



<b>STOP</b>	Death due to road accidents is one of the leading causes of accidental death in children worldwide, particularly in developing countries.
<b>STUDY</b>	Car seats are not designed for children, so child car safety restraints are required, however how do you choose the best one?
<b>ACT</b>	This article identifies the best tools available to choose and fit the child car safety restraint that is right for you, and one that will minimise the risk of injury during an accident.

## 1.0 Car Safety Restraints – Why your child needs one

Death due to road accidents is one of the leading causes of accidental death in children worldwide. The below table shows a comparison of the road fatality rate in Malaysia compared to other countries [2] [5] [16].

Country	Road Fatalities per 100,000 inhabitants annually	Road Fatalities per 100,000 motor vehicles	Total Fatalities latest Year	Year Data Sourced
Malaysia	23.0	34.3	6,260	2010
Indonesia	13.0	43.0	31,234	2010
Vietnam	12.6	33.3	11,029	2010
India	10.9	116.5	133,938	2010
Australia	5.71	8	1,291	2011
France	6.9	12	-	2009
United Kingdom	3.59	7	2,222	2009
United States	12.3	15	33,808	2009

In most countries (including Malaysia) seat belt use is legally required for front and rear seats. However in Malaysia child car seats are not legally required whilst in most developed countries they are legally required (for example in the UK a back seat child restraint is required until the child is 12 years old [4]). To compare statistics for these two examples the following is seen:

- In Malaysia for a child less than 5 years old the risk that a death or serious injury will occur rather than a minor injury when a reportable road accident happens is 61% [2].
- In comparison to the UK (where car seats are legally required) the same statistic is only 12% [1].

The above is a simple comparison of the potential risks to a child during road travel. Children need to be appropriately restrained in a children's safety restraint to reduce the chance of serious injury or death if involved in a crash. A children's safety restraint prevents a child from being ejected from the vehicle (or from becoming a projectile in an accident) and distributes the extreme crash forces over the strongest parts of the child's body – thus minimising injury.

Adult seat belts and car seats are not designed for children, they are designed for adults. Placing a child in an adult sized seatbelt and car seat is not safe because they are too big for the child's small and developing bone structure [6]. Children up to seven years of age are at



least four times as likely to sustain a head injury in a crash when using an adult seat belt when compared to children sitting in an appropriate child restraint [6].

Children lack the emotional and intellectual intelligence (their brain hasn't fully developed to analyse risk) to make evidence based decisions on their safety and welfare. Children are not going to take into account that they may be travelling in a car at 100km/h before having a tantrum or removing their adult sized seatbelt. However if the child is restrained in an adequate car safety restraint, they won't be physically able to remove the restraint, even when having a tantrum. It is our responsibility as our children's guardians to ensure they have the best protection from accidental death or injury on the road.

## 1.1 What is required by Malaysian Law?

The Malaysian Institute of Road Safety Research (MIROS) website states that child safety restraints are not required by law in Malaysia [7]. In the first and most recent crash test conducted in 2010 by MIROS; it was confirmed that a child properly secured in a car seat travelling at 30 km/h (note the very slow speed) showed no signs of injury.

In contrast to this in the same round of crash tests, the dummy of a three month old baby in the hands of an adult passenger in the rear seat was thrown forward, hitting the back of the driver seat as a result of the 30km/h impact. Even though the adult passenger was wearing a seatbelt, the momentum of the vehicle and the force of the collision overwhelmed the strength of the adult to hold the baby in place. This kind of impact can cause serious injury or death of the infant.

MIROS Professor Ahmad Farhan recommended in the same article that "drivers, parents and adult passengers in a vehicle are to always ensure that children of all ages are properly secured when travelling, either in a dedicated child seat, infant seats or buckling up their seatbelts. Children should also always travel in the rear seat."

Unrestrained children can be easily flung out of the vehicle, thrown forward against the front windscreen or dashboard, or against the back of the front vehicle seats, which can result in serious injury or often fatality. A child in the front seat and on the lap of a parent can be crushed between the parent and the dashboard during collision, or bear the full brunt of a deployed airbag.

The above only compares a secured child to a non-secured child, however international comparisons between a children secured with an adult seat belt to a child in a child safety restraint shows a lowering of the risk of serious injury or death in an accident:

- Compared with seat belts, properly used child restraints were associated with a 28% reduction in risk for death for children aged 2 through 6 [10].
- Child safety seats provide a statistically significant, 25% reduction in the least serious injury category for children aged 2 through 6 [11].
- When compared with restraint by seat belts alone, restraint by belts positioned more correctly by the use of booster's results in 59% fewer injuries in children aged 4 through 7 years in motor vehicle crashes [12].
- For children younger than roughly 24 months, adult seat belts conclusively cannot be safely used [13].

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Statistics and analysis varies but nonetheless a child car seat is always shown to be safer than an adult car seat for children involved in an accident.

## 2.0 What type of car seat should I use for my child?

This guide is based on the current American [8] and United Kingdom [9] recommendations.

### 2.1 Birth - 12 months

Your child under age 1 should always ride in a rear-facing car seat.

There are different types of rear-facing car seats: Infant-only seats can only be used rear-facing. Convertible and 3-in-1 car seats typically have higher height and weight limits for the rear-facing position, allowing you to keep your child rear-facing for a longer period of time.

