May 17, 1999

There were 15,774 intercountry adoptions in the U.S. in 1998 according to the Immigration and Naturalization Services (INS). This was up from 13,621 intercountry adoptions in 1997. International adoption in the U.S. has almost doubled since 1989 (7,948). There is no reason to doubt that this trend will continue especially since the age of eligibility of parenting for adoption in China has gone down to thirty years of age and second adoptions are no longer required to be special needs adoptions. Of course changes in world politics can alter the policies of China Center Adoption Affairs and we must always be ready for this possibility. The two main sources of kids from abroad are now Russia and China with Russia having moved into the lead for the past two years. Until 1995, Korea had been the leading country for international adoption in the U.S. for three decades.

In 1995, Russia leaped ahead of Korea and from 1994 to 1995, China almost tripled its numbers of adoptions from 809 to 2,098. From 1995 to 1996 adoption from China doubled (2,098 to 3,363)! In 1998 there were 4,206 children adopted from China. We should also note that intercountry adoption has been popular in many other countries like Canada, Western Europe, Scandinavia, New Zealand, and Australia. We know a lot more about the health issues of children adopted from China in 1999 than we did in the late 80s and early 90s. Experience has been a great teacher. The news is great. Kiddies from China have limited long-term medical problems and these medical issues are generally easily resolved with proper diagnosis and treatment. The important message is that children adopted from China and other countries need to be assessed comprehensively within the first few weeks of their arrival in their new home country. If the medical problems are addressed swiftly, children are quickly able to go about their lives as normal healthy children with the potential for a happy, healthy, and successful life. Children need to be followed by their primary care pediatricians or family doctors throughout their childhood and they need to be aware of the ever increasing adoption focused and specialized medical, developmental, and psychological resources that are now available in the community at large. We are quite fortunate to have a richness of professionals in the New York area who have begun to focus their attention on the special needs of kids adopted from abroad especially in the areas of language and sensory integration.

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Adoption Medicine as a Specialty

The adoption medical specialists in the U.S. have formed a formal group which has recently petitioned the American Academy of Pediatrics which certifies pediatricians in the U.S., to become a section on international adoption medicine within the Academy. The group met for the first time on August 13, 1998 in Cincinnati as part of the North American Conference on Adoptable Children. Most recently in Washington, D.C. on April 14, 1999 the adoption medical group convened as part of an all day medical institute sponsored by the Joint Council on International Children's Services for Adoption Professionals from agencies all over the U.S. Most of the adoption medical specialists were in attendance giving over 25 mini-lectures on the health issues of children adopted from abroad. The group has a private listserver through the internet to communicate and share among themselves, new medical developments for children adopted from abroad. (The American Academy of Pediatrics Provisional Section on Adoption (PSOAD) was formalized on July 1, 2000. The staff contact is Eileen Casey. PSOAD can be contacted at 1-800-433-9016, extension 7937; fax 1-847-434-8000; www.aap.org.)

Based on the experience of a number of adoption centers across the country including my own practice where I have evaluated well over 650 children adopted from abroad, I will review the medical issues that are most common in children adopted from China. It is essential to remember that many of the health issues of children adopted from China are the health issues of children in general in China. With 1.2 billion people and 23 million births each year, China has limited financial resources as we move into the new millennium; there are very common health issues that children face daily whether in or out of an orphanage. Malnutrition, rickets, anemia, lead poisoning, asthma, tuberculosis, hepatitis B, bacterial and parasitic intestinal infections are common medical problems for Chinese children.

