

SOUTH



AUSTRALIA

FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 22nd day of July and the 18th day of September 2003, before Wayne Cromwell Chivell, a Coroner for the said State, concerning the death of Ronald Luke Newton.

I, the said Coroner, find that, Ronald Luke Newton aged 7 years, late of Lot 35, Third Street, Dublin, South Australia died at The Women's and Children's Hospital, North Adelaide, South Australia on the 2nd day of January 2001 as a result of hypoxic-ischaemic encephalopathy.

1. **Background**

- 1.1. At about 9:40am on Tuesday, 2 January 2001, Ronald Luke Newton, aged 7 years, was a rear seat passenger in a Toyota Corolla sedan being driven in an easterly direction along Angle Vale Road at Virginia by his mother Suzanne Schwenderling when the vehicle collided with a Ford Falcon sedan being driven by Paul Archangelidis.
- 1.2. Also in the Corolla sedan were Ronald's grandmother, Beryl Newton, and his sister Jessica.
- 1.3. The evidence of Ms Schwenderling, supported as it is by the statement of independent witness Shirley Harvey (Exhibit C4a), establishes that the Ford Falcon had been travelling west on Angle Vale Road when it turned suddenly and without warning to its right, across the path of the Corolla sedan thereby causing the collision.

- 1.4. I will say no more about the causation of the collision because it is not my task to analyse legal culpability in such a situation (see Section 26(3) of the Coroner's Act, 1975). It is sufficient to observe that such collisions are tragically common on our roads.
- 1.5. As a result of the collision, Ms Schwenderling and Mrs Newton received serious but not lethal injuries, and Jessica was not seriously injured.
- 1.6. Unfortunately, Ronald received very serious injuries. He was removed from the back seat of the car by bystanders.
- 1.7. An ambulance was called, and officers administered emergency treatment at the scene. Ronald suffered a cardiac arrest in the ambulance. He was defibrillated and ventilated by a retrieval team at the scene, and conveyed to the Lyell McEwin Hospital where he was stabilised and then transferred to the Women's and Children's Hospital. He had suffered an undisplaced fracture of the second cervical vertebra, bilateral lung contusions and pneumothoraces, pneumo-mediastinum and diffuse cerebral oedema (brain swelling).
- 1.8. Ronald developed severe hypoxic-ischaemic encephalopathy (death of brain tissue) and suffered another cardiac arrest at 5:00pm from which he was also resuscitated. Tragically, his condition continued to deteriorate and he suffered a further cardiac arrest at 10:53pm that night. Dr Belinda Leigh certified his life extinct at that time (see Exhibit C2a).

2. Cause of death

- 2.1. A post-mortem examination of Ronald's body was performed by Associate Professor R W Byard, Forensic Pathologist, on 3 January 2001 at the Forensic Science Centre, Adelaide. Professor Byard noted the following injuries:

'A horizontal parchmented linear mark was present under the neck measuring 100mm in length, more pronounced on the left than the right side. On the left side there were also two small parchmented areas over the sternomastoid muscle. A similar parchmented circular mark was present over the right sternomastoid muscle. The lower lip was bruised on the left side. An abraded area measuring 70 x 40 mm was present over the upper aspect of the left side of the chest. A circular area of lividity was present over the anterior aspect of the abdomen.'

(Exhibit C10a, p3)

- 2.2. Professor Byard diagnosed the cause of death as hypoxic-ischaemic encephalopathy. He commented:

'Death was attributed to hypoxic ischaemic encephalopathy associated with trauma from the accident and cardiac arrest at the scene. This may have been related to either blunt head trauma, or to damage to the upper cervical cord. The results of the formal neuropathological evaluation were not available at the time of this report. Marked pulmonary oedema was also present most likely due to a combination of neurogenic pulmonary oedema from cerebral injury as well as possible local trauma to the lungs. This was also associated with extensive intra-alveolar haemorrhage. No underlying organic diseases were present which could have caused or contributed to the death.'

