

# Outdoor Playspaces for Children: An Evidence Review

August 2017



## Acknowledgements

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## Author

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This report was written by Monique Beneteau, Health Promoter.

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## For more information please contact:

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Peterborough Public Health  
Jackson Square, 185 King Street  
Peterborough, ON K9J 2R8  
Phone: 705-743-1000  
Fax: 705-743-2897  
[peterboroughpublichealth.ca](http://peterboroughpublichealth.ca)

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## Executive Summary

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In response to questions about falls prevention in children, Peterborough Public Health undertook an extensive review of evidence related to outdoor playspaces for children. Interpretation of the research evidence on issues such as outdoor play, safety and risk, injury prevention, physical activity and physical and mental health are summarized in six sections as listed below.

### SECTION 1: Children's Play

- Play is a human right and fundamental to well-being.
- Outdoor play provides unique opportunities (or affordances) essential to healthy child development.
- Any playspace design must incorporate a variety of features to ensure that many types of play (e.g., active, creative, quiet) are available.
- Outdoor playspace designs must be barrier-free to be available and accessible (physically and financially) to all children, promoting equity.

### SECTION 2: Outdoor Playspaces

- Composite playstructures have a role in playspaces, however, this equipment provides limited opportunities for a diversity of play and can be inaccessible to some children.
- The play equipment only has value if children actually use it.
- Natural playspaces are more inclusive, gender-neutral and accessible to a broader range of ages and abilities.
- Natural playspaces may encourage more active and creative play.
- Adapting the CSA Standard to natural playspaces is possible but adopting a risk-benefit assessment will provide a more complete picture.
- Simple adaptations to existing playspaces will enhance the play experience (e.g., introducing loose parts, making use of green space).

### SECTION 3: Risk and Play

- Risky play is an essential component of healthy child development. Risk is relative and in relation to play, it is based on each child's perception of risk rather than objective risk.
- Outdoor playspaces, under the proper conditions, should include as many elements of risky play as possible. For instance, in unsupervised environments, playing at heights, testing balance and co-ordination, rough and tumble play, and disappearing or getting lost is appropriate. On the other hand, being around dangerous elements (e.g., fire) and tools should happen only under supervision.
- Natural environments and materials are more affordance-rich and provide other benefits to health.

## **SECTION 4: Injuries and Playground Safety**

- Injuries due to playground equipment are inevitable and the majority of those injuries will be minor.
- Minor injuries are a natural part of growing and learning.
- Proper installation and on-going maintenance of the equipment will mitigate the risk of injury but not eliminate it.
- Better safety practices in backyard play areas will reduce the most serious injuries.
- Preventing children from playing in outdoor playspaces because of potential harm may replace one risk (i.e., physical injury) with other risks such as poorer physical and mental health in both the short- and long-term.

## **SECTION 5: Risk-Benefit Analysis**

- Play providers need support in developing comprehensive play policies that recognize the importance of reasonable risk.
- Risk-benefit assessments must be built into planning and design of playspaces.
- Advocacy for more reasonable liability guidelines for play providers is needed.
- Benefits of risky play need to be promoted.

## **SECTION 6: Built Environment and Playspaces**

- To have the best outcomes in child development, the design of a play environment should be a collaborative effort among key stakeholders including, most importantly, children of all abilities.
- Playspaces need to provide adequate space for multiple play zones.
- Ensure a diversity of play elements that allow children to choose their own play experience.
- The space should conform to universal design principles as often as possible.
- The space should meet the safety requirements in the CSA Standard.



## About This Report

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### Introduction

The Ontario Public Health Standards (OPHS) (MOHLTC, 2015) covers a range of health issues that public health is mandated to address. Among the health issues is the prevention of injury and substance misuse with a goal “to reduce the frequency, severity, and impact of preventable injury and of substance misuse” (Ontario Ministry of Health and Long-Term Care, revised 2016, p. 29). Falls prevention across the lifespan is one of four components specifically targeted in the OPHS.

Provincial data released in 2012 showed that playground injury rates per 100,000 children were higher in Peterborough than Ontario (Parachute, 2012). For example, “...children aged 0-4 landed in emergency departments after a fall from playground equipment at a rate of 152 (per 100,000) in Toronto, compared with 424 (per 100,000) in Peterborough and 251 in Ontario as a whole...” (Parachute, 2012). To address these high rates of injuries, Peterborough Public Health (PPH) focused specifically on strategies to enhance playground safety thereby reducing injury rates. Part of the strategy included supporting training that resulted in every municipality having certified playground inspectors. In addition, some municipalities and other community partners received additional training on accessible playgrounds. This work spanned May 2014 to November 2015. Discussions with municipal and school partners during this time led public health staff to a broader question that moved beyond injury prevention to general child health. The question was: Are existing playgrounds the best outdoor play environments for children? PPH staff embarked on an evidence review to answer this question.

Please note that unless otherwise specified, the term ‘Peterborough’ will be taken to mean the geographical area of Peterborough County, including the City of Peterborough, Curve Lake First Nation and Hiawatha First Nation.

### Purpose

This report provides a review of the evidence around healthy playspaces which will be used to:

- assist the Board of Health of Peterborough Public Health (PPH) to meet OPHS requirements;
- describe healthy playspaces;
- inform priority setting and planning within PPH;
- provide information and perspective for providers of healthy playspaces (e.g., municipalities, school boards, schools, parent councils and early childhood care providers) and community planners; and
- influence the development of healthy public policy.

## Framework

This report is presented in six sections:

1. Children's Play
2. Outdoor Playspaces
3. Risk and Play
4. Injuries and Playground Safety
5. Risk Benefit Analysis
6. Built Environment and Playspaces

## Rationale

According to the Report on Child Health, "healthy child development lays the foundation for adult health and sketches the blueprint for the next generation. Examining the status of child health and development is an important part of public health work, since the health and well-being of children impacts the overall functioning and well-being of society, both in the short-term and in the future" (Peterborough Public Health, 2015, p. xvi). Children's outdoor play experiences address several health issues of interest to public health including physical activity, injury prevention, environmental health (e.g., air quality), nutrition (e.g., hydration), tobacco prevention (e.g., second hand exposure), sun safety, school health and health equity. Having a broader understanding of what make a healthy outdoor playspace will provide a comprehensive perspective that will inform public health education and advocacy strategies resulting in the best play experiences for children.

## Methods/Data Sources

A literature review was completed in the fall of 2014 that focused specifically on playground injuries and playground equipment. Subsequently, a request was made of the librarian through the Public Health Shared Library Services Partnership to conduct an expanded literature search using the following key words: natural play spaces; play spaces; healthy parks; injury rates and natural play spaces; green spaces; greening play spaces; and risk management/injury prevention in natural play spaces.

A total of 266 articles in both peer-reviewed journals and grey literature were identified. The abstracts were reviewed and those that most closely aligned to our research question were flagged for reading. Over 80 articles and reports were read and summarized into an annotated bibliography. Initially, each item was categorized into one of the following 14 categories: social determinants of health; nature-outdoor time; play spaces; natural play spaces; schools; safety; healthy parks; risky play; traditional play; community development; municipal considerations; key documents; benefits of play; and, physical activity.

Articles reporting on meta-analyses were given more weight. The review was deemed exhaustive when 1) future reading in a certain topic area did not provide any new insights and 2) articles within a certain topic area referenced the same authors and their studies which had already been reviewed.

## Limitations

This report is focused on the unstructured, free play of children which captures one of many ways that children play. The report does not address family play or organized activities including sports. Playspaces refer to traditional play environments that may include play equipment. The report does not include an analysis of the benefits and costs of other play environments such as splash pads and skateboard parks. In addition, the report addresses children between two and 12 years of age since most play equipment is designed for this age group.

## SECTION 1: Children's Play

### Play

**Play**<sup>1</sup> is a natural vehicle for learning. Some may consider play as frivolous but, according to the United Nations, it is a serious issue. The Convention on the Rights of the Child states in Article 31 that:

1. States Parties recognize the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.
2. States Parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity (United Nations).



Depending on the researcher, play is defined in different ways. The two key features of play focus on the idea that it is **Child-directed play** and that it is process-focused rather than goal-oriented. According to the All-Party Parliamentary Group in the UK, play "...is what children freely choose to do when their time and ability to act are entirely their own. It may be what a child chooses to do when they are not under the control, overt or implied, of an adult. Many people regard play as a 'process' rather than an outcome" (Working Group, 2015, p. 5). Put plainly, "Play is 'what we do when no adult is telling us what to do'" (Staempfli, 2009, p. 272).

Play is a foundational element of a child's development. One author described how, "[r]esearch on the brain demonstrates that play is a scaffold for development, a vehicle for increasing neural structures, and a means by which all children practice skills they will need in later life" (Sherer, 2006, p. 21). Supporting this notion of development, play is a key contributor to physical literacy in children. Physical literacy is defined as, "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life" (IPLA, 2016). Providing an environment that motivates children to move, gain confidence in their skills, and develop a habit of **Active Play** will benefit them in their immediate and long-term lives (Canada's Physical Literacy Consensus Statement, 2016).

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<sup>1</sup> There are key words used throughout the report that may not be common to some readers. The first time the word appears, it is hyperlinked to Appendix A: Glossary.

Play is also an opportunity for children with different abilities to learn about one another. According to the *Let's Play Toolkit* from the Rick Hansen Foundation, risk aver

- “Children with disabilities enjoy the benefits of active play, including social skills and overall health.
- Children without disabilities learn valuable lessons about the world, including that everyone has similarities and differences.
- All children develop concepts related to tolerance, diversity, and acceptance” (Standfield, nd, p. 5).

In addition, parenting expert Alyson Schafer said, “Children who have direct and personal experiences of interacting of playing [sic] with children that are different from themselves (in age, sex, ability, language, social economic status, etc.) benefit because they learn about diversity and it shatters stereotypes and creates better mindsets and attitudes for all” (Martz, 2015, p. 39).

A distinction should be made between free or **Unstructured Play** as described above, and **Structured Play** which better describes organized activities including sport. Without its rules, structure and requirement for a specific skill set and level, **Free Play** welcomes all ages and abilities. In this way, it is **Inclusive** and accessible which means play opportunities are available to everyone. The term ‘free’ has two meanings in this case. First, children are free to engage in any activity they choose. Second, the activity is usually cost-free (Vogel, 2015). Therefore, free play poses no economic barrier to children.



Unstructured, free play allows children greater control over the type of play they want to experience which contributes to positive **Child Development** (Brussoni, Olsen, Pike, & Sleet, 2012). As Dr. Walsh put it, “we don’t need to choose between unfettered freedom and stifling structure. We need to ensure that amidst the intense drive to prepare children for life, we don’t crowd out opportunities for them to create their own playgrounds” (Walsh, 2014). Additionally, psychologist Peter Gray wrote in an essay that,

In play, children make their own decisions and solve their own problems. In adult-directed settings, children are weak and vulnerable. In play, they are strong and powerful. The play world is the child’s practice world for being an adult. We think of play as childish, but to the child, play is the experience of being like an adult: being self-controlled and responsible. To the degree that we take away play, we deprive children of the ability to practise adulthood, and we create people who will go through life with a sense of dependence and victimisation, a sense that there is some authority out there who is supposed to tell them what to do and solve their problems. That is not a healthy way to live (Gray P. ).

