CLINICAL REPORT Guidance for the Clinician in Rendering Pediatric Care

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Comprehensive Health Evaluation of the Newly Adopted Child

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Children who join families through the process of adoption, whether through a domestic or international route, often have multiple health care needs. Pediatricians and other health care personnel are in a unique position to guide families in achieving optimal health for the adopted children as families establish a medical home. Shortly after placement in an adoptive home, it is recommended that children have a timely comprehensive health evaluation to provide care for known medical needs and identify health issues that are unknown. It is important to begin this evaluation with a review of all available medical records and pertinent verbal history. A complete physical examination then follows. The evaluation should also include diagnostic testing based on findings from the history and physical examination as well as the risks presented by the child's previous living conditions. Age-appropriate screenings may include, but are not limited to, newborn screening panels and hearing, vision, dental, and formal behavioral and/or developmental screenings. The comprehensive assessment may occur at the time of the initial visit to the physician after adoptive placement or can take place over several visits. Adopted children can be referred to other medical specialists as deemed appropriate. The Council on Adoption, Foster Care, and Kinship Care is a resource within the American Academy of Pediatrics for physicians providing care for children who are being adopted.

Pediatricians have played a significant role in the adoption process, in some cases providing counseling to parents during the preadoption phase and subsequently providing health care for these children. Special needs among adopted children need to be identified so they may be evaluated and treated appropriately. The pediatrician also needs to become knowledgeable about the resources available to help families integrate the new adoptee into the family unit. The purpose of this Clinical Report is to provide the general pediatrician with practical guidance that addresses the initial comprehensive health evaluation of adopted children.

abstract

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The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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CURRENT STATUS OF ADOPTION

It is estimated that every year, approximately 120 000 children are adopted in the United States. In 2012, the last year of reported data for total numbers of adoptions in the United States, 119 514 children joined families through adoption.[1] This number represents a 14% decrease from 2008 and a 15% decrease from 2001. Children may be adopted through the national public welfare system, through private agencies, through existing relationships, or internationally.

TRENDS IN DOMESTIC ADOPTION

Most domestic adoptions occur through the national public welfare system or independent agencies. According to data from the Adoption and Foster Care Analysis and Reporting System, the number of children adopted from the foster care system had remained flat until a slight increase was noted in 2015.[2] The number of adoptions had been approximately 50 000 to 52 000 between 2005 and 2014, except for 2008 and 2009, when the number reached a high of 57 200. The number of finalized adoptions leveled back to 50 800 in 2013 and 50 600 in 2014. In 2015, the number of adoptions from the foster care system increased to 53 500. A review of the data revealed a similar increase in the number of children within the foster care system since 2013 who were designated as waiting to be adopted and whose parents' rights had been terminated, which may be attributable to increased accountability by the states for permanency planning in compliance with the Adoption and Safe Families Act of 1997.[3]

An assessment of demographic data revealed the mean age at the time of adoption was 6.2 years, with male adoptees accounting for 51% of the population.[2] The mean time elapsed from termination of parental rights to adoption was 11.9 months.[2] White children accounted for 48% of adoptions. Twenty-two percent of children who were adopted were identified as Hispanic and/or Latino, and 18% were identified as black or African American. Children were adopted by foster parents in 52% of cases. Other relatives became adoptive parents for 34% of adoptees. Married couples and single women represented the majority of adoptive parents, accounting for 68% and 29%, respectively.[2]

A report from the Child Welfare Information Gateway stated that in 2012, approximately 49% of all adoptions in the United States were from sources other than the public child welfare system or intercountry sources.[1] Other sources include private agencies, American Indian and/or Alaskan native tribes, and facilitated, independent, or step-parent adoptions.[1,4] However, unlike adoptions through public child welfare and orphan visas for foreign-born children, for which there is federally mandated reporting, there is not a complementary system for domestic placements from other sources, which are typically governed by widely varying state laws, making it difficult to determine exact numbers.

TRENDS IN INTERNATIONAL ADOPTION

Primarily because of changes in internal policies of several countries, partnering countries' concerns about illegal or unethical practices by adoption service providers and the ability to appropriately monitor adoption service provider activities, and concerns about the unregulated custody transfer of adopted children, the number of international adoptions has been decreasing over recent years, with only 5372 immigrant visas issued to children adopted abroad or coming to the United States to be adopted by US citizens in 2016 (down from 7037 in 2015).[5] These numbers represent a decrease of nearly 77% from the high of 22 989 adoptions in 2004.[5] China accounted for the majority of international adoptees with 2231 adoptions (down 5% from 2015). The Democratic Republic of the Congo and Ukraine accounted for the second and third largest numbers of adoptions with 359 and 303 child adoptees, respectively.[5] Available data revealed that boys accounted for 51% of adoptions, which is a shift from previous years. Children 2 years or younger accounted for 18% of adoptees, children between the ages of 3 and 4 years accounted for 29% of adoptees, and children between the ages of 5 and 12 years accounted for 38% of adoptees. Only 13% of internationally adopted children were between the ages of 13 and 17 years, with young adults 18 years of age or older making up 2% of the population.[5]

Numerous studies have demonstrated that children in the foster care system, children adopted through private domestic agencies, and those adopted internationally all have an increased incidence of physical, developmental, and mental health concerns.[6–11] Children adopted through the international route may have additional concerns related to development and infectious diseases.[12–19] Early life experiences of adoptees that may account for the aforementioned health needs include poverty, inadequate prenatal care, malnutrition, prenatal and postnatal exposure to toxins and pathogens, inadequate developmental stimulation, child abuse, and exposure to extreme violence.[20,21] Children waiting for adoption are at high risk of having been exposed prenatally to illegal drugs and/or alcohol.[12,21–23] Before adoption, children may have been directly or indirectly exposed to physical, emotional, or sexual abuse.[12,24] Although these concerns may be addressed before adoption, many of

these issues persist and continue to be significant or do not become apparent until after the time of placement in an adoptive home.