(Exhibit C10a, p2)

- 2.3. A neuropathological examination performed by Professor Peter Blumbergs of the Institute of Medical and Veterinary Science confirmed Professor Byard's observations of hypoxic-ischaemic encephalopathy, as well as traumatic subarachnoid haemorrhage and hypoxic-ischaemic myelopathy of the lumbosacral spinal cord (see Exhibits C3a and C3b).

- 2.4. Professor Byard wrote a further report into Ronald's death dated 7 February 2002. By that time he had received Professor Blumbergs' neuropathological report and had the opportunity of reconsidering his earlier comments. In particular, he concluded that there had been no significant head trauma, and that the injury to the cervical spine, since it was undisplaced, was unlikely to have caused the cardiac arrest. Upon further consideration, he said:

'Given the absence of evidence of significant trauma to the cervical spine and brain on neuropathological examination it is considered most likely that reflex cardiac arrest occurred due to compression of nerve receptors in the larynx and carotid arteries. This resulted in a sustained period of oxygen deprivation (hypoxia) with subsequent death from brain damage (hypoxic-ischaemic encephalopathy). A similar reflex is recognised as a cause of cardiac arrest when the front of the neck is forcibly struck with so-called 'commando punch'.'

(Exhibit C10b, p3)

- 2.5. I accept Professor Byard's conclusions and find that the cause of death was hypoxic-ischaemic encephalopathy.

3. Issues arising at the inquest

- 3.1. Ms Schwenderling said that Ronald had been sitting on a 'small booster seat without a back behind me' (Exhibit C1b, p1). The police officers took custody of the car seat (Exhibit C9a). It is a 'Safe-n-Sound' brand 'safe-n-see' child booster seat, a single moulded plastic device upon which the child is seated in order to raise the position of the child so that the lap-sash seatbelt is correctly located across the shoulders, chest and hips. It is intended that the seatbelt will then be just as effective in protecting the child as it would in relation to an adult passenger.
- 3.2. The booster seat in question is constructed of moulded plastic. There is a strap passing through the lower portions of the device, and there is a hook attached to one end of the strap. This is designed to be attached to the bottom of the seat cushion, or the seat squab. The strap is installed by placing the hook around the appropriate part of the seat thereby anchoring it, and then pulling the adjuster strap at the opposite end of the device so that it is firmly and securely anchored in position.
- 3.3. The document reproduced over the page illustrates the design of the seat, and the instructions for its correct installation and use.

safe-n-sound

"SAFE-N-SEE" CHILD SEAT INSTRUCTIONS FOR INSTALLATION AND USE

This seat is designed to raise a child's seating position in the car which improves his or her ability to see out and enables the safe use of adult lap/sash belts by a child or the safer use of child harnesses. Suitable for children of mass 14 kg - 30 kg, wearing garment size 3 - 8. Normally suitable for children aged 2½ - 8 years.

This restraint is incomplete without the use of:

- A. An Adult lap/sash belt, either static or retractor reel types,
OR
B. A child harness plus adult lap belt.

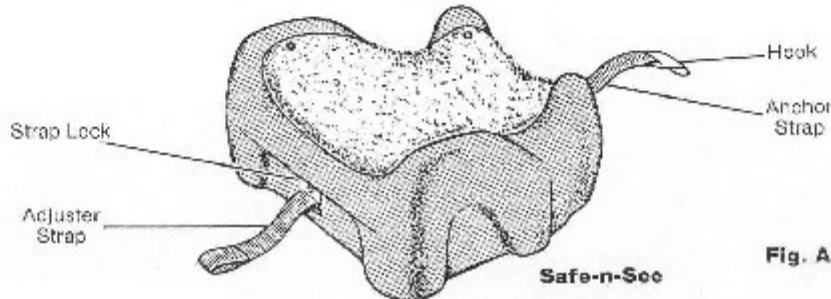
The child harness must be approved to AS 1754. The adult seat belts must be approved to AS E35. This kit does not include a child harness or adult belt.