## Outdoor and Nature Play

There is strong evidence that time spent outside in nature is very good for human health. One of the foremost researchers in this area, Ming Kuo wrote in 2015 that:

Time spent in and around tree-lined streets, gardens, parks, and forested and agricultural lands is consistently linked to objective, long-term health outcomes. The less green a person's surroundings, the higher their risk of morbidity and mortality – even when controlling for socioeconomic status and other possible confounding variables. The range of specific health outcomes tied to nature is startling, including depression and anxiety disorder, diabetes mellitus, attention deficit/hyperactivity disorder (ADHD), various infectious diseases, cancer, healing from surgery, obesity, birth outcomes, cardiovascular disease, musculoskeletal complaints, migraines, respiratory disease, and others,... (p. 1).

A systematic review (Gascon, et al., 2015) and a report from the National Collaborating Centre for Environmental Health (Rugel, 2015) showed that general mental health (e.g., mood) is positively influenced by exposure to green space. Other researchers found that even short episodes outdoors in green spaces can have “micro restorative” opportunities (Dustin, Bricker, & Schwab, 2010).

Toronto Public Health in a literature review conducted in 2015 concluded that:

- Green space improves physical health, mental health and wellbeing of urban residents.
- Frequent access to nearby green space is important, especially for children.
- Nearby green space may provide added benefit in low-income neighbourhoods.
- Green space that is perceived as unsafe and poorly maintained does not provide health benefits (p. 6).

The 2016 ParticipACTION Report Card graded children's participation in active play at D+ which measures the number of hours that children and youth play actively and spend time outdoors (ParticipACTION, 2016). According to the report, only “37% of 11- to 15-year-olds play outdoors for more than 2 hours each day...[and] according to parents, 75% of 5- to 19-year-olds participate in unorganized physical activities or sports after school” (ParticipACTION, 2016, p. 6). Clearly, there is a need to create opportunities for children to spend more time outdoors in active play. The Ontario Children's Outdoor Charter describes a myriad of ways that children can engage in nature throughout the seasons including following a trail, harvesting something to eat, playing in the snow, and building an outdoor fort (Ontario Children's Outdoor Charter).



## Types of Outdoor Play

Being outdoors provides different play opportunities than play indoors; **Outdoor Play** allows for “...louder and bigger actions, greater sensory stimulation, **Risk** taking, testing of physical limits, and exploration in a more meaningful way than a controlled indoor setting” (Warr, 2013, p. 6). It also encourages different kinds of play that range from what typically comes to mind (i.e., physical or functional play such as running, climbing, and riding a bike) to imaginative and creative play such as:

- **Constructive** (building play activities – e.g., building sand castles, creating huts and shelters, playing with **Loose parts** like sticks, cones, pebbles);
- **Symbolic** (creative/imaginative play – e.g., role play, dramatic play, social play like house and pirates);
- **Self-focused/looking on** (no interaction with others, not engaged in play – e.g., day dreaming, empty staring, watching activities); and
- **Talking** (not engaged in active play but talking with another child) [emphasis mine] (Dyment & O’Connell, 2013, p. 266).

The uniqueness of outdoor play in nature (i.e., **Nature Play**) is that the environment itself can be a plaything. From trees, rocks and streams to sticks for digging up bugs and bushes doubling as a hideaway, the environment provides what researchers refer to as **Affordances**. One researcher defined it as “...the range of functions provided by environmental objects...” (Anggard, 2011, p. 8). Another researcher described an affordance as “...an ‘action possibility’ for an individual in relation to the environment, depending on that individual’s capabilities” (Stanley, 2011, p. 189); for example, building something out of twigs and branches.

Weighing the evidence, it appears that time spent outdoors is good for overall health. Given the diversity of play experiences in child-led, unstructured outdoor play, children reap the benefits—physically, mentally, cognitively, socially and emotionally (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007; Sullivan, 2014; Stanley, 2011; NCCEH, 2015). Table 1 provides a sampling of the health benefits.

**Table 1. Health Benefits of Unstructured, Outdoor Play**

Health Benefit	Source
Cognitive functioning	(Sullivan, 2014; Campbell, 2013)
Improved mood and reduced stress and anxiety	(NCCEH, 2015)
Elevated motor skills	(ParticipACTION, 2015)
Improved social behaviour	(ParticipACTION, 2015; Brockman, Jago, & Fox, 2011)
Greater independence	(ParticipACTION, 2015)
Improved negotiation, conflict resolution and self-advocacy skills	(ParticipACTION, 2015; Campbell, 2013; Brockman, Jago, & Fox, 2011)
Greater creativity and imagination	(Campbell, 2013; Brockman, Jago, & Fox, 2011; Warr, 2013; Gray P. )

Health Benefit	Source
Greater emotional resilience	(Campbell, 2013)
Development of decision-making and leadership skills	(Campbell, 2013)
Greater physical activity	(Campbell, 2013; Dustin, Bricker, & Schwab, 2010; Warr, 2013)
Enhanced learning skills	(Warr, 2013)
Development of problem solving, reasoning skills	(Townsend, Henderson-Wilson, Warner, & Weiss, 2015)
Way finding and spacio-temporal relation	(Townsend, Henderson-Wilson, Warner, & Weiss, 2015)
Empathy, compassion and sense of wonder	(Townsend, Henderson-Wilson, Warner, & Weiss, 2015)

### Benefits of Outdoor Play

Play benefits children in two timeframes - what they are learning in the moment but also the lessons that they will carry with them throughout their lives. As one group put it, “children learn and develop both while playing and through play - they are both learning how to cope with the immediate world around them, and at the same time, acquiring skills that will serve them well in the future” (Working Group, 2015, p. 7). Some of the skills developed through outdoor play benefit health but also general development, for instance, “...it is well established that opportunities to play in parks allow children to explore the diversity of protective factors offered by experiencing nature: capitalizing on the chance to practise reasoning, reaction, observation, logic, attentiveness, responding to the environment and people, way finding, spacio-temporal relation and task accomplishment” (Townsend, Henderson-Wilson, Warner, & Weiss, 2015, p. 27). According to Peterborough-based environmentalist and nature advocate, Cathy Dueck, having plenty of time to play in diverse **Natural Environment** is one of the key childhood factors that leads to environmental interest and stewardship in later life (Dueck, 2017).



From the child’s perspective, children aged 10 and 11 years said they sought out active play to socialize, prevent boredom, and acquire health benefits and experience freedom (Brockman, Jago, & Fox, 2011).

In addition, the concept of self-regulation is being discussed in the school system. Schools are dealing with children who are struggling to handle emotional and mental issues that manifest themselves through unhealthy behaviour. According to a document produced by the



Peterborough Victoria Northumberland Clarington Catholic District School Board, “self-regulation is the ability to manage your own energy states, emotions, behaviours and attention, in ways that are socially acceptable and achieve positive goals, such as maintaining good relationships, learning and maintaining well-being” (PVNCCDSB). One school in the County of Peterborough has worked closely with Dr. Stuart Shanker and the Merit Centre to embed self-regulation principles and practices within the school. Students are intentionally taught to extend their growing self-regulation skills from the classroom into the school yard zones at recess and lunch breaks. The students are encouraged to ask themselves questions such as “How am I feeling? Do I need some quiet time in the forest area, small group play, or active loose parts play?” This report has outlined the social and health benefits of outdoor play which extends to the development and enhancement of self-regulation in children.

### Barriers to Outdoor Play

While playing outdoors is preferred by children and it is good for their health, there are a variety of factors at work that may be creating barriers to outdoor play (Dustin, Bricker, & Schwab, 2010). First, there may be *design issues* such as equipment placed too close together or a small selection of equipment that quickly becomes boring. Whether it is the surface around the equipment, the type of equipment or the lack of pathways to the playspace, many are not physically accessible to children and adults with mobility issues.

Second, *environmental issues* such as limited or no access to green space prohibits children from playing outdoors. Depending on the location, weather conditions have also been identified by children as a barrier to play. One study in England showed that children identified rain (more than snow) as a barrier to active play (Brockman, Jago, & Fox, 2011). However, providing children with suitable clothing for all weather is a simple way to address this barrier.

Third, there are numerous *societal issues* that impede children’s ability to play outdoors, most notably the fear of strangers and traffic injuries (which will be discussed in a later section). Furthermore, there is greater pressure on parents to expose their children to a variety of experiences through arts and sports resulting in full schedules that leave no time for free play. “**Videophilia**” or excessive screen time figures prominently in the lives of children today which is time usually spent indoors (Dustin, Bricker, & Schwab, 2010).

Finally, one researcher asserted “... ‘that green space may have greater health benefits for people who live on low incomes than on those who live on higher incomes’” (Perotta, 2015). However, *socioeconomic barriers* may impact if and how children play. For instance, children may not be accessing outdoor playspaces due to family circumstances. Depending on the neighbourhood, there may be little green space. One researcher referred to these neighbourhoods as “park poor” (Scott, 2013). Attractive green space may not be in close proximity and lack of transportation precludes these children from being able to participate in those park experiences.

If outdoor play opportunities are limited, indoor play may also be restricted, that is, children may be living in homes with limited space to play (e.g., no recreation room, no yard). It is conceivable that in park poor urban neighbourhoods, the school playground may be the only outdoor playspace available. A review conducted by Public Health Ontario showed that, children in neighbourhoods where school playspaces were available after hours, were more active both during and after school (Jarvis & Oei, 2015).



Scott (2013) suggested that with limited exposure to the outdoors, children may become afraid of nature. The environment is essential to human survival, making it all the more important that children feel a connection to nature. This research makes the case for ensuring that playspaces are welcoming, inclusive, green and accessible for everyone to use.

Even when availability and accessibility is not a concern, children in low income families may encounter another barrier, namely, the competing demands that parents/caregivers must juggle every day. Milteer et al. (2012) stated, “[a]lthough lower-income parents have the same desires for their children to succeed and reach their full potential...they must focus primarily on the family’s day-to-day survival. When food and shelter are at risk, ensuring time for the children to have free and creative playtime, may not be a priority” (Milteer & Ginsburg, 2012, p. e208).

## Interpretation of Evidence: Children’s Play

- Play is a human right and fundamental to well-being.
- Outdoor play provides unique opportunities (or affordances) essential to healthy child development.
- Any playspace design must incorporate a variety of features to ensure that many types of play (e.g., active, creative, quiet) are available.
- Outdoor playspace designs must be barrier-free to be available and accessible (physically and financially) to all children, promoting equity.

## SECTION 2: Outdoor Playspaces

For many, the thought of a playspace may conjure up images of a slide, monkey bars, swings and a sandbox. Many playgrounds include these elements either stand-alone or as a composite structure in bright primary colours in an open space under the glare of the sun. These types of playgrounds will be referred to in this report as “traditional” playgrounds. More recently, there is a movement afoot to install more natural play environments that encourage different types of play. This section will review the research that looks at both the “traditional” playground and natural playspaces.

### Canadian Standards Association

The CAN/CSA Z614-14 – Children’s playspaces and equipment standard (CSA, 2014) is a guideline that play equipment installers may follow. According to Dr. Brussoni, one of Canada’s leading researchers on risky play, “there is no legislative requirement to meet [the standard], unless a particular entity decided that was their policy...The first mandate of standards is to promote trade between nations. **Safety** comes afterwards. Child development is not systematically considered” (2017). While not designed to do so, the Standard is “widely accepted as a **Risk Management** tool by institutional and regulatory stakeholders” (Kells P. , 2015). Whether this is an appropriate use for the Standard will be discussed in a future section.