COMPONENTS OF THE INITIAL PLACEMENT EVALUATION

A comprehensive medical evaluation is best completed soon after placement in an adoptive home to confirm and clarify existing medical diagnoses; assess for any previously unrecognized medical issues, including oral health problems; discuss developmental and behavioral concerns; and make appropriate referrals.[12,25] This evaluation typically includes a thorough review of the medical history, incorporating an assessment of health risks, a developmental assessment, and a complete, unclothed physical examination.[12,13,18,21,25,26] The initial health evaluation of an adopted child needs to be comprehensive in nature, but it is not necessary for this to occur during only 1 medical visit. Several visits to the pediatrician may be necessary to complete the assessment of the child's history, review laboratory findings, and make referrals to medical, developmental, mental health, and dental specialists. Subsequent evaluations, including referrals and laboratory testing, can be undertaken to allow for comprehensive health planning.

THE PREADOPTION VISIT

The preadoption visit can be helpful for the adoptive family.[18,21,24,26–30] In an ideal situation, the future adoptive parents would present medical records of the child and/or biological parents to the pediatrician for review. Desired information includes general past medical history, including growth and development; immunization records; medications; allergies; chronic illness; dental problems; hospitalizations; and infectious disease exposures. Information about family history, pregnancy course, and childbirth may be relevant. Many children have faced adverse childhood experiences related to the combination of early life experiences and environmental influences, which have been shown to impact the genetic predisposition of the emerging brain architecture and can alter lifelong health outcomes.[26] The pediatrician can work closely with adoptive families to develop strategies to ameliorate some of the effects of the adverse childhood experiences on the prospective adoptees.

It is important to document environmental history and any childhood experiences, including developmental, mental, and educational history, as well as previous relationship histories.[24] If this information were available, the pediatrician would be able to use those records to help parents determine additional questions that could clarify a particular health issue and help parents clarify what special needs they would be prepared to accept. Unfortunately, in most cases, complete information is not obtainable, particularly with international adoption. However, using the available information, the pediatrician may be able to address specific issues in the medical records, including growth trends and a preliminary assessment of developmental progress, allowing for appropriate referral to services. The pediatrician may offer clarification of medical diagnoses, particularly in cases of international adoptions, because a particular diagnosis may be more prevalent in particular regions of the world.[18,27,29] In addition to medical records, parents may have other materials, such as photographs and videos, for review. Although these may be informative to confirm or refute what is written in the medical record, they do not provide a conclusive diagnosis.

The preadoption visit allows the pediatrician time to counsel families on other issues.[24] Closed versus open adoption can be discussed. Open adoption describes a continuum of communication between the birth parents and the adoptive family.[24,31] Pediatricians can discuss with adoptive families the extent of their comfort level with communication between them and the biological families and provide needed support by identifying potential and real benefits and drawbacks to the relationship. Special issues related to the nutrition of the children need to be addressed. Pediatricians need to be cognizant of short- and long-term problems related to malnutrition. This is particularly relevant for internationally adopted children, especially if a child has a previous history of residing in an institutional setting.[25,32] Some families may be interested in breastfeeding their infants, so the pediatrician needs to be familiar and supportive of the option and techniques of induced lactation.[33,34]

The preadoption visit may also allow the pediatrician to discuss other relevant issues related to the adoptive family. The immunization status of adoptive family members can be explored, and relevant information can be provided. It is recommended that unvaccinated household contacts or caregivers of adopted children with chronic hepatitis B virus (HBV) infection should receive a hepatitis B vaccine. If children are adopted internationally from a country with intermediate or high hepatitis A virus infection prevalence, administering a hepatitis A vaccine to household contacts or caregivers 2 or more weeks before the child's arrival is suggested.[18] Finally, providing information about available community support services may ease the transition for the expected family. For further assistance, the primary care physician can consult with the American Academy of Pediatrics (AAP) Council on Foster Care, Adoption, and Kinship Care (aap.org/cofcakc).

INITIAL HISTORY AND REVIEW OF MEDICAL RECORDS

When a child presents for an initial complete adoption evaluation, it is important to review the current and any available past medical history, with particular attention to any previous medical findings in the child's medical records. The electronic health record, using health information exchange standards, may eventually help facilitate the transfer of health information. A list of information to be sought from the child's history is provided in Table 1.

A complete medical history, including prenatal history obtained from the mother and genetic history obtained from both parents, is ideal but rarely available.[14,24,25] The adoption agency's social worker (who may be trained appropriately to do a skilled genetic, medical, and prenatal interview) may take an extensive history from the birth parent(s), if possible, and enter these data into the formal medical record for the future adoptive parent. It is important to review perinatal risks, which include lifestyle-related information about the birth parent(s) that may affect the fetus, neonate at birth, or child later in development.[28–30,36,37] Such information includes parental use of alcohol or drugs (licit and/or illicit use) and history of sexual practices that increase the risk of sexually transmitted infections both in the mother and her partner(s). Physicians and adoption agency social workers can be trained to obtain such information in a manner that is sensitive to the psychological and cultural needs of the families.[38]

Children being adopted from foster care most likely have had fragmented care and limited continuity of medical records. Health care before foster care placement may have been inadequate, with multiple unmet medical needs.[24,28,39] The AAP recommends a comprehensive health evaluation of all children at the time of entrance into foster care.[1,39–41] Adoptive parents may wish to review any available medical records from all previous health care providers, ideally before placement into an adoptive home and certainly before finalization of adoption from foster care. Incomplete or unavailable medical records should not prevent parents from scheduling timely initial comprehensive health evaluations. Parents, working in collaboration with their legal representative, their pediatrician, and local child welfare and adoption agencies, can continue to work to obtain the child's complete medical records, including (if possible) oral health history and developmental, educational, and mental health assessments.[24,25,42] For children being adopted from foster care, equal emphasis is placed on review of the medical history and the physical examination.[28,40,41]

