



# Booster Seat Use in Canada: A National Challenge

June 2004

Safe **Kids**  
CANADA

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## About Safe Kids Canada

Injuries are the number one cause of death and disability among children and youth in Canada.

As a national leader, Safe Kids Canada works as a knowledge broker with a network of community partners and stakeholders by conducting, translating and disseminating research to prevent unintentional injuries. We use evidenced-based information to create injury prevention programs that have real-world applicability – raising awareness and educating parents on how to keep their children safe. In addition, Safe Kids Canada advocates for safer environments through changes to standards and legislation.

Safe Kids Canada is the national injury prevention program of The Hospital for Sick Children.



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Cette ressource est également disponible en français.

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## Report methodology

*Booster Seat Use in Canada: A National Challenge* was developed for Safe Kids Week 2004, a national campaign promoting the need for booster seats. The report is based on an extensive literature review of national and international academic sources, as well as the analysis of unpublished statistics from key Canadian sources including Transport Canada, the Canadian Institute for Health Information, and the Canadian Hospitals Injury Reporting and Prevention Program. Safe Kids Canada also commissioned two research surveys to measure public attitudes and behaviours about booster seats.

The Safe Kids Week 2004 campaign *Age 4 to 9? It's Booster Seat Time!* has been endorsed by the Canadian Paediatric Society, the Canadian Public Health Association and the Auto 21 Network of Centres of Excellence.

Age 4 to 9?  
It's Booster Seat Time!

# From the Executive Director

Imagine if a classroom full of primary students died in a tragedy that could have been prevented.

That is essentially what is happening every year in Canada. More than 35 children between the ages of 4 and 9 die in car crashes. Another 360 are seriously injured and need to be hospitalized. **That's more than one child killed or seriously injured every day.**

Motor vehicle crashes are the leading cause of death and serious injury to children of all ages, but those age 4 to 9 are currently the most vulnerable. Canadian data shows that the death rate from car crashes has dropped in all other age groups, but not for children in this age range.

Data also tells us that the majority of Canadian children age 4 to 9 are riding in seat belts, which puts them at risk for serious injuries in a crash. Seat belts are designed to fit adult proportions; children generally don't reach the right size for a seat belt until at least age 9, often older.

Children who are too small for seat belts run the risk of what doctors call "seat belt syndrome" in the event of a crash. This refers to the range of serious injuries that happen to the internal organs and spine when a seat belt doesn't fit properly.

The risks of serious injury and death can be significantly reduced by use of a booster seat, a simple safety device that ensures a seat belt fits a child correctly. Unfortunately, our research shows that 28 per cent of Canadian parents of children age 4 to 9 say they are using booster seats for their children. Most parents think that their children are too big or too old for booster seats, but they are not.

As a nation, we must work harder to address this gap in protection of our 4 to 9 year old children:

1. **Parents must be given good information on the importance of booster seat use and how to tell if their child needs a booster seat or a seat belt.** While this will require many different strategies, Safe Kids Canada is raising the profile of the issue this spring through a large-scale national public awareness campaign. The Safe Kids Week campaign *Age 4 to 9? It's Booster Seat Time!* is being conducted with the help of our national network of more than 375 community partners and our sponsor Johnson & Johnson.
2. **Provinces and territories must implement booster seat legislation.** Legislation highlights the importance of safety products. Only Quebec has specific booster seat legislation, passed in 2002. In May 2004, Ontario introduced a bill that, if passed would make booster seats mandatory. We urge other provinces and territories to follow suit.

If implemented, these measures will ensure booster seats are as common to Canadian parents as car seats are now.

We protect our children with car seats when they are infants, toddlers, and preschoolers – our older children deserve the same degree of protection.



Allyson Hewitt  
Executive Director

## Johnson & Johnson: Partners in child safety

This report was made possible by the generous support of Johnson & Johnson, the primary sponsor of our annual Safe Kids Week campaigns and long-time supporter of Safe Kids Canada and other Safe Kids programs worldwide. This is more than a financial sponsorship; Johnson & Johnson is an active partner in our campaigns. The company distributes educational materials to parents through more than 5,000 stores that sell Johnson & Johnson products.

Post-campaign research tells us that as many as 20 per cent of parents learn about our safety messages through materials that they have picked up at stores. This year the campaign features a detailed growth chart with a Seat Belt Test, which parents can use to determine if their child needs a booster seat or seat belt.

