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## Doctors May Be Giving Wrong Dosage Of Adrenaline In An Emergency Because Of Labelling

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Adrenaline is stored in salt water in glass ampoules which are broken open when the drug is needed. The amount of adrenaline contained in the ampoule is usually expressed as both a dose (1 mg of the drug per 1 mL of salt water) and a ratio (1 part drug for every 1000 parts of salt water) on the label.

The ratio requires doing arithmetic to figure out how much drug to give. Therefore, doctors understand doses much better (and quicker) than ratios. Dr Daniel Wheeler at the University of Cambridge concluded from his research that having to do extra calculations to figure out how much adrenaline to give a person in an emergency might lead to the errors and delays which are common in administering the drug.

Dr Wheeler said: "It is well documented that patients are commonly given the wrong dosage of adrenaline." In order to determine whether the labelling was indeed the cause of the high number of dosing errors, the researchers set up mock scenarios. They programmed a medical mannequin to look like it was having a life-threatening allergic reaction. They then gave the doctors ampoules of adrenaline and told them to treat the emergency.

One half of the doctors were randomly assigned to ampoules with labels that had the adrenaline dose. The other half were randomly assigned to ampoules with labels that had the amount of adrenaline expressed as a ratio. The researchers then measured the amount of drug the doctors gave and how long it took them to give it.

All but 2 doctors out of 14 whose ampoules with labels that expressed the amount of adrenaline as a ratio overdosed their patients. Because they had to figure out how much drug to give, the doctors using ampoules labeled with a ratio also took about 1.5 minutes longer to give it.

"The findings might be different if the doctors had to treat a real person. In reality, the labels have doses and ratios, not one or the other," said Dr Wheeler. "However, this does give us insight into the problem and a fairly easy solution -- expressing drug concentrations exclusively as doses we believe would improve patient safety."

'The Effect of Drug Concentration Expression on Epinephrine Dosing Errors' will be published in the 1 January 2008 edition of *Annals of Internal Medicine*.

Adapted from materials provided by University of Cambridge.

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Published on : Thu, 3 Jan 2008