

Blood Lead Screening Work Group Final Report

February 2000

Minnesota Department of Health
Division of Environmental Health



Executive Summary

In a series of nine meetings held from November 1998 through November 1999, a work group met to discuss and debate protocols for testing children for elevated blood lead. This work group, the Blood Lead Screening Work Group (BLSWG), was made up of a diverse group of professionals who represented health care, health policy, and housing issues in Minnesota. The BLSWG was asked to discuss potential blood lead screening guidelines for Minnesota and make recommendations on such guidelines to the Minnesota Department of Health (MDH).

The outcome of these discussions was a set of screening guidelines for physicians or other health care providers with instructions on screening children for elevated blood lead. The screening guidelines direct physicians to order blood tests for (1) children residing in specific geographic areas that have a high rate of cases of elevated blood lead and (2) children matching specific demographic groups that have a high rate of elevated blood lead. In addition, the guidelines include a set of questions, a personal risk questionnaire, that should be administered to all other children to determine if they are being exposed to lead and, therefore, should be tested.

- ▶ Universal screening

In Minnesota, all children (0 to 72 months of age) living in the cities of Minneapolis or St. Paul should receive a blood lead test. A blood lead test is also recommended for all children (0 to 72 months of age) that receive Minnesota Care; the Supplemental Food Program for Women, Infants, and Children; Minnesota's Medicaid program known as Medical Assistance, which includes the Prepaid Medical Assistance Program; are recent arrivals to Minnesota from other countries or major metropolitan areas within the last twelve months; or if a parent expresses concern about lead or asks for their child to be tested for blood lead poisoning.

- ▶ Targeted screening

A blood lead test should be administered to those children that do not meet the criteria above but who are living in an environment that may expose them to lead. Living in older housing or substandard (deteriorating) housing likely to contain lead paint, or in the same environment as other children diagnosed with lead poisoning, are indicators that a high risk for exposure to lead paint is present.

- ▶ Schedule for Testing

Child health care providers should test children at one and two years of age, and children up to six years of age who have not previously been tested if they meet the routine screen criteria. There are two exceptions to this screening schedule. A blood lead test should be considered for a child of any age, if a parent requests it. In addition, a blood lead test should be considered for children of any age, if they have recently moved to Minnesota from a major metropolitan area or another country.

▶ Periodic Evaluation

All children from three to six years of age whose last blood lead level was less than 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) should be reevaluated annually. The child should be reevaluated using a personal risk assessment questionnaire. This questionnaire will help the family and health care provider determine if the child's risk for lead poisoning has changed.

▶ Current Status of the Screening Guidelines

A final version of the Recommended Blood Lead Screening Guidelines was adopted by the BLSWG in September 1999. The screening guidelines were evaluated in actual clinic settings by physicians in October and November and the results were reviewed by the BLSWG in December. The guidelines were presented to the Minnesota Medical Association (MMA) in December 1999. The support and endorsement of the MMA was given in January 2000.

▶ Next Steps

The screening guidelines are currently being prepared for publication and distribution. Publication of the guidelines is scheduled for March 2000.

The BLSWG will continue to meet to provide advice to MDH staff on the screening plan. The BLSWG will provide input on implementation of the new screening guidelines, and on the evaluation of the guidelines.

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Work Group Organization

Work Group Objectives

The Minnesota Department of Health (MDH) Division of Environmental Health (EH) established a work group in November of 1998 to assist in the development of a statewide childhood blood lead screening plan. Screening refers to determining which children should be tested for elevated blood lead and assuring the lead test is administered. The goal for this plan was to protect children from the damaging effects of lead poisoning by effectively directing screening services to identify and test children at greatest risk. The development of new screening guidelines was in response to the November 1997 Centers for Disease Control and Prevention (CDC) recommendations that each state create a blood lead screening plan based on the conditions and needs of their state. The MDH concurred with the CDC that an effective screening plan would assist physicians and other health care professionals in directing screening services toward the children who are at the greatest risk for blood lead poisoning.

Collaboration between MDH and a diverse work group of professionals who represented health care, health policy, and housing issues in our state was essential for planning. Working together with the MDH technical staff, the work group members were to critique potential screening guidelines, and assess implementation and evaluation plans. This workgroup would review the current CDC recommendations and proposals for screening guidelines.