Medical problems are obviously compounded in the orphanage because these kiddies are often abandoned as they begin their lives and orphanages do not have access to modern medical facilities. When a doctor is involved in the medical care of an orphan, it is a non-university trained doctor who attends to the child. It would be uncommon for a university physician to care for a child from an orphanage. Children are rarely taken to modern medical centers because of lack of geographic proximity and economics; it is impossible to spare a child care worker to take a child a long distance for hospital care; the expense of hospital care is beyond the means of most institutes in China. Daily medical care is left to the common sense of experienced child care workers who staff the "social welfare institutes" all over China. Many institutes attempt to create in-house clinics and are equipped to give intravenous fluids, antibiotics, and other medications right in the orphanage, but without the supervision of trained medical clinicians. Children survive in spite of the limitations of medical care. Their circumstances are truly a test of their inherent survival capacity. They are truly hardy!

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Malnutrition, Growth Failure, and Rickets

Children living in orphanages in China are malnourished, but the severity of the poor nutrition varies from orphanage to orphanage. It is impossible to generalize about the health and nutritional status of all children living in orphanages in China. There are orphanages with more resources than others and even when an orphanage has been reported to have better living conditions, that orphanage can be altered by the economy of the region during different times of the year and in different years. Most kids living in orphanages are fed very dilute formula in infancy. The formula is usually milk-based and resembles standard baby formula used in the U.S. Rice cereal is often added to thicken the feeds. Occasionally children will get a steamed egg or a bowl of rice congi. On holidays, bananas and oranges are sometimes available. Feeds are fast and furious and bottles are propped. Children get used to a speedy avalanche of fluid without much nutritional value which can lead to difficulties with coordinating swallowing and the handling of different textures of foods during the transition after adoption (oral aversion). The poor quality of nutrition and lack of exposure to sun leads to vitamin D and calcium deficiency which is called rickets. This is one of the top five medical issues in children living in China (malnutrition, rickets, anemia, lead poisoning, and asthma). The characteristic "Raggedy Ann" or floppy appearance of many children adopted from China is attributed to rickets. With proper nutrition, rickets resolves. The muscles and bones are weak and poorly developed in ricketic kids, but with replenishment with vitamin D and calcium, the body strengthens. Rickets can clearly account for a lot of the gross motor delays that are seen when kids first arrive. Obviously, decreased muscle tone and delayed gross motor development cannot always be attributed to rickets, but the first assumption should be that nutrition is the cause. Proper follow-up with the pediatrician on a regular ongoing basis will allow exploration of other causes as time goes by.

Babies and toddlers adopted from China may also be quite small when they are first adopted by families. The body slows its growth when nutrition is poor in order to conserve energy to meet basic metabolic needs. The undernutrition described above clearly accounts for most failure to thrive that we see in children adopted from abroad in general. Typically weight catches up before height. Certainly, genetic characteristics of a particular culture must be kept in mind when evaluating a child for growth failure or failure to thrive. There are Chinese children who are small, but not all Chinese are small people.

It is essential that the pediatrician plot the child on a standard Chinese growth chart if the child appears to be small to give the child the benefit of the doubt. If the child's anthropometric measurements (height, weight, and head circumference) are found on a standard American growth chart, then I would suggest that the American growth curve is appropriate. If a child is not on either growth curve and catch-up growth is not observed within 6 months, this child needs to be evaluated by the pediatrician more closely for other more complex underlying medical problems.

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Dental Health

Note that a lot of kids from China who have had rickets and malnutrition may have damage to the primary dentition. Twenty teeth erupt during the first 2 ½ years of life. Rickets and malnutrition actually can delay tooth eruption. We commonly see lots of teeth suddenly erupting with the replenishment of calories and micronutrients during the early transition after adoption. Existing primary teeth may sustain enamel damage from bathing in sugar containing feeds in the orphanages as well as from lack of proper nutrition. I recommend that children be seen by a general dentist with an interest in children or a pediatric dentist within 6 months of arrival in the U.S. The American Academy of Pediatrics recommends that children be seen by a dentist by the age of two years.