With international placements, medical history may be sparse or inaccurate. The evaluation of a child who has been adopted internationally will depend, to a large degree, on a complete physical examination and comprehensive laboratory screening based on environmental, nutritional, ethnic, and infectious disease risks.[12,18,25,43,44] All internationally adopted children are required to have a medical evaluation performed by a panel physician who is a US Department of State–designated physician before departure from the country of origin. This examination is not considered a comprehensive examination; it is simply addressing legal requirements of screening for communicable diseases and serious physical or mental conditions that would prevent the issue of a permanent residency visa.[25] Therefore, all internationally adopted children need to undergo screening evaluations based on the risks presented by their previous life circumstances, including health risks specific to country of origin.[18,43–46]

INITIAL PHYSICAL EXAMINATION

The initial physical examination, as noted in Table 2, is comprehensive, with particular attention being given to the child's growth parameters and to systems that have been found to be more at risk for adopted children.[1,9,25,47] Care needs to be exercised when approaching the newly adopted child, particularly for older children (who may have had traumatic experiences with health care) and internationally adopted children (who may have never experienced a comprehensive examination). For older international adoptees, it is advisable to have an interpreter present, either in person or by telephone, to explain what is happening. For all children, one needs to proceed slowly, be sensitive to the children's cues, and provide reassurance.

Accurately measured growth parameters, including height, weight, and head circumference, are needed for all children. Racial- and ethnic-specific charts are no longer recommended to plot growth parameters; measurements can be plotted on standard Centers for Disease Control and Prevention (CDC) or World Health Organization growth charts as appropriate for age.[25,27,48] Although some controversy continues around the validity of these growth charts for varying ethnic groups, they allow for monitoring of the child's growth rates over time.[48–51] When possible, previous measurements should be obtained and plotted because trend data may provide a more objective assessment of the child's nutritional and medical status.[21,30]

Assessing nutritional status is an important component of the comprehensive examination. Children may present with low height for age (growth stunting), which may be attributable to inadequate nutrition as well as a result of chronic adversity. In contrast, children in

TABLE 1 Review of Medical History and/or Previous Records

- Birth record data
  - o Prenatal blood and urine test results of biological mother
  - o Exposure to medications, licit and/or illicit substances, alcohol, tobacco, marijuana
  - o Gestational age, birth wt, length, head size, Apgar scores
  - o Prenatal concerns, neonatal complications
  - o Newborn hearing screening results
  - o Newborn cardiac screening results
  - o Newborn metabolic screening results
- Previous growth points, including head circumference
- History of abuse: emotional, physical, and sexual; history of neglect
- Reason for placement into adoptive home
  - o Voluntary versus involuntary termination of parental rights
- Nutritional history, particularly with respect to iron, calcium, vitamin D, iodine, and other nutrients
  - o Assess history of food insecurity as well as current dietary habits
  - o Determine if the child has any sensory or oral motor eating difficulties
  - o Exercise history
- Developmental milestones, past and present
- Behavioral issues, particularly with respect to socialization, indiscriminate friendliness, response to stress
- Laboratory test results, radiographic studies, other studies
- Document immunization history
  - o School records may be sufficient, particularly for older children
  - o Review original international records with adequate timing of doses
  - o Children with no records or records that do not appear to be original or accurate are to be immunized according to standard Advisory Committee on Immunization Practices and/or AAP catch-up schedules[35]
- Document results (if known) of previous testing or treatment of tuberculosis
- Document chronic medical diagnoses
- Allergies (medication, food, environmental, latex, or insect stings)
- Medications (traditional and/or herbal, used acutely and chronically)
- Reports from previous specialists seen
  - o If available, have an original translation of records from other countries
- Family history (when available)
  - o Vision, hearing concerns
  - o Genetic diseases
  - o Concerns related to specific populations (eg, sickle cell anemia, thalassemia, Tay Sachs disease, or lactose intolerance)
  - o Mental health diagnoses
  - o Alcohol and/or substance use (licit and/or illicit use)
- Environmental risk factors
  - o Assessment of lead risks
  - o Document whether the child had experience with institutionalization
    - ■ If known, reason and timing of placement
    - ■ If known, feeding and sleeping schedule and environment where feeding and sleeping occurred
  - o Risks for previous physical, emotional, and sexual abuse
    - ■ Substandard housing, multiple changes in residence
    - ■ Family members using licit and/or illicit substances or alcohol, domestic violence
  - o Passive tobacco exposure, methamphetamine production products, other licit and/or illicit substances in the home environment
  - o Other environmental toxins, both in the home and surrounding community
- No. previous placements, quality of such care

Notes

- Children who have been adopted internationally may have neurologic, hematologic, cardiac, and metabolic disorders that were previously overdiagnosed, underdiagnosed, or undiagnosed.
- Medical records from other countries (if available) may be limited in information, inaccurate, or falsified.
- For children adopted domestically, there may be issues of confidentiality associated with obtaining records, particularly if a child's name was changed at the time of the adoption. In all cases, physicians can work with families and adoption workers to obtain complete medical records while also strictly adhering to laws regarding confidentiality of medical information.

- Relationship history
  - o Important ongoing relationships, including with biological family members, foster parents, and/or friends and important relationship losses

foster care may be classified as overweight or obese because of diets high in fat and sugar combined with being physically inactive secondary to their past environments.[52–54]

It is recommended that the child's general appearance be assessed and that any dysmorphic features that might be suggestive of a genetic disorder or syndrome (such as fetal alcohol syndrome) or congenital defects be noted. A thorough examination of the skin may lead to a diagnosis of an infectious disease or identification of lesions suggestive of previous abuse. It is necessary to perform a thorough but sensitive examination of the genital area to identify any abnormality suggestive of previous sexual abuse as well as documentation of female genital cutting.[55] The timing of this examination may need to be adjusted depending on the child. Children who have been traumatized in the past and are new to their adoptive homes may become anxious and overwhelmed. If the relationship with the adoptive parent is still new, the child may feel helpless without adequate support. As is expected for any new patient, a comprehensive neurologic examination can be performed.