### Traditional Playgrounds

Given the description in Section 1 about the different types of play, the challenge with traditional equipment is that it encourages only functional play (e.g., climbing, swinging) for two age groups—children 18 months to five years of age and children over five to 12 years of age. The developmental needs of a six year old are very different from those of a 12 year old, therefore, the equipment will have limited appeal and may not provide the proper level of stimulation and challenge. As some researchers questioned, “A sixth grader is not expected to read the same textbook as a first grader, so why would one select the same playground equipment for each group?” (Hudson, Thompson, & Olsen, 2005, p. 18). In addition, two researchers stated that, “Play is one of the greatest tools that a child may experience; yet standard public outdoor modular playgrounds exclude all but able-bodied children” (Bould & Bezerra, p. 1). While the play experience will be different for each child, the authors emphasized that being able to access play equipment, to feel socially connected and safe are shared needs among children and supervising adults regardless of level of ability (Bould & Bezerra).



Manufactured prefabricated **Composite Playstructure** are costly (e.g., \$25,000 to \$75,000) so it is important to know whether or not children are using the equipment, and if so, how. In a study

observing children’s play at day care centres, researchers found that, for the most part, equipment was not being used. When equipment was used, children were not using them as intended (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007). The researchers reported that, “[t]he equipment was unoccupied 87% of the time. Of the 13% of the time the equipment was occupied, children used loose parts together with the structure 5% of the time, played underneath the structure 4% of the time, used it as intended 3% of the time, and used it for **Prospect** 1% of the time” (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007, p. 9). Another study looked at whether or not children used themed equipment as intended; for example, did the children use the pirate ship-themed equipment like a ship. Results showed that they did not but rather they created their own stories and themed play (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007).

Even for those children who may spend some time on this equipment, one criticism is that the play structures are limited in what they offer and they don’t include a “...variety of colors, shapes, smells, loose parts and movable materials, and biodiversity” (Luken, Carr, & Brown, 2011, p. 326). In other words, the traditional playground is static and does not lend itself to a broad range of uses and applications. The challenge is that the equipment may not provide adequate, on-going stimulation leading to boredom which may result in either misuse of the equipment or non-use.

## Natural Playspaces

Playground equipment manufacturers are aware of the trend toward natural playspaces and they are designing single-function manufactured equipment that looks like nature (e.g., plastic toadstools, boulders and logs). Nature-inspired equipment is much different from a playspace with interactive and manipulable natural elements.

In British Columbia, children in a research study were asked to take photographs of their favourite playspaces. Only 3% of children photographed traditional playgrounds, leaving the rest of the images to reflect natural green spaces and other **Built Environment** (e.g., vacant and parking lots) (Ibrahimova, Wilson, & Pike, 2013).

Natural playspaces focus on using the environment to engage children in play rather than pre-fabricated equipment. These spaces vary but the common theme is the use of natural elements and the landscape to design a play experience. Some natural playspaces incorporate slides into the side of a hill and use boulders and tree stumps. They can also include gardens, water features, outdoor musical instruments and greenery (i.e., bushes, trees, edible plants). The key driver for natural playspaces is to provide opportunities to engage all the senses and to stimulate group and individual play. As one author put it, “Natural **Playscape** promote play *with* nature not just play in nature” (Warr, 2013, p. 12). This engagement with the outdoors also translates into greater interest and care for the environment (Barton, 2015).



The other difference is that natural playspaces provide new experiences continuously since the environment is always changing. According to Warr (2013), “[n]atural playscapes can be directly compared to a complex organism having a number of elements which are constantly changing through both natural processes (i.e., vegetation growth) and human interaction (i.e., children moving loose parts). As a result of this constant change, new, exciting, and engaging learning opportunities exist and are created every time the child plays” (p. 18).

The diversity of the natural playspace allows for different types of play, making it more appealing to a wider age range including parents and caregivers who can engage with nature too (Barton, 2015). Provided the space is designed to be accessible, the natural playspace offers more opportunities for children and adults of varying levels of ability to participate in a diversity of play opportunities (Barton, 2015). Every child in a natural playspace will experience it differently depending on developmental ability, preferences and other individual factors. The playspace becomes a unique experience for each child with the challenge being determined by the child rather than the equipment. Furthermore, having a diversity of ages with different levels of ability in the playspace all interacting together in the same play contributes to greater learning than play among same-age children (Gray P. , p. no page).



Traditional play structures and parks, including sports fields, are more likely to be used by males than females since they tend to focus on gross motor play which is encouraged in boys. On the other hand, natural playspaces are gender-neutral. As Angaard stated, “[n]atural environments are not gender-coded in themselves and they invite certain play activities where girls and boys play together. Thus, nature spaces seem to offer good opportunities to promote gender equity” (Anggard, 2011, p. 5).

Furthermore, when comparing the various play environments, researchers found that the natural play areas invited diversity and inclusiveness whereas the “[m]anufactured equipment can also set up uncomfortable power relations that influence participation, with certain pieces of equipment being dominated/controlled as a function of gender, physical prowess and ability, as well as age” (Dyment & O’Connell, 2013, p. 276).

Natural playspaces seemed to also increase the level of physical activity. One study looked at children’s activity levels prior to and following renovations from a traditional to a natural playspace. Results showed that children engaged in more moderate to vigorous physical activity on the natural than the traditional playground (39.8% and 16.2% respectively) and children were less likely to engage in sedentary behaviour in the natural playspace (16.9%) compared to the traditional playground (20.5%) (Coe, Flynn, Wolff, Scott, & Durham, 2014).

Sandseter (2009) looked at preschool play environments focusing a great deal on the affordances in outdoor settings. To remind the reader, affordances are “...what [the environment] ‘invites’ us to do,

and the concept of affordances includes both the environment and the person, meaning that the affordances are unique for each individual and correspond with the individual's body size, strength, skills, courage, fear, etc." (p. 439).

Within this study, the author shared the results of an older study done by Lee in 1999 which concluded:

... that children reacted to naturalized playgrounds enthusiastically and actively, and that naturalized playgrounds afforded most challenging play. On the other hand, traditional playgrounds afforded the least challenging play and most non-play (wandering or standing). Similarly, Fjortoft (2000) found that functional play such as gross-motor activities and basic skills (running, jumping, throwing, climbing, crawling, rolling, swinging, and sliding) was predominant when children played in nature as opposed to playing on a traditional preschool play area... (Sandseter, 2009, p. 440).

In her conclusion, Sandseter noted that children take greater risks in a natural playspace since the environment provides such affordances. At the same time, she reported that the rate of risk-taking did not change from traditional to natural playspaces (Sandseter, 2009).

Finally, one principal in a Winnipeg school noted changes in child behaviour after a natural playspace was installed: "...they're more spread out, no longer spending all their time on the flat-top playing with the tether ball or the four square. There's also less conflict during recess..." (Roesveld, 2012).

The assumed concern from playground equipment providers is that natural playspaces potentially may be a greater liability if the "equipment" used has not met CSA standards. In an April 2015 webcast for OSBIE (Ontario School Boards' Insurance Exchange), Peter Kells outlined several strategies for ensuring a natural playspace meets CSA standards. For instance, he suggested getting the expertise of an engineer (who are parents too) to ensure that items bearing weight can handle the load. Given the abundance of elements in a natural playspace, he also highly recommended contacting a poison control centre to identify any known poisons (e.g., some mushrooms or other plants) in the area. Finally, he reiterated that even when using natural elements like rocks and logs, it is important to put them through the same rigorous inspection for such **Hazard** as entanglements and entrapments as you would other playground equipment (Kells P. , 2015). Other experts promote the use of **Risk Benefit Analysis** in order to ensure that the value of a play space takes into consideration more than just the potential risks (Brussoni M. , 2017).



## Hybrid Playspaces

In seeking engaging and challenging outdoor playspaces, the concept of a playscape may be helpful (Luken, Carr, & Brown, 2011). Similar to landscapes, the orientation is about looking at the environment and seeing how it supports active play rather than cordoning off an area within which children can play. When designing any kind of environment, it is important to look at the multifaceted needs of the people who will use the space and perhaps create play zones. Table 2 provides a description of various play environments and the type of play they encourage (Dyment & O'Connell, 2013).

**Table 2. Play Environments and Types of Play**

Play Environment	Types of Play Encouraged in this Environment
Paved Expanses and Areas	<ul style="list-style-type: none"> <li>• serves as connective pathways to other areas and is accessible for all levels of ability. It best serves functional play and is favoured by boys.</li> </ul>
<b>Softfall</b> and Grass	<ul style="list-style-type: none"> <li>• these areas allow for more diverse use including the use of loose parts like balls and logs. Fewer injuries occur in this space and it is ideal for functional and self-focused play.</li> </ul>
Sand features	<ul style="list-style-type: none"> <li>• a play area attractive to children who don't want fast-paced active play. It encourages creative and symbolic play.</li> </ul>
<b>Manufactured constructive</b>	<ul style="list-style-type: none"> <li>• "[i]ncludes all areas that encourage constructive, symbolic or creative play such as wooden boat, tree house, store, post office" (p. 276).</li> </ul>
<b>Manufactured functional</b>	<ul style="list-style-type: none"> <li>• contains prefabricated equipment that predetermines the type of play; what the authors refer to as "prescriptive play" (p. 276) which may lead to boredom and perhaps the misuse of the equipment. It serves functional play and increases the risk of injuries.</li> </ul>
Natural	<ul style="list-style-type: none"> <li>• these areas highlight natural elements like trees, rocks, logs, water allowing for a wide range of free play activities. Due to the diversity of play, the space is more inclusive, thus less discriminating of a child's abilities.</li> </ul>

It is not a question of choosing one area or type of play structure over another but rather creating various zones of play that allow for gathering, individual time, experimenting, being active and spending time in natural spaces (Campbell, 2013). It is important to emphasize that much of a child's time today is spent in groups and that children need to have spaces to be alone and/or have quiet time - even outdoors (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007).

Many existing outdoor playspaces are outfitted with manufactured functional equipment. In this space, there are other ways to encourage a diversity of play without needing to replace existing equipment. Public Health Ontario produced an evidence brief on active play which listed strategies for

maximizing the existing play environment (Jarvis & Oei, 2015). Many of these suggestions are most relevant for school environments but may have applications in other play environments. They include:

### A. Physical Changes to Play Area

Two systematic reviews looked at how interventions in the school yard affected physical activity (Broekhuizen, Scholten, & de Vries, 2014; Escalante, Garcia-Hermoso, Backx, & Saavedra, 2014). Some of the interventions included playground markings, game equipment and physical structures. The results showed only moderate success. There was some increase in moderate physical activity among school children but not preschool children and the change lasted for only the short- to medium-term. One explanation was that the novelty of the changes wore off. Alternatively, one review found that the more physical space children had, and the longer they had to play, the more physically active they were (Broekhuizen, Scholten, & de Vries, 2014).

### B. Extra Equipment

Introducing loose parts such as balls, skipping ropes, milk crates, car tires, hay bales, crash mats, cardboard boxes, plastic barrels, tubing, and wooden planks increased activity and encouraged more creative, co-operative and social play (Jarvis & Oei, 2015).

Recognizing that playspaces are expensive to install and that the composite, manufactured equipment has some value in encouraging certain types of play, one study looked at augmenting existing playspaces on school grounds with loose parts (Bundy, et al., 2009). Simply introducing new portable materials resulted in more active and diverse types of play. For example, the researchers described how the children,

made inventive use of the materials' potential for construction (e.g., building a 'pyramid'); exploration of mechanical properties (e.g., rolling balls down planks); combining with their own toys and with pre-existing equipment and 'ball bag' items; creating spontaneous rule-based games (e.g., who was allowed to climb on a built structure); creating friendly competitive games (e.g., tyre-rolling contests); testing physical prowess (e.g., 'balancing' on tyres or walking along planks); and creating highly imaginative play (e.g., sitting in tyres 'pretending [to be] on some Caribbean cruise') (Bundy, et al., 2009, p. 39).