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Eczema and Scabies

Another direct consequence of poor nutrition is poor skin condition. Kids often have rough, red, dry cheeks of the face and the skin of the rest of the body can peel and have dry, scaly patches. This is most likely a combination of factors. Kids are rarely bathed. They are wrapped up in layers of warm clothing all day and the under layers may be drenched with sweat, urine, and stool even though the pants are backless. Those insults rob the skin of its natural oils. Poor nutrition mitigates against the natural renewal of skin cells. Micronutrient deficiencies such as zinc deficiency can contribute to poor skin health. Exposure to food substances that are allergenic can also cause the red, dry, scaly appearance of a child's skin. This could be eczema (thirsty skin). Also, scabies can compound the poor condition of the skin. Scabies are microscopic mites that burrow under the skin and cause rashes and itching. It is essential that pediatricians recognize the many faces of scabies. It is the great pretender. We are very hip to scabies in the office, so we usually empirically treat it if we have any doubt about skin that doesn't get better within a few weeks after adoption. The whole family needs to be treated in case of exposure.

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Hearing Screening

We recommend that all kids coming from abroad have initial hearing screens within six months of arrival in the U.S. We have no available medical history on past ear infections in the orphanage and we also know that a small percentage of children all over the world have congenital hearing deficits. It is very difficult to diagnose subtle hearing problems in young children and since deafness impairs language acquisition we are very aggressive about hearing evaluations in adopted kids from abroad (audiologic evaluation). The American Academy of Pediatrics has recently recommended that all newborns be assessed for congenital deafness in the nursery (policy of uniform newborn hearing screening). Since kids adopted from abroad are at increased risk for language delays, normal hearing must be demonstrated to provide optimum diagnosis and treatment of language delays.

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Vision Screening

Because kids from China have epicanthal folds (flat skin fold in the corner of each eye), it is often difficult to distinguish the fold from a lazy eye. An eye can appear to be moving inside, but it actually the fold covers the eye. This is called pseudo-lazy eye or pseudostrabismus. Pediatricians need to be watching this carefully; parents should be aware of times when the eye(s) appear to go in or out and mention this to the health care provider. There is no increased incidence of lazy eye in Chinese kids, but it can be a confusing diagnosis to make.

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Vaccines in the Orphanage

Vaccines administered in orphanages may be expired, improperly stored, or the malnourished and suppressed immune system may not respond to vaccines, so it is recommended that all vaccines be repeated in kids adopted from abroad in spite of immunization records. It is generally not harmful to re-immunize a young child. The Redbook 1997 published by the American Academy of Pediatrics has charts to guide pediatricians on how to accelerate the vaccine schedule for kids who have been incompletely immunized. A study published from the University of Minnesota adoption clinic in 1998 by Hostetter et al. showed that only 35% of kids with records of vaccines administered, from Eastern Europe, Russia, and China had antibodies to dipththeria and tetanus, but 65% of those kids did not! Older children can have a modified vaccine schedule based on individual titer assessments.

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Lead Poisoning

Scientists and researchers in universities in China have been studying lead poisoning for the last 25 years. Leaded gasoline, coal burning, smelting, and rapid industrialization especially during the 60s and 70s during Mao's cultural revolution have all contributed to a serious health hazard for all Chinese people. Lead poisoning is found in the urban, suburban, and rural regions of China. A published study by Aronson et al.1999 of 301 children adopted from China, revealed that 13% of these children had elevated lead levels. Only one child was treated (lead level 48) and she remains healthy and neurodevelopmentally normal. Lead poisoning, if sustained, can cause damage to the central nervous system. Lead levels in this study diminished to acceptable levels within a year of follow-up, except for the one child who was treated who is only slightly above normal most recently.