REFERRAL FOR DIAGNOSTIC TESTING

It is recommended that diagnostic studies appropriate for the evaluation of the adopted child's risk factors be completed according to US recommendations, even for internationally adopted children who have received these tests outside of the United States (Table 3).[18,21] Children born outside of the United States should have all tests that were completed in the country of birth repeated, according to US recommendations.[18,21] Previous laboratory testing is often not verifiable, leaving concerns about the accuracy, appropriate reporting and interpretation, and timing of the tests.

TABLE 2 Components of the Comprehensive Physical Examination Pertinent to Adoption

- Vital signs (temperature, pulse, respiratory rate, and blood pressure)
- Growth points, including length or height, wt (unclothed), head circumference (on all children); plot data on WHO or CDC growth charts, along with comparison with any measurements previously obtained; BMI can be calculated and plotted
- Complete physical examination, with emphasis on the following areas
  - o Careful assessment for dysmorphic features suggestive of possible syndromes, including fetal alcohol spectrum disorders
  - o Careful eye examination, including red reflex and/or funduscopic examination and assessment of extraocular muscle functioning
  - o Skin examination
    - ■ Identify infectious diseases, rashes, or infestations, including scabies, lice, candidiasis, pediculosis, and impetigo
    - ■ Identify and document any congenital skin abnormalities, including hemangiomas, nevi, and blue macules of infancy (usually seen in children of Asian, African, or Hispanic ethnicity)
    - ■ Identify and document bruises or scars that may have resulted from previous abuse or immunization
  - o Perform a careful genitalia examination (including the anus) to identify any abnormality that may indicate previous sexual abuse or genital cutting
    - ■ If indicated, referral for full forensic evaluation may be needed
  - o Neurologic examination with emphasis on developmental and neurologic abnormalities; careful examination of the spine, including stigmata of spinal dysraphism

WHO, World Health Organization.

Recommendations are also available for children who have lived in foster care,[39] including the AAP Policy Statement and Technical Report, both titled, "Health Care Issues for Children and Adolescents in Foster Care and Kinship Care."[40,41]

Diagnostic testing may vary depending on whether the child was adopted through the domestic or international route. For children who lived in a foster home in the United States before finalization of adoption, verifiable diagnostic studies do not need to be repeated unless there has been additional risk of infectious disease or environmental exposures. Infants being adopted domestically shortly after birth need to have accurate verification of the biological mothers' prenatal laboratory test results, with testing being performed on the infants if the information is unavailable or if the accuracy of the records is unclear.

It is recommended that children adopted internationally be tested for tuberculosis, HIV, HBV, and sexually transmitted infections. For those adopted domestically, testing is recommended for children with definite or unknown exposure to and/or risk for tuberculosis, HIV, HBV, and sexually transmitted infections.[18,45,46,56,58] Other tests can be considered on an individual basis.[18,45,46,56,58] Consideration of individual risk factors is particularly relevant for internationally adopted children, for whom infectious diseases are among the most common medical diagnoses identified after arrival in the United States.[18,44,56] The latest edition of the AAP *Red Book*[18] and the CDC's *Health Information for International Travel* (commonly known as the *Yellow Book*)[44] should be consulted regarding follow-up for positive test results.

In many countries, perinatal screening for HBV is inconsistent, and administration of a hepatitis B vaccine at birth is unreliable. Prenatal screening for syphilis and HIV is also variable. In addition, according to the CDC *Yellow Book*,[44] many countries have a high prevalence of intestinal parasites and tuberculosis. Accordingly, all international adoptees should be screened for these infections after arrival in the United States. Other recommended screening tests for infectious diseases in international adoptees include *Trypanosoma cruzi* serological testing for children from countries where infection is endemic. In children with eosinophilia and negative stool ova and parasite examination results, testing for *Strongyloides* species, *Schistosoma* species, *Toxocara* species, and lymphatic filariasis can be considered depending on the children's country of origin. Other diseases, such as malaria, typhoid fever, leprosy, and melioidosis, are rare and not routinely tested for in internationally adopted children. However, if a child has findings such as unexplained fever, splenomegaly, anemia, or eosinophilia and is from a country where the disease is endemic, appropriate evaluation should be pursued.[18,56] For children with abnormal developmental screening results whose birth mother resided or spent time in a country with endemic Zika virus infection during pregnancy, current guidance is available from the CDC (www.cdc.gov/zika/index.html).[59]

Children, whether domestically or internationally adopted, may be at risk for iron, calcium, and vitamin D deficiency secondary to past dietary inadequacies.[25,54,56,60,61] Therefore, screening for anemia and rickets is suggested. Newly adopted children should also be screened for lead toxicity and thyroid function.[25] Screening for lipidemia may be indicated, according to guidelines, on the basis of known or unknown biologic family history.[35]

IMMUNIZATIONS

Immunization records should be reviewed carefully, particularly with respect to vaccines administered, the dates when vaccines were administered, intervals between vaccines, and the age of the child at the time the vaccines were administered.[18,47] Immunization records for children who have lived in several foster homes may be incomplete; children can be caught up using standard catch-up schedules.[62] Children who were immunized in an

