Consumer Product Safety Commission

CPSC Staff Recommendations for Identifying and Controlling Lead Paint on Public Playground Equipment

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I. Introduction

The purpose of this document is to: 1) report U.S. Consumer Product Safety Commission (CPSC) staff findings that indicate a potential lead paint poisoning hazard for young children (6 years and younger)from some public playground equipment, and 2) provide recommendations to owners/managers of public playgrounds for identifying and controlling the hazard to reduce the risk of childhood lead poisoning from playground equipment.

II. Background

Ingestion of lead from deteriorating paint is a major source of lead poisoning for children 6 years old and under. The effects of lead ingestion are cumulative. In children, behavioral problems, learning disabilities, hearing problems, and growth retardation have been associated with sustained blood lead levels as low as 10 micrograms per deciliter (ug/dl).

In 1978, the CPSC banned the sale of paint containing in excess of 0.06% lead intended for consumer use. It also banned toys and other articles intended for use by children, such as playground equipment, that uses paint with a lead content in excess of 0.06% because they present a risk of lead poisoning in young children (16 CFR Part 1303).

Nationwide efforts to address lead paint hazards in homes and elsewhere have used 0.5% lead by weight as the level of lead in paint that should be targeted for lead hazard control measures. This level, cited in the 1992 Residential Lead-Based Paint Hazard Reduction Act (Pub.L. 102-550, Title X, October 28, 1992), has helped focus attention and resources on controlling the most significant lead paint hazards.

Testing by the CPSC staff and some state and local jurisdictions has shown that many school, park, and community playgrounds across the United States have painted metal or wood playground equipment that present an additional potential lead paint poisoning hazard for young children. The equipment was painted with lead paint, and over time, the paint has deteriorated into chips and dust containing lead, due to exposure to sunlight, heat, moisture, and normal wear and tear. The lead paint chips and lead dust can be ingested by young children who put their hands on the equipment while playing and then put their hands in their mouths.

The CPSC staff conducted an investigation of older equipment in 26 playgrounds in 13 cities in 11 states across the United States (Appendix 1). In the 5 cities where playground equipment age was reported, the equipment is 14 or more years old; 4 of the 5 cities reporting age had equipment that is 25-45 years old. CPSC found that 20 playgrounds in 11 of the cities investigated had equipment with lead levels over the CPSC 0.06% level. Sixteen of these playgrounds had equipment with lead levels in excess of 0.5%, the level that is identified in Title X as a priority for hazard reduction activities. The paint on the playground equipment that exceeded 0.5% lead ranged from 0.62% to 8.76% by weight, with a median lead level of 1.47%.

In addition to the 26 playgrounds inspected by CPSC staff, playground equipment with high lead levels have also been reported from several states and cities (Appendix 1). The CPSC staff received reports from the jurisdictions of testing in 223 playgrounds in 19 cities in 9 states and the District of Columbia. In 11 cities, 125 playgrounds had lead paint on their playground equipment that was over the CPSC 0.06% level. The content of the lead in the paint on the equipment reportedly ranged from 0.09% to 29%. These reports corroborate the CPSC findings. The information received from the cities by the staff did not identify the extent to which the paint exceeded the 0.5% level.

III. Health Risk Assessment

The CPSC, the Centers for Disease Control and Prevention (CDC), the Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and other Federal agencies, state that blood lead levels above 10 ug/dl are a health concern and recommend community-wide preventive measures (CDC, 1991 and CPSC, 1992a,b). Sustained blood lead levels of 10 ug/dl or greater have been associated with a variety of adverse health effects including deficits in neurobehavioral function and intellectual performance, developmental delays, decreased stature, and diminished hearing acuity. To prevent young children from exceeding the 10 ug/dl blood lead level of concern, CPSC staff suggests that chronic ingestion (about 15-30 days considered surrogate for chronic ingestion) of lead from paint and other consumer products not exceed 15 ug lead/day (CPSC, 1990). The limit of 15 ug lead/day is based on human chronic exposure models relating ingested lead to blood lead levels (CPSC, 1989, 1990, 1992a,b). Included in the 15 ug/day limit is consideration of several parameters such as amount of lead ingested, lead absorption, weight of lead paint, and other "background" sources of lead.