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Parasitic and Bacterial Intestinal Infections

Not fun for parents are the parasites commonly found in the stools of their newly adopted children. Parasites are identifiable and quite easy to eradicate with medication. One of my families recently referred to ascaris roundworms as the "alien nation". She insisted that I see the critters myself and saved them in a little bottle for my viewing pleasure during a recent office visit! To not diagnose parasitic infection could contribute to continued malabsorption and failure to grow. Giardia and ascaris are the most common parasites found in kids adopted from China. The ascaris worms and giardia cysts can often be missed in the routine ova and parasite stool examination as the parasites do not always shed in every stool. At least three specimens should be obtained. Parents need to be forewarned that the "spaghetti-like" ascaris roundworms may be seen months after adoption in the diaper. There are special pharmacies that now will compound better tasting medicine particularly for the treatment of Giardia. You can contact our office for the details. For adults who have traveled to China to adopt, please contact your physician if you have symptoms of increased flatulence, diarrhea, abdominal distention, or any changes in bowel habits. This infection is transmitted with the changing of a child's diaper without proper handwashing. Also, it is transmitted by drinking tap water or eating foods contaminated with untreated water. It is best to drink bottled water, boil water, and/or drink canned, sealed beverages. A small group of children from China will also have bacterial intestinal infections; assessment by performing a bacterial stool culture is simple, easy, and should be a routine part of the initial adoption medical evaluation. Treatment is usually quite successful.

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Tuberculosis

Tuberculosis is a serious health problem all over China. When I was in China in December 1996, I visited two children's hospitals in Hefei (Anhui Medical University and Hefei Children's Hospital). During hospital rounds I saw a number of children with tuberculosis of the lung and the central nervous system. I currently have a grant from the Centers for Disease Control TB Elimination division to look at tuberculosis infection and disease in children adopted from abroad.

8% of children adopted from China in my practice (5.1% Johnson & Traister 1999) have tested positive for TB. These TB skin tests were greater than or equal to 10 mm of induration (a palpable bump), but their chest x-rays were normal and they do not have TB disease. They have been most likely exposed to TB while living in the orphanage. The adult staff who care for the children have no medical care and they are at great risk for TB disease due to their poor nutrition and crowded living conditions. There actually have been a few children adopted from China over the past ten years who have had TB disease, but so far this is rare.

We need to continue to be very aggressive about testing kids adopted from abroad for TB. The risk for acquiring TB disease within the first few years of exposure is very high. With preventive treatment with a medicine called isoniazid, daily for 9 months, this disease is preventable. It is important to remember that BCG (Bacille Calmette Guerin) vaccine against TB is very ineffective. It is a vaccine designed to prevent TB and is given in China and other countries abroad, but not in the U.S. It may cause the skin test to be slightly positive, but not usually as much as 10 mm. The effect of this vaccine diminishes over time. We cannot afford to attribute a 10 mm TB skin test to past exposure to BCG TB vaccine. If we do this, we will risk having children develop TB because they will not have been given preventive therapy. All TB skin tests should be read within 48-72 hours of placement on the forearm and the test should be interpreted by a health care provider like a physician, physician assistant, nurse practitioner, or nurse.

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HIV Infection

There have been 6 girls adopted from China between May 1998 and May 1999 who have tested positive for HIV antibody; none of these girls have actual HIV infection. When they had polymerase chain reaction (PCR) tests for actual HIV infection, they were found to be uninfected. They are currently healthy and thriving. Their mother's were infected and the antibody from the mother was passed through the placenta from mother to infant. Only 25% of girls born to infected mothers actually are infected with the virus. If the mother is treated with AZT during pregnancy, only about 5% of girls are infected. Unfortunately this preventive treatment for pregnant women with HIV infection is not yet available in China.

Two girls are from Anhui province, and one each is from Guangdong, Yunnan, and Jiangxi provinces; the most recent girl's data is not yet available at the time of this writing. Drug traffic and prostitution in Southeast Asia probably account for the recent spread of HIV into China. Based on INS statistics, there have been 15, 351 children adopted from China between 1988 and 1998. Six children testing positive for HIV antibody results in an overall incidence of 0.04 percent. For the years 1998 and 1999, the incidence would be slightly increased at 0.08 percent. It is essential to note that HIV infection is an evolving story all over the world. It is clear that no country will be spared. The world is small with the advent of international business and the spread of drug traffic.