The following objectives for the work group were adopted:

- ▶ Critique potential screening guidelines for Minnesota communities.
 - identify strengths and weaknesses in the screening guidelines
 - recommend improvements to potential screening guidelines

- ▶ Advise MDH on the implementation and evaluation of screening guidelines:
 - identify communication and informational needs of health care professionals and the families they serve
 - identify strategies for implementing and evaluating the screening guidelines

- ▶ Report final recommendations for a statewide screening plan to the MDH.

A core group of MDH technical staff coordinated the work group meetings and the development of the screening guidelines, including research and data analysis. The core group included:

Pamela Shubat, Ph.D., Childhood Lead Poisoning Prevention Program (CLPPP) Director
Myron Falken, Ph.D., CLPPP Principal Epidemiologist
Dianne Kocourek Ploetz, Lead Program Health Educator
Becky Krueger, CLPPP Health Program Representative (Project Coordinator)

These staff represent a cross-section of MDH programs which deal with the lead issue. All of these sections are located in the MDH Division of Environmental Health.

Work Group Members

Staff recruited individuals who represented health care, health policy, and housing issues in Minnesota. Physicians who had served on a Blood Lead Surveillance Advisory Group in 1998 were also contacted to see if they would be interested in becoming a member of the Blood Lead Screening Work Group (BLSWG). The following individuals agreed to serve on the BLSWG:

Nicole Brown, MSN, PHN, CPNP	Minnesota Dept. of Health, Maternal & Child Health
James Cegla	Minnesota Housing Finance Agency
Representative Karen Clark	House of Representatives
Ronald French, Ph.D., MPH	Minnesota Dept. of Health, Disease Prev. & Control
David Griffin, M.D.	Health Partners
Vonna Henry	Sherburne County Public Health Department
Roy House, Jr., M.D.	Mayo Clinic
Mary Johnson	Phillips Neighborhood Healthy Housing Collaborative
Carolyn McKay, M.D.	Minnesota Medical Association
James Nordin, M.D., MPH	Health Partners, Pediatrics
Susan Palchick, Ph.D., MPH	Hennepin County Community Health Department
Ed Petsche	Greater Minneapolis Day Care Association
Senator Patricia Piper	Senate
Genie Potosky	Minnesota Department of Human Services
Jean Radke, RN, BSN	Metropolitan Visiting Nurse Association
Mary Ellen Smith, RN, PHN	St. Paul - Ramsey County Department of Public Health
Senator Dan Stevens	Senate
Susan Strand	Anoka County, Community Hlth & Environ. Serv. Dept.
Representative Kathy Tingelstad	House of Representatives
Tim Zager, M.D.	Duluth Clinic

As planning for screening guidelines developed, the BLSWG debated adding members who might contribute unique perspectives to screening, such as parents of lead-poisoned children. The BLSWG decided to use meetings or focus groups with those stakeholders rather than to expand membership in the BLSWG.

During the year that the BLSWG met to develop screening guidelines, one member left the group and three joined. By December 1998, Senator Dan Stevens stepped down. In February 1999, Jerrie Daly, RN, from UCare Minnesota and Susan Puskas, MT(ASCP)SC, from Medtox Laboratories, Inc., joined the work group. The last member to join the BLSWG was Susan Sommers, RN, from Blue Cross/Blue Shield of Minnesota, in July of 1999.

Some members were very active while others did not regularly attend meetings. Representative Karen Clark, Mary Johnson, and Carolyn McKay, MD, were kept updated on the progress of the work group via minutes and handouts from the meetings. Tim Michaels attended meetings on behalf of Senator Patricia Piper.

Decision-making Within the BLSWG

The work group members agreed that fifty percent of the BLSWG would need to be in attendance in order to hold a meeting. This fifty percent could not include the core group of MDH technical staff (listed on page 1) or guests at the meeting. It was also decided that if the members could not come to consensus on an issue after all information had been provided and debated, decisions would be made through a voting process. The core group of MDH technical staff were not included as eligible voting members.

The BLSWG was co-chaired by an MDH staff person and a BLSWG member. The co-chairs' responsibilities included approval of agenda items, facilitating meetings when necessary, and representing the BLSWG on correspondence. Tim Zager, MD, and Pamela Shubat served as co-chairs.