Our heartfelt thanks to our friends at Johnson & Johnson who support the campaign, year after year. You truly are making a difference.

# The case for booster seats

## Deaths and serious injuries can be prevented

Every year, more than 35 Canadian children between the ages of 4 and 9 are killed in car crashes, and another 360 are seriously injured.<sup>1</sup> Many of these deaths and severe injuries could be prevented by the use of booster seats, a device which lifts a child to help the seat belt fit correctly over his or her body.

**Booster seats provide 60 per cent more protection than seat belts alone, and substantially reduce the risk of serious injury.**<sup>2</sup> In a crash, children in seat belts alone can suffer serious injuries to the head and face, internal organs, spine, and spinal cord.<sup>3,4,5,6,7</sup> Several studies have shown that children in booster seats rarely suffer spinal or abdominal injuries.<sup>8,9</sup> In addition, booster seats provide protection from devastating head injuries by preventing the child from hitting the inside of the car in a crash. Children in seat belts alone have four times the risk of a head injury, compared to children of the same age in booster seats.<sup>10</sup>

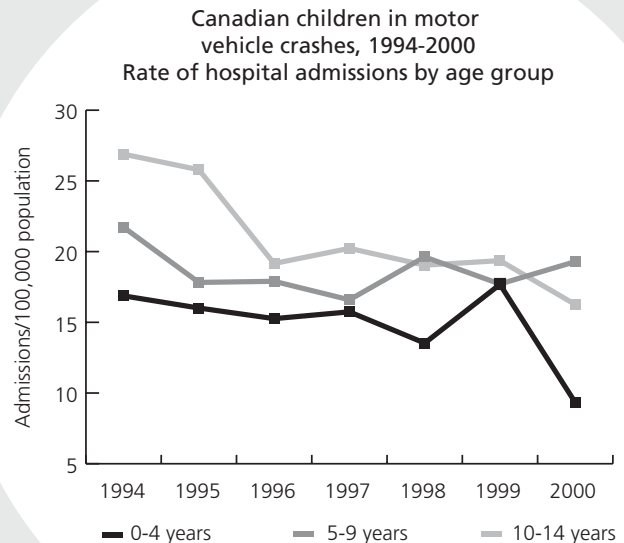
**At most, 28 per cent of Canadian children age 4 to 9 regularly use booster seats.**<sup>11</sup> Studies show that most babies, toddlers, and preschoolers are restrained in car seats, but when they outgrow these restraints – most commonly between the ages of 4 and 5 – the majority of children are moved directly into seat belts, not booster seats.<sup>12,13</sup> A Safe Kids Canada survey in the spring of 2004 showed that less than one third (28 per cent) of parents of children age 4 to 9 said they used booster seats.<sup>14</sup> Actual use (rather than self-reported use) is likely to be even lower, but no recent national observational studies are available. The last such study, conducted in 1997 by Transport Canada, put booster seat use at less than 5 per cent.<sup>15</sup>

**An estimated 1.8 million children age 4 to 9 are at risk of serious injury.** There are roughly 2.5 million Canadian children between the ages of 4 and 9.<sup>16</sup> If only 28 per cent of them are riding in booster seats, the vast majority – nearly 1.8 million children – are not properly protected.

## Statistics tell the story

Primary school children – age 4 to 9 – need our urgent attention. Serious injuries from motor vehicle crashes have been steadily declining since the 1980s, but primarily among children younger than 5 and older than 9; in stark contrast, the number of hospitalizations for children age 5 to 9\* has not dropped even half as much and the deaths have not dropped at all.

- Between 1997 and 2001, the death rate from car crashes dropped by 52 per cent among children under age 5 and by 25 per cent among children age 10 to 14, but did not drop at all for children age 5 to 9.<sup>17</sup>
- Between 1994 and 2000, hospital admissions from car crashes dropped by 45 per cent among children under age 5 and by 40 per cent among children age 10 to 14, but by only 18 per cent among children age 5 to 9.<sup>18</sup>
- Trends in head injuries are particularly disturbing. Hospital admissions for head injuries due to car crashes have declined by 48 per cent among children under age 5 and 54 per cent among children age 10 to 14, but only 32 per cent among children age 5 to 9.<sup>19</sup>



\* Some national statistics are compiled in the 5 to 9 age range, not 4 to 9; hence the discrepancy.