The teachers' observations of the play revealed that children were more verbal since they needed to provide a narrative to their creative/imaginative/pretend play. Other observations included less aggression, more physical activity and no change in **Injury** rates. Teachers' did





notice that children seemed to exhibit more resilience—so engaged in the play, the children would pick themselves up when they fell and resume playing rather than crying (Bundy, et al., 2009).

### C. Changing Density

One example includes introducing loose parts such as pails and tree cuts that can be used in other parts of the school grounds which means that children are more dispersed throughout the space thus reducing congestion. The evidence showed that “...decreasing playground density significantly reduced sedentary time by 5.1%, and increased light to moderate, and moderate to vigorous physical activity by 5.1% and 4.8% respectively during recess” (Jarvis & Oei, 2015, p. 7). In addition, provincial data from the Ontario School Boards’ Insurance Exchange (OSBIE, 2015) showed that the major cause of loss cited in provincial injury claims was collision with a person or object: 112 (2005-2009) and 80 (2010-2014). The next cause of loss was horseplay: 50 (2005-2009) and 40 (2010-2014). Diffusing the number of children in one play area may contribute to a decline in the number one cause of injuries (i.e., collisions).

In addition, one might speculate that the risk of injury may also decline with fewer children competing for space on the equipment. Among children in child care centres, it was found that levels of aggression declined when children had more playspace (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007).

### D. Changing Play Area

Expanding the play zone beyond the asphalt and manufactured equipment to include green spaces also encourages more physical activity. In one study, it was reported that “[m]ost students were observed using all parts of the school ground to engage in physical activity where 66% were reported using greened areas of the school ground for active play” (Jarvis & Oei, 2015, p. 5).

## Interpretation of Evidence: Outdoor Playspaces

- Composite playstructures have a role in playspaces, however, this equipment provides limited opportunities for a diversity of play and can be inaccessible to some children.
- The play equipment only has value if children actually use it.
- Natural playspaces are more inclusive, gender-neutral and accessible to a broader range of ages and abilities.
- Natural playspaces may encourage more active and creative play.
- Adapting the CSA Standard to natural playspaces is possible.
- Simple adaptations to existing playspaces will enhance the play experience (e.g., introducing loose parts, making use of green space).

## SECTION 3: Risk and Play (a.k.a. Risky Play)

### Risk

Creating opportunities to explore risk in the early years provides children with skills in identifying potential risks, assessing the probability of that risk and problem solving strategies for mitigating it (Brussoni, Olsen, Pike, & Sleet, 2012). In addition, navigating small risks successfully builds confidence and resilience in children who will be able to take progressively greater risks as they develop. In other words, the earlier smaller risks create the building blocks for risk assessment and problem solving that will benefit children throughout their lives (Ball, Gill, & Speigal, 2012) as they navigate more serious risks around such issues as substance use, sexual activity and workplace health and safety.



In his essay, Gray asserted the necessity of **Risky Play** in ensuring that children grow up to be resilient adults. He wrote:

Researchers who study animal play argue that one of play's major purposes is to help the young learn how to cope emotionally (as well as physically) with emergencies. Juvenile mammals of many species deliberately and repeatedly put themselves into moderately dangerous, moderately frightening situations in their play... Human children, when free, do the same thing, which makes their mothers nervous. They are dosing themselves with fear, aimed at reaching the highest level they can tolerate, and learning to cope with it. Such play must always be self-directed, never forced or even encouraged by an authority figure. It's cruel to force children to experience fears they aren't ready for, as gym teachers do when they require all children in a class to climb ropes to the rafters or swing from one stand to another (Gray P. ).

According to Pierre Harrison, risk is about exploring uncertainty and allows children to “learn what they can and can't do” (Harrison, 2016). In addition, Ball, Gill & Speigal (2012) asserted that playspaces were a safer place for children to experiment with their abilities, limitations and judgements of risk than a less “controlled” environment. If there is no or little risk in the play environment, then children will seek it elsewhere (Brussoni, Olsen, Pike, & Sleet, 2012).

One definition of this type of risk is: “...a situation whereby a child can recognize and evaluate a challenge and decide on a course of action. This is in contrast to common use of the word to describe hazards that children cannot assess for themselves and that have no clear benefit” (Brussoni, et al., 2015, p. 6425).

Some of the risks that children will take may result in injury and one reason why some children may be at elevated risk for recurring injuries is their own perception and appraisal of the risk. One study found that children, “...actively seek out those activities that offer challenge, thrill and excitement” (Little & Wyver, 2010, p. 309) and that boys were more likely to attribute their injuries to bad luck whereas girls attributed their injuries to their behaviour. As a result, girls were less likely to repeat the behaviour (Little & Wyver, 2010). This same study reported that children as young as four and five were able to assess whether or not an activity was risky, however, they were less likely to be able to determine the severity of the risk. As a general rule, boys take more risks and suffer more injuries than girls (Morrongiello, McArthur, Kane, & Fleury, 2013).

Additionally, research shows that the degree of risk taking by a child is moderated by the behaviour of their peers (Morrongiello, McArthur, Kane, & Fleury, 2013). In their study, Morrongiello et al. (2013) examined the influence of peer social norms on risk taking behaviour and found that “[c]hildren have been found to show more risk taking in the presence of another child, to model risk taking demonstrated by another child who does not experience any negative consequence from engaging in the behavior, and to recruit friends who have similar tolerance levels for risk taking...” (p. 745)



## Risky Play

Risky play is “...thrilling and exciting play that can include the possibility of physical injury” (Brussoni, et al., 2015, p. 6425). It is often characterized by the following activities or circumstances:

- playing at heights (e.g., climbing, jumping);
- playing at high speed (e.g., swinging, sliding, sledding);
- rough and tumble play (e.g., wrestling, stick play);
- having the chance of disappearing or getting lost (e.g., exploring alone);
- being around dangerous elements (e.g., fire, water, cliffs); and
- using dangerous tools (e.g., saws, knives, ropes, axes) (Tanenbaum, 2016).

Brussoni explained that risky play is in the “eye of the doer” and that personality, comfort level and the child’s developmental stage all factor in to what is the perceived risk. In other words, the level of risk is based on the child’s perspective (Tanenbaum, 2016). The child could be under supervision but, for example, when out of view behind a bush or inside a log, the child may feel a thrill of potentially being ‘lost.’

Having said that, Wakes & Beukes (2012) listed the three common risk factors for children using playground equipment are height, co-ordination and upper body strength. They argued that while many playgrounds include equipment that emphasizes height (e.g., monkey bars), if children have other challenges around co-ordination and balance, height is not a necessity. In their study, when

children were asked to select the play equipment they thought would be most fun, they selected activities that tested their co-ordination. They wrote, “[o]verall, coordination appears to have been more of a factor than height in determining whether a child found a piece of equipment to be their favourite, safe, boring or difficult” (Wakes & Beukes, 2012, p. 104).

There is a difference between risk and hazard. According to Brussoni risky play is not “neglect, recklessness or the promotion of hazards” (Brussoni M. , 2016). The *risks* in the play environment are known and part of the play experience; whereas, *hazards* are unwanted and unanticipated dangers. For instance, bushes that provide a place for children to hide or “get lost” is part of risky play whereas a rusted out slide is a hazard that needs to be removed. Another risk-hazard comparison includes monkey bars that allow playing at heights (risky play) versus a log that is rotted in the centre (hazard). Given these distinctions, risky play is not about putting children in danger but creating a space where they can feel that they may be in danger. Having said this, risky play elements such as fire and dangerous tools should be used in environments where children are supervised. Sole put it this way,

there’s a big difference between how much risk a child believes there might be (perceived risk) and the actual risk to their safety (objective risk). It’s up to parents, caregivers, educators, and program leaders to do a careful analysis and make sure that the objective risk is much, much lower than the perceived risk. This will ensure that kids can enjoy the enrichment of active outdoor time that should be part of every child’s experience from birth to Grade 12 (Sole, 2016).

Risky play proponents challenge us to think of creating play environments that are “as safe as necessary” as opposed to as safe as possible (Active & Safe PEI; Brussoni, et al., 2015; Brussoni, Olsen, Pike, & Sleet, 2012). A group of older children came together in Kingston to talk about overprotection and safe risk (Child Health 2.0, 2015). One child interviewed said: “It can be really fun and exhilarating ‘cause I mean if you just sit there doing not much then it’s bored, you’re safe. But what’s the point. You’re just sitting around existing?” (Child Health 2.0, 2015, p. 4:38 min mark).

Risk, as it relates to children’s health, is not only a *physical* issue. There are other *social* risks of inactivity and unchallenging play experiences. Bundy et al. (2009) stated that,

...many parents and teachers are narrowly focused on the risk of one type of ‘danger’: physical injury. They are seemingly unaware of a host of other dangers that potentially come *as a result of* restrictive active play. The potential for children to become afraid to use their bodies actively is among the risks of being overly concerned with protecting



children from injury in their school grounds... contributes to a risk of being overweight and developing associated health problems (e.g., Type 2 diabetes) as well as to restricted emotional, intellectual and social development [emphasis theirs] (Bundy, et al., 2009, p. 34).

Supporting this view, Brussoni et al. (2012) reported that risk deprived children are more prone to obesity, mental health concerns, lack of independence and decreased learning, perception and judgement skills. In addition, there is research indicating that sensation seeking adolescents who do not have an outlet for risk taking will seek it in potentially harmful ways (Brussoni M. , 2017).

Interestingly, there are gender differences in the way that parents perceive risk for their children. Studies showed that parents were more likely to let their boys take greater risks than their girls (Morrongiello, Zdzieborski, & Normand, 2010; Morrongiello & Dawber, 2000; Morrongiello & Dawber, 1999). Girls are socialized to believe they are more fragile and vulnerable. Both boys and girls think girls are more likely to be injured when, in fact, it is boys (Little & Wyver, 2010).

Whether aware of it or not, there is a great deal of risk involved in allowing children to play on traditional playspaces (Morrongiello, McArthur, Kane, & Fleury, 2013). The actual physical risks from the use of the equipment is compounded by the practices of parents and caregivers who allow children to play on equipment not intended for their age or ability - even going so far as to assist their children in getting on the equipment they cannot reach on their own. Furthermore, injuries in organized sports are higher than free play (Ball, Gill, & Speigal, 2012) yet parents and caregivers endorse and encourage this organized play. It clearly demonstrates that risk is about perception and socially acceptable behaviour.



The evidence is clear that risky play has both physical and mental health benefits. In 2015, a systematic review of 21 articles found “...overall positive effects of risky outdoor play on a variety of health indicators and behaviours, most commonly physical activity, but also social health and behaviours, injuries, and aggression” (Brussoni, et al., 2015, p. 6424). More specifically, they found “...improved risk detection and competence, increased self-esteem and decreased conflict sensitivity, relative to their pre-intervention performance, as well as when compared to a control group...more developed motor skills, social behaviour, independence and conflict resolution...” (Brussoni, et al., 2015, p. 6425). In a personal communication with Dr. Brussoni, she noted that one of the most interesting findings of this review was the lack of findings of adverse effects of risky play, including injuries (Brussoni M. , 2017).