Meetings

The BLSWG met approximately every six weeks from November 1998 through November 1999. A total of nine meetings were held. All meetings took place in St. Paul, Minnesota.

At the initial meeting, a historical overview of lead poisoning and lead screening guidelines was presented by staff. The 1997 CDC booklet, *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials* was reviewed by the BLSWG. At this first meeting, the BLSWG shared many ideas for future discussion and requested data that would aid them in making decisions regarding blood lead screening guidance. Subsequent meetings were devoted to research and data on blood lead prevalence and screening. By the eighth meeting, in September 1999, the BLSWG was discussing specific language for screening guidelines.

Supporting Data & Research

The following data and research were presented to the BLSWG over the course of many meetings. MDH staff or guests of the MDH presented the information to the BLSWG.

CDC Guidance

The CDC booklet, *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials* included sample guidelines for states to consider. This guidance document also suggested housing and other data to help states determine the best approach for their area. MDH staff raised the question of whether the BLSWG believed there was sufficient data in Minnesota to utilize the CDC example. The CDC guidance suggested using 27 percent or more pre-1950 housing in a geographic area, and a 12 percent or greater rate of elevated blood lead in the population to determine if an area should be recommended for universal screening (meaning, every child should be tested for blood lead levels). Areas with newer housing or fewer

cases of elevated blood lead would use a targeted screening plan. Targeted screening involves assessing risk through short questionnaires or otherwise evaluating each child for whether or not they should be tested. MDH staff developed maps that showed these criteria applied to Minnesota. The maps showed that using the CDC criteria, virtually the entire state would be recommended for universal screening.

EPA Region V Data

EPA Region V (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin) maps, developed during the preceding year, were shared with the BLSWG. These maps showed that metropolitan areas of these states had the greatest concentration of cases of elevated blood lead.

MDH Blood Lead Surveillance Data

Data collected in 1995 and 1996 and stored in the MDH blood lead surveillance database were used to answer the question, “How many counties in Minnesota have enough screened children to reliably estimate rates of elevated blood lead?” Epidemiologists at the MDH concluded that not enough children have been screened in most Minnesota counties to reliably estimate rates of elevated blood lead. The exception appeared to be Minneapolis in Hennepin County. BLSWG members suggested that the MDH consider a prevalence study in a rural area to get a better idea of the prevalence of elevated blood lead cases in rural Minnesota. MDH staff informed the BLSWG that such a study is in the planning stages for an area in western Minnesota.

Guidance Used by Other States

In order to take advantage of work that had already been conducted in other states, the BLSWG reviewed how other states have acted on the CDC guidance to develop screening guidelines. Most of the eleven states contacted were using a combination of universal and targeted screening. States used zip codes, counties, or cities as the boundaries for areas of universal screening. The BLSWG felt that the use of zip codes created numerous problems in correctly identifying a city of residence and recommended that zip codes not be used for screening guidelines.

The work group members, as well as MDH staff, were particularly interested in Wisconsin’s screening guidelines. In that state, the metropolitan cities of Racine and Milwaukee were selected as universal screening areas, and targeted screening was used in the remainder of the state. Many BLSWG members felt that Minnesota is very similar to Wisconsin in its rural and urban makeup and that the metropolitan cities of Minneapolis and St. Paul could be designated for universal screening.

Medicaid Data

In January 1999, the General Accounting Office (GAO) released a report on screening and resulting blood lead levels of children receiving Medicaid services (medical services for the poor).

The report was discussed by the BLSWG. It was noted that in the GAO study, three-fourths of all children (ages 1 through 5) who had an elevated blood lead level were enrolled in Medicaid or the Supplemental Food Program for Women, Infants, and Children (WIC) programs. More than eight percent of children receiving Medicaid services had harmful levels of blood lead poisoning, which was five times the rate of elevated blood lead levels in the population of children not in these federal programs. The GAO study showed only about twenty percent of Medicaid-eligible children received a blood lead test. This lack of testing occurs even though a federal mandate requires that all children in the Medicaid program receive a blood lead test for lead poisoning. This information was of great interest to the BLSWG and led to much discussion about Minnesota's own Medicaid program, which is referred to as Medical Assistance (MA). MDH staff also shared the National Health and Nutrition Examination Survey (NHANES) data for 1991 to 1994 with the BLSWG. These data showed that 4.4 percent of a random sample of children ages 1 to 5 had blood lead levels of 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) or greater. A smaller percentage, 0.4 percent, had blood lead levels of 20 $\mu\text{g}/\text{dL}$ or greater.