## Why seat belts don't fit young children – and what happens in a crash

Few people realize that seat belts are designed for adult bodies.<sup>20</sup> Most children don't reach the minimum size requirement to use a seat belt alone until **at least age 9**,<sup>21</sup> often older.

Seat belts are designed to keep people from hitting the inside of the vehicle or being ejected in a crash. To do this, a seat belt must put a great deal of pressure on the body to hold a person in place. The belt is designed to cross over the bones of the shoulder, chest, and hips, not soft tissues, since bones can better withstand the pressure of the seat belt in a crash.

**When a child is too small for a seat belt, it crosses over the wrong places such as the neck and abdomen.** These vulnerable areas, rather than the tougher hip and chest bones, would absorb the forces of a crash.

- A lap belt that starts out over the hips will eventually ride up onto the abdomen because a child's hipbones are not well enough developed to keep the belt in place.<sup>22</sup> In a crash, the child may suffer internal injuries to the liver, kidneys, bladder, spleen, or intestines.<sup>23,24</sup>
- Children have difficulty sitting up straight in a seat belt when they are too small; their legs can't bend comfortably over the edge of the vehicle seat.<sup>25</sup> They slouch to become comfortable, and this causes the lap belt to ride further up onto the abdomen.<sup>26</sup>

**Children are also at increased risk when they tuck the shoulder belt behind their back or under the arm.** Children do this because the seat belt is touching their neck or face.

- In a crash, these children are likely to jackknife forward – fold in half – over the lap belt.<sup>27</sup> Their spinal cords may be severely injured,<sup>28</sup> and their internal organs are likely to be ruptured or crushed.<sup>29</sup> Their heads are likely to hit the inside of the vehicle, causing head and brain injury.<sup>30,31</sup> Children may also sustain disfiguring facial injuries.<sup>32</sup>

**These risks are significantly reduced by a booster seat.**<sup>33</sup> It raises a child so that the shoulder belt crosses over the shoulder and chest bones, well away from the neck and face. It also keeps the lap belt in place over the hipbones.



A lap belt over the abdomen puts a child at risk for serious internal injuries



It is dangerous to put the shoulder belt behind the back or under the arm



### Doctors call it "seat belt syndrome"

The name is an apt description. It's the medical term for the pattern of injuries<sup>34</sup> to a child's internal organs and spine caused by an ill-fitting seat belt.

The damage is so severe that doctors can often see the mark of a lap belt on a child's abdomen. Organs between the spine and seat belt are ruptured or crushed – the liver, kidneys, bladder, spleen, or small intestines. Damage to the spinal cord leaves children at risk of permanent disabilities, including paralysis.

Left: Normal spine. Right: Spine damaged by ill-fitting seat belt.

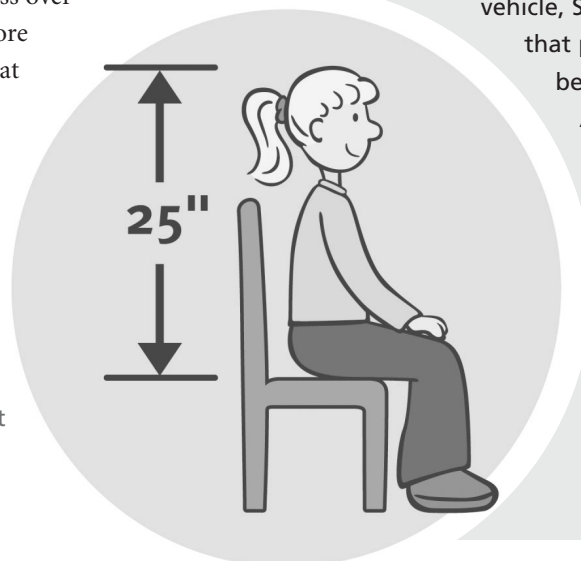
# Booster seats – the best protection

## “But my child is big enough for a seat belt”: A common misconception

That’s the number one reason why parents of children age 4 to 9 say they don’t use booster seats.<sup>35</sup> (See more about parental attitudes on page 8.) Some think it’s an issue of maturity and skill – that their children can use seat belts alone when they buckle themselves into vehicles. These are not key factors in crash protection. There are physical reasons why young children’s bodies are not ready for seat belts:

- **Children’s hipbones and spines are still developing.** Adults have strong and fully developed hipbones to anchor the lap belt in place.<sup>36</sup> Children’s underdeveloped hipbones simply cannot do this; the lap belt rides up onto the abdomen, putting them at risk of internal injuries.<sup>37</sup> In addition, children’s developing spines are more flexible than adults, which puts them at increased risk of sliding out of a seat belt in a crash.<sup>38</sup>
- **Children have different proportions than adults.** Children cannot sit up straight with their legs bent over the edge of the vehicle seat, a posture needed for the seat belt to fit correctly.<sup>39</sup> They lack both the height and thighbone length to sit in this position. In order to bend their legs over the seat, children slouch down in the seat belt, which causes the lap belt to slide high up onto the abdomen.<sup>40</sup> In addition, children have a shorter torso and narrower shoulders, both of which cause the shoulder belt to cross over the neck and face. Children are also more top-heavy than adults, which means that children’s bodies are more likely to snap forward in a sudden stop or crash, causing them to hit the inside of the vehicle.<sup>41</sup>

Seated height



## Who needs a booster?

Parents should assume that their child needs a booster seat from the time he or she outgrows the car seat – usually between age 4 and 5 – until at least age 9, often older.

Age is just a guideline, since children vary widely in proportions and rate of growth. However, growth charts show that the majority of children age 4 to 9 do not have the right proportions to fit seat belts safely without the help of belt-positioning booster seats.

When is a child ready to use a seat belt alone? There are two key criteria:

**Seated height.** A child needs to have a seated height of **at least 25 inches (63 cm)** before he or she can be considered for a seat belt. When a child is sitting down, this is the measurement from the tailbone to the top of the head.

**Seat belt fit.** Next, parents should try the child in the seat belt. The shoulder belt should cross the chest without touching the face or neck, and the lap belt should fit low over the hipbones and stay there without riding up onto the abdomen. The child must also be able to bend his or her knees comfortably over the edge of the vehicle seat while sitting up straight. (See *The Seat Belt Test*, page 9.)

Seat belt fit can vary depending on the model of vehicle. If a family has more than one vehicle, Safe Kids Canada recommends that parents check the way the seat belt fits their child in each vehicle.

A child may be able to use a seat belt in one vehicle, but still need a booster seat in the other. In addition, parents and caregivers should always follow manufacturers’ instructions regarding the height and weight limits for booster seats.

## A simple and effective safety device

A booster seat is a positioning device that works with the existing seat belt system. A booster seat raises a child so that the seat belt fits correctly across the shoulder, chest and hip bones.

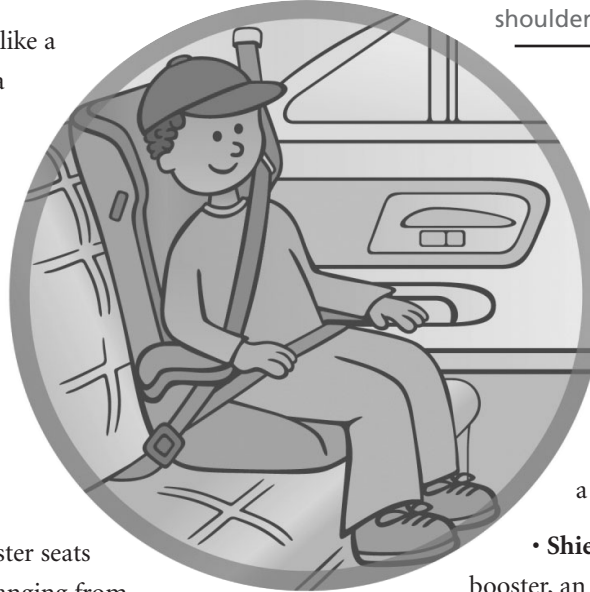
Using a booster seat is simple. Unlike a car seat that must be installed in a vehicle, a booster seat is simply placed on the vehicle seat and is held in place by the seat belt over the child's body. This makes it easy to move a booster seat between vehicles.

In order to be sold in Canada, booster seats must meet safety regulations set by Transport Canada.

There are four main types of booster seats with an average cost of \$75, but ranging from \$30 to \$200 depending on the model:

- **High-back booster seat:** This booster must be used with a shoulder and lap belt. Just as it sounds, it has a high back and is designed to provide head and neck support in vehicles without head rests. A headrest – or a high-back booster – reduces the chance of whiplash injuries.
- **Combination harness/booster seat:** This 2-in-1 or 3-in-1 seat is converted as the child grows. It begins as a car seat with harness system for a baby and/or toddler, and then the harness is removed to convert it into a booster seat.