At a recent physical literacy summit in Peterborough, Brandy Tanenbaum, co-lead of Play Safe, summarized the new view of risk in Figure 1 (Tanenbaum, 2016, p. slide 32).

Old way...	New way...
Risk is always <b>negative</b>	Risk can be <b>positive and negative</b>
All risks should be <b>avoided</b>	Negative risk should be <b>managed</b> ; positive risk must be <b>acknowledged</b>
Play spaces must be <b>free from risk</b> of injury	Play spaces must <b>encourage risky</b> elements
Children should be <b>protected from risk</b> of injury	Children must be <b>exposed to risk</b> that encourages the development of critical thinking skills
<b>As safe as possible</b>	<b>As safe as necessary</b>

**Figure 1. Old and New Views on Risk**

The next question is, “what type of playspace provides the best opportunities for exploring risk?” The conclusion from a systematic review is that **traditional playspaces do not provide adequate opportunities for healthy risk-taking**. They refer to these playspaces as KFC playgrounds—Kit, Fence and Carpet—arguing that they provide minimal value to comprehensive healthy child development (Brussoni, et al., 2015; Brussoni M. , 2016). These researchers are strong advocates for natural playspaces.

Finally, in a webinar hosted by Public Health Ontario, Dr. Brussoni made a compelling case for embracing risky play as an essential element of a healthy childhood. One of her four recommendations included “[promoting] natural elements over pre-fabricated playgrounds” (Brussoni M. , 2016).

### Interpretation of Evidence: Risk and Play

- Risky play is an essential component of healthy child development. Risk is relative and in relation to play, it is based on each child’s perception of risk rather than objective risk.
- Outdoor playspaces, under the proper conditions, should include as many elements of risky play as possible. For instance, in unsupervised environments, playing at heights, testing balance and co-ordination, rough and tumble play, and disappearing or getting lost is appropriate. On the other hand, being around dangerous elements (e.g., fire) and tools should happen only under adult supervision.
- Natural play environments and materials are more affordance-rich and provide other benefits to health.

## SECTION 4: Injuries and Playground Safety

Peterborough Public Health began focusing on playgrounds as a result of the injury rates in the City and County of Peterborough. For this reason, a closer look at the injury rates in a broader context as well as other safety issues will be reviewed in this section.

### Injury Statistics and Facts

#### Deaths

Based on research done by Howard et al. (2005), over the 30 year span from 1982-2012, there were 18 playground deaths in Canada. A U.K. study reported that yearly playground-related deaths were one in 30 million children between the ages of 0 – 16 years (Ball, 2004).

#### Injuries

Between 1995 and 2008, there were 39,730 injuries on playgrounds in Canada. Elementary school-aged children were more likely to incur injuries (65%) than preschoolers (35%). The vast majority of injuries occurred in public playgrounds with only 16% happening at home. However, preschool children were more likely to be injured on playground equipment at home (22%) than elementary school-aged children (13%). Slightly more than half (53%) of the children injured were male (Keays & Skinner, 2012). According to Brussoni et al. (2015), “[i]n Canada, approximately 2,500 children age 14 and under are hospitalized annually as a result of playground falls (play at height)—81% are for fractures” (Brussoni, et al., 2015, p. 6426). They also stated that “[t]he vast majority of risky outdoor play-related injury incidents result in minimal or no medical treatment” (Brussoni, et al., 2015, p. 6426).



The rate of injuries varies depending on the setting. For example, more injuries happen in school grounds but the more severe injuries are more likely to occur in backyards (Keays & Skinner, 2012). One explanation would be the frequency and exposure to the equipment. That is, more children are playing on equipment on school grounds for longer periods of time so the risk of getting any injury is higher. However, the equipment and environment in the school ground are more likely to meet CSA Standards resulting in less severe injuries. In addition, the school may also have more rules around use of playground equipment. Backyard play equipment and the fall surface likely do not meet the Standard which may explain the greater likelihood of sustaining more severe injuries.

Again, due to frequency and exposure, children are more likely to get injured on school play equipment than municipal equipment. In one study located in Kingston, Ontario, the rate of injury in schools was 12 times as likely as injuries sustained in municipal playgrounds (Howard, 2009). To put this into perspective, however, OSBIE data for 2010-2014 shows that, of the 81,070 provincial incidents of injury reported, only 2,066 were attributed to climbers, slides and swings. The vast majority of injuries in school grounds do not involve play equipment (OSBIE, 2015).

Furthermore, injury rates are dependent on socioeconomic issues. For instance, children from low-income neighbourhoods are at greater risk of injuries requiring hospitalization and they are more likely to be exposed to "...hazards such as inadequate playspaces and high levels of traffic..." (Ibrahimova, Wilson, & Pike, 2013, p. 4).

Macpherson et al. (2010) stated that injury morbidity and mortality is negatively related to socioeconomic status (SES). In their study, they looked at injury rates among various schools in the Toronto District School Board (TDSB) prior to and following playground upgrades using the CSA standard as a guideline. Following the upgrade, injury rates came down although the rate was still higher in low SES schools. The difference between low and high socioeconomic schools, however, was no longer statistically significant. The authors noted that non-equipment injuries still remained high for low SES schools. They posited, "that differences may be related to the availability of funds to upgrade the outdoor environment and the presence of adults on the playground" (Macpherson, Jones, Rothman, Macarthur, & Howard, 2010, p. 4).



Other risks for incurring injuries include time of year, previous experience of playground injuries and exposure time. With respect to time of year, one report asserted that playground injury rates in the U.S. are more likely to occur on school playgrounds in the first few weeks of a new school year and on public playgrounds at the beginning of the summer (Terrana, 2013).

Another study reported that children who had previously been injured on playground equipment were more likely to be injured again; that is, they are at "high risk" for future injuries. If, however, the parents of these children were educated on playground injury risk, they became more sensitized to potential injuries - not just with respect to the piece of equipment where the first injury occurred but to all playground risks (Morrongiello, Howard, Rothma, & Sandomierski, 2009).



In looking at the injury rates, it is important to factor in how much time children are exposed to the play equipment (Mitchell, Cavanagh, & Eager, 2006). If children lose interest in the equipment early in their play, then playground equipment injuries will be reduced - not because the equipment is “safe” per se but rather because exposure to that risk possibility is gone. Nauta et al. (2015) looked at the amount of time children are exposed to certain activities (i.e., sports, active commuting, leisure physical activity) and the related risk of injury. They found that, in absolute numbers, there were more children injured during leisure physical activity (i.e., recreation/play) but that is because more children spend more time in this activity. However, the researchers found that the more serious injuries requiring medical treatment were higher in sporting activities. They wrote: “...sports came out as the most risky (range 0.20-0.67 medically treated injuries per 1,000 h of sports) compared with active commuting (range 0.15-0.52 injuries per 1,000 h of active commuting) and unorganized leisure time PA [physical activity] (range 0.15 and 0.27 injuries per 1,000 h of [PA]” (Nauta, Martin-Diener, Martin, van Mechelen, & Verhagen, 2015, p. 327). Brussoni (2016) framed this finding by pointing out that a child would have to play for three hours every day for ten years before needing to report an injury (likely a fracture) requiring medical attention. Therefore, while exposure to playground equipment may be a risk factor, it appears that it is not as large a risk for injuries requiring medical treatment - which could range from a visit to a nurse’s office to hospitalization - than organized sports or active commuting.

## Safety

There are various components regarding the safety features of a playspace including the physical and social environment.

### The Physical Environment

In referring to the physical environment of a playspace, the following components are relevant: 1) the equipment; 2) the immediate physical surroundings (within the park space); and 3) the external physical surroundings abutting the park space (i.e., neighbourhood).

The initial literature review conducted by Peterborough Public Health in 2014 which focused exclusively on playground injuries revealed a very consistent finding in the research which identified the four most common elements contributing to the prevention of playground injuries:

1. supervision (i.e., children are properly monitored);
2. age appropriateness (i.e., children are using the equipment designated for their age);
3. fall surfacing (i.e., equipment sits atop appropriate surfacing to mitigate the impact of a fall), and;
4. maintenance of equipment (i.e., no hazards such as loose bolts or damaged surfaces are present).

The technical requirements for the third and fourth elements are addressed in detail in the playground standard (CSA, 2014).

As mentioned in the injury statistics, falls from heights are, by far, the number one cause of playground injuries (Mitchell, Cavanagh, & Eager, 2006). Appropriate surfacing on which children fall is described as a passive intervention that does not require any thought or consideration by the users (i.e., children or their caregivers). Some researchers compare this intervention to vaccinations stating that “...a child does not need to have an awareness of the mechanism of prevention, and the child does not need to perform any special action to benefit from the protection that has been put in place” (Hodges & Smith, 2013, p. 338). Brussoni cautioned, however, that this passive intervention raises the question of the “risk compensation hypothesis” whereby “...making playgrounds ‘safe’ by passive interventions might actually result in kids taking greater risks to be able to still get the thrill” (Brussoni M. , 2017).

Given that the most severe injuries occur on backyard equipment, Keays and Skinner (2012) argued that, “...simply addressing the landing surface in the backyards of private homes would help decrease severe injuries due to falls from PGE [playground equipment]” (p. 140). While mandating caregivers to install proper fall surfacing may be tempting, enforcement would be problematic and the cost may be prohibitive for some. Realistically, given that most children are playing in public playspaces such as municipal parks and schools, the public health focus must be on proper maintenance of these community playspaces. For this reason, installing appropriate surfacing around playground equipment may be a key **Injury Prevention** strategy provided children can still experience risky play.

Individuals responsible for both playground and equipment installation and maintenance can do all they can to ensure the equipment surfacing meets the requirements of the Standard but children can still get injured because the equipment is being used inappropriately (Huchcroft, McGowan, & Mo, 2013). First, today’s equipment is usually a composite structure where each element is joined into one large unit. With grab bars and different elevations, it makes it easier for children to access parts of the equipment that are not intended for their age group (Hudson, Thompson, & Olsen, 2005). On the other hand, other researchers asserted that children only go so far as they feel comfortable but that they get into trouble when the supervising caregiver helps them play on equipment beyond their developmental level (Wakes & Beukes, 2012). Since children seek out risk in their playspaces, the inappropriate use of equipment may be



a sign of boredom or a desire to take more risks (Brussoni, Olsen, Pike, & Sleet, 2012; Little & Wyver, 2010; Bundy, et al., 2009). One could argue that the inappropriate use of the equipment is more hazardous than a “safe” risk.

Regardless of whether or not traditional playground equipment provides the best play experience, one study showed that equipment meeting the CSA standard reduced the rate of injuries (Howard, 2009) and that regular use of the Standard to assess the safety of the equipment resulted in fewer injuries but it was not a significant reduction (Howard, MacArthur, Willan, Rothman, Moses-McKeag, & MacPherson, 2005). There may be some value in applying the CSA Standard to reduce the risk of injury. However, Brussoni argued that while the CSA Standard is a great engineering document, the problem is that it is being used as a design document which leads to more restrictions than necessary (Brussoni M. , 2016).

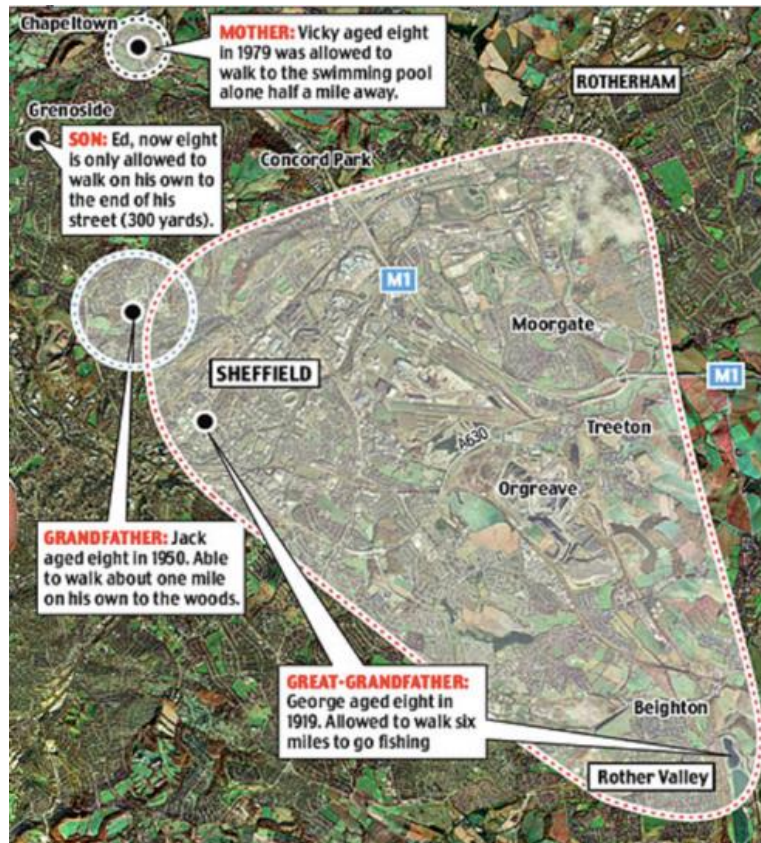
Finally, there are concerns around the design of spaces and how the placement of the equipment may create safety hazards; for instance, placing equipment too close together or in such a way that it creates unwanted traffic patterns that cause children to “intersect”. These situations increase the risk of injury and conflict; which one researcher referred to as “knock and bump” accidents (School Grounds Transformation).

To counteract these potential hazards, the CSA Standard requires that the equipment be positioned in such a way as to reduce these potential collision zones (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007). As a result, many playgrounds are installed in the middle of the playspace with much of the space empty to allow for these **No-encroachment** or safety zones (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007). By placing the equipment in the middle of the playspace, it creates interference with other types of play that require an expanse of playspace (e.g., playing tag).



## The Social Environment

The perceived safety of the immediate and external surroundings by children and their caregivers will influence whether or not a playspace will be used, and if so, how and when. To illustrate this, an often-cited article in the *Daily Mail* (Derbyshire, 2007) showed the range that children roamed over four generations. Figure 2 shows that the great-grandfather travelled just under 10 km away from home on his own as opposed to his great-grandson who is allowed to roam only one-third of a kilometre.



**Figure 2. Roaming Range for Children Over Four Generations**

Research done in B.C. revealed that children’s fears of playing outdoors focused on bullying, unkempt play areas, traffic and strangers and that parents’ fears included strangers, teenagers/gangs and traffic (Ibrahimova, Wilson, & Pike, 2013). Some researchers acknowledged that parents have a legitimate concern regarding their children’s safety around traffic (Brussoni, Olsen, Pike, & Sleet, 2012).

Ironically, the risk of children being injured by vehicles is exacerbated by these same parents who drive their children everywhere due to concerns of stranger abductions (Brussoni M. , 2016). In addition, “children are 8X more likely to die as [a] vehicle passenger than as [a] pedestrian or cyclist” (Brussoni M. , 2016, p. slide 25).

With respect to the perceived safety of children, it is important to address the concerns regarding strangers. According to Tremblay et al., “Outdoor play is safer than you think! The odds of total stranger abduction are about 1 in 14 million based on RCMP reports. Being with friends outdoors may further reduce this number” (Tremblay, et al., 2015). The risk of stranger abductions is so small and yet seems to loom large in the minds of parents which is exacerbated by formal and social media coverage. ParticipACTION addressed the issue of the “protection paradox” stating that caregivers may want to “overprotect kids to keep them safe but keeping them close and keeping them indoors may set them up to be less resilient and more likely to develop chronic diseases in the long run” (ParticipACTION, 2015, p. 2). Brussoni described this anxiety-based caregiving as meeting the needs of parents rather than their children (Brussoni M. , 2016).

This **Risk Aversion** is leading to a 'safe at all costs' mentality which will almost certainly shortchange children and society: "The resultant lack of development of skills in risk assessment, and the potential flow-on effects of that deficit, are overlooked in favour of peace of mind and protection from legal and financial culpability" (Townsend, Henderson-Wilson, Warner, & Weiss, 2015, p. 14). Put another way: "By overprotecting our children, by not letting them explore risk and uncertainty on their own terms, we invalidate their ability to find out what they can and can't do" (Harrison, 2016). Harrison went on to say that children are set up for much greater risks when they become adults and have to navigate the world without knowing how to identify and deal with risk. Being better skilled at assessing and managing risk is key to diminishing risk aversion and empowering play providers and parents and caregivers in encouraging unsupervised, active outdoor play. The Canadian Public Health Association summed it up nicely stating, "While limiting playground injuries is an important component of children's safety, children's long-term health should be considered of greater importance" (CPHA, 2016).



### **Interpretation of Evidence: Injuries and Playground Safety**

- Injuries due to playground equipment are inevitable and the majority of those injuries will be minor.
- Minor injuries are a natural part of growing and learning.
- Proper installation and on-going maintenance of the equipment will mitigate the risk of injury but not eliminate them.
- Better safety practices in backyard play areas will reduce the most serious injuries.
- Preventing children from playing in playspaces because of potential risk of harm may replace one risk (i.e., physical injury) with other risks such as poorer physical and mental health in both the short- and long-term.

## SECTION 5: Risk-Benefit Analysis

The emphasis on safety has led to an over-reliance on the CSA Standard and the manufactured equipment designed to meet the Standard. Researchers question whether some unwanted risk-related consequences have been replaced by others. As Staempfli (2009) put it, “...no doubt that safety is of utmost importance, but at the same time there is always the potential that intervention in and of itself will create new risks that may lead to more and not less harm to our children’s healthy development” (p. 275). The research around risky play demonstrated that risk is normal and needed for healthy child development.

It is impossible to talk about risk exploration through play without talking about risk management. The Municipal Access to Recreation Group, a group made up of representatives from several municipalities in Peterborough County, and representatives from two local school boards indicated that their selection of playground equipment is influenced by insurance requirements based on the recommendations of the CSA Standard. According to Ball et al. (2012), many stakeholders such as “[s]ome institutions, courts, and insurance companies tend to use compliance with standards as the sole evidence of good practice. As a result, non-compliance may be used against duty holders as evidence of a failure to manage risk. This is a difficult situation, as it can foster an unadventurous approach which deters providers from experimenting with new types of provision” (p. 101).



Choosing the traditional playground, however, means that children may not be adequately stimulated by the ‘safer’ equipment and they will seek risk elsewhere in a less controlled environment. In other words, removing all the potential risks for the sake of liability may have unintended consequences that prove to be more harmful to children’s well-being (Zimmerman, Kramer, & Trowbridge, 2013; Bundy, et al., 2009). Brussoni et al. (2012) flagged this when they wrote, “...Herrington and Nicholls argued that the Canadian Safety Association’s own standards for children’s playspaces and equipment did not reflect children’s developmental and play needs, but rather the goals of risk reduction” (p. 3138). Ball et al. (2012) stated, “sensible risk management is not about creating a totally risk-free society” (p. 11).

While those responsible for playgrounds may be concerned about risk and potential litigation, a recent legal decision, citing the 2015 Position Statement on Active Outdoor Play (Tremblay, et al., 2015), may be the first sign that risk mitigation needs to be re-evaluated. In British Columbia, a judge dismissed the case of an 11 year old girl who sustained a head injury from a fall from playground equipment (Thompson v. Corp. of the District of Saanich 2015 BCSC 1750, 2015). The decision centered on the difference between a reasonable and unreasonable risk. Representatives from the District of Saanich relied on the position statement that emphasized that risky play is a natural part of child development.

In his decision, the judge wrote: “I repeat that the District’s duty to the plaintiff did not include the removal of every possible danger that might arise while she was in the care of its employees, but was only to protect her from unreasonable risk of harm.” The judge went on to say, “But I am afraid that the consequences of the plaintiff’s misadventure cannot transform the District into a no-fault insurer, and perfection is not the standard of care to be discharged by its employees when minding school-aged children” (Thompson v. Corp. of the District of Saanich 2015 BCSC 1750, 2015, pp. 7-8).

To focus only on the risk of a certain environment without also taking into consideration the benefits may shortchange children. The work from the Play Safety Forum in the U.K. emphasized the essential need of conducting risk-benefit analyses of playspaces (Ball, Gill, & Speigal, 2012). The authors asserted that just as the degree of risk is based on perceptions, so too is the level of benefit (also known as **Risk Benefit**), therefore, different people will have different ideas of what is a risk and what is a benefit. Equally important is the need to ensure that not only physical risks are discussed but social risks as well (Ball, Gill, & Speigal, 2012).

Play Safety Forum in the U.K. produced, *Managing Risk in Play Provision: Implementation Guide* which is an invaluable source for ensuring a balanced analysis of the risks and benefits of the play experience being designed. The guide emphasized the need for a play policy:

This guide advises that all risk management in play provision should start with a clear policy framework, which is best set out in a play policy. A play policy—as distinct from a play strategy - asserts the values, understandings, principles and criteria that form the framework for making judgements about play provision. It will include statements about the benefits of play for children and young people, and set out why providers should create play environments that offer, amongst other things, risk-taking opportunities. The policy should drive the strategy by stating the values that have been adopted.

A play policy establishes the framework against which providers can make judgements about reasonableness in risk management. It does this by affirming that risk is an inherent and necessary aspect of play.

It makes explicit the duty of play providers to offer risk-taking opportunities, and asserts that, without such opportunities, children’s and young people’s happy and healthy development will be impaired. The policy must be formally endorsed by the relevant authority or organisation (Ball, Gill, & Speigal, 2012, p. 41).

Depending on the playspace, it may be an opportunity to engage children, parents, and other key stakeholders (e.g., teachers, day care providers) in the development or renovation of a playspace. Working together on a play policy and conducting a risk-benefit assessment together generates engagement that can result in a sense of ownership. In addition, children who participate in this process would also gain valuable education about risk and risk management (Ball, Gill, & Speigal, 2012).

Dr. Brussoni shared three more recommendations from the National Position Statement on Outdoor Play in her webinar presentation that addressed this issue of risk:

- Do not restrict public entities to using CSA Standards for Children’s Playspaces & Equipment
- Establish reasonable liability limits for municipal governments (Joint & Several Liability Reform)
- Examine existing policies & by-laws and reconsider those that pose a barrier to active outdoor play” (Brussoni M. , 2016, p. slide 39).

### **Interpretation of Evidence: Risk-Benefit Analysis**

- **Play providers need support in developing comprehensive play policies that recognize the importance of reasonable risk.**
- **Risk-benefit analyses must be built into planning and design of playspaces.**
- **Advocacy for more reasonable liability guidelines for play providers is needed.**
- **Benefits of risky play need to be promoted.**



## SECTION 6: Built Environment and Playspaces

The built environment as it relates to outdoor playspaces (i.e., parks, school grounds and day care outdoor spaces) includes not just the equipment (natural and manufactured) but the immediate and extended surroundings like pathways, links to roads and neighbourhoods.