The Safe-n-See seat is suitable for use in front or rear compartment of vehicles complying with ADR3 or 3A Seat Anchorages for Motor Vehicles with folding/hinged/bench seats with adult lap/sash seat belt, in either the front outboard position, or both rear outboard positions.

The seat is suitable for use in centre rear position only when used with an approved child harness and an adult lap belt.

Unsuitable for use in other applications.

WARNING: The seat must not be used with an adult lap belt only.
This product is not a toy.



HOW TO INSTALL THE SEAT

1. Pull the strap lock out slightly and at the same time withdraw the anchor strap to its maximum length. See Fig. A.
2. Push the hook down the gap between the seat cushion and squab and engage the hook in the frame of the cushion. See Fig. B.

Alternatively the hook may be engaged in the frame of the squab. See Fig. C

N.B. Because the construction of the seat cushion and squab varies in different makes and models of cars it is not possible to specify a particular method of attachment for every vehicle.

In some station wagons rear seats it may be necessary to pull the seat cushions up and engage the hook in the hinged side of the cushion frame.

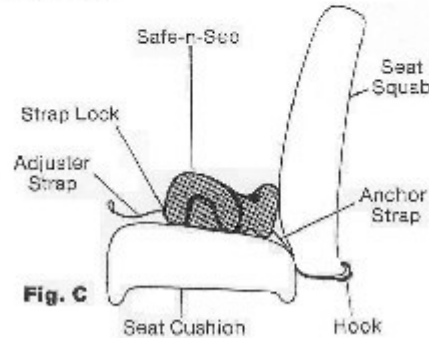
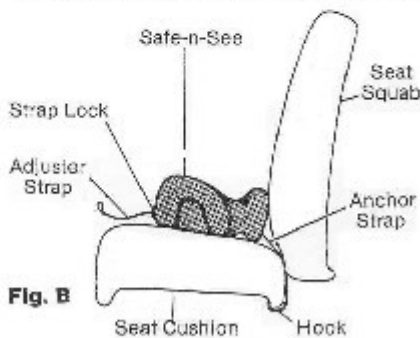
3. Pull the adjuster strap out and at the same time push the Safe-n-See firmly back against the seat squab, as far as it will go. The Safe-n-See will now stay in position.

WARNING

In case of doubt as to the method of installation please contact the manufacturer.

The Safe-n-See Seat must not be attached to unsound metal, wood or plastic structures. The webbing should be protected if in contact with sharp corners and edges.

The Safe-n-See Seat must not be altered or modified in any way.



- 3.4. Unfortunately, the investigation performed by officers of the Major Crash Investigation Section of South Australia Police did not extend to a detailed analysis of the role played by the booster seat in Ronald Newton's death. In particular, it has not been established clearly whether the seat was correctly installed at the time of the accident.
- 3.5. When the booster seat was produced to me in court during the inquest, the adjuster strap had been pulled through to the maximum extent so that the hook at the end of the anchor strap was hard up against the body of the seat. Assuming that the strap had not been pulled through since the accident, it is very unlikely that the booster seat was correctly anchored to the car seat at the time of the accident.
- 3.6. I was informed by Professor Byard that he was informed by an investigating police officer that the seat was found 'loose within the car' (T33). Since that time the seat has been in the custody of the police, and then in the custody of this court. If it had been anchored properly to the car seat in accordance with the manufacturer's instructions, the anchor straps would not have been completely pulled through in that manner.
- 3.7. Advice received from the police investigating officers, confirmed by counsel representing Ms Schwenderling (who did not formally appear at the inquest) was that Ms Schwenderling was unable to give evidence as to whether the anchor strap was appropriately attached to the vehicle seat or not.
- 3.8. In all of the circumstances, I am led to the conclusion, that the anchor strap of the child booster seat was not attached to the seat of the Corolla sedan at the time of the accident.
- 3.9. Professor Byard told me that in his opinion, the horizontal abrasion across the front of Ronald's neck was caused by the sash portion of the seatbelt when both Ronald's body and the child booster seat were propelled forward as a result of the forces generated in the collision. He said:

'When you examine the injuries, the most striking one is the horizontal mark across the front of his neck. He has a horizontal abrasion there which fits with a mark from a seatbelt. There wasn't a significant injury to the tissues underneath, bruising or damage to the cartilage, but I think that a blow to the front of the neck, such as was sustained, can result in a reflex cardio respiratory arrest. It's seen in a soldier with a commando chop or

in karate, when someone is hit in the front of the neck and they damage the receptors in the front of the neck and that stops their breathing and stops their heart and I think that, given the whole spectrum of the findings, that's the most likely initiator of what happened. There may have been some rotations of the head as well, but that would have been once his neck had been caught under the belt.' (T29)

- 3.10. Professor Byard said that if Ronald's seatbelt was not correctly adjusted and tight, the forces generated in the collision could have caused him to slide underneath the seatbelt (so-called 'submarining') and sustained the 'blow' to the throat that way (T39-40).
- 3.11. I heard evidence from Dr Ronald Somers, who is the Head of the Injury Surveillance and Control Unit of the South Australian Department of Human Services. Dr Somers provided a report which is Exhibit C9.
- 3.12. Dr Somers is an expert in epidemiology, and has been prominent in accident and injury prevention in this state for many years.
- 3.13. When he examined the booster seat, Dr Somers noted that there were no instructions for the installation of the device which appeared on any part of it. He said that the seat would originally have had a paper 'appliqué' on the underside with installation instructions thereon, but this had apparently separated from the seat over the years (T26).
- 3.14. Both Dr Somers and Professor Byard told me in evidence that in the absence of written instructions, they would have had difficulty in working out how to install and use the device (T26, T38). Once those instructions were obtained, the installation and use of the device became obvious.
- 3.15. His examination of the device indicated that although it was manufactured in 1979, there was nothing about its condition, or its design, which rendered it inappropriate for use. There was no sign of damage to the device, and it complied with the relevant Australian Standard applicable at the time. Indeed, Dr Somers compared the device with products of similar type available in retail outlets in Adelaide on the day before the inquest, and found no material difference between them (T17).
- 3.16. Australian Standard 1754-1975 amended in March 1978, specifically acknowledged the need for such devices to be directly restrained to the vehicle. In relation to older-style child restraint systems, the attachment to Dr Somers' report advises as follows:

'The booster cushion provided for inspection was manufactured in 1979 and complied with the relevant Australian Standard at the time of its manufacture. This early standard did contain provisions for the booster cushion to be securely anchored to the vehicle.

As outlined above, there are several potential dangers associated with the use of second hand child restraints with either an unknown history and/or more than ten years of age. These risks, many of which could severely compromise the effectiveness of the restraint, may not be readily apparent to parents.

As previously stated, it became obvious during our investigations that the practice of using second hand child restraints, often passed down between family and friends, is quite common. We were surprised by the number of comments we received simply from work colleagues about their ownership and use of similar booster products.'

(Exhibit C9, p5-7)

- 3.17. Dr Somers pointed out that it is important that the booster seat is secured in some way so that it does not shift its position relative to the adult seatbelts because:

'Under the forces of impact, an unsecured seat of whatever design is always unreliable and will always tend to shift forward.' (T18)

- 3.18. In considering Dr Somers' evidence about this, it appears that many people assume that the weight of the child will tend to anchor the booster seat, even during a collision (T19). However, it is easily conceivable that the forward momentum of the child's body generated by the collision may tend to lift the child's body, particularly if there is any slack in the adult seatbelts, after which the booster seat will become unstable. There is no way of knowing whether that occurred in this case.