A booster seat lifts a child so that the seat belt fits correctly – and stays in place – over the shoulder, chest, and hips.



- **No-back booster seat:** As its name suggests, this type of booster seat does not have a back. It is designed for vehicles that have adjustable headrests, eliminating the need for a high-back booster seat. This booster must be used with a shoulder and lap belt.

- **Shield booster seat:** The shield booster, an older style of seat designed for use with the lap belt only, is no longer considered the best option because it does not provide adequate upper body protection. Children in shield booster seats are at higher risk of head and spinal cord injury and ejection from the seat than children restrained in booster seats with both the shoulder and lap belt. A shield booster should only be used if parents have no other option but to transport their child in a vehicle that has only lap belts in the back seat.

## Seat belt adjusters – a potentially dangerous alternative

Seat belt adjusters are products that are marketed to improve the fit of the seat belt system for children. They are widely available in retail stores in Canada, and are viewed by some parents as an inexpensive solution when the seat belt does not fit their child.

Seat belt adjusters are not regulated by Transport Canada. A seat belt adjuster pulls the shoulder and lap belts together and secures them with straps. In doing this, it often pulls the lap belt over the child's abdomen, increasing the risk of serious injury.<sup>42,43</sup>

Seat belt adjusters are sold alongside regulated car seats and booster seats; many parents have no idea that these products may be unsafe. Safe Kids Canada does not recommend the use of any adjuster product. Only a booster seat should be used to fix an ill-fitting seat belt.

# Why so few children use booster seats

## Many Canadian parents think children are ready for seat belts by age 6. That's too young.

In the last few years, the low level of booster seat use has become an issue of increasing concern across North America, prompting several major studies and programs. An influential study found that parents did not understand that booster seats provided an increased level of safety, and most parents were unaware that booster seats applied to their child's size and age group.<sup>44</sup> Misconceptions are so prevalent that more than 50 per cent of parents surveyed said they owned a booster seat but were not using it with their booster seat aged child.<sup>45</sup>

Over the past year, Safe Kids Canada conducted two national surveys on booster seat awareness and use among Canadian parents of booster-age children. The results are consistent with the findings of other U.S. and Canadian studies:

- **More than half (53 per cent) of Canadian parents believe that children are big enough by the age of 6 to use a seat belt by itself.**<sup>46</sup> In fact, a large portion of this group – one-third (33 per cent) of all respondents – think children are ready for a seat belt between the ages of 3 and 5.<sup>47</sup> This is a serious gap in parents' knowledge; a child that young is much too small for a seat belt to fit safely.
- **Only 28 per cent of parents of children said they used booster seats.**<sup>48</sup> Other respondents used car seats (17 per cent) and seat belts (53 per cent).<sup>49</sup> The remaining 2 per cent refused to respond or did not know. The actual use of booster

seats is likely to be even lower; surveys that ask people to report their own safety practices generally show higher numbers than observational studies. The most recent national observational study, conducted in 1997 by Transport Canada, put booster seat use at less than 5 per cent.<sup>50</sup>

- **More than three-quarters of parents don't use booster seats because they believe their children are too big (42 per cent), they don't need one (23 per cent), or they are too old (19 per cent).**<sup>51</sup> This indicates a significant lack of awareness about the size and age guidelines for booster seat use. Other parents said that the child doesn't like it (4 per cent), or that it is uncomfortable (3 per cent).<sup>52</sup> The remaining 9 per cent did not give a reason.<sup>53</sup>