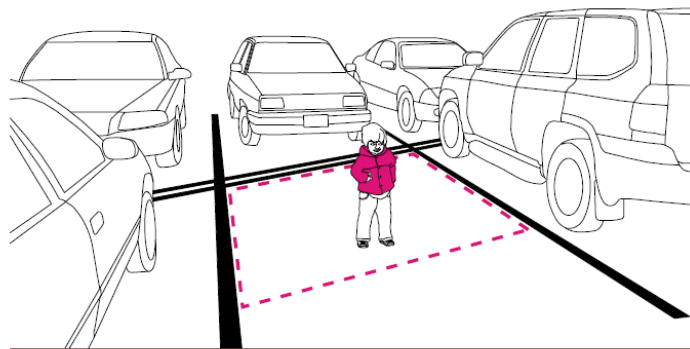
The physical design of a playspace influences the development of children including their social behaviour (Coe, Flynn, Wolff, Scott, & Durham, 2014). Framed a different way, Dymont & O’Connell (2013) asserted that the design of the playground is a determinant of play, in other words, the playspace determines how much and what kind of play children will have. For this reason, great care should be taken to clearly identify the goal and purpose of a playspace. If it is to maximize the opportunities for all aspects of child development, then the space must reflect this. In addition, if the goal is to enhance the childhood experience, then we must design the space based on the needs of the children rather than what parents, play providers and insurers want (Ball, Gill, & Speigal, 2012).



Research shows that certain park characteristics are more attractive than others and include: “park size, the availability of active recreation facilities and programs at the park, aesthetic features like water and trees, a park’s level of maintenance, and its perceived safety...” (Loukaitou-Sideris & Sideris, 2010, p. 90). In addition, research shows that having adequate shade in an area will also increase use of space and, by extension, increase levels of physical activity (Coe, Flynn, Wolff, Scott, & Durham, 2014; Cox, 2014).

The Toronto District School Board and Evergreen (Campbell, 2013) created a comprehensive document entitled, *Landscape and Child Development: A Design Guide for Early Years-Kindergarten Play-Learning Environments*, that is highly recommended for anyone planning to create a playspace, especially in a school setting. The report emphasized the need to have a diversity of spaces with multipurpose elements and loose (moveable) parts. They also emphasized the need for the space to have a community presence and to be an attractive setting in all four seasons.

Similarly, Herrington et al. (2007) developed a thorough guide for day care centres, called 7 C’s, however, many elements could be transferred to any playspace. The 7 C’s include: character, context, connectivity, change, chance, clarity and challenge. The guide provides a great illustration (see Figure 3) of how much outdoor space is allocated per child at a day care centre today compared to a parking spot for a vehicle. In essence, 14m<sup>2</sup> is available for a Lincoln Navigator and half of that 7 m<sup>2</sup> is allocated per child for outdoor play (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007, p. 5). It is important to note that since this report, British Columbia has further reduced the requirement to 6 m<sup>2</sup> per child (Brussoni M. , 2017). In Ontario, day care centres are required to provide 5.6 m<sup>2</sup> per child (Government of Ontario, 2015).



**14m<sup>2</sup> for your Lincoln Navigator**  
**7m<sup>2</sup> for your Little Navigator**

**06 left:** Child care licensing regulation in British Columbia requires a minimum of 7m<sup>2</sup> per child of outdoor play space only half of a vehicle parking space.

**Figure 3. Available outdoor playspace per child in British Columbia.**

While the space allocation per child for outdoor play has shrunk since the 1980's, the requirements for the allotment of space around playground equipment has increased. As mentioned in Section 4: Injuries and Playground Safety, the CSA Standard includes regulations that seriously hamper the use of the playspace area resulting "...in lower play structures with bigger no-encroachment zones (areas that must be kept free of objects and children not playing on the equipment). These regulations further decrease space for gross motor play" (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007, p. 4). While this study focused on day cares, the safety regulations apply to all equipment in any setting meaning that the available playspace is shrinking in order to accommodate these no-encroachment zones.

In addition to the restrictions created by the Standard, there may be other municipal or school regulations that may also influence the quality of the playspace. For instance, developers are required to provide a certain amount of parkland in sub-divisions, however, the space may not necessarily be the best quality land which results in limited options for play features.

Given that healthy child development benefits from various types of free play, developing different zones that allow for different play experiences including risky play is important. Luken et al. (2011) outlined the principles of a playscape which included a natural environment that allows each child to experience the space in a different way. The design is such that every child can tailor it to their needs; it puts the child in the director's chair of her/his own experience. The authors described a number of playscape principles that encourage different kinds of play and includes terms such as: "hands-on," "multi-sensory," "open-ended," "multiple and divergent uses," and "experienced by children as they choose to do so" (Luken, Carr, & Brown, 2011, pp. 328-329). It is imperative to ensure that zones flow well and are compatible; for instance, a rough and tumble play zone would not be located near a quiet zone (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007).

While the physical area for the play features is important, using different elements that make the space more comfortable for humans, especially with respect to such issues as sound, air quality, and

temperature needs to be considered. One study looked at different day care play environments and found that “[c]entres that had primarily hard surfaces and exposure to street sound measured high in noise levels. The adults and children using these spaces also experienced higher level [sic] of stress than at quieter centres” (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007, p. 11).

## A Word about Accessibility

It is imperative that playspaces are AODA (Accessibility for Ontarians with Disabilities Act) compliant. As it relates to outdoor play spaces in our community, the agencies required to follow the AODA Standards include municipal governments, public sector organizations and large private and not-for-profit organizations. The relevant regulations include 80.18, 80.19 and 80.20 (Government of Ontario, 2005) and can be found in Appendix B.

Annex H of the CSA Standard includes the requirements to make a playspace accessible to persons with physical and cognitive disabilities. According to Scott Belair, instructor for the Playspace Accessibility Course through the Canadian Playground Safety Institute, Annex H of the CSA Standard is more rigorous than the requirements of AODA (Belair, 2015). If a playspace meets the Standard, then the AODA standard will be met as well. Accessibility advocates are quick to point out that accommodating children with disabilities does not mean creating a separate area with accessible play elements. Instead, there is a strong push to use **Universal Design** principles which means that every element is interesting and accessible for all ages and abilities. In following these principles, the playspace is inclusive and welcoming to all. In addition to Annex H of the CSA Standard, the *Let’s Play Toolkit* from the Rick Hansen Foundation is a great resource for inspiring inclusive playspace design (Standfield, nd).



It is important to remember that children with mobility issues represent a small minority of children with disabilities (13%) (Statistics Canada, 2008). Table 3 outlines the percentage of children with various disabilities based on Statistic Canada’s 2006 Participation and Activity Limitation Survey.

**Table 3. Types of Disabilities for Children between 5 and 14 years of age for 2006 and 2001.**

Disability	2006	2001
Hearing	12%	13%
Seeing	10%	9%
Mobility	13%	14%

Disability	2006	2001
Agility (formerly Dexterity)	21%	20%
Chronic Condition (e.g., asthma, cystic fibrosis, heart condition)	67%	65%
Learning	69%	65%
Psychological	35%	32%
Developmental	31%	30%
Other	4%	3%

The AODA requires that users of the space including children with disabilities need to be consulted when designing new play environments. Various stakeholders (i.e., children, parents, teachers, early learning specialists, schools and municipalities) may have differing ideas of what encompasses an ideal play space. In order to best meet the needs of everyone, engaging children, the community, neighbourhood, user groups and play/park specialists at the beginning of the design of a new or updated playspace is a key strategy. It starts with being clear about the purpose of the space. According to the Canadian Biodiversity Institute which supports schools in developing their outdoor spaces, “involving everyone right from the start gives people an equal chance to join in the consultation and planning processes. Making sure everyone is involved will help you to achieve the best results for your school including the long-term use and maintenance of the grounds” (School Grounds Transformation).

## Key Design Features

Table 4 outlines the various design features that were generated from the many articles and reports reviewed for this paper that support active outdoor play and healthy child development. These features were identified by the many researchers as the items that encourage different types of play incorporating both manufactured and natural elements. It is not an exhaustive list.

**Table 4. Design Features for Outdoor Playspaces**

Design Categories	Design Features
Geography and Surfaces	<ul style="list-style-type: none"> <li>Rolling topography (Warr, 2013; Luken, Carr, &amp; Brown, 2011)</li> <li>Shade (Coe, Flynn, Wolff, Scott, &amp; Durham, 2014; Cox, 2014)</li> <li>Natural elements (Brussoni, et al., 2015)</li> <li>Ground level vs. elevated level play elements (CPSI, 2015)</li> <li>Firm and stable surfaces (Topping, 2014)</li> <li>Variety of surfaces (e.g., wood chips/bark mulch, sand, engineered wood fibre, recycle rubber chips) (Topping, 2014)</li> </ul>

Design Categories	Design Features
Landscape	<ul style="list-style-type: none"> <li>• Looped pathways (Coe, Flynn, Wolff, Scott, &amp; Durham, 2014; Luken, Carr, &amp; Brown, 2011)</li> <li>• Sand areas (Coe, Flynn, Wolff, Scott, &amp; Durham, 2014; Luken, Carr, &amp; Brown, 2011; Topping, 2014)</li> <li>• Water features (Coe, Flynn, Wolff, Scott, &amp; Durham, 2014; Luken, Carr, &amp; Brown, 2011; Topping, 2014)</li> <li>• Pathways (Warr, 2013)</li> <li>• Large trees and shrubs (Warr, 2013; Luken, Carr, &amp; Brown, 2011)</li> <li>• Ramped pathway (CPSI, 2015)</li> <li>• Adequate clearance around elements (Topping, 2014; Standfield, nd)</li> <li>• Linked accessible pathways between playspace and other amenities (Topping, 2014)</li> </ul>
Introduced items	<ul style="list-style-type: none"> <li>• Boulders (Warr, 2013; Luken, Carr, &amp; Brown, 2011)</li> <li>• Logs (Warr, 2013; Luken, Carr, &amp; Brown, 2011)</li> <li>• Gardens/edible landscape (Luken, Carr, &amp; Brown, 2011; Topping, 2014)</li> <li>• Hiding places, tunnels, digging pits (Luken, Carr, &amp; Brown, 2011)</li> <li>• Messy zones (Herrington, Lesmeister, Nicholls, &amp; Stefiuk, 2007)</li> <li>• Seating (Luken, Carr, &amp; Brown, 2011; Topping, 2014)</li> <li>• Storage for loose parts (Luken, Carr, &amp; Brown, 2011)</li> <li>• Manipulable materials (Brussoni, et al., 2015)</li> <li>• Ramps (CPSI, 2015)</li> <li>• Handrails and transfer systems (CPSI, 2015)</li> <li>• Accessible play equipment (CPSI, 2015)</li> <li>• Wind-chimes and other noise-makers (Topping, 2014)</li> </ul>
Philosophy	<ul style="list-style-type: none"> <li>• Freedom to choose play activities (Brussoni, et al., 2015)</li> <li>• Universal design - “all people can use the majority of features and spaces” (Standfield, nd, p. 8; Topping, 2014)</li> </ul>

## Interpretation of Evidence: Built Environment and Playspaces

- To have the best outcomes in child development, the design of a play environment should be a collaborative effort among key stakeholders including, most importantly, children of all abilities.
- Playspaces need to provide adequate space for multiple play zones.
- Ensure a diversity of play elements that allow children to choose their own play experience.
- The space should conform to universal design principles as often as possible.
- The space should meet the safety requirements in the CSA Standard.