CPSC staff has determined that daily ingestion over about 15-30 days of as little as one-tenth of a square inch of paint (about the size of the head of a pencil eraser) could result in blood lead levels at or above the 10 ug/dl amount the Federal government considers a health concern, especially for young children (Appendix 2). This determination is based upon the median level of lead found on playground equipment that exceeds the 0.5% lead level (1.47%) and assumes an absorption of 30%.

IV. Recommendations

Deteriorating lead paint in homes poses the most significant lead poisoning health risk to young children and requires immediate attention. Playground equipment with deteriorating lead paint is an additional and avoidable source of lead to which children may be exposed. Since the health effects of lead are cumulative, exposure to lead from playground equipment can contribute to the overall risk to children.

The CPSC staff's investigation of older playground equipment reveals a wide range of lead levels and paint conditions. Just knowing that a playground has paint containing lead may not indicate if there is a hazard. The CPSC staff does not consider playground equipment with lead paint that is intact and in good condition to be a hazard. Over time, paint will deteriorate from exposure to sunlight, heat, moisture, and normal wear and tear. If that paint contains lead, it does present a hazard once it deteriorates, and requires attention.

To be consistent with the intent of Title X to focus attention and resources on areas with the highest levels of lead, responsible authorities should give priority attention to playground equipment with lead levels at 0.5% lead and above. CPSC staff believes that a reduced priority, but nevertheless important for authorities to consider, is the risk that exists to children from lead paint at levels between 0.06% and 0.5%.

To reduce the risk of childhood lead poisoning, the CPSC staff recommends the following strategy for identifying and controlling the lead paint hazard associated with older public playground equipment (also see Appendix 3). The strategy complements the framework described in the 1995 "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" that was developed by HUD and other Federal agencies to support the requirements of Title X. The Guidelines are available for a fee by calling HUD at 1-800-245-2691.

Local jurisdictions will have to decide how to respond to the potential hazard of lead paint on playground equipment. The appropriate control measures must be determined on a case-by-case basis, considering such factors as condition of the paint; percent of lead present; the playground equipment's age, location, use, and overall safety; the financial resources available to address this and other lead paint hazards; the relative costs of control measures; and the regulatory requirements of individual states, cities, and localities. Continued monitoring (visual inspection) may be an appropriate control measure for intact paint even if it contains lead.

Some states and localities require the services of licensed or certified professionals to identify and address lead paint hazards and correct lead problems. Individual state/local health departments, lead poison prevention programs, housing authorities, the EPA National Network of Lead Training Centers (413-545-5201), or the National Lead Information Center (1-800-424 LEAD) can provide help in locating qualified professionals in each area.

A. When and How to Check and Test Playground Equipment for Lead Hazards - Lead Hazard Assessment

A lead hazard assessment for playground equipment may include a visual inspection, examination of records, paint testing, characterization of the hazard, identification of potential control measures, and a plan for establishing the priority for the implementation of control measures.

1) Conduct a visual inspection of the playground and the equipment. The visual inspection should:

- Examine the condition of the entire painted surface. Any painted surface that has not been repainted after 1977 should be assumed to contain lead, since the ban on lead paint did not come into effect until 1978. Even if the surface has been repainted after 1977, the paint should be considered suspect unless records have been maintained showing that nonleaded paint was used. Also, the original paint may contain lead, and this paint may become available for ingestion when the repainted surface deteriorates.
- Identify areas of visible paint chips and dust accumulation. Lead chips and dust are generated as lead paint deteriorates over time due to weathering, aging, and moisture; or is disturbed in the course of renovation or repair. Check for the presence of paint chips underneath the playground equipment.
- Evaluate the need for significant structural repairs or changes to the equipment that are likely to affect the integrity and condition of the painted surface.

2) Evaluate the results of the visual inspection.

- If the paint is intact and in overall good condition, there is no visible paint dust or paint chips, and significant repairs or equipment changes are not needed, one of two alternatives can be taken: monitoring (periodic visual inspection) or laboratory testing to determine if the paint contains lead.