TABLE 3 Diagnostic Testing

- Infectious diseases (for updates and further details on infectious disease screening, please consult the current AAP *Red Book*[18,56])
  - o Positive results for any infectious testing need to be treated according to standard guidelines[56]
  - o Hepatitis B surface antigen, hepatitis B surface antibody, and hepatitis B core antibody[a]
  - o Hepatitis C virus serological testing
  - o Hepatitis A (IgM and IgG)
  - o HIV 1 and 2 serological testing[a]
  - o Syphilis serological testing[a]
    - ■ Nontreponemal test (RPR or VDRL)
    - ■ Treponemal test (MHA-TP, FTA-ABS, or TPPA)
    - ■ For children adopted internationally, repeat all testing performed before adoption
    - ■ If sexual abuse is suspected or history is unknown, test the child for gonorrhea, *Chlamydia*, and other sexually transmitted infections; testing should include any suspected site of abuse, including the mouth and rectum
  - o Tuberculosis[a]
    - ■ TST or IGRA; TST is preferred. Although TST can be performed, IGRA may be preferred in children with previous exposure to Bacillus Calmette–Guérin vaccine and in people in whom follow-up with TST reading is questionable. For children adopted internationally, consider repeating this testing after 6 mo to rule out exposure just before leaving the country of origin.
  - o In children from countries with endemic infection, *T cruzi* serological testing (http://www.who.int/mediacentre/factsheets/fs340/en/)
  - o Stool screening for pathogens for any child who previously lived in inadequate housing, another country, or an institution or has diarrhea (diarrhea need not be present for children to have parasite infections)
    - ■ Ova and parasites: 3 tests collected on separate days for optimal screening with a specific request for *Giardia* intestinalis and *Cryptosporidium* species testing
    - ■ Stool testing by using culture or nonculture methods for *Salmonella*, *Shigella*, and *Campylobacter* if the child has diarrhea and *Escherichia coli* 0157:H7 and *Clostridium difficile* if bloody diarrhea or known or suspected history of prolonged antibiotic exposure
  - o Complete blood cell count with red cell indices
    - ■ Routine anemia screening for all children ≥6 mo old as well as all children adopted internationally
    - ■ In children with absolute eosinophil count exceeding 450 cells/mm^3 and negative stool ova and parasite examination results
      - • *Strongyloides* species serological testing
      - • *Schistosoma* species serological testing for children from sub-Saharan African, Southeast Asian, and certain Latin American countries
      - • *Toxocara canis* species serological testing
      - • Lymphatic filariasis serological testing for children >2 y old from countries with endemic infection (http://gamapserver.who.int/mapLibrary/Files/Maps/LF_2016.png)
  - o Screening for hemoglobinopathies and blood disorders in children of African, Asian, Hispanic, or Mediterranean ethnicities
    - ■ Sickle cell disease
    - ■ Thalassemia
    - ■ G6PD deficiency
  - o Blood lead concentration for children up to 6 y of age; older ages if indicated (ie, refugees, with history of institutional care, in at-risk cultural practices)
  - o Thyroid function ascertainment in all new international adoptees
  - o Newborn screening panel (young infants)
  - o Rickets screening (calcium, phosphorus, alkaline phosphatase) for children who were institutionalized, have growth delay, or had a history of poor vitamin D intake or limited sunlight
- It is recommended that children adopted internationally be retested for hepatitis B and HIV 6 mo after placement in the home.[44] Testing does not need to be repeated for children adopted from the US foster care system who recently had verifiable laboratory studies consistent with recommendations from the AAP.[57]

FTA-ABS, fluorescent treponemal antibody absorbed; G6PD, glucose-6-phosphate dehydrogenase; IgG, immunoglobulin G; IgM, immunoglobulin M; IGRA, interferon-γ release assay; MHA-TP, microhemagglutination assay for *Treponema pallidum* antibodies; RPR, rapid plasma reagin; TPPA, *Treponema pallidum* particle agglutination; TST, tuberculin skin test; VDRL, Venereal Disease Research Laboratory.

[a] For all children adopted internationally, it is recommended that they be tested for tuberculosis, HIV, hepatitis B, and sexually transmitted infections. Other tests can be considered on an individual basis.

institutional setting may have an inadequate immunologic response because of poor storage of vaccines or vaccines being used beyond the expiration date.[63] In addition, there may be no adult who can verify that the child actually received the vaccines written on the record. A recommended alternative is to reimmunize the child by using the appropriate AAP catch-up schedule.[56] If reimmunization is not acceptable, antibody concentrations may be measured to confirm immunity (see Table 4 for recommended antibody titers).[56] If antibody concentrations are to be obtained, it is important to interpret results in light of the dates of the last vaccine doses and possible persistence of maternal antibodies.[56]

CHRONIC HEALTH CONCERNS

During the health assessment of an adopted child, health concerns known and not previously diagnosed need to be identified. For many children, the availability of health information, including history of maternal and/or child drug use, previous hospitalizations, medications, and types of subspecialists the children have seen, may be incomplete or, when present, may need further exploration to define its significance. This scarcity of information may leave the family and the health care team uncertain of events that may affect the overall health of a child. Previous studies have confirmed that many adopted children have previous chronic illnesses or are at risk for the development of physical and mental health issues.[26,64–71] In 2014, a report from the Congressional Research Service found that 35% to 60% of children in the child welfare system had at least 1 chronic or acute physical health condition that needed treatment.[64] Some of the most common findings were growth failure, asthma, obesity, vision impairment, hearing loss, neurologic problems, sexually transmitted infections, and complex chronic

TABLE 4 Serological Testing to Assess Immunization Status of Adopted Children

- Diphtheria, tetanus
  - In children >6 mo old with or without written documentation of immunization, serological testing to document antibodies to diphtheria and tetanus may be considered to determine if the child likely has received and responded to dose(s) of the vaccine.
- Pertussis, rotavirus
  - No serological test is available to assess immunity to pertussis or rotavirus.
- Measles, mumps, rubella
  - In children >12 mo old, measles, mumps, and rubella antibody concentrations could be measured to determine if the child is immune.
  - Do not perform antibody testing in children <12 mo old because of the potential presence of maternal antibody.
  - Measles antibody testing may be irrelevant if the child has not received mumps or rubella vaccines and will need the measles-mumps-rubella vaccine anyway.
- Varicella
  - In children >12 mo old, varicella antibody concentrations could be measured to determine if the child is immune.
  - Do not perform antibody testing in children <12 mo old because of the potential presence of maternal antibody.
  - The documented receipt of 2 doses of the varicella vaccine is the best indication of immunity to varicella because commercially available varicella antibody tests are insensitive.
- Poliovirus
  - Neutralizing antibody for types 1, 2, and 3 can confirm immunity to poliovirus.
- *Haemophilus influenzae* type B
  - If no records are available, it may be prudent to reimmunize according to the routine catch-up schedule. If there are records of immunization available, it may be prudent to check titers to validate, but this does not convey full immunity. Use of the catch-up schedule may still be warranted.
  - For immunocompetent children ≥5 y old, there is no need to perform serological testing because no dose is indicated, except certain high-risk older children may still require vaccination.
- Hepatitis B
  - HBV infection is covered in Table 3. HBsAb can be tested to confirm immunity if the child has a record of vaccines administered with appropriate timing.
- Hepatitis A
  - Serological tests for anti–hepatitis A virus (IgG and IgM) can be considered.
- Pneumococcus
  - No serological test is available.