## Conclusion

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A question about reducing playground injury rates resulted in an analysis of the evidence around outdoor play and the myriad of issues surrounding it including risky play, natural playspaces, risk-benefit assessments, playspace design and so much more. This review of the literature has contributed to a greater understanding of the issues around outdoor playspaces for children. With this knowledge, Peterborough Public Health will develop resources and tools to assist play providers in updating and enhancing existing playspaces as well as designing and building healthy, complete outdoor playspaces for children.



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## Appendix A: Glossary of Terms

Term	Definition
<b>Active Play</b>	“...play that includes light, moderate, and/or vigorous physical activity” (Outdoor Play Canada, 2017).
<b>Affordances</b>	<p>“An affordance can be thought of as an ‘action possibility’ for an individual in relation to the environment, depending on that individual’s capabilities” (Stanley, 2011, p. 189).</p> <p>“...the range of functions provided by environmental objects...” (Anggard, 2011, p. 8).</p> <p>“...physical environment that we live in affords different actions and behaviors. The affordances of the environment include what it ‘invites’ us to do, and the concept of affordances includes both the environment and the person, meaning that the affordances are unique for each individual and correspond with the individual’s body size, strength, skills, courage, fear, etc.” (Sandseter, 2009, p. 439).</p> <p>Physical affordances will only have value if children are actually given the time, space and “permission” to play (i.e., social and cultural affordances) (Babcock, 2017).</p>
<b>Built Environment</b>	“...part of the physical environment that is human-made or the modified physical surroundings in which people live, work, and play. The built environment includes: land use patterns, transportation systems, physical infrastructure of roads, trails, sidewalks, bike paths, parks; design of the physical elements in a community” (Outdoor Play Canada, 2017).
<b>Child Development</b>	“...the physical, cognitive, social, and emotional maturation of human beings from conception to adulthood. It is a process that is influenced by interacting biological, social and environmental processes” (Outdoor Play Canada, 2017).
<b>Child-directed play</b>	Play activities are initiated and directed by children. Adults have a hands-off approach—they can be nearby but do not organize or interfere in the play (i.e., adult-directed). The term “child-directed is used as a qualifier to emphasize the principle component of play in which the child leads and directs how he or she chooses. The child’s central role is in determining her or his play.” (Outdoor Play Canada, 2017)
<b>Composite Playstructure</b>	“Two or more play structures attached or functionally linked to create one integral unit that provides more than one play activity” (CSA, 2014, p. 15).

Term	Definition
<b>Free Play</b>	“...used interchangeably with unstructured play. Consistent with the broad definition of play, it is child directed, intrinsically motivated and is a goal in itself without external rules and structure. Activities such as organized sports are not considered free play. Free play can happen within an organized program when it is child-directed and freely chosen” (Outdoor Play Canada, 2017).
<b>Hazard</b>	“...a potential source of harm or danger. Hazards can be mitigated or avoided. They are a source of harm that is obvious (e.g. walking on the railing of a bridge) or not obvious, such that the potential for injury is hidden, or where the child does not have the competence to manage the hazard, or where there is no obvious benefit to the child in experiencing the hazard (e.g.: broken railing, fast moving current in a river).” (Outdoor Play Canada, 2017).
<b>Inclusive</b>	“...the practice of ensuring that people feel they belong, are engaged, and connected. Inclusive playgrounds are ones designed specifically to ensure that children of multiple abilities can play together—not just alongside each other” (Standfield, nd, p. 8).
<b>Injury</b>	<p>“...the damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance, or from a lack of one or more vital elements (e.g., oxygen). Injuries are usually defined by their intention, including unintentional injuries (e.g., fall, motor vehicle crash), and intentional injuries (e.g., assault).</p> <p>Injury covers two general categories: general injuries—unintentional (including poisoning, spinal cord and traumatic brain injuries, motor vehicle injuries, falls, fires, pedestrian-related injuries, water-related injuries, and natural disasters), and violence (child maltreatment, intimate partner violence, sexual violence, suicide, youth violence, and terrorism).” (Outdoor Play Canada, 2017).</p>
<b>Injury Prevention</b>	“...the effort to prevent, ameliorate, treat, and/or reduce injury-related disability and death” (Outdoor Play Canada, 2017).
<b>Loose parts</b>	“...materials that can be moved, carried, combined, redesigned, lined up, and taken apart and put back together in multiple ways. They are materials with no specific set of directions that can be used alone or combined with other materials” (Outdoor Play Canada, 2017). Also known as dynamic or responsive materials.
<b>Manufactured constructive</b>	Playground equipment that “[i]ncludes all areas that encourage constructive, symbolic or creative play such as wooden boat, tree house, store, post office” (Dyment & O’Connell, 2013, p. 276).

Term	Definition
<b>Manufactured functional</b>	"Includes all areas that encouraged functional play such as slides, metal forts, monkey bars and swings" (Dyment & O'Connell, 2013, p. 276).
<b>Natural Environment</b>	"...all living and non-living things that are naturally occurring on Earth. It is the environment that is not designed by humans. When humans influence an environment, it is defined as the built environment or cultural landscape" (Outdoor Play Canada, 2017).
<b>Nature Play</b>	"...play that happens primarily outside in a natural environment and/or involves play with natural elements and features, such as water and mud, rocks, hills, forests, and natural loose parts, such as sticks, pine cones, leaves, grass etc." (Outdoor Play Canada, 2017)
<b>No-encroachment</b>	"The additional area adjacent to the protective surfacing zone intended to allow pedestrian traffic near the play equipment in use while minimizing the risk of injury to pedestrians" (CSA, 2014).
<b>Outdoor Play</b>	"...play that takes place outside and includes concepts of risky play and nature play. The principles of child directed and unstructured are assumed in this definition." (Outdoor Play Canada, 2017)
<b>Play</b>	"...what children and youth do when they follow their own instincts, ideas and interests, in their own way, and for their own reasons. <sup>5</sup> Play is <b>freely chosen</b> (a child chooses when, if and how to play), <b>intrinsically motivated</b> (a child plays because they are motivated internally to do so), and <b>personally-directed</b> (a child individually and/or collectively directs their own play)..." (Outdoor Play Canada, 2017).
<b>Playscape</b>	"...a play environment focused on providing children with an avenue for unscripted play. The physical play elements within natural playscapes are predominantly made using natural, recycled, or reclaimed materials" (Warr, 2013, p. ii).  "nature-based environments designed for children's open-ended play and learning" (Luken, Carr, & Brown, 2011)
<b>Prospect</b>	Using the highest part of the playscape to provide the child with a vantage point to see the surrounding area (Herrington, Lesmeister, Nicholls, & Stefiuk, 2007).

Term	Definition
<b>Risk</b>	<p>“...the possibility of gaining or losing something of value, with an intentional interaction with uncertainty and probability. Risk is subjective and can vary from person to person” (Outdoor Play Canada, 2017).</p> <p>“...a situation whereby a child can recognize and evaluate a challenge and decide on a course of action. This is in contrast to common use of the word to describe hazards that children cannot assess for themselves and that have no clear benefit” (Brussoni, et al., 2015, p. 6425).</p>
<b>Risk Aversion</b>	<p>“...human behaviours or actions to reduce uncertainty and danger when exposed to unknown, potentially negative outcomes” (Outdoor Play Canada, 2017).</p>
<b>Risk Benefit</b>	<p>“...a part of a risk assessment method in which an evaluation of the potential benefits to children and others. Play and social value are considered alongside the potential risks associated with the provision. It allows providers to satisfy legal obligations, while promoting a balanced approach” (Outdoor Play Canada, 2017).</p>
<b>Risk Benefit Analysis</b>	<p>“...a process where the practitioner or program weighs, with equal consideration, the duty to protect children from avoidable, serious harm and the duty to provide them with valuable play opportunities” (Outdoor Play Canada, 2017).</p>
<b>Risk Management</b>	<p>“...a systemic rational approach to managing uncertainty within an operating environment” (Outdoor Play Canada, 2017).</p>
<b>Risky Play</b>	<p>“...thrilling and exciting forms of play that involve a possibility of physical injury. Risky play provides opportunities for challenge, testing limits, exploring boundaries and learning about injury risk. Risky play can be categorized as: 1. play with great heights, 2. play with high speed, 3. play with dangerous tools, 4. play near dangerous elements, 5. rough-and-tumble play, and 6. play where the children can “disappear”/get lost.” (Outdoor Play Canada, 2017)</p>
<b>Safety</b>	<p>“...a state in which dangers and conditions that could cause physical, psychological or material harm are controlled in a manner to preserve the health and well-being of individuals and the community.<sup>15</sup> Safe or safety are perhaps the most commonly encountered terms in debates about children and risk. e.g.: ‘Is this playground, park, tree, public space safe?’ It is important to understand that the word ‘safe’ can mean different things to different people” (Outdoor Play Canada, 2017).</p>
<b>Softfall</b>	<p>Fall surfacing like wood chips (Dyment &amp; O'Connell, 2013).</p>



Term	Definition
<b>Structured Play</b>	“...distinctly different from the definition of play understood in this context. This concept includes games when they are adult directed, e.g.: tag, kick the can, soccer, grounders and sport related activities” (Outdoor Play Canada, 2017).
<b>Universal Design</b>	“...produces buildings, products, and environments that are usable and effective for everyone, not just people with disabilities, without the need for adaptation or specialized design” (Standfield, nd, p. 8).
<b>Unstructured Play</b>	“...play that is <b>not</b> initiated in an organized, planned or formal way. It emphasizes self-directed, emergent aspects of play and is not externally directed by adults. It is aligned, but distinct from play-based learning, which uses play concepts for educator-directed learning. It is important to note that play often becomes more structured when children are given time and repeated experiences in the same space” (Outdoor Play Canada, 2017).
<b>Videophilia</b>	The “...growing inclination to be preoccupied with sedentary activities involving electronic media” (Dustin, Bricker, & Schwab, 2010, p. 4).

## Appendix B: AODA – Regulations Regarding Outdoor Playspaces

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### Outdoor Play Spaces, Application

80.18 (1) This Part applies to newly constructed and redeveloped outdoor play spaces that an obligated organization, other than a small organization, intends to maintain and that fall within the description set out in subsection (2). O. Reg. 413/12, s. 6.

(2) The outdoor play spaces to which subsection (1) applies consist of an area that includes play equipment, such as swings, or features such as logs, rocks, sand or water, where the equipment or features are designed and placed to provide play opportunities and experiences for children and caregivers. O. Reg. 413/12, s. 6.

### Outdoor Play Spaces, Consultation Requirements

80.19 When constructing new or redeveloping existing outdoor play spaces, obligated organizations, other than small organizations, shall consult on the needs of children and caregivers with various disabilities and shall do so in the following manner:

1. The Government of Ontario, the Legislative Assembly, designated public sector organizations and large organizations must consult with the public and persons with disabilities.
2. Municipalities must also consult with their municipal accessibility advisory committees, where one has been established in accordance with subsection 29 (1) or (2) of the Act. O. Reg. 413/12, s. 6.

### Outdoor Play Spaces, Accessibility in Design

80.20 When constructing new or redeveloping existing play spaces that they intend to maintain, obligated organizations, other than small organizations, shall,

- (a) incorporate accessibility features, such as sensory and active play components, for children and caregivers with various disabilities into the design of outdoor play spaces; and
- (b) ensure that outdoor play spaces have a ground surface that is firm, stable and has impact attenuating properties for injury prevention and sufficient clearance to provide children and caregivers with various disabilities the ability to move through, in and around the outdoor play space. O. Reg. 413/12, s. 6.