## Other findings

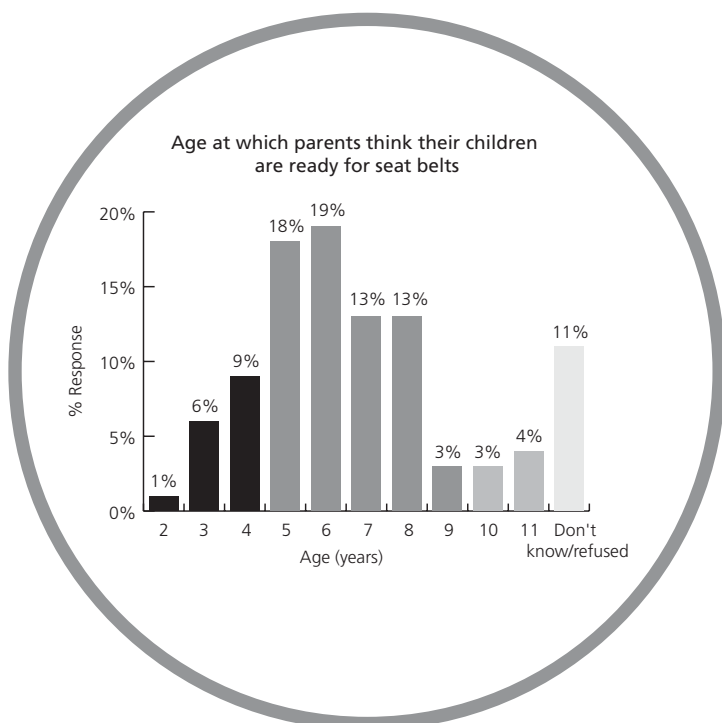
- **There were no significant differences in parents' answers based on income or education.**<sup>54</sup> It has long been believed, although not confirmed, that parents with higher incomes and education have better child safety practices. These surveys did not show evidence of this.<sup>55,56</sup> There were also no significant differences in booster seat use across regions.<sup>57</sup>
- **Cost was not a factor.** Some studies have identified cost as a possible barrier to booster seat use, but not a single respondent identified cost as the reason why their child was not in a booster seat.<sup>58</sup>

## Survey details

The national telephone surveys were conducted by Decima Research Inc. on behalf of Safe Kids Canada.

**October 2003, 242 respondents:** Results from the national sample of parents with children age 5 to 9 are considered accurate to within plus or minus 6.4 percentage points, 19 times out of 20, of what they would have been had the entire Canadian parent/guardian population been polled.

**March 2004, 277 respondents:** Results from the national sample of parents with children age 4 to 9 are considered accurate to within plus or minus 5.9 percentage points, 19 times out of 20, of what they would have been had the entire Canadian parent/guardian population been polled.





## – and what can be done

### “I’m not a baby!”

Parents often move their children out of child restraints too early, or choose not to use them, because their children don’t like the car seat or booster seat.<sup>59</sup> School-age children are likely to view themselves as too old or too big for booster seats; this perception is shared by many Canadian parents, as indicated by Safe Kids Canada’s survey results.

Research shows that most children resist booster seats, but the parents who were successful in getting their children to use them made it clear that safety was not negotiable.<sup>60</sup> These parents started early with safety rules, set clear boundaries, communicated that safety is important, and were consistent.<sup>61</sup> They were also resistant to peer pressure, and stressed to their children that what other people did was unimportant – what mattered was their own child’s safety.<sup>62</sup>

### Convincing parents to use booster seats

Safety campaigns must help parents understand the risks of not using booster seats. Research shows that parents who place their children in booster seats are more aware of the potential for injury than those whose children use seat belts alone.<sup>63,64</sup> At the same time, parents need to be given a simple way to evaluate whether their children should be in booster seats or seat belts.

Safe Kids Canada’s 2004 national campaign *Age 4 to 9? It’s Booster Seat Time!* addresses these issues. Focusing on the age range in the slogan captures the attention of parents with children in the booster seat age group. The campaign then raises awareness of the injury risks to children who do not use booster seats, and challenges parents’ widespread assumptions that their young children are big enough to use a seat belt on its own. (See *The Seat Belt Test*.)

### THE SEAT BELT TEST

Think your child is big enough to use a seat belt? Take our test.

- 1 Check your child’s seated height. Have your child sit up straight in a chair. Measure from the tailbone to the top of the head. If that is **at least** 25 inches (63 cm), your child **might** be ready to use a seat belt.
- 2 Check the way the seat belt fits your child. Have your child put on the seat belt in the vehicle. Look at our picture of a child in a seat belt. If your child’s seat belt does not fit this way, he or she needs a booster seat to be safe.



#### Check the fit:

- The shoulder belt should go over the shoulder and across the middle of your child’s chest. It should not touch the neck
- The lap belt should fit low over the hip bones, under your child’s belly area
- Your child’s knees should bend comfortably over the edge of the vehicle seat

# Legislation is critical

Laws about vehicle occupant restraints make a significant difference.<sup>65</sup>

In the 1970s and 80s, the number of motor vehicle deaths and serious injuries convinced legislators to implement seat belt laws. Car seat laws soon followed, generally for children under 40 pounds (18 kg). This means that people are protected by legislation when they are very young and when they reach the right size for a seat belt, but not in between (approximately age 4 to 9).

