agree with Dr. Astrup that lidocaine is a "good drug," but we want to emphasize that it may have detrimental effects in some situations.

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Differences in the Response of Humans and Dogs to Succinyldicholine

To the Editor:—We were interested to read Professor Merin's comments on the duration of action of succinyldicholine (SDC) in dogs compared with humans.[1] Our findings indicate strongly that the prolonged relaxation experienced by dogs when treated with SDC, in a dose which would be appropriate for a human, can be attributed to differences between canine and human cholinesterase.

We measured plasma cholinesterase activity in 14 dogs of different breeds and both sexes. For each animal, we performed four measurements using as substrates propionylthiocholine,[2] from which thiocholine is released and coupled with 5-5′ dithiobis (2 nitrobenzoic acid) (DTNB); butyrylthiocholine,[3] again utilizing DTNB; benzoyl choline,[4] relying on its absorption at 240 nm; and SDC,[5] measuring choline by use of choline

TABLE 1. A Comparison of Cholinesterase Activities in Dogs and Humans (±1 SD) Measured Using Four Substrates. Figures in Parentheses Represent the Mean Activity in Dogs Expressed as a Percentage of that for Humans Using the Same Substrate

Substrate	Propionyl Thiocholine IU/ml	Butyryl Thiocholine IU/ml	Benzoylcholine IU/ml	Succinyldicholine IU/l
Humans N = 117	4.58 ± 1.16	5.04 ± 1.27	0.88 ± 0.25	58.5 ± 11.75*
Dogs N = 14	2.33 ± 0.94 (48.7%) $P < 0.001$†	2.33 ± 0.47 (46.2%) $P < 0.001$†	0.36 ± 0.046 (40.1%) $P < 0.001$†	8.6 ± 4.3 (14.8%) $P < 0.001$†

*N = 91.

† Statistical method employed: *t* test assuming unequal variance.

oxidase, peroxidase, and 4-aminophenazone. The first three compounds are widely used in laboratories interested in the investigation of cholinesterase problems in humans, but SDC has only recently been made amenable to such use. In this context, its advantages over other substrates are still a matter for debate.[5,6]

Our results are shown in table 1.

Dogs have lower cholinesterase activities than humans, whichever substrate is used, but the contrast is most marked when results obtained using SDC are compared.

As Professor Merin has pointed out, muscle relaxation in dogs is readily achieved following administration of 0.1–0.2 mg SDC/kg bodyweight, 10–20% of that required in humans. Such an observation can be reconciled with plasma cholinesterase activity only when the latter is measured using SDC. This emphasises the importance of using such a method in the investigation of all animal species, but especially those in which experience with the use of SDC as a muscle relaxant is limited.

We believe that the failure until now to explain fully the differences in response of dogs and men to succinyldicholine stems from the choice of techniques for cholinesterase analysis notable for their biochemical simplicity, rather than pharmacological relevance.

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In Reply:—I am very pleased to see the results of the plasma cholinesterase assays reported by Faye and Evans. Certainly their continued interest has resulted in clarification of the mechanism of the difference in kinetics for succinylcholine between humans and dogs. Appreciation of the difference is particularly important if investigators wish to recover their animals for use in chronic experiments. Elucidation of the mechanism behind these differences cannot help but advance experimental investigation. I thank Drs. Faye and Evans for their efforts.

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