³ Burgess PR, Perl ER. Cutaneous mechanoreceptors and nociceptors. In: Iggo A, ed. *Handbook of sensory physiology*. Vol II. Heidelberg, Berlin, New York: Springer-Verlag, 1973.

⁴ Laverack MS, Cosens DJ. *Sense organ*. London: Blackie, 1981.

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Conflagration of children in cars

This paper reports on the recent deaths of seven Irish preschool children and the burning of seven others while unattended in parked motorcars. Death was from complications of severe extensive burns, from respiratory burns, or from toxic fumes. In every case the accident occurred while the children were playing or waiting in the car with the ignition switched off.

Case reports

Fourteen children were trapped in conflagrations in 10 cars, resulting in seven deaths and seven burns of varying severity. All ignitions were off at the time of the accident, no electrical faults were found, and no car had a

Case details of children burnt in parked cars

Case No	Age (years)	Sex	Date of accident	Make and model of car	Cigarette lighter*	Artificial fur seat covers	Comment
1	2½	M	June 1981	Ford Cortina Mark III	+	+	Died
2	4	F	June 1981	Ford Cortina 1600	+	+	Died. Matches?
3	2	F					
4	4	M	April 1982	Datsun 120Y	+	+	Died
5	4	M	September 1982	Ford Cortina Mark III	+	?	Died. Matches?
6	2	M	April 1983	Datsun Stanza	+	+	Died. Matches?
7	1½	M	October 1980	Audi 100	+	+	Died
8	2	M	May 1982	Toyota Corolla	+	+	60% burns
9	3	F	June 1980	Ford Cortina	+	+	{ 30% burns 20% burns }
10	3	M					
11	2½	M	April 1983	Ford Capri	+	+	{ 15% burns 20% burns 15% burns }
12	2	M					
13	2½	M					
14	2½	F	April 1983	Ford Escort		+	20% burns. Matches?

*Symbol + = present but not working.

gas conversion. Most of the cars were equipped with a cigarette lighter, and almost all had been fitted with artificial fur seat covers, usually on the front seats. There was no evidence of malice in any accident. Brief details of the cases were as follows (see table).

Case 1—A 2½ year old boy was waiting in a car parked outside a shop at 9.40 am. There was a sudden inferno, and a passerby was unable to rescue the child.

Cases 2 and 3—Two sisters aged 4 and 2 were waiting in a car while cattle were being mustered. There was rapid conflagration. The 5 year old sibling escaped but later died. Fire was possibly started by matches. Forensic examination was performed.

Case 4—A 4 year old boy was awaiting mother in car in front garden. Car exploded in flames. Forensic examination failed to determine cause.

Case 5—A 4 year old boy was playing in a stolen, abandoned car, which caught fire. Other children escaped. Inside of car was burnt out. May have been playing with matches. Forensic examination was inconclusive.

Case 6—A 2 year old boy was playing alone in car. He was found burnt in driver's seat. Box of matches found in front of car.

Case 7—This 18 month old boy was in a child's seat. Fire may have started in the engine.

Case 8—A 2 year old boy was playing in car outside house. Car was engulfed in flames. Child suffered 60% burns, many full thickness. No matches or electrical fault were found.

Cases 9 and 10—A brother and sister aged 3 years were sitting in car when it caught fire. Cause of accident remained unknown after forensic examination.

Cases 11, 12, and 13—Two boys aged 2½ and one aged 2 were playing in a parked car. Matches may have ignited a seat cover and then roof of car.

Case 14—A 2½ year old girl was left for three minutes in front seat. Was rescued by father. Cause of fire was unknown.

Comment

These tragic deaths and disfigurements all occurred to preschool children while playing or waiting alone in a parked car. In a survey of 50 Irish parents 20 admitted to occasionally leaving a child in a parked car while doing brief errands. Possible causes of the conflagrations were (a) spontaneous combustion (all fires occurred in the warmer half of the year, but this seemed unlikely to explain all (if any) of the events); (b) electrical fault (no evidence was elicited, though the interiors of several cars were too extensively damaged to comment); (c) petrol or gas explosion (but no car had had a gas conversion, and no fire started in a petrol tank); (d) the cigarette lighter; (e) matches left in car; and (f) combustible seat materials.

The main culprits came to be the cars' cigarette lighters or matches and artificial seat covers. In nine of the 10 cars the front seats were fitted with artificial fur covers. These are frequently made of highly inflammable acrylic or Dralon. One industry source estimated that three quarters of the "shaggy" seat covers sold in Ireland are highly inflammable. These coverings are banned for domestic furniture, but no fire safety order covers their use for vehicle seats.

Most modern cars contain a cigarette lighter. Surprisingly, many of these lighters are operative (live) with the car's ignition switched off; this is true of most 1982 models in the Renault, Peugeot, Ford, and Austin range. Cigarette lighters are attractive to children. It is, however, difficult to ignite car seat covers with the car's cigarette lighter. Nevertheless, they light easily with matches or with paper ignited from the cigarette lighter. Matches may have been implicated in five of the 10 fires. Once on fire car seat covers burn furiously, giving off dense black smoke. My own simple experiments show that acrylic shaggy seat covers are incinerated within one and a half to two minutes after beginning to burn. Furthermore, the seat itself is usually filled with combustible polyurethane foam.

I suggest that (a) parents should be advised against leaving preschool

children alone in cars; (b) car manufacturers should be recommended to connect cigarette lighters to the ignition circuit; (c) fire safety requirements for domestic upholstered furniture should be extended to motor vehicle seating materials.

I thank the Garda Forensic Bureau, the Institute for Industrial Research and Standards, and John Butler, of Bolton Street College of Technology, for their most helpful cooperation. I also thank the several fire officers, coroners, and paediatric colleagues who informed me of cases.

ADDENDUM—Several other such events, including one death, reported in Irish newspapers are not included in this paper for lack of data. Further studies on the flammability of car seats and seat covers are being conducted at the Bolton Street College of Technology, Dublin.

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