

# Paramedic - Evidence Based Medicine (P-EBP) Program

## Paramedic CAT (Critically Appraised Topic) Worksheet

**Title:** Using car seats as immobilization.

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**2<sup>nd</sup> Party Appraiser:**

**Clinical Scenario:** A paramedic crew arrives on scene to a high speed motor vehicle collision (MVC) and find a pediatric patient who is still restrained in their car seat in the same compartment as 2 adult patients who are both complaining of neck pain and have visible trauma. The crew along with fire remove the car seat from the crashed car and move into their truck. After checking the patient over should they transport the patient in their car seat collared and securing C-Spine control or remove the patient from the car seat and follow traditional C-Spine control?

**PICO (Population – Intervention – Comparison – Outcome) Question:**

**P** Pediatrics in car seats in a motor vehicle collision (MVC)

**I** Removing them and doing standard immobilization

**C** Leaving them in the car seat

**O** C-Spine clearance and neurological outcomes

**Search Strategy:** (pediatric) OR (car seat) OR (immobilization) OR (C-Spine)

**Search Outcome:** 2

**Relevant Papers:**

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Johnson (1994)	Children ages < 15 years old both restrained and unrestrained.	Retrospective Study LOE II	None noted Rates of injury, rates of optimal, suboptimal and no restraint Attributable risk ie preventable injuries if the	59% of toddlers weren't restrained, 83% of no injury when in a car seat decreased to 57% if unrestrained. Injury increased with age which was related to the amount of front seat use, high speeds & non adult	Looked at 16 685 children involved in MVCs, but it was just a look at the data. It wasn't really just a look at the data. It had a PICO question: In Children

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			unrestrained children had been restrained	supervision. The factors most associated with injury were non-restraint and front seat positioning of infants/toddlers. Toddlers were a high risk group.	involved in car crashes reported to the police, how many restrained versus unrestrained children sustained an injury? Secondary outcomes included the positioning in the car, the comparison between age groups, and the preventable injuries (ie if the unrestrained children had been restrained, and had the same proportion of injuries as the restrained children, how many injuries would be prevented)
Armstrong (2007)	<p>Patients who were suspected to have C-Spine injury &amp;/or neck pain.</p> <p>A bit of drift of the PICO here as the population was not pediatric and there was no discussion of car seats</p>	Prospective Study LOE II	Hard to clear C-Spine	Out of 105 69 no CSI on scene ( 9 taken to ED, 60 cleared on scene), 34 not cleared (4 self discharged), no report of missed CSI.	<p>They did treat everyone &amp; did a follow up but they did not have a control group.</p> <p>They did not describe how they searched for missed injuries – it is possible that they missed some “misses”</p> <p>They also don’t use a validated clearance algorithm</p>

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**Comments:** Both of these cases only looked at data that was out there and turned them into charts. They did not offer a study that was created to determine if there was anything to help other than traditional safety methods ie: seat belt, car seats.

**Consider:** There is no support to change any protocols.

**Clinical Bottom Line:** There is no evidence provided to support changing protocols or to support either keeping pediatric patients in their car seat or that traditional methods provide better C-Spine control.

### **References:**

Armstrong, BP; Simpson, HK; Crouch, R; Deakin CD (2007) *Prehospital clearance of the cervical spine: does it need to be a pain in the neck?*, Emergency Medical Journal 2007; 24: 501 – 503

Johnston, Carden; Rivara, Frederick P.; Soderberg, Robert (1994) *Children in Car Crashes: Analysis of Data for Injury and Use of Restraints*, Pediatrics Vol. 93 No. 6 June 1994 Pg. 960 – 965