Lead paint is not considered to be a hazard until it deteriorates. Accordingly, CPSC staff recommends that such equipment be monitored (visually inspected) on a regular basis to ensure that the paint has not deteriorated. This inspection can be coordinated with regular safety inspections. For information on playground safety, consult the CPSC "Handbook for Public Playground Equipment Safety." The handbook is available from CPSC (1-800-638-2772 or info@cpsc.gov). If at any time, the painted surface begins to deteriorate, paint samples should be collected and analyzed for lead.

Instead of regular monitoring (visual inspection), owners/managers may wish to immediately collect and test paint samples for lead. However, as long as the paint is intact, the CPSC staff does not believe that testing is necessary.

If laboratory testing is conducted on intact paint and the presence of lead is confirmed, continued monitoring (visual inspection) can be implemented as a control measure to ensure that the paint does not deteriorate.

- If the paint is in a deteriorating condition (as noted by its peeling, cracking, chipping, or chalking), paint samples should be collected from several locations on the playground equipment (sampling each type and color of paint) for laboratory testing. Red, orange, yellow, green, and brown paint are the colors most likely to contain lead.

Priority should be given to collecting and analyzing deteriorating paint from playground equipment that you know has been painted or repainted before 1978. Check with the laboratory that will be analyzing the paint samples to determine whether trained professionals are needed to collect samples.

Paint samples should be analyzed by an accredited laboratory according to standard methods for total lead analysis (for example, ASTM, EPA, or Association of Official Analytical Chemists standards). The amount of lead in the paint is one important factor in deciding whether control measures are needed.

- If the visual inspection indicates the need for significant structural repairs or changes to the equipment that are likely to affect the integrity and condition of the painted surface (i.e., will result in peeling, cracking, chipping, chalking), the paint should be tested to determine if it contains lead - before any repair work begins.

Note: Laboratory analysis is the most accurate and reliable way to determine the presence and amount of lead in a paint sample. Studies conducted by the CPSC, EPA, and HUD indicate that lead test kits do not accurately and reliably discriminate between paint with lead and paint without lead. And, lead test kits are not designed to tell you the amount of lead present. If portable X-ray fluorescence (XRF) analyzers are used to screen for lead, follow-up analysis with a laboratory is also needed. XRF measurements have a large margin of error compared to laboratory analysis. They are not reliable when used to test curved surfaces, such as might be found on playground equipment.

3) Evaluate the results of the laboratory tests.

- If the laboratory analysis indicates that the paint contains lead levels that are equal to or exceed 0.5% by weight, and the paint is deteriorated, the extent of the hazard should be characterized and control measures undertaken. Owners/managers may consider control measures for lead paint between 0.06% and 0.5%. However, priority should be given to implementing control measures for deteriorating paint at, or above, 0.5%.
- EPA is currently developing an addendum to their July 14, 1994 (60 *Federal Register*: 47248) guidance on lead-based paint, lead-contaminated dust, and lead-contaminated soil. The addendum will address the issue of soil and playgrounds.
- Playground equipment should be inspected and regularly maintained to ensure that it meets safety guidelines and provides a safe environment for children, regardless of whether it contains lead paint.

4) Characterize the Hazard.

- Playground owners/managers may consider hiring trained professionals to conduct risk assessments to characterize the extent of the hazard, recommend control measures, and establish priority for the implementation of control measures. State/local health departments, lead poison prevention programs, housing authorities, the EPA National Network of Lead Training Center (413-545-5201), or the National Lead Information Center (1-800-424 LEAD) can provide help in locating qualified professionals in each area.

The surface area of paint containing 15 ug of lead that a child would need to ingest over about 15-30 days to exceed a blood lead level of 10 ug/dl was estimated by CPSC staff (Appendix 2). The surface area was estimated using a range of lead concentrations that have been found, or might be found in playground paint samples, and the easily extracted lead percentages (bioavailability surrogate representing the amount of lead absorbed by the body) found in samples tested by CPSC's Health Sciences Laboratory.

B. How to Control the Lead Hazard from Public Playground Equipment - Lead Hazard Controls

Just knowing that a playground has paint containing lead may not indicate if there is a hazard. The CPSC staff does not consider playground equipment with lead paint that is intact and in good condition to be a hazard. Therefore, continued monitoring (visual inspection) is essential, and may be an appropriate control measure for intact paint containing lead.

