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## Ketamine Contains Benzethonium

*To the Editor:*—For a recent study Malinovsky *et al.* asked, "Is ketamine or its preservative responsible for neurotoxicity in the rabbit?"<sup>1</sup> They concluded, "The appearance of spinal cord lesions after intrathecal chlorobutanol strongly suggests that this preservative is responsible for apparent toxicity of ketamine and therefore should not be used in any solution intrathecally injected into humans." However, chlorobutanol, which they studied, is not the preservative used in commercial preparations of ketamine available in the United States. Parke-Davis (Morris Plains, NJ) uses benzethonium chloride, up to 0.1 mg/ml, in preparations sold in the United States.\* Malinovsky *et al.* studied ketamine solutions formulated in France, which, although also made by Parke-Davis (Courbevoie, France), are prepared differently than those made in the United States.†

Different preservatives probably explain the different findings of neurotoxicity reported in the world-wide literature referenced by Malinovsky *et al.* in their earlier study of ketamine toxicity.<sup>2</sup> Application, across national boundaries, of results from drug studies always must be interpreted carefully because the same drug, from the same

company, may be prepared and preserved differently in different countries.

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\* Ketalar (ketamine hydrochloride) package insert, Revised 1990. Morris Plains, Parke-Davis.

† Rhodes D: Personal communication. 1993.

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*In Reply:*—The commercial preparation available in France is formulated with chlorobutanol. However, since lesions have been observed in earlier studies using the preparation containing benzethonium chloride, studies also are needed to determine the spinal cord toxicity of ketamine with and without the latter preservative.

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