The federal program that establishes blood lead testing requirements for the Medicaid (Medical Assistance) population is the Early Periodic Screening and Diagnostic Testing (EPSDT) program; known as the Child and Teen Checkup (CTC) program in Minnesota. The EPSDT program stipulates blood lead testing at ages one and two as part of a wide range of health care services.

MA (Minnesota's Medicaid program) includes the Prepaid Medical Assistance Program (PMAP). The BLSWG asked for eligibility requirements and the numbers of children and families enrolled in MA, WIC, PMAP, or Minnesota Care (MnCare). MnCare is a state health plan for those who cannot afford commercial health plans. The work group expected to find that all patients eligible for WIC, PMAP, or MnCare would also be eligible for MA. However, after reviewing information on these programs, it was evident that none of the program's eligibility requirements would universally meet the eligibility requirements for the other three programs.

Creating Guidance for Screening

The BLSWG was asked to make recommendations on screening guidelines to the MDH. The work group debated the various examples available and discussed options for both universal (testing all children) and targeted (identifying individual children for testing based on a personal risk questionnaire) screening.

One of the earliest decisions made by the BLSWG was whether to recommend universal or targeted screening within Minnesota. After reviewing the MDH blood lead surveillance data and reviewing examples from other states, the BLSWG members agreed that Minnesota's needs are much like Wisconsin's. A combination strategy of universal and targeted screening appeared to be the best solution for the state.

Universal Screening

The work group discussed geographic areas and demographic populations of Minnesota where all children should be tested for blood lead. The BLSWG felt that a recommendation for universal screening was appropriate for certain state-wide populations that have a significantly higher risk for elevated blood lead than the general population. In this discussion the BLSWG did an exemplary job of presenting facts and issues to each other. The membership came to consensus over most issues. When consensus could not be reached a vote was taken.

Screening in Minneapolis and St. Paul

CDC guidance suggested universal screening in areas where 12 percent of children, ages 12 to 36 months, had blood lead levels greater than or equal to 10 $\mu\text{g}/\text{dL}$. Although MDH epidemiologists had suggested that only one area in the state had sufficient testing to conclusively demonstrate such a rate (Hennepin County/Minneapolis), members of the BLSWG felt that St. Paul's similar high rate of cases merited including St. Paul in universal screening. There was some debate over including other cities such as Duluth, Rochester, and St. Cloud as areas for universal screening. The BLSWG chose to include only the cities of Minneapolis and St. Paul as universal screening areas. However, the work group felt that other cities should be added to the universal screening list in the future as supportive data become available.

Additional discussions included whether residents or their providers would know exactly where patients resided. Using a designation of city boundaries was considered preferable to using zip codes.

Children Receiving Medical Assistance for the Poor

There was a great deal of discussion about the CDC guidance to screen all children who receive government assistance for the poor. MDH staff voiced strong support for the Minnesota Department of Human Services, the state MA agency, which requires blood lead testing of all children in Minnesota receiving MA or MnCare services. The BLSWG reviewed data that showed children on government assistance programs have a higher rate of blood lead poisoning. The various Minnesota programs providing aid to the poor were discussed. After reviewing information on MA, PMAP, WIC, and MnCare, the BLSWG felt that none of the programs alone would reach all of the children at risk. These four programs together, however, should identify the majority of the children receiving medical assistance for the poor. The consensus of the BLSWG was that a child who receives services from any of these programs should be tested for blood lead poisoning.

Further discussion centered on whether clinic staff should identify these patients from clinic records, or by asking the patient's family. Work group members strongly urged that clinics and physicians determine which patients should be tested due to their economic status. Work group

members agreed that clinics ultimately should set their own policy on how to identify patients receiving any of the four services listed previously.