Over time, paint will deteriorate due to exposure to changing weather conditions and normal wear and tear. If that paint contains lead, it does present a hazard once it deteriorates, and requires attention.

Priority should be given to controlling deteriorating leaded paint on public playground equipment containing lead in amounts equal to or exceeding 0.5% by weight. Because playground equipment is intended for use by children, consideration of measures that permanently eliminate the potential hazard posed by lead paint are recommended. In general, interim control measures for playground equipment may be considered appropriate if the playground is slated for repair or the equipment is expected to be replaced within a few years.

While interim control measures often have a lower initial cost than permanent control measures, they require regular monitoring and re-evaluation to ensure that the lead paint is still intact. In some cases, permanent control measures may be more cost-effective over the long-term than interim control measures when the cost of monitoring is considered.

The CPSC staff contacted city officials in a few cities that have already implemented control measures for playgrounds with leaded paint. (Appendix 4) provides information on the activities and expenditures to date by four cities as an illustration of the range of strategies being used to reduce the lead hazard.

Interim Control Measures

1. Stabilize and cover the lead paint surface with nonleaded paint or an encapsulant. Because outdoor metal and wood playground equipment is continually subject to deterioration due to exposure to sunlight, heat, moisture, and wear and tear through normal play activities, covering the lead paint surface with nonleaded paint or encapsulants will only temporarily reduce human exposure to lead. Covering the lead paint surface requires ongoing and regular monitoring because lead paint is still present and may become hazardous in the future. Sanding, scraping, and using power tools to prepare the surface to be repainted or encapsulated can increase the hazard by spreading lead paint chips and dust. Precautionary measures outlined in the 1995 HUD Guidelines and the 1996 EPA Section 402 Rule, "Lead Requirements for Lead-Based Paint Activities," should be followed to ensure that lead control measures are conducted safely.

   Encapsulants are coatings that provide a barrier between the lead paint and the environment. They vary in their effectiveness and how long they are expected to last. The degree of adherence depends on the encapsulant used and the substrate to which it will be applied. While some encapsulants may

last for many years, they were developed for use in interior spaces. Their effectiveness and longevity in outdoor environments where they are subject to deterioration from changing weathering conditions is uncertain. Therefore, encapsulants for playground equipment should be considered only as an interim measure.

In addition, according to the 1995 HUD Guidelines, encapsulants are generally not effective on metal surfaces that are prone to rust or corrosion unless a proper corrosion-control primer is used before the application of the encapsulant.

Playground equipment that has been covered with an encapsulant or nonleaded paint requires regular monitoring (visual inspection) throughout the life of the equipment. Such monitoring would allow detection if the surface does not remain in good condition throughout changing weather conditions and wear due to normal play activities.

Permanent Control Measures

1. Replace the playground equipment. Replacing playground equipment or component parts that contain lead paint is the most definitive way to eliminate the risk of lead poisoning from exposure to lead paint on playground equipment. Contracting with a professional will reduce the likelihood of environmental contamination during replacement, especially if the paint is in poor condition and likely to be disturbed. Because of varying regulations regarding hazardous waste storage, transport, and disposal, state/local health departments or environmental agencies should be contacted to find out what laws are applicable.
2. Remove lead paint. To remove lead paint permanently, a lead paint removal professional who is trained, certified, or licensed to remove lead hazards should be used. Removing lead paint improperly can increase the hazard by spreading lead chips and dust around the play area. Individual state/local health departments or environmental agencies can help you locate qualified contractors. Surfaces should be repainted with paint containing no more than 0.06% lead, according to CPSC regulations.

References

CDC, 1991. Preventing Lead Poisoning in Young Children. A Statement by the Centers for Disease Control - October 1991.
CPSC, 1989. Review of Low Level Lead Toxicology. Memo from BC Lee to SC Eberle.
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CPSC, 1992a. Notice of Regulatory Investigation Requesting Information Concerning Limits for Lead in Paint. Briefing Package OS # 4367.
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EPA, 1996. 61 *Federal Register*: 45778. Lead, Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities, Final Rule.
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