

## Garden trampolining

### Introduction

Trampolining is both a popular grass-roots activity and an elite, Olympic-level sport. At the grass-roots level, garden trampolines provide a relatively inexpensive source of enjoyment as well as aerobic activity for thousands of young children. As children grow, they can develop their gymnastic prowess thanks to the resources available in local school trampoline clubs, leisure centres and parks.

Children of all ages love the feeling of flying through the air and mastering skills ranging from basic jumps and landing safely to advanced acrobatics including complicated somersaults.

The downside is that hospital Emergency Departments (A&E) are now having to deal with significant numbers of trampolining injuries.

The challenge is to provide participants with the skills and simple rules that enable them to enjoy trampolining without getting injured.

### Background

Over the last 15 years we have seen a huge increase in the number of trampolines in British gardens, with sales taking off in 2005<sup>1</sup>. Between 200,000 and 250,000 trampolines were sold in the UK in 2014<sup>2</sup>. Many domestic trampolines are relatively inexpensive and they are hugely popular among children and young teenagers. Bouncing on a trampoline is a source of aerobic exercise which can be great fun. There is no minimum requirement - in terms of shape, size or ability – and no limit to the skills and fitness that can be developed.

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<sup>1</sup> <http://www.bbc.co.uk/news/magazine-19711501>

<sup>2</sup> Manufacturer's estimate

However, there is a poorly documented downside. Trampolining causes injuries, ranging from minor bruises and sprains to life-changing compound fractures and spinal injuries. The growing toll of Spring and Summer-time trampolining injuries has led clinicians to raise concerns about the activity and identify a number of causal factors. According to a research study carried out in Dundee, causal factors include<sup>3</sup>:

- 60 percent of injuries are caused by more than one person bouncing on the trampoline at the same time, contrary to guidelines.
- Almost half of injuries happened when there was a lack of adult supervision.
- Children have been hurt while being supervised or bouncing with adults who have been drinking at a summer garden party.

After many years of drafting, a new European Union standard has been published (EN 71 – 14:2014 “Safety of toys - Trampolines for domestic use”). However, according to some trampoline manufacturers, this standard is unlikely to make a significant difference to the number and severity of trampolining injuries.

## **New data**

RoSPA has been working with the Royal College of Emergency Medicine (RCEM) to improve understanding of why record numbers of people are attending England’s hospital Emergency Departments (A&E). Since January 2012, Oxford University Hospitals Trust has been collecting the RCEM’s Minimum DataSet (MDS) which includes a combination of demographic data as well as location, activity, injury severity and injury mechanism. These records have now been analysed by the Global Public Health team at Queen Mary, University of London.

Within these records, injuries for 20,883<sup>4</sup> children (aged 0-19) were treated by A&E in the 27 months between January 2012 and March 2014. The vast majority (80.8%) of these injuries were sustained in the home, in leisure and in school.

372 (1.8%) of these injuries involved a trampoline. Pro-rata, more than 13,000 trampolining injuries are treated in English A&E departments every year at an annual cost to the NHS of £1.5million<sup>5</sup>. Almost three quarters of these trampoline injuries happened in the home environment<sup>6</sup>. In contrast, it is worth highlighting that relatively few injuries have been reported from trampolining in the more controlled environments of clubs and schools.

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<sup>3</sup> <http://www.telegraph.co.uk/health/healthnews/5429450/Summer-trampoline-warnings-dont-drink-and-bounce.html>

<sup>4</sup> Location for 0-19 year olds in the Oxford data: Home 7,700, Leisure 4,906, Education 4,269, Road 1,822, Work 323, other 1,863 giving a total of 20,883.