Information is taken from the AAP *Red Book*.[18,56] For non–US-born children, serological testing may be a strategy to determine if antibody concentrations are present for some vaccine-preventable diseases. However, serological testing is not available for all vaccine-preventable diseases, can be costly, and does not confirm whether the child is fully immunized. Therefore, it may be judicious to repeat the administration of all immunizations in question.[56] HBsAb, hepatitis B surface antibody; IgG, immunoglobulin G; IgM, immunoglobulin M.

illnesses. The report also noted that one-half to three-fourths of these children exhibit behavioral or social competency problems that necessitate care from health services. The findings confirmed that many of these problems persist even in children who are adopted.

Children with a history of foster care involvement have frequently experienced psychological trauma.[40,41] Studies have shown early experiences and environmental influences may have long-term sequelae on the emerging brain architecture, resulting in long-term health problems.[26] These children are more likely to report externalizing and internalizing psychiatric symptoms.[65–69] Common mental health diagnoses for children in foster care include disorders related to attention-deficit/hyperactivity disorder and oppositional defiant and conduct disorders. Other problems include anxiety disorders; eating disorders; elimination disorders; mood disorders, including major depression and mania; and disruptive behavioral symptoms. In addition, adolescents in foster care are at increased risk for having attempted suicide and having a drug dependency diagnosis within the preceding 12 months compared with their peers who had not been involved with the foster care system.[69,71]

The pediatrician plays a key role in coordinating the health care management of adopted children with special health care needs. After any acute and chronic illnesses have been identified, a review of any previous medical testing is appropriate to make referrals to pediatric medical subspecialists. Although referral is important, carefully prioritizing acute and chronic conditions is critical to promoting successful adjustment and encouraging the family to establish a medical home for ongoing continuity of care.

HEARING SCREENING

Assessment of hearing is recommended for all children (Table 5). Newborn hearing screening is recommended for all newborn infants in the United States. It is recommended to document the results and make them a part of the child's permanent medical record. For international adoptees, conductive and sensorineural hearing loss has been shown to occur at a higher rate compared with the general population, justifying the recommendation of a formal audiological examination for all adoptees.[25,57,72] Regardless of the route of adoption, if hearing loss is noted, the child is at risk for speech and language delay.

VISION SCREENING

Pediatricians should ask the parents about any history of vision problems. An eye examination needs to be performed on all children, as the AAP recommends in Bright Futures (Table 5).[73] Vision screening is particularly important for international adoptees. A study involving the Minnesota International Adoption Project survey reported approximately 30% of international adoptees screened had vision problems.[74] Diagnoses included myopia, hyperopia, astigmatism,

TABLE 5 Other Screening Evaluations

- Hearing
  - o Validate newborn screening when available
  - o Screen all children, particularly those with risk factors for hearing loss as well as developmental (speech) delays
- Vision
  - o Eye examination as appropriate for age
  - o Screening for refraction error at 3 y of age
  - o Funduscopic examination for children with birth wt <1500 g
- Dental
  - o Referral to dentist for all children ≥12 mo old
  - o Earlier referral if evidence of dental caries or abuse via the mouth
- Developmental screening, assessment, and/or interventions
  - o Timely identification of developmental delays is strongly recommended
  - o Risk factors include prematurity, licit and/or illicit drug and/or alcohol exposure, poor prenatal care, institutionalization
    - ■ Formal referral for all children adopted in the newborn period or beyond with risk factors as listed or other concerns
    - ■ Referral for all children adopted beyond the newborn period with risk factors or concerns about development when appropriate
    - ■ For children adopted internationally, a speech evaluation within a few weeks of arrival home by a speech therapist fluent in the child's native language is optimal to help reveal gaps in articulation and language processing skills
  - o Referrals may be made to an early intervention program for children from birth up to 36 mo of age
  - o Referrals through the school system for children ≥36 mo old with establishment of an IEP when appropriate
  - o Referral for speech and/or language, occupational, and physical therapy when indicated; children adopted internationally can be placed in an educational setting with flexible placement based on the child's developmental profile, not solely on the child's age

strabismus, and other abnormalities, including optic atrophy and abnormal tearing. Of note, international adoptees who were institutionalized are 10% to 25% more likely to have strabismus.[25] The red reflex should be documented in all newborn infants. A funduscopic examination of dilated eyes can be performed by an ophthalmologist for all children with a birth weight <1500 g.[75] It is recommended that older children be examined for strabismus and abnormalities of the fundus, eyelids, and extraocular muscles. Vision screening should be performed for all children 3 years and older.[73] For internationally adopted children, particularly if the history includes institutionalization, it is recommended that an ophthalmologist see the children within the first few months after arrival in the United States.[25]

DENTAL

A dental assessment should be performed on all children, and referral to a dentist is recommend on the basis of risk assessment (including abuse of the mouth) as early as 6 months of age, 6 months after the first tooth erupts, and no later than 12 months of age (Table 5).[73] Any previous dental diagnoses should be reviewed, including appropriate referrals to dental specialists, for the establishment of a dental home. Dental professionals should be informed about any previous medical illnesses and malnutrition as well as periods in which the child lived in an area of the world with no fluoride in the diet.