Transient Populations

Of particular concern among BLSWG members was lead poisoning within transient populations, especially those children coming to Minnesota from other countries. Concern was raised that when children move from metropolitan areas to rural areas they may not be diagnosed for lead poisoning because many rural physicians are not aware of the likelihood of exposure to lead. Work group members noted that many lead-poisoned children come from families that have recently moved to Minnesota from Chicago, Illinois; Detroit, Michigan; or another country. There was some discussion over whether an elevated blood lead would be detected six months or a year after moving to Minnesota. Some of that discussion concerned the half-life of lead in the blood and the potential for long term storage of lead in bone. The work group thought that testing a child within one year of moving to Minnesota would be prudent.

The work group agreed that an encompassing statement for screening guidelines would be to test any child moving to Minnesota from a major metropolitan area or another county.

Parent Requests

There was some debate over testing children solely because a parent asks for the child to be tested. Discussion covered whether an age limit needed to be considered and whether parents might request a test at every visit. The BLSWG decided that because these are guidelines only, and the testing is done at the discretion of the physician, a strong statement supporting the parent's interest in testing was needed. Physician members of the BLSWG agreed that at the very least, a physician should find out why parents feel the test is needed.

The BLSWG agreed that, at any age, a physician should consider testing a child if the parent requests the test.

Targeted Screening

The BLSWG next considered the children who would not be tested under the conditions or criteria discussed above. Families that did not match the criteria for universal testing would be asked questions concerning the likelihood that a child had been exposed to lead. There was general discussion about whether questionnaires should be administered in written form or verbally, and who--the clinic staff or physician--should administer them or review the answers. In general, work group members felt that these decisions should be left up to the clinic and physician.

Risk Assessment Questionnaires

The BLSWG considered risk assessment questions that would help determine whether a child had exposure to lead and therefore should be tested for blood lead poisoning. The CDC recommended three questions, and risk assessment questionnaires were also available from other states. After reviewing these materials, it became apparent that each state had incorporated the CDC's three questions into their risk questionnaires in one form or another. After discussing unique scenarios of how children might have exposures resulting in elevated blood lead levels, and evaluating the effectiveness of the risk questions for each scenario, the BLSWG decided to use modified versions of the recommended CDC questions. The questions focused on three conditions:

- living in older housing likely to contain lead paint,
- living in substandard (deteriorating) housing likely to contain lead paint, and
- living in the same environment as other children diagnosed with lead poisoning.

The exact wording of each question was discussed in more than one work group meeting. Some questions were debated because the jargon used by health and housing professionals, or lead activists, have meaning that are not obvious to either the physician or the patient. At the same time, the MDH was holding focus group meetings with parents of young children. Parents were asked a variety of questions, including the readability of the guidelines. Agreement was reached within the BLSWG on wording that MDH staff believed would be understood by parents (for exact wording, see Appendix A-1).

One major concern was to define "living" in contrast to someone visiting a location that has older paint. Part of this discussion included concerns about how to describe children regularly visiting buildings used for child care.

Schedule for Testing

The work group discussed recommendations for the ages at which children should be tested. The BLSWG agreed that a routine screen should be administered for children at one and two years of age, and children up to six years of age who have not previously been screened. This routine screen means the health care provider determines whether the child meets the criteria for universal screening (testing) or administers the risk questionnaire. If the criteria for testing are met, the provider then follows up with a blood test for the child.

The work group also agreed that testing should be considered for a child of any age if the parent asks for it or if the child has recently moved to Minnesota from another country. Therefore, for these two criteria, testing might occur at any age.

Periodic Evaluation

As the work group began to discuss the ages at which children should be screened, a concern arose that the CDC guidance of routine screening only at ages one and two would miss an important group of children. The CDC recommendations imply that a child screened at two years of age who had a low blood lead level (less than 10 ug/dL) would no longer need to be screened for lead. Adherence to this guidance would not detect a child's exposure to a new source of lead after the age of two. This was a great concern to some members of the work group who had specific concerns about exposures from changes in the child's environment such as remodeling in an older home.

Another risk may involve a child moving into a new environment contaminated with lead (e.g., a new child care site or residence). Data from a lead study in Duluth supported the concern that frequent moves are associated with elevated blood lead levels. The federal guidelines focused on children two years of age or less because exposure is thought to decrease dramatically as children out-grow age-specific behaviors (e.g., hand-to-mouth, mouthing objects) and move from crawling to walking. Data from Minnesota's blood lead surveillance system support the fact that fewer cases of lead poisoning are detected in children older than two years of age. However, work group members were concerned that so little testing had been done in the three-year-old age group, the data were not helpful in determining whether testing in this age group should continue.