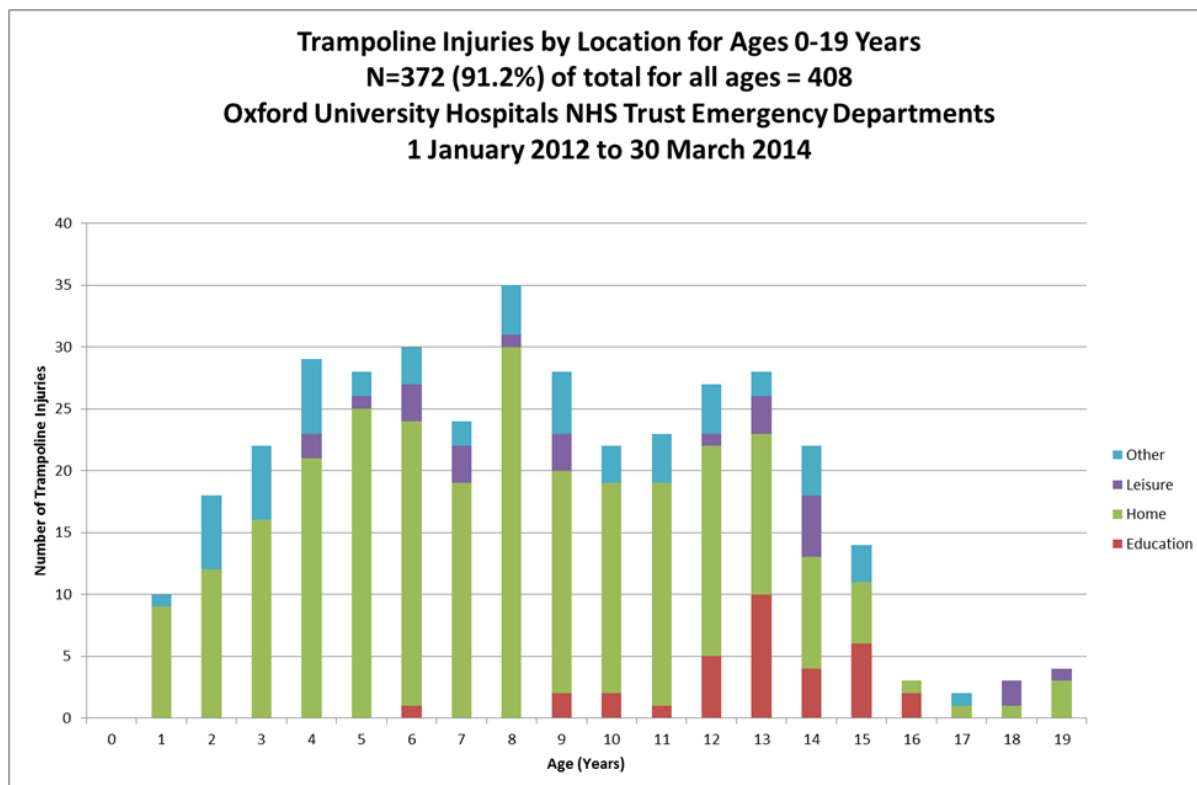
<sup>5</sup> Population of Oxfordshire / England in 2014 = 661,000 / 53.9 million. Oxfordshire is 1/80 of England’s population. In 27 months, pro-rata attendances = 372 x 80 = 29,760. Annually, pro-rata attendances = 29,760 / (27/12) = 13,227. According to the Department of Health’s Reference Costs 2012/13, each A&E attendance costs £114. Hence 13,227 x £114 = £1.5m.

<sup>6</sup> Home is listed as location along with Trampolining as activity for 258 cases in 0-19 year olds, 69% of trampoline injuries across all locations for this age group.

In Oxfordshire, girls aged 0-19 years accounted for 57% of trampolining injuries.<sup>7</sup>

19% of trampolining injuries were deemed by clinicians to be among the most serious triage codes requiring urgent medical attention.<sup>8</sup>

The graph of trampolining injuries by age and location shows that garden trampolines account for the majority of trampolining injuries among young children, with 8 year olds suffering the largest number of injuries. As children become teenagers, school trampolining accounts for a larger share of a shrinking number of injuries.



## Types of injuries

Published academic research doesn't give us a clear picture of the most likely trampolining injuries. A review by Graham Kirkwood<sup>9</sup> shows that some research suggests arm or leg fractures<sup>10</sup> while other suggests soft tissue injuries (such as

<sup>7</sup> Among 0-19 year olds, 213 girls and 159 boys were injured on trampolines. Total 372. Proportion of girls is 213/372 = 57%.

<sup>8</sup> Classified as red meaning "immediate life threat", orange "imminent life threat" and yellow "potential life threat, limb threat".

<sup>9</sup> Graham Kirkwood: Research Fellow at the Global Public Health Unit (Centre for Trauma Sciences), Queen Mary, University of London.

<sup>10</sup> Hurson C, Browne K, Callender O, O'Donnell T, O'Neill A, Moore DP, et al. Pediatric trampoline injuries. Journal of pediatric orthopedics. 2007;27(7):729-32. Epub 2007/09/20.

bruises) and strains<sup>11</sup> are the most common type of injury. Similarly there is no clarity over which is the most likely part of the body to be injured, with some research finding upper body injuries more likely<sup>12</sup> while other finds that lower body injuries are more likely<sup>13</sup>. This confusion may be due to the age of some of the research and the fact that trampoline design has evolved over time.

Net enclosures are now sold with most of the UK's garden trampolines and this helps prevent people from falling off the trampoline and suffering injuries to their feet, ankles and legs. However, nets don't prevent awkward landings within the trampoline. The Oxford data shows that the most common, serious trampolining injuries are now fractures to the upper limb:

1. Elbow
2. Wrist
3. Forearm
4. Hand
5. Collar bone

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<sup>11</sup> Smith GA, Shields BJ. Trampoline-related injuries to children. Archives of pediatrics & adolescent medicine. 1998;152(7):694-9. Epub 1998/07/17.

<sup>12</sup> Sandler G, Nguyen L, Lam L, Manglick MP, Soundappan SS, Holland AJ. Trampoline trauma in children: is it preventable? Pediatric emergency care. 2011;27(11):1052-6. Epub 2011/11/10.

<sup>13</sup> Nysted M, Drogset JO. Trampoline injuries. British journal of sports medicine. 2006;40(12):984-7. Epub 2006/09/27.

## **Enjoying trampolining – without the injuries**

What follows is an evidence-based checklist that should help bouncers reduce the risk of serious injuries to themselves and others, while still enjoying all the benefits of trampolining.

### **Key safety points**

- Take turns, one at a time! 60% of injuries occur when more than one person is on the trampoline. The person weighing less is five times more likely to be injured.
- Trampolining isn't suitable for children under the age of six because they're not sufficiently physically developed to control their bouncing.
- Trampolining injuries can occur to all parts of the body, including the neck, arms, legs, face and head. Head and neck injuries are the most serious injuries associated with trampolines.
- Adult supervision is no guarantee of safety. More than half of all trampoline accidents occur whilst under supervision. However a trained 'spotter' can greatly reduce this risk.
- Never combine alcohol with trampolining! Children have been hurt while bouncing with adults who have been drinking at summer garden parties.
- Whatever your ability level, join a local trampolining club to learn new trampolining skills.

### **Advice for parents**

#### **Purchase**

- Buy safety pads, or ensure that the model comes with safety pads that completely cover the springs, hooks and the frame. The pad should be a contrasting colour to the mat.
- Consider models that have safety netting as part of the design, or purchase a safety cage when you buy the trampoline. Ideally the netting should be designed to prevent contact with any rigid components (such as the trampoline frame) and it will reduce the chance of your child falling off the trampoline and striking the ground.
- All commercial trampolines manufactured from 2001 should meet BS EN 13219:2001 Trampolines. Trampolines should also be compliant to the relatively new European Standard EN 71 – 14:2014 "Safety of toys – Trampolines for domestic use".

#### **Positioning**

- Most garden trampolines should have a safety net enclosure. This prevents falls from the trampoline and associated injuries (fractures and sprains) to legs, ankles and feet. If your trampoline doesn't have a safety net, choose a clear area, which is clear from hazards such as

trees, fences, washing lines, greenhouses, cold frames, poles or other garden equipment. Ideally there should be a safe fall zone, completely around the trampoline of at least 2.5 metres. This safe fall zone should be clear of any objects such as bikes, skateboards and other toys.

- Smaller junior trampolines may have a hand rail instead of safety net enclosure. Children should be encouraged to hold onto the hand rail to help keep their balance while bouncing. Unfortunately, hand rails can cause head injuries when children fall onto them.
- Place the trampoline on soft energy absorbing ground such as a soft and springy lawn or bark wood chip, sand or other cushioning materials.
- Never place the trampoline on a hard surface such as concrete or hard-packed mud, without some form of crash matting or safety netting.
- Most trampoline retailers/manufacturers provide ladders. When the trampoline isn't in use, ladders should be removed to prevent unsupervised access by very small children. At other times, when ladders are aligned with the net entrance, they offer safe access to the trampoline. By making it easier to get into the middle of the trampoline, ladders can discourage older children from walking around the outside of the net...and potentially falling off.

### **Storage**

- It is important that a trampoline is stored safely when not in use, particularly during winter months when the wind can force a trampoline to become airborne.
- Tie down large trampolines – there are tether kits available that can be used for this purpose.
- With smaller trampolines, flip them upside down.
- Remove safety netting from enclosure/cage frames to reduce the sail-like qualities of the cages during windy weather.

### **Using the trampoline**

- Never allow more than one person on the trampoline at the same time.
- Bouncers should always aim for the 'sweet spot' in the centre of the trampoline.
- Trampolines are not suitable for very young children and toddlers (0 to 3 year olds). Although RoSPA doesn't recommend trampolining for children under the age of 6, children aged 3-6 should only use trampolines designed for their age and size. 'Junior' trampolines are sold as being suitable from 3 years of age.
- Always supervise children.
- Don't allow somersaults or risky, complicated moves unless bouncers have learned the skill from experts at a properly organised trampoline club.
- Never allow bouncing to exit the trampoline.

### **Advice for bouncers - using your trampoline**

- Take it in turns! Although bouncing with friends and family can be fun, you're far more likely to crash into each other or fall off and injure yourself.
- Always aim for the 'sweet spot' in the centre of the trampoline.
- No somersaults - unless you have been trained. If you want to learn new trampolining skills and complicated moves, go to a properly organised club and learn from experts.
- Never use a bounce to leave the trampoline – you'll probably be travelling too fast to land safely without hurting yourself.
- Enjoy the thrill of soaring through the air...and landing safely.