AGE DETERMINATION

For some international adoptees, accuracy of date of birth may be questionable. For children younger than 1 year, a difference of weeks or a few months will not be critical in the long-term.[27,47] For older children, age determination may be more important, especially with respect to placement in school and eligibility for special education services.[27,47] There are no accurate or reliable tests for age determination. Malnutrition and deprivation may affect assessments using standard measurements, including radiographic bone age and dental eruption. Onset of puberty may be advanced as a child's nutritional status rapidly improves. It is usually best to delay changing a birth date until at least 12 months after adoption to allow for catch-up growth as well as prolonged observation of a child's physical and emotional development.[42,47] Input from other providers and professionals interacting with the child is advisable to facilitate optimal outcomes for the child.

DEVELOPMENTAL SCREENING

Developmental screening should be performed by using validated screening tools; for the internationally adopted child, this may be a complicated issue (Table 5). Validated screening tools performed shortly after arrival often may be difficult to interpret. The child usually faces a language barrier, and his or her exposure to the types of materials used for testing may be limited. For these children, early scores may not be predictive of later functioning.[76] Several studies have demonstrated significant developmental delays in children as they enter foster care, particularly in speech and language.[6,9,68,77–79] Likewise, children adopted internationally nearly always demonstrate delays in at least 1 area of development, with nearly half having global delays.[17,80–82] Children adopted internationally may demonstrate delays in expressive and receptive language that are not solely related to acquisition of a new language.[17,21,83] Although catch-up development does occur, studies have shown that many children are at increased risk of long-term consequences of developmental delay depending on age at adoption and length of time spent in an

institutional setting.[75,82] Therefore, it is recommended that pediatricians refer adopted children to an intervention program in a timely manner.

MENTAL HEALTH REVIEW

Children adopted from foster care and children adopted from institutions are at an increased risk of mental health disorders, including socioemotional problems.[8,82,83] Preplacement factors, such as prenatal stress, prenatal drug and alcohol exposure, prolonged institutionalization, multiple placements, and previous trauma, contribute significantly to the emotional problems of these children.[24,26,36,42,76,83–85] These early experiences, either singularly or in combination, may have a lifelong effect on the developing brain secondary to the body's physiologic responses or toxic stress reaction.[26] Children who have been exposed to high levels of stress because of life experiences may develop heightened activity of the stress system, resulting in problem behaviors later in life.

When available, it is recommended that pediatricians consider any history of mental health diagnoses in members of the birth family and manage a child or adolescent carefully with the use of validated screening tests, such as the Pediatric Symptom Checklist,[86] Brief Infant-Toddler Social and Emotional Assessment,[87] Ages and Stages Questionnaire: Social-Emotional,[88] Early Childhood Screening Assessment,[89] Strengths and Difficulties Questionnaire,[90] or Patient Health Questionnaire 2.[91] Appropriate referrals for evidence-based therapies[92–94] need to be made when such a risk presents itself. Although referrals may be performed at the time of placement for children with a history of abuse or neglect, screening for mental health disorders needs to be conducted at all medical visits, particularly at the time of regular health assessments (Table 6).

ISSUES OF ADJUSTMENT AND TRANSITIONS

It is important to address adjustment issues at the time of placement into the home. Many of these issues may be intensified by the many transitions that the adopted child may have experienced. Children may be withdrawn, have temper tantrums, be aggressive or defiant, cry inconsolably, or even have autisticlike behavior as they undergo changes in their family placement.[16] Some children may regress in previously obtained skills. Older internationally adopted children may encounter frustrating language barriers with their adoptive family.[16,21] Even if transitions into an adoptive home are gradual, most children experience grief with the change in their caregivers, peers, and home environment.[16,95,96] Sleep problems are also common.[16,95,96] Difficulties in timing, location, duration, and quality of sleep are typical.[16] Feeding problems may present after adoption. Feeding issues may include overeating, hoarding, or food refusal.[16] Pediatricians need to counsel families about potential adjustment issues and encourage them to look for cues that the children may be overwhelmed and help them to develop strategies to promote strong, healthy attachments within the family unit.[96] Parenting strategies to address overeating, food hoarding, and sleep struggles may need to be different from usual pediatric advice, addressing the child's need for extra security around food and sleep.

KINSHIP-SPECIFIC ISSUES

The Child Welfare League of America defines kinship care as "the full-time care, nurturing, and protection of children by relatives, members of their tribes or clans, godparents, stepparents, or any adult who has

TABLE 6 Behavioral and Mental Health Recommendations

- Review behavior, including past and present concerns
  - o Adjustment
  - o Fostering or positive relationships
  - o Aggressive behavior
  - o Disruptive behaviors (stealing and lying)
  - o Hyperactivity
  - o Impulsivity
  - o Internalizing behaviors (withdrawal and anxiety)
  - o Sleep issues
  - o Feeding issues, including overeating or hoarding food
  - o Enuresis and/or encopresis
  - o Selective mutism
  - o Habit disorders (trichotillomania and dermatillomania)
- Document psychiatric medications used currently or in the past
- Document any past psychiatric hospitalizations
- Previous violent behavior or animal cruelty
- Sexualizing behaviors
  - o Sexual promiscuity or acting out
  - o Excessive or inappropriate masturbation
- Substance use
  - o Tobacco, alcohol, and licit and/or illicit substances
- Suicide
  - o Suicidal ideology
  - o Previous suicide attempts
- Monitor for issues related to loss and grief, attachment disturbances, posttraumatic stress disorder
  - o Children may not admit to previous abuse or neglect until they are secure in a new family. This may be revealed months or years after placement.
  - o Even children placed as newborn infants may have struggles related to their history of adoption (ie, identity development) that do not necessarily rise to the level of mental health issues.

