDPH website for more information on **TB Testing** (<http://idph.iowa.gov/immmtb/tb/testing>).

Cervical Dysplasia Screening: Adolescents are no longer routinely screened for cervical dysplasia until 21 years of age. The 2010 AAP statement “Gynecologic Examination for Adolescents” notes the indications for pelvic examinations prior to age 21 years (<http://pediatrics.aappublications.org/content/126/3/583.full.pdf+html>).

Anticipatory Guidance

Resources and Materials to Share with Families

EPSDT encourages providers to offer practical and contemporary health information to parents before significant physical, emotional, and psychological milestones. This guidance will help parents anticipate impending changes and take action to maximize their child’s developmental potential and identify their child’s special needs.

- **Bright Futures:** A joint project of the Maternal and Child Health Bureau and the American Academy of Pediatrics, these offer comprehensive health supervision guidelines and tools, including recommendations on immunizations, routine health screenings, and anticipatory guidance (http://brightfutures.aap.org/tool_and_resource_kit.html). Bright Futures also offers **free parent handouts and other resources** (<https://brightfutures.aap.org/families/Pages/Resources-for-Families.aspx>).
- **Iowa Child Health and Development Record** (<http://www.iowaepsdt.org/iowa-child-health-development-record/>)
- **Zero to Three:** Materials for parents and providers, including child development handouts for parents that discuss development from the child’s perspective (<http://www.zerotothree.org>).
- **Agnes and Stages:** Downloadable brochures on child development based on age from Iowa State University (<https://store.extension.iastate.edu/product/5021>). These brochures are also available in a Spanish version, **Edades** (<https://store.extension.iastate.edu/ProductList?Keyword=edades>).
- **Essentials for Parenting Toddlers and Preschoolers:** This CDC website provides information and materials to help parents develop strong, stable, and nurturing relationships with their children (<http://www.cdc.gov/parents/essentials/>).

Transition to Adult Healthcare

The AAP recommends that **transitioning to adult healthcare** begin at 12 years of age. Find out more about transitioning to adult healthcare (https://www.aap.org/en-us/Documents/medicalhome_transition_resources.pdf). Visit our **Resources** page for more information (<http://www.iowaepsdt.org/other-resources/>).

A copy of the Periodicity Schedule is available for download at: <http://www.iowaepsdt.org/iowa-epsdt/periodicity-schedule/>



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