Preventing playground injuries

P Fuselli; NL Yanchar; Canadian Paediatric Society
Injury Prevention Committee
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Abstract
With concerns increasing around childhood obesity and inactivity, playgrounds offer a chance for children to be active. But playgrounds also have risks, with injuries from falls being the most common. Research has shown that playground injuries can be reduced by lowering the heights of play equipment and using soft, deep surfaces to cushion falls. The Canadian Standards Association (CSA) has published voluntary standards for playgrounds to address these risks for several years. Parents can further reduce injury risks by following simple playground strategies. This statement outlines the burden of playground injuries. It also provides parents and health care providers with opportunities to reduce injury incidence and severity through education and advocacy, and to implement evidence-informed safety standards and safer play strategies in local playgrounds. This document replaces a previous Canadian Paediatric Society position statement published in 2002.

Key Words: Equipment; Falls; Injury; Playground; Play space; Standards; Surfacing

Active outdoor play contributes immeasurably to children’s health, well-being and overall development. Local playgrounds offer opportunities to climb, slide, jump, run and socialize with other children, and to play creatively. Playgrounds are also places where injuries can happen, but risks to children can be minimized by improving equipment design, safer placement and better surfacing and still provide ample scope for physical activity. Preventive measures that minimize risk include ensuring that equipment heights are age-appropriate, upgrading impact-absorbing surfaces around and beneath play structures, inspecting/maintaining equipment and play areas regularly, and providing adequate and active supervision.

Playground data
At least 29,000 children younger than 15 years of age receive treatment for playground injuries in hospital emergency departments each year in Canada [1]. Children five to nine years of age have the highest risk of injury, with males injured slightly more often than females (53% versus 47%). Playground injuries occur most often in summer (43%), followed by fall (27%), spring (24%), and winter (6%).

Mechanisms and types of injury
Up to 75% of injuries seen in emergency departments are incurred by falling [2][4]. Most other injuries are the result of impact with an obstacle (11%), a body part being cut, pinched or crushed (8%), or entrapment (1%) [8]. Fractures, usually of an upper limb, are the most common form of injury [2][5][6], with falls from a climbing structure – compared with from a swing or slide – being the most common cause [7].

Head injuries account for about 15% of the playground injuries seen in emergency rooms [5], with falls from a swing – compared with from a slide or climbing structure – being the most common cause [7].

Hospitalizations
From 1994 to 2003, an estimated 2500 children ≤14 of age were hospitalized every year in Canada for serious injuries from playground falls. Approximately 81% of these children had a fracture, while 14% were hospitalized for a head injury; the remaining 5% had injuries such as joint dislocations and open wounds. Over the period studied, hospitalization rates declined by 27%, likely in response to improvements to playground equipment and compliance with playground safety standards [8].
Home playground injuries
Backyard play equipment accounts for about 20% of all play area injuries. Children aged one to four years are more likely to get hurt at home than older children. Climbing structures, swings and slides are involved in most home playground injuries [8].

Deaths
Playground deaths are rare and almost always caused by strangulation. Strangulation can happen when clothing drawstrings, a scarf or a skipping rope get caught on play equipment, usually at the top of a slide. A child’s head can also be entrapped in an opening in playground equipment (eg, in the space between ladder rungs); this has happened when children were wearing a bicycle helmet [8].

Strategies to reduce playground injuries
Improvements to playground design, especially to equipment height and surfacing, would further reduce playground injuries [4][12].

Research shows that fall height and impact (ie, the surface a child falls on) influence the nature and extent of injuries [4][9][11]. One study found that falling from higher than 1.5 metres (4 ft 11 in) quadrupled the risk of injury [9]. Falls from higher heights cause even more serious injuries [10]. Impact-absorbing materials, such as sand or pea gravel, provide better protection [4] than a grassy surface, with one study finding that risk of injury is reduced by 1.7 times when playgrounds are surfaced with sand rather than grass [11].

The Canadian Standards Association (CSA, www.csa.ca) developed the only nationally recognized standard for playground safety. Their guide, entitled Children’s Playspaces and Equipment, was first published in 1990. It was revised and accepted as a voluntary national standard by the Standards Council of Canada in 1998, with updated editions published in 2003 and 2007. The CSA standard provides detailed specifications for playground layout, access (ie, for getting on and off equipment), and surfacing materials, equipment strength, performance requirements and installation, inspection and maintenance, and design specifications for each piece of play equipment. The standard recommends:

• **Reducing the maximum fall height of equipment.** Strategies include:
  – innovative designs for new equipment at lower heights
  – using age-appropriate equipment.

• **Reducing the risk of falling from equipment.** Examples include:
  – protective barriers and guardrails
  – using vertical rather than horizontal bars (to discourage climbing)
  – using peaked or curved surfaces for guardrails (to discourage their use as play surfaces).

• **Improving protective surfacing under and around play equipment.** Appropriate surfaces include:
  – loose fill, such as coarse sand or pea gravel (smooth, round, pea-sized stones), wood chips and synthetic surfaces, to depths of at least 15 cm (6 in) for preschool equipment and 30 cm (12 in) for full-sized equipment.

Changes and enhancements to the current standard included a lower optimum fall height measurement, a surfacing materials comparison chart and additional guidelines for making play spaces more accessible to children with special needs [18]. One study has shown that playgrounds modified to meet the current CSA standard can reduce associated injuries by as much as 49% [13].

**Active supervision** is important. Research has shown that children younger than five years of age were much less likely to take harmful risks when a parent was near by [14][15]. One program has been successful at increasing teacher supervision of young children in play-
grounds, with an associated outcome of fewer risk-taking behaviours by the children [16][17].

In addition to structured playgrounds, communities may consider more nontraditional outdoor play environments. These areas can be less expensive to develop and are designed to challenge children’s natural faculties and their urge to play without the risk of falling from equipment. Examples ‘alternative’ playgrounds can be found at www.evergreen.ca.

**Recommendations**

To protect children from the most common playground injuries, the Canadian Paediatric Society recommends that:

**Health care providers:**

- Offer anticipatory guidance about playground injuries and what parents can do to reduce children’s risk. SafeKids Canada <www.safekidscanada.ca> and the Canadian Paediatric Society <www.caringforkids.cps.ca> have evidence-based information and resources on making playgrounds safer, for families, child care providers and communities.

- Report playground injuries to local playground operators and authorities.

- Educate playground operators about injury prevention by being involved with municipal planning and public health initiatives. A participating physician or health care professional can bring credibility to safety issues and provide specific details about the nature and risk of playground injuries.

- Advocate that new and existing playgrounds in the community be designed or upgraded to meet current CSA guidelines. To obtain a copy of Children’s Playspaces and Equipment, visit www.csa.ca.

**Policy makers:**

- Ensure that municipal policies on playground development and maintenance focus on compliance with CSA standards and reflect evidence-informed strategies to reduce playground-related injuries in children. To obtain a copy of Children’s Playspaces and Equipment, visit www.csa.ca.

**Parents and caregivers:**

- Provide active supervision.

- Teach and model playground safety rules, and remind children how to use equipment safely.

- Check local playground equipment and surfacing regularly, reporting problems to operators.
  - Dress children in a neck warmer instead of a scarf in cold weather, and avoid clothing with drawstrings or cords. These items can catch on playground equipment and cause strangulation.
  - Remove a child’s helmet before permitting access to play equipment.
  - Build home playgrounds to meet the CSA standards. To obtain a copy of Children’s Playspaces and Equipment, visit www.csa.ca.

**Note:** For parent information, visit www.caringforkids.cps.ca

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Principal authors: Pamela Fuselli; Natalie L Yanchar MD