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Hepatitis B Infection

Hepatitis B infection has been a stable story over the years. Of 342 children adopted from China from 1/91 to 10/98 (Johnson & Traister 1999), 3.5% were hepatitis B surface antigen positive. My practice reflects a similar incidence. It is important for prospective parents to know that these children tested negative for hepatitis B in China. Their positive test in the U.S. may reflect inaccurate testing in China, a lengthy incubation period for Hepatitis B infection (6 weeks to 6 months), orphanage exposure from those with acute and/or chronic hepatitis B infection, blood transfusions, or exposure to unsterile needles with administration of vaccines or in the drawing of blood. Children with chronic hepatitis B infection can go many years without any ill effects. It can be a manageable medical problem. There is no way to predict when the liver will become inflamed. Carriers need to have a yearly assessment of their liver enzymes and they should probably be followed by a children's liver specialist. Treatment is available for children and adults with active hepatitis B infection and research is ongoing. (Jenista, JA 1997)

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Hepatitis C Infection

All of the adoption doctors across the U.S. are alerted to collecting their data on Hepatitis C infection in children adopted from abroad. The incidence is very low in China. This kind of hepatitis is associated with blood transfusions, intravenous drug abuse, and in a very small percentage of cases maternal-to-infant transmission (5-7%) Two children (2%) of 129 children assessed in an adoption clinic in Boston between 1989 and 1993 (Miller et al. 1995) were found to have active HCV infection. There was a cluster of 5 cases of HCV in children adopted from China in 1995 from an orphanage in Yangzhou, China in Jiangsu province and two children adopted from China were found to be infected with HCV in a large New York City practice where well over 400 children adopted from China have been evaluated over the past 5 years.(Traister & Aronson 1998 personal communication). The cluster of cases in Yangzhou in Jiangsu province were children adopted to Canada and according to a parent who adopted children from Yangzhou in 1995, the children were forced to have blood tests in Beijing before they left China; all bloods were drawn with the same needle in the hospital despite protests from the parents (Johnson 1998 personal communication).

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Anemia

Anemia is widespread in children adopted from abroad. Malnutrition is the major cause of iron deficiency anemia. It has been documented in the medical literature of specific countries, like China. (Chen et al. 1992) A complete blood count (CBC) will uncover anemia. We know that iron deficiency anemia can interfere with normal growth and be a cause of developmental delay and learning problems. With proper nutrition and iron supplementation, anemia can resolve and medical complications can be minimized.

There are also genetic anemias that are found in children from specific countries like Vietnam, Cambodia, Thailand, and China. Children from China can have alpha or beta thalassemia traits genetically. When there were great waves of immigration of Southeast Asian individuals during and after the war in Vietnam, physicians gained experience in the epidemiology, diagnosis, and treatment of anemias indigenous to this area of the world. This has helped pediatricians enormously in their understanding of anemia in children adopted from this part of the world. (Glader & Look 1996) Having a genetic trait for an anemia is generally not harmful to the individual, but in combination with the same trait as might occur during reproduction, this can lead to a life threatening disease in the newborn infant. A CBC and a hemoglobin electrophoresis test will reveal underlying hemoglobinopathies (anemias due to abnormal hemoglobin proteins).

