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Immersion **C**ould **E**scalate **D**eath (**ICED**)

Defense Attorney Brian Bulter questioned Dr. Dan Danzl during testimony at the criminal trial of former PRP Coach Jason Stinson. Every Coach in the country needs to know what a heat stroke expert, who is a M.D., had to say about ice immersion.

Dr. Danzl is the professor and chair of the department of emergency medicine at University of Louisville School of medicine. He has authored some of the chapters of *Rosen's Emergency Medicine*, and he is one of the editors of the book. This is a medical textbook of emergency medicine. This textbook is used in essentially every medical school across the United States.

Dr. Danzl has published many different books and articles related to emergency medicine. In relation to heat illness, he first published a review article 20 years ago on heat illness, heat exhaustion, and heatstroke. Since then, he has edited chapters on heat illness in *Rosen's*, and he currently is the editor of an up to date edition which

is online and circulated around the world. He is the section editor for adult and pediatric environmental emergencies which includes heat illness and heatstroke. He has also given lectures to several different medical groups regarding heat illness and the diagnoses of heat illness as well as treatment of heat illness.

PLEASE CONSIDER WHAT DR. DANZL HAS TO SAY BEFORE IMMERSING A HEATSTROKE VICTIM IN ICE. THIS METHOD CAN HAVE SERIOUS CONSEQUENCES, AND IT SHOULD NEVER BE USED UNLESS UNDER THE SUPERVISION OF A MEDICAL PROFESSIONAL.

The following is an unedited excerpt of Dr. Dan Danzl's testimony at Jason Stinson's criminal trial on September 15, 2009.

Q. Let's talk about this -- this ice immersion. Do you believe that that's the gold standard for treating someone in heatstroke?

A. No, sir.

Q. Can you explain to the jury why that's -- do you even believe that's a good idea?

A. There might -- there are extenuating circumstances where it might be okay when nothing else was available. But it's clearly not -- we've never done it and won't in our emergency department. Or children's. Well, bear with me for just, like, two or three minutes so you'll understand why I'm saying this. When we teach the medical students, we say, Okay, what happens if we throw you in a bucket of ice or ice water? And they say, Well, you shiver. And you're right. And what is shivering? Shivering is your body's attempt to make more

heat. You're contracting and relaxing muscles involuntarily that make heat. In heatstroke, that is bad.

The second thing that happens when we - or you go in a cold -- ice cold shower is, you vasoconstrict; your blood vessels and your skin clamp down. The radiator isn't working and you're trying to save heat because your body is sensing that you're cold because of your skin. Two very bad things with heatstroke. So the studies have been done. The best ones are by the gentleman I mentioned, Dr. Cogali, and he compared soaking people in tubs of ice water and laying them unclothed on the equivalent of a hammock spraying tepid lukewarm water on them and then fan jets to cause evaporative cooling. And what he discovered is the rate of cooling, it's not intuitive, is faster with lukewarm water and fans than it is in ice water.

And the reason is, as I told you, it's like when you sweat, why do you lose heat when you sweat? You only lose heat when you sweat if the sweat evaporates off your skin. Takes 540 calories of heat. Number's not important. If you wipe that sweat off, you lose nine calories per gram. So it's not surprising that if you artificially sweat by putting water on people and making the water evaporate, that you will rapidly cool them. And that's not even talking about the issues of the complications of throwing people in tubs of ice water, aspiration down the lung, if they have a seizure, which is not rare you're in trouble. It's impossible to monitor the patient. It's impossible to ventilate the patient, make them breathe with a bag. And it's really impossible to do chest compressions on a patient floating in water. It's impossible.

So the whole thing is not only not the best way to do it, but it comes with some bad side effects.

Q. Doctor, do you -- do you routinely give your medical students a question about this?

A. Yes, I do.

Q. And the question is: The best way to cool a heatstroke patient is, A, slowly with cool IV water; B, slowly in cool air; C, rapidly with extremities in ice water; D, rapidly with tepid water and a fan; and E, limiting ice to the trunk.

A. I hope they would pick the correct answer.

Q. Which is?

A. D.

Q. If they write, I would have immersed them in an ice water tub, what happens to them?

A. They don't pass -- our medical students wouldn't pass that course.

Q. What about the use of icepacks?

A. It's not essential and -- I mean, I guess what I would say is, I wouldn't have an extreme complaint if physiologically and medically if evaporative cooling were combined, if you had ice, with ice just on the neck, just in the axilla and just in the groin. Because you probably aren't going to harm anybody and those are big arteries, and so those big arteries aren't going to completely shut off with ice. There's some debate in the literature as to whether that really speeds up the cooling or not. I don't see a significant downside to it.