Seat belts and car seats have been accepted as a normal part of life by most Canadians, with a use rate of more than 90 per cent for seat belts<sup>66</sup> and at least 75 per cent for car seats.<sup>67</sup> In contrast, booster seat use is a dismal 28 per cent, at best.<sup>68</sup>

**This gap is unacceptable.** Safe Kids Canada urges all Canadian provinces and territories to make booster seat legislation a priority. Only Quebec has legislation specifically requiring booster seats, passed in 2002.<sup>69</sup> In May 2004,

Ontario introduced a bill that, if passed, would make booster seat use mandatory for children.

Laws and enforcement strategies, along with ongoing public education, are widely credited with achieving the high rates of seat belt and car seat use that have saved thousands of lives.<sup>70</sup> It's time to bring the same level of commitment to addressing the gap in protection for children who need booster seats.

Canada's *Road Safety Vision 2010*, a national strategy developed by The Canadian Council of Motor Transport Administrators (CCMTA) and promoted by Transport Canada, calls for a 95 per cent use rate for seat belts and appropriate child restraints by the year 2010.<sup>71</sup> As we reach towards this target, it is critical that booster seats be considered the appropriate child restraint when children graduate from their car seats. Booster seat legislation is needed to send a strong, clear message that these devices save children's lives.

## Toward model legislation

With the exception of Quebec, Canada's occupant restraints laws have not kept pace with recent research that confirms the value of booster seats. The National Occupant Restraint Program (NORP), composed of a number of government agencies and concerned organizations, is developing model legislation to help provinces and territories ensure that their laws reflect current knowledge.<sup>72</sup>

Safe Kids Canada is a member of NORP, which is a standing committee of The Canadian Council of Motor Transport Administrators (CCMTA).

For more information on legislation, visit [www.safekidscanada.ca](http://www.safekidscanada.ca).