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Iodine Deficiency and Hypothyroidism

An article in the New York Times on June 4, 1996 reviewed the current status of iodine deficiency in China. It prompted concerns from all parents who have adopted children from China and those who were in the process of their adoption. (Aronson 1997) Iodine is a trace element found in the soil, air,

and sea. It is an essential component of the thyroid hormones which in turn are vital to brain development. The most severe from of iodine deficiency is cretinism, a rare consequence of fetal/infant hypothyroidism. Iodine is ingested in food, water, and, most commonly throughout most of the world today, as iodized salt. Most children adopted from China are from orphanages located within areas where iodized salt is part of the diet. Infants in Chinese orphanages usually receive milk-based formula that has enough iodine to prevent severe deficiency. Only the inaccessible areas of China, such as inland rural areas, plateau and mountain regions as well as most of Mongolia and Tibet, have remained iodine deficient. With virtually no adoptions taking place from these regions, iodine deficiency is not a significant problem among Chinese adoptees at this point in time. Obviously, if adoption patterns change or if feeding patterns change radically, iodine deficiency can cause hypothyroidism and can potentially become a threat to the health and growth of children anywhere in the world. This is an ever evolving and changing nutritional issue.

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Hypothyroidism

Congenital hypothyroidism has a worldwide prevalence of one in four thousand births having nothing to do with iodine deficiency. Congenital hypothyroidism is caused by the improper development (dysembryogenesis) or complete absence (agenesis) of the thyroid gland; it is an embryologic defect which can lead to devastating brain damage if not diagnosed swiftly in the first few months of life. The U.S. and most industrialized nations perform newborn screens to assess for hypothyroidism within 48 hours of birth. Unfortunately, children adopted from China are most often abandoned and do not have the benefit of a newborn screen. Children adopted from other countries may also not be born in hospitals where newborn screens are available. There have been isolated reports of hypothyroidism in children adopted abroad, but too few to consider as higher than the worldwide prevalence of one in four thousand. Some of these children have had nutritional deficits which cause transient hypothyroidism. Since children who are adopted from orphanages may not have the benefit of hospital screening programs, it has been my protocol to perform the New York State Newborn Screen at the time of the initial medical evaluation; this contains the following metabolic tests: thyroxine, phenylalanine, galactose transferase, biotinidase, sickle hemoglobin, leucine, methionine, HIV-1 ELISA. We also perform thyroid function tests for older children because the cutoff values for thyroid hormones may differ by age.

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Asthma

When a child is adopted from China, it is not uncommon for the child to have an upper respiratory infection at the time of the adoption. The orphanages are crowded and infections spread swiftly. These infections are usually self-limited, but at least 10% of kids continue to cough and wheeze with each respiratory infection after adoption. This is called reactive airways disease or asthma. Medication placed in a nebulizer which the baby then breathes in effectively manages asthma for children. Asthma is a rapidly increasing medical problem in China today because of air pollution. Anyone who has traveled to China for business, vacation, or for the adoption of a child will tell you that their throat hurt in China and for many weeks after returning home. I actually coughed for over a month after I returned from my trip to China. We know here in the U.S. that pollution has probably been one of the main causes for the increasing incidence of childhood asthma. There is no evidence that Chinese individuals have asthma more commonly than persons from other cultures. Without knowing the family history of a child, it is obviously impossible to determine the actual cause of the asthma since there is a genetic role. What I see in my daily practice is that some kids do potentially have the capacity to grow out of asthma.

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Development

At the April 1999 Joint Council medical institute in Washington, D.C., Dr. Miller presented her data on the development of 192 children adopted from China The mean age at arrival was 14 months and 180 children were seen within 3 months of arrival. 74% of children had at least one area of delay. In a study by Johnson & Traister, 136 children examined by a physician for gross and fine motor skills, tone, strength, language and social abilities, 74% were abnormal in one or more areas at the time of arrival. I refer about 75% of the kids I evaluate in my office during the first few months of arrival from China for early intervention services. The vast majority of the children I follow long-term in my practice catch-up for gross motor, fine motor, and personal-social development within the first year after adoption. Sustained language delays are more common. What we don't know at this point is much about follow-up. It is obvious that kids living in orphanages in China will sustain delays and that these delays will be less for kids who stay for shorter periods of time, but we know little about long-term outcome. This must be the next step for research in the next millennium as children mature and become school age.

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