### 2.2 1-3 Years

Keep your child rear-facing as long as possible. It's the best way to keep him or her safe. When an accident occurs the forward force of the crash propels the child forward. If the child is rearward facing then she is supported by the back of the rearward facing car seat rather than being propelled forward with no support. Your child should remain in a rear-facing car seat until he or she reaches the top height or weight limit allowed by your car seat's manufacturer (whatever comes first). Once your child outgrows the rear-facing car seat, your child is ready to travel in a forward-facing car seat with a harness.

### 2.3 4-7 Years

Keep your child in a forward-facing car seat with a harness until he or she reaches the top height or weight limit allowed by your car seat's manufacturer. Once your child outgrows the forward-facing car seat with a harness, it's time to travel in a booster seat or an appropriate convertible car seat, but still in the back seat. Harnesses can be purchased separately and attached to the belt.

### 2.4 8-12 Years in the United States, over 12 years in the United Kingdom

Keep your child in a booster seat until he or she is big enough to fit in a seat belt properly. For a seat belt to fit properly the lap belt must lie snugly across the upper thighs, not the stomach. The shoulder belt should lie snug across the shoulder and chest and not cross the neck or face. Remember: your child should still ride in the back seat because it is safer there, even with the passenger seat airbag disengaged.

## 3.0 What brand of car seat should I buy?

The answer to this question is relatively easy. Choose the car seat that scored the best in the crash test results. This is going to take research and time but it will be worth it, your child's car seat is what is protecting your child from becoming a projectile in an accident which could cause death or serious injury. From our research often the safest car seat is not the most expensive and the best marketed car seat is not always the safest. Here a just a couple of crash test websites that you can review before you buy a child car seat. Note that not all car seats for sale have passed crash tests! It is your responsibility to check.

- Child Restraint Evaluation Program – Australian Crash Test Results, available at: <https://www.childcarseats.com.au/>

Document Number			
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MH	SS	0	17 Aug 2014
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- German Crash Test Results (use Google Translate to translate into your preferred language) available at: <http://www.adac.de/infotestrat/tests/kindersicherung/kindersitz-test/default.aspx?tabid=tab1>
- South East Asian Crash Test Results, available at: <http://www.aseancap.org/>

There are many different crash tests under the name NCAP (New Car Assessment Program), the main ones include [15]:

- US NCAP
- Japanese JNCAP
- Euro NCAP
- Chinese C-NCAP
- ASEAN NCAP
- Australian ANCAP

The best rating in any of the above is 5 stars (with 6 for Japan), however each authority determines what a 5 star rating actually is – and they differ from country to country with the more developed countries having more stringent requirements, some examples are listed below:

- Euro, Australian and Japanese NCAP requires stability control as standard.
- ASEAN NCAP only tests frontal impact (no side or roll-over).
- Chinese NCAP tests frontal at 50km/h, rather than around 60km/h for the rest.

If you would like more information see the NCAP reference [15].

### 3.1 Second hand car safety restraints

Be extremely cautious if you're offered a second hand seat or booster. Always check that it:

- Is an up-to-date model and has not had a safety recall.
- Has complete fittings and instructions, with straps that are not frayed, worn or damaged, and a buckle that works smoothly.
- Is in good condition and hasn't been involved in a crash (any splits, cracks or large stress marks on restraint shell).
- It isn't more than 10 years old

### 4.0 Safety Rules for Children's Car Restraints [14]

Children learn by watching the adults around them. Set a good example by always wearing your seatbelt. Children are commonly killed or injured in motor vehicles crashes from being crushed by unrestrained adults.

After purchasing a children's car restraint that is age and weight appropriate, it is important to carefully follow the manufacturer's instructions on how it is installed, if it isn't installed properly it won't provide maximum protection. Phone the manufacturer or the store you bought it from if you have concerns. Make sure the seat is secured properly before each trip; the baby seat harness should fit snugly with no slack and should not be twisted. Always try a child restraint in your car before you buy it to make sure that it is suitable for your child and that it fits into your



car. Most cars will only fit two car seats in the back, some can fit three with the new “slim designs”.

Use child car restraints even when driving at low speeds or on short trips, as a car accident can happen at any time and anywhere. Statistically most accidents occur within 10 km of the home. Ensure your child keeps their arms, legs and head inside the car when it’s moving or parked on the side of the road. You can also activate the childproof locks so your child can’t get out when the car is moving or stationary.

Many children die in cars every year when left alone. NEVER leave your child in the car by themselves. The temperature rises rapidly and many children die of dehydration and heat exhaustion quickly

## 4.1 Keeping your child happy in the car

The following is recommended:

- What works? One family we know tells their children the car won’t start without everyone having their seatbelts on.
- Play the soundtrack of your child’s favourite movie, our kids love Frozen and there is a lot less screaming when Frozen is on the stereo.
- Have sing-a-long or recite some nursery rhymes.
- Purchase a mirror than can be stuck on the back window for rearward facing children, this is so you don’t need to turn around to see your child in the car seat, you can simply look in the rear-view mirror.
- Make sure your child can see you by placing the car seat where you can see each other, or position the mirror. If your child can see your face, she’s less likely to get bored or feel lonely. The best place for the car seat is in the middle of the back seat.
- Praise your child for good behaviour in the car, such as not wriggling out of seatbelts or harnesses, not distracting the driver and not playing with the locks. Mention your child’s good behaviour several times during the journey. For example, ‘I like driving the car when you keep your seatbelt on – that’s great behaviour’.
- Provide plenty of safe distractions, such as CDs or audio books to listen to, and soft hand-held games to play with.

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Document Number			
TSE-	CTS-	DOC-	001
By	Checker	Revision	Date
MH	SS	0	17 Aug 2014
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