The BLSWG recommended a strategy that no other state had chosen. The BLSWG decided that periodic reevaluation of children using a risk questionnaire was needed when a child had a low lead level or low risk recorded at their previous lead screening. In other words, all children from three to six years of age whose last blood lead level was less than 10 $\mu\text{g}/\text{dL}$ should be reevaluated. To perform a periodic evaluation, a different set of questions was needed so that a blood lead test would only be given to those children who's environment has changed to a high risk situation (see Appendix A-1).

In order to monitor a change in the child's status, the BLSWG recommended the Periodic Evaluation be administered annually. Physicians may have difficulty administering this reevaluation because children from three to six years of age may not have annual examinations. The work group chose to use the phrase, "Since the child's last blood lead test:" to help the physician and family understand that the reevaluation is focused on new conditions in the child's environment. The child would only need to be tested if something new had happened that exposes the child to a lead source—for example, repair or remodeling in an older home. If nothing has changed then there is no reason to test for blood lead poisoning. Any child with a blood lead level of 10 $\mu\text{g}/\text{dL}$ or greater should already be receiving follow-up care.

Guidance

The resulting guidance from these discussions, as decided in September 1999, is described below. The work group agreed that the final wording of these ideas would likely be altered as the MDH staff prepare the screening guidelines for publication and distribution. In addition, the September 1999 version of the screening guidelines was used for a pilot study with approximately forty physicians in different parts of the state. The pilot study tested the clarity of the language used in the guidelines as well as how physicians comprehend them. Also tested were risk questionnaire forms (Appendix B-1) that were offered as a screening tool to assist physicians with the process of determining, and recording, if a child needs to have a blood lead test. Physicians critiqued these for understandability and usefulness. The most recent version of the screening guidelines which has been prepared for publication is attached (see Appendix A-1).

The screening guidelines recommend that children should be tested at any age, if they have moved from a major metropolitan area or another country within the last twelve months; or if a parent expresses concern about lead or asks for their child to be tested for blood lead poisoning.

Children should receive a blood lead test at one and two years of age, or up to six years of age when not previously tested, if they live within the city limits of Minneapolis or St. Paul, receive medical assistance for the poor such as MA, or live in an environment that has a high risk of lead exposure (as determined with the risk questionnaire).

In order to monitor a change in the child's environment, all children from three to six years of age whose last blood lead level was less than 10 $\mu\text{g}/\text{dL}$ should be reevaluated annually. This means administering the Periodic Evaluation risk assessment questions which target changes in the child's environment that places them at an increased risk for lead exposure.

Current Status of the Screening Guidelines

A final version of the Recommended Blood Lead Screening Guidelines was adopted by the BLSWG in September 1999. This version of the screening guidelines was tested with physicians during October and November 1999. The work group met in November to hear results of the testing. This testing resulted in minor changes in wording and major changes in layout and design of a one-page version to be distributed to physicians.

The screening guidelines were presented to the Environmental Subcommittee of the Public Health Committee of the Minnesota Medical Association in December 1999. In January 2000, the Environmental Health and Occupational Medicine Subcommittee of the Minnesota Medical Association informed the MDH that, "The MMA endorses and supports the Blood Lead Screening Guidelines developed by the Minnesota Department of Health."

The MDH is preparing a release of the screening guidelines, through press releases, publications and local public health agencies, in March 2000. Key local public health agencies have planned direct mailings to physicians in their service area. During the month of February, MDH staff will be working closely with local public health agencies to plan local promotion activities.

The MDH is also planning the evaluation phase of the screening plan. Evaluation will be based on screening activities within Minnesota that can be recorded through the blood lead surveillance system. The BLSWG will remain active throughout the implementation and evaluation phases of the screening plan. The BLSWG will provide feedback on implementation of the new screening guidelines and will advise the MDH on evaluation, and interpretation of results.

Appendix A-1

Recommended Blood Lead Screening Guidelines

Appendix B-1

Risk Assessment Questionnaires