Only one province in Canada has booster seat legislation

## References

- 1, 17 Transport Canada. Traffic Accident Information Database, unpublished data, 1997-2001.
- 2, 8, 10, 33 Durbin DR, Elliott MR and Winston FK. Belt-positioning booster seats and reduction in risk of injury among children in vehicle crashes. *Journal of the American Medical Association* 2003; 289 (21): 2835-2840.
- 3 Garrett JW, Braunstein PW. The seat belt syndrome. *Journal of Trauma* 1962; 2: 220.
- 4, 24 Anderson PA, Rivara FP, Smith GF, and Hardin WD Jr. The epidemiology of seatbelt associated injuries. *Journal of Trauma* 1991; 31 (1): 60-67.
- 5, 41 Cyr C, Lemoine C, and Santschi M. Lap-belt syndrome. Canadian Paediatric Surveillance Program research brief. Canadian Paediatric Society 2003. [www.cps.ca/english/CPSP/Studies/lap-belt\\_syndrome.htm](http://www.cps.ca/english/CPSP/Studies/lap-belt_syndrome.htm)
- 6, 34 Durbin D, Arbogast KB, and Moll EA. Seat belt syndrome in children: a case report and review of the literature. *Pediatric Emergency Care* 2001; 17 (6): 474-477.
- 7 Winston FK and Durbin DR. Buckle Up is not enough: Enhancing the safety of children in motor vehicles. *Journal of the American Medical Association* 1999; 281: 2070-2072.
- 9 Lutz N, Arbogast KB, Cornejo RA, Winston FK. Suboptimal restraint affects the pattern of abdominal injuries in children involved in motor vehicle crashes. *Journal of Pediatric Surgery* 2003; 38 (6): 919-923.
- 11, 14, 35, 46, 47, 48, 49, 50, 54, 55, 57, 68 Safe Kids Canada and Decima Research Inc. Results from Decima Televox National Telephone Omnibus, March 2004.
- 12, 15, 67 Transport Canada. Child restraint use in Canada: 1997 Survey Data. TP 2436, Road Safety Leaflet #CL 9804E. 1998.
- 13, 45 Ramsey A, Simpson E, Rivara FP. Booster seat use and reasons for nonuse. *Pediatrics* 2000;106(2): e20-e24.
- 16 Statistics Canada. Population by sex and age group, 2003. CANSIM II, table 051-0001. [www.statscan.ca](http://www.statscan.ca)
- 18, 19 Canadian Institute for Health Information. National Trauma Registry Minimal Dataset, unpublished data ICD-9 E-810-819 (.1, .3), 1994-2000.
- 20 Transport Canada. Motor Vehicle Safety Act, Motor Vehicle Safety Regulations Standard 208 (14, 14a, 14b). Seat belt fitment requirements. 1978.
- 21, 42 Weber K. Crash protection for child passengers: a review of best practice. *UMTRI Research Review* 2000; 31(3): 1-28.
- 22 Campbell DJ, Spruce R II, Smith LA, Kelley JE, and Carr MG. Injuries in pediatric patients with seat belt contusions. *American Surgeon* 2003; 69(12): 1095-1099.
- 23 Partners for Child Passenger Safety. The state of child occupant protection: interim report 2003. [www.traumalink.chop.edu](http://www.traumalink.chop.edu)
- 25 Norton S. A study to document the improved fitment of the vehicle seatbelt using a belt-positioning booster set by the appropriate child passenger. Proceedings of the Canadian Multidisciplinary Road Safety Conference XII, London, Ontario, June 10-13 2001.
- 26, 40 Howard A. Automobile restraints for children: a review for clinicians. *Canadian Medical Association Journal* 2002; 167 (7): 769-773.
- 27, 29, 30, 36, 39 Winston FK, Durbin DR, Kallan MJ, and Moll EK. The dangers of premature graduation to seat belts for young children. *Pediatrics* 2000; 105(6): 1179-1183.
- 28 Sturm PE, Glass RB, Sivit CJ, Eichelberger MR. Seat belt syndrome in children: a case report and review of the literature. *Pediatric Emergency Care* 2001; 17(6): 474-477.
- 31 Agran P, Winn D and Dunkle D. Injuries among 4 to 9-year-old restrained motor vehicle occupants by seat location and crash impact site. *American Journal of Diseases in Children* 1989; 143(11): 1317-1321.
- 32 Arbogast KB, Durbin DR, Kallan MJ, Menon RA, Lincoln AE, and Winston FK. The role of restraint and seat position in pediatric facial fractures. *Journal of Trauma* 2002; 52(4): 693-698.
- 37 Nance ML, Lutz N, Arbogast KB, Cornejo RA, Kallan MJ, Winston FK, and Durbin DR. Optimal restraint reduces the risk of abdominal injury in children involved in motor vehicle crashes. *Annals of Surgery* 2004; 239(1): 127-131.
- 38 Howard A, Moses-McKeag A, Rothman L, Comeau JL, Monk B, and German A. Ejections of young children in motor vehicle crashes. *The Journal of Trauma: Injury, Infection and Critical Care* 2003; 55(1): 126-129.
- 43 Sullivan LK and Chambers FK. Evaluation of devices to improve shoulder belt fit. DOT/HS 808 383. Paper Number 96-27-O-01. National Highway Traffic and Safety Administration. 1994.
- 44, 60, 61, 62, 63 Simpson EM, Moll EK, Kassam-Adams N, Gwenyth JM, and Winston FK. Barriers to booster seat use and strategies to increasing their use. *Pediatrics* 2002; 110(4): 729-736.
- 51, 52, 53, 56, 58, 59 Safe Kids Canada and Decima Research Inc. Results from Decima Televox National Telephone Omnibus, October 2003.
- 64 Ebel BE, Koepsell TD, Bennett EE and Rivara FP. Too small for a seatbelt: predictors of booster seat use by child passengers. *Pediatrics* 2003; 111(4): e323-e327.
- 65, 70 Peden M et al. (editors). World report on road traffic injury prevention. World Health Organization. Geneva: 2004.
- 66 Canadian Council of Motor Transport Administrators. Road Safety Vision 2010: Annual Report 2002. [www.ccmta.ca](http://www.ccmta.ca)
- 69 National Assembly of Quebec. An Act to Amend the Highway Safety Code and Other Legislative Provisions. 2nd Session, 36th Legislature, Bill 67 (chapter 29), 2002. [www.assnat.qc.ca/eng](http://www.assnat.qc.ca/eng)
- 71, 72 Canadian Council of Motor Transport Administrators. National Occupant Restraint Program. [www.ccmta.ca/english/standingcommittees/standingcommittees-roadsafety-norp.html](http://www.ccmta.ca/english/standingcommittees/standingcommittees-roadsafety-norp.html)

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