- 3.19. Notwithstanding those concerns, Dr Somers said that it was important to use this equipment for children in Ronald's age group. He said:

'Children in the age range roughly four to eight years have been called, in the literature, 'the forgotten children' because our efforts to promote safe transport of children have focused on the children younger and then the children older. But children between four and eight years, historically, have been left out as a focus of our concern and that's only now recently being addressed in a more active way overseas. I can tell you that approximately a dozen of the US States have, in very recent years, enacted new legislation requiring booster seats for children in this age range, and although South Australia can be very proud as being the first Australian State to mandate the use of child restraints for children from birth to four years, none of the Australian States, that I'm aware of, have actually addressed the forgotten age range from four to eight years.' (T20-21)

- 3.20. Dr Somers said that although the particular booster seat in question here complies with the Australian Standard, there are other designs which he regards as preferable.

In particular, he referred to a booster seat which is fashioned with two arms through which the adult seatbelt is looped so that both the child and the booster seat are restrained by the seatbelt. He said that it would be almost impossible to use that type of booster seat incorrectly (T22).

4. **Recommendations**

4.1. Section 25(2) of the Coroner's Act entitles me to make recommendations if I form the opinion that to do so might 'prevent, or reduce the likelihood of, a recurrence of an event similar to the event that was the subject of the inquest'.

4.2. Dr Somers suggested I make the following recommendations:

'The community should be encouraged to:

- Always use booster seats in motor vehicles when transporting children of the manufacturer's specified size;
- Use booster seats that are approved and no more than ten years old;
- Ensure proper installation of booster seats, preferably seeking professional assistance; and
- Avoid worn or damaged booster seats.

Manufacturers should be encouraged to:

- Ensure that installation instructions are conveyed in language understandable by the average consumer; and
- Ensure that installation instructions will not separate from the booster seat for the expected life of the seat.

Governments should be encouraged to make the use of booster seats mandatory, as for child restraints designed for smaller children.'

(Exhibit C9, pp2-3)

4.3. Professor Byard supported those recommendations.

4.4. I agree with Dr Somers' recommendations with the proviso that I do not consider that I have sufficient information to make a specific recommendation that the use of booster seats for children aged 4 to 8 years in motor vehicles should be mandatory. I am aware that Ministers of Transport of the various States of Australia meet regularly to discuss such issues, and I do not know whether this issue has been considered at such meetings, or whether a decision has been taken one way or the other. I have not been made aware of any arguments to the contrary of the proposition that the use of such seats should be mandated.

4.5. Accordingly, I recommend that the Minister for Transport, in consultation with organisations such as the Royal Automobile Association of South Australia Inc, Kidsafe Child Accident Prevention Foundation of Australia, and any other relevant organisation, consider ways in which the following aims can be achieved:

- That the use of booster seats in motor vehicles when transporting children between the age of 4 and 8 years should be encouraged;
- That such booster seats should be of a type which comply with the relevant Australian Standard;
- That such booster seats should be properly installed, and that if there are any doubts surrounding the method of installation and use, that professional help from the Royal Automobile Association of South Australia Inc or similar organisation should be sought;
- That the use of worn or damaged booster seats should be avoided;
- That the manufacturer of such booster seats should consider ways in which the instructions for installation and use of such seats are conveyed in language understandable by the average consumer;
- That manufacturers of such booster seats should also consider ways in which installation instructions can be attached to the seat in such a way that they will not be separated from the seat for the expected life thereof;
- That further consideration should be given to the question whether the use of such booster seats in motor vehicles in relation to children between the ages of 4 and 8 years should be made compulsory.

Key Words: Motor Vehicle Accident; Child Restraint Systems; Australian Standards

In witness whereof the said Coroner has hereunto set and subscribed his hand and

Seal the 18th day of September, 2003.

Coroner