

American Academy of Orthopaedic Surgeons Public Information

A Guide to Playground Safety

Playgrounds

Orthopaedic surgeons treat a variety of injuries of adults and children, but they also are interested in prevention of injuries. Each year, almost a quarter of a million children under age 15 are treated at hospital emergency rooms for injuries related to playground equipment, according to a study by the National Electronic Injury Surveillance System (NEISS) of the U.S. Consumer Product Safety Commission. Many of these injuries could have been prevented by greater attention to playground design and maintenance and closer adult supervision.

Prevention of Injury

There are many ways to prevent playground injuries, and to lessen the severity of injuries that do occur. Children are marvelously inventive, and use playground equipment in many different ways not intended by the manufacturers. However, these patterns of use are predictable.

1994 Playground Injuries treated in Hospital Emergency Rooms

Injuries related to:	0-4 years	5-14 years
Swings	28,001	28,001
Climbing Equipment	13,565	64,921
Slides	22,337	27,018
Other	7,526	17,913
Teeter-totters/Seesaws	3,517	5,892
Total Injuries	74,946	173,341

Estimated cost of playground equipment-related injuries for children under age 15 is \$1 Billion in 1994.

Source: U.S. Consumer Product Safety Commission

Percentages of All Public Playground Equipment Injuries, by Manner of Injury

Falls to surface	58%
Falls-struck same equipment	14%
Falls-struck other equipment	2%
Impact with moving equipment	13.1%
Impact with stationary equipment	5.4%
Contact with protrusions, pinch points, sharp edges, sharp points	6.9%
Total	100%*

*Some numbers are rounded

Source: NEISS special study, April-December 1988. U.S. Consumer Product Safety Commission, Directorate Epidemiology, Division of Hazard Analysis, Washington, D.C.

Because falls are the most common type of playground accident, there should be special attention to preventing falls and lessening their severity. Children fall because they slip, lose their grip, or lose their balance while playing on monkey bars, swings, slides, merry-go-rounds, and seesaws. Often they are hurt not only by the fall, but by being struck by the equipment as they fall.

Whether playground injuries are caused by falls or other types of contact, attention to three major factors can help to reduce the incidence of injury: playground surface, playground design, and equipment installation and maintenance.

Playground Surface

The type of surface on the playground is the most important factor in the number and severity of injuries due to falls. Obviously, hard surfaces such as asphalt and concrete would result in the most severe injuries, and are unsuitable under any playground equipment. The number and severity of injuries can be reduced by using softer surfaces such as wood mulch or chips, shredded tires, or sand. Soil, packed dirt, grass and turf are not recommended for surfacing, as their shock-absorbing ability can be affected greatly by weather conditions and wear.

Playground Design

A well-planned playground should offer activities to encourage the development of perception and physical skills, including running, walking, climbing, dodging, swinging, sliding, throwing, catching, pulling, and pushing. There should be separate areas for active play, such as swinging, and quiet play, such as digging in sandboxes. Spaces for preschoolers should be located away from areas where older, more active children play.

A "use zone" should be established around equipment, with adequate space for entering and exiting. Open fields should be located so that children can run freely without the

colliding with other children or equipment. Zones for popular activities should be separate to avoid overcrowding. Pathways that link activity areas should provide for easy travel between areas, and unobstructed vision for a child's height. Sight lines in all playground areas should be clear to allow proper adult supervision.

Equipment Installation and Maintenance

Playground equipment should be well-designed and made of materials proven durable when exposed to the weather. Manufacturers' instructions for proper installation and spacing should be followed carefully, including recommendations for maintenance. Equipment should be inspected regularly to identify any loosening, rust or corrosion, or deterioration from use, rot, insects, or weathering.

Playground Safety Guidelines

The following guidelines for playground design and playground maintenance of the U.S. Consumer Product Safety Commission are presented for quick reference. Detailed technical information about playground equipment and design is available in a government publication, 1994 Handbook for Public Playground Safety. To obtain a copy, write: 1994 Playground Equipment Handbook, U.S. Consumer Product Safety Commission, Washington, D.C. 20207.

Guidelines for Playground Design

Playground safety can be improved by careful planning of activity location, playground surface, and equipment design. The following guidelines are recommended:

- Avoid installing equipment over hard surfaces such as concrete or asphalt
- Separate play areas by age group, type of equipment, and active or passive play
- Link activity areas with paths that allow easy travel between areas, with unobstructed vision from a child's height and clear sight lines for adult supervision
- Allow adequate space for children to exit equipment such as slides or merry-go-rounds
- Separate the playground from adjacent streets with fences, shrubs, or other barriers
- Avoid any equipment or other installation (e.g., benches) made with angles or openings that could trap a child's head or any part of a child's body
- Install guardrails on elevated platforms more than 20 inches and less than or equal to 30 inches high for preschoolers. For school-age children, install guardrails on elevated platforms more than 30 inches and less than or equal to 48 inches high
- Choose hand grips sized and shaped so that children can grasp them easily

Guidelines for Playground Maintenance

Thorough inspections of the playground area and equipment should be performed frequently and regularly. If repairs cannot be made immediately, equipment should be removed from service until repaired. Any of the following could result in injury:

- Loose, damaged, or missing supports, anchors, or footings
- Loose or missing nuts, bolts, or other connectors
- Broken or missing rails, steps, rungs, or seats
- Bending, warping, rusting, or breakage of any component
- Protective end caps missing from bolts or tubes
- Sharp edges or points due to wear or breakage
- Deformed hooks, shackles, rings, links, etc.
- Worn swing hangers and chains
- Worn bearings
- Lack of lubrication on moving parts
- Exposed mechanisms such as joints or springs that could result in pinch or crush injury
- Splintered and deteriorated wood
- Cracks or holes in surfacing materials
- Trash in area (particularly glass or cans)
- Environmental hazards such as roots, rocks, or poor drainage areas

Your orthopaedist is a medical doctor with extensive training in the diagnosis and nonsurgical and surgical treatment of the musculoskeletal system, including bones, joints, ligaments, tendons, muscles, and nerves.

This brochure has been prepared by the American Academy of Orthopaedic Surgeons and is intended to contain current information on the subject from recognized authorities. However, it does not represent official policy of the Academy and its text should not be construed as excluding other acceptable viewpoints.

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