a kinship bond with a child."[97] The Annie E. Casey Foundation reports that 2.7 million (4%) US children are being raised by extended family members or family friends, with the majority being in an informal arrangement.[98] Only about 104 000 of these children have been placed in a formal kinship arrangement, accounting for one-fourth of all children who have been removed from their homes by the child welfare system and placed in state custody.[98]

Kinship care has been shown to add value for children in care.[98–102] Children in kinship care experience greater stability by having fewer placement changes and fewer school changes.[98–102] Children are more likely to live with their siblings and, if they reunify with birth parents after kinship care, are less likely to reenter foster care.[100–102] Children in kinship care report being more likely to have positive views of their living environment, feel more culturally connected, and have a feeling of being loved than children in nonkinship foster care.[101,102]

Although kinship care has many advantages for children, there are some notable potential concerns. Contact with biological parents, who may be responsible for the neglect or abuse of the child, may be unavoidable.[102,103] Caregivers are typically older and less economically stable.[102–104] Many families who are eligible for benefits fail to request and accept government assistance.[102,105] Children are also more likely to be in guardianship rather than being adopted.[101,102]

Children placed with kin need the same comprehensive evaluation as those living in nonrelative placements.[40,41,102] This recommendation applies even if the child has had no interruption in his or her medical home before or after placement. Studies have demonstrated that the incidence of chronic medical problems and mental health concerns in children living in kinship foster care are similar to those of children living in nonrelative foster care.[102,106–108]

SAFE HAVEN INFANTS

All states, including the District of Columbia and Puerto Rico, have enacted legislation to address infant abandonment and infanticide.[109] Infants can be safely placed anonymously in designated locations where they can be protected and given medical care until a permanent home can be found. Age limits for relinquishing infants through this program are state specific, ranging from no more than 72 hours to up to 1 month of age. Physician responsibility and legal accountability also differ by state.[109] Although the purpose of infant safety is enhanced, maternal and infant history may be deidentified, scarce, or unknown. Therefore, the same attention to care given to other adopted children needs to be given to these infants.

SPECIAL ISSUES IN THE EDUCATION ENVIRONMENT

Despite the route of adoption, children come to the educational system with their own unique needs secondary to their complex life experiences. Their physical and mental health, as well as their socioemotional responses, affect their ability to maximize learning. Pediatricians need to be aware of available resources within the educational system. For children younger than 3 years, there are early intervention programs available in every state and territory. After the third birthday, it is recommended that children who are at risk or have known developmental deficits or academic challenges be referred to the school system for evaluation and ongoing services. Important resources include the Individualized Educational Program (IEP) and the 504 Plan.[110] Pediatricians can be helpful in this process by providing detailed information concerning the children's chronic or complex health care needs on school forms (Table 7).

An IEP uses a multidisciplinary approach to establish a written educational program designed to meet a child's individual needs and how progress will be monitored. Typically, the IEP involves a psychological and educational assessment, review of the child's developmental and psychosocial histories, and an examination of medical data. For children who do not meet the criteria for an IEP, an option for support services is the 504 Plan. Many schools use the 504 Plan as a first step to provide services and then advance to an IEP. It is available to children who may have medical needs that affect learning even if they do not have a verified learning disorder or chronic disease.[110]

ROLE OF ADOPTION MEDICAL SPECIALISTS

Adoption and foster care medicine is an evolving subspecialty within the field of pediatrics that serves as a valuable resource for adoptive and foster families, especially families with international adoptees. Many international adoption specialists may review records electronically, thereby increasing the availability of this resource to families who may not live near an international adoption clinic. The AAP Council on Foster Care, Adoption, and Kinship Care is a resource for further training for physicians who care for children who have been adopted or are in foster or kinship care.

FINANCIAL CONSIDERATIONS

The comprehensive assessment of a newly adopted child requires extensive physician time and commitment. The initial evaluation visits are far more in-depth than simple well-child visits and can be billed as problem-based encounter

TABLE 7 Educational Resources

- 504 Plan
  - o Children who do not meet criteria for an IEP but still need classroom support services, including educational or speech and language services
- IEP
  - o A legal document detailing the child's learning needs and the school system's responsibility in providing the needed services to maximize student success and how it will be measured
  - o Plans typically include a psychological assessment, educational assessment, developmental history, psychosocial history, and medical data

visits. Coding of the problem-based encounter is then based on the complexity of the visit or time spent in counseling and/or coordination of care.[111,112] Services such as the preplacement consultation may not be covered by most insurance carriers, but the pediatrician may want to advise the adoptive parent to seek information from the parent's employer about benefits covered through an adoption subsidy plan or flexible-spending account. Children adopted through the foster care system may have continuation of their Medicaid benefits even after the adoption is finalized. Finally, families may be eligible for the federal adoption tax credit to offset some of the adoption-related costs.

ADDITIONAL RESOURCE

The CDC's *Yellow Book*[44] can serve as a useful resource for international travel and includes a chapter specifically for international adoption (https://wwwnc.cdc.gov/travel/yellowbook/2018/international-travel-with-infants-children/international-adoption).[113] It provides information on pretravel preparation of adoptive parents, discussion of the overseas medical examination, and the follow-up examination after arrival in the United States. There is also information on screening for infectious diseases and review of immunizations.

CONCLUSIONS

Children who are adopted are in need of a comprehensive health evaluation to fully address all their health and developmental needs. This comprehensive evaluation is best accomplished with the establishment of a medical home for adopted children. The comprehensive health evaluation should include a review of the child's medical history, complete physical examination, and necessary diagnostic testing. It is recommended that important consideration be given to risks in the child's past with full attention given to infectious diseases and environmental, nutritional, developmental, and mental health risks. Pediatricians play an important role in working with families to identify children's needs and providing emotional support to help families through the adoption process. Ongoing awareness of the adopted child's history through enhanced well-child care and follow-up visits will enable the pediatrician to identify other health issues that may develop and assist families in accessing resources that will help them in the long-term.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
CDC: Centers for Disease Control and Prevention
HBV: hepatitis B virus
IEP: Individualized Education Program

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