Peds Pearls

Epi, Tequila, and Margaritas!

Crucial Concentrations

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Can you guess what emergency medication is the most misunderstood one in your pediatric toolkit? According to experienced nurses, medics, and educators alike, it's none other than **epinephrine**! Surprised? Feeling doubtful? Take a moment to answer the following questions:

1) If you have a 5-year old in anaphylaxis from eating a peanut, what type of epinephrine is needed?
2) What is the volume of that epinephrine for the child?
3) If you have that same 5-year old in full arrest, what type of epinephrine is needed?
4) What is the volume of that epinephrine for the child?

OK, let's be honest here. How did you do? If this little exercise wasn't a piece of cake for you, to paraphrase Shakespeare, read on, Mc Duff.

Epinephrine can be used for several medical emergencies with variable doses and routes, but for now, we will focus on just epi 1:1,000 and 1:10,000 when used for anaphylaxis and cardiac arrest.

Lime and Salt?

It may help to think of epinephrine as two related (adult) beverages: tequila shots and margaritas. The tequila shot is, of course, undiluted and at full potency - a little goes a long way! The margarita, on the other hand, takes that shot of tequila and dilutes it with lots of yummy extras. And so, for this pearl, you can think of 1:1,000 epinephrine like a tequila shot – it's strong and packs a lot of punch into a little volume. And while it's labeled 1:1,000, those three zeros are just there to confuse you. This is a 1:1 medication; this means the volume in milliliters and the delivery dose in milligrams are exactly the same. 1 mg of epi = 1 mL of **1:1,000** epi.

Epinephrine 1:10,000, on the other hand, is just 1/10th the strength of the other epi. It's as if you took 1 mL of the strong epinephrine (1:1,000) and added 9 mL of normal saline. And just like the tequila in a margarita, it's diluted so there's more volume carrying the shot into your system. You can think of epi 1:10,000 as just a diluted form of epi 1:1,000, and you can still ignore the last three zeros. So, you'll have 1 mg of epinephrine in 10 mL of fluid, or 1:10.

Why the diluted epi?

Anytime a pressor is pushed into a vein, it requires dilution and more volume to get it into circulation faster. And while you could dilute it yourself, it is easier for us if it comes pre-diluted. It's a convenience and time saver that comes in a prefilled syringe, prepackaged in a box that's hard to open.

So, now that we cleared that up, you should always recognize that the dose of epi 1:1,000 will always be very small compared to epi 1:10,000. Actually for the same pediatric weight, there will be a 10-fold difference between the two. So, if our 5-year old gets 0.2 mL of 1:1,000 epinephrine for anaphylaxis (the shot of tequila), then the dose of 1:10,000 epinephrine will be 2 mL for cardiac arrest (the yummy margarita). It is crucial to remember that even though these may be the same mg dose, the volume and routes (IM vs. IV) are very different!

I'll drink to that!



Aside from emotional aspects, pediatric cardiac arrests are not that different than their adult counterparts. High quality BLS, a dose of epinephrine, and voila, you're running the code. And when you are pushing epi for anaphylaxis or resuscitation, remember that decimal points really do make a difference!



Quick Note from Scott: As described above, historically the concentration of epinephrine for resuscitation was expressed in ratios. 1:10,000 and 1:1,000, rather than 0.1 mg/mL (the 1;10,000) and 1 mg/mL (the 1:1,000). There has been a move to eliminate the ratios on the labels and use only the mg/mL (i.e. 1 mg/mL or 0.1 mg/mL) to avoid confusion and errors. However, to date, the ratios are still in many hospitals and EMS systems and it will be a while before everything is converted.



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Contact us to have Scott DeBoer or one of our other pediatric experts present at your next conference.

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