Liz Olson: 00:00 Targeted Temperature Management is a Class 1 guideline, according to the American Heart Association. But, despite the evidentiary support, many hospitals still lack the protocols to include this therapy in their post-cardiac arrest care protocols. I'm Liz Olson with the American Heart Association and today we're here to talk through the recently released 2020 American Heart Association CPR and ECC guidelines, and what they tell us about Targeted Temperature Management and in hospital cardiac arrest. Our guest today is resuscitation expert, Dr. Dana Edelson of University of Chicago Medicine. Hi Dana, how are you?

Dana Edelson: 00:38 Hi Liz, thanks for having me.

Liz Olson: 00:40 Great to have you here. Can you tell us a little about your background?

Dana Edelson: 00:44 Sure. So I'm adult hospitalist at the University of Chicago where I serve as the executive medical director for rescue care. I'm also the president and co-founder of AgileMD and the chair elect of the resuscitation systems of Care Advisory Group.

Liz Olson: 01:03 Well, it's great to have you here. Thanks. Let's dive right in. What would you say is the biggest major change in these new 2020 guideline updates?

Dana Edelson: 01:13 Probably the focus on epinephrine, for me is the one that stands out as the most... I would say probably the most important piece in all of this is that the key fundamentals haven't changed. We're still talking about good high quality chest compressions, early defibrillation, none of that has changed. So we're still looking for compression depth of five to six centimeters or two to 2.4 inches. We're still looking for a compression rate of 100 to 120 avoiding unnecessary pauses, particularly before shock, trying to make sure we fully recoil after with each chest compression, those are all basic fundamental pieces that remain. There's been some new data that's come out in the last five years that's actually been helpful and informing some of the places where recommendations were hazier. And so we think one of those places was around epinephrine.

Epinephrine has long been a staple of our guidelines, but now having data that actually shows that it improves survival in randomized controlled studies, we'd had some before we had a new big one and now a meta-analysis that came out very recently, and so those really improve our confidence and the ability to make that recommendation. So that's a class one recommendation now to give epinephrine, but not just to give

recommendation but also to give it early, because there is increasing more data that the earlier we give the epinephrine the better that seems to... The stronger the impact tends to be. Maybe that's some of the reasons why we didn't see the benefits that we wanted to do in former studies, which is because of the delay in administering that epinephrine particularly in out of hospital studies where it can be upwards of 20 minutes before that first dose gets given.

Liz Olson: 03:16 These all in hospital cardiac arrest chain of survival has been updated to better highlight the evolution of systems of care, and the critical role of recovery and survivorship with the addition of a new link. Can you elaborate a little bit on the significance of the new recovery link?

Dana Edelson: 03:33 Yeah, actually, that's a really nice addition too. We're recognizing now that the treatment really doesn't end when patients leave the hospital often they've suffered a significant episode where their recovery can last for a long time. And so the idea of breaking it up into different time periods with different focuses is really helpful. And also just recognizing that people will often do continue to recover over time. So thinking about there's the immediate post recovery period, and where we maybe focusing on basic things like, preventing seizures, making sure people are swallowing okay, to the short-term we're focused on some early cognitive focus, just in basic daily activities of living to the medium. And long-term where we're trying to get people back to work memory and then dealing with some of the psychological impact of it, the PTSD, the fatigue, things that can linger for a long time. It's to have a near death experience. Is a life changing event in a lot of ways and so, we've recognized this for a long time to have this now in the guidelines, I think is a really nice addition.

Liz Olson: 05:12 The AHA and other organizations have recommended structures for specific performance improvement initiatives in resuscitation, including conducting structured team debriefs after resuscitation events and responding to data in hospital cardiac arrests collected through American Heart Associations, Get With The Guidelines resuscitation program. So how can hospitals use data to continually improve preparedness and resuscitation outcomes within their facilities?

Dana Edelson: 05:43 So I actually would almost flip that question and say, how can you do quality improvement without data? This is a passion of mine and something I've spent the last decade plus of my life trying to figure out how to do and data comes all sorts of varieties. But I will say that from a basic premise of quality

improvement is you got to measure it. You got to know where you start, you got to set goals and then you got to be measuring it and feeding that data back. And that's whatever quality improvement project you're working on. And so if your goal is to improve resuscitation processes and outcomes, you got to know where you started. So the Get With The Guidelines, resuscitation tools have been set up to help people do that. So even just basic things to track incidents and outcomes, I can't tell you how many hospitals I've around the country and the world in general. I can't even tell you how many arrests they had in their hospital or where they occurred, led alone what the outcomes of those events are.

And that's because it's really hard. It's hard because unlike it's not stored in electronic forms and easy places for the hospital. It actually requires somebody too at this point, almost it requires manual work to collect that data and to store it in a place where other people can access it, as opposed to an Excel file in one person's desk or on sheets of paper that just land in the basement somewhere. And so you see though now, increasing numbers of hospitals doing this. There are many hospitals now that participate with Get With The Guidelines, that allows people to not only see what's happening in their own institution, but also to benchmark against other facilities. So if you're trying to set a goal for Ross grades, for example, for non-shockable rhythm, it's really good to know where other hospitals are both in your region and by types of hospitals. And so these are all things that you can do with Get With The Guidelines.

There are lots of other ways to get and store data that we have defibrillators now that measure CPR process variables. We have the ability now to be able to extract that data and look at it. I'm a big fan of Debriefing, these are programs that I helped develop in lots of institutions. And I would say that one of the underlying key pieces of it is to have some kind of objective data that you can look at. Otherwise, it's just, everyone's going by memory and it's really hard. What you notice in a stressful event is we're not reliable historians of reality when we're under stress. And so having some form of objective data is really useful, allows you to correct and make a plan for future risk solicitations. And honestly, just knowing that data is being captured in and of itself changes culture in an institution, because it makes people cognizant. It says, "This is important. This is something we're working on fixing and there's going to be accountability around it."

Liz Olson: 09:20 That's really interesting. And I think it's some times hardness to get a system to do the sea change as, okay, we're going to focus more on quality, and to adopt that and support it like in normal times. And this year when a system, a hospital is dealing with COVID, how do you also incorporate quality? I mean, there's a lot of competing priorities and certainly patient care and survival is very important, but organizational needs or focuses may have to change as you're trying to adapt for COVID. But I mean, what does quality look like? Quality improvement look like this year really?

Dana Edelson: 10:05 That's a great question, because there's always competing limited resources particularly in time and attention, I'm not even talking about money, but just for QI that's what you're competing for. And COVID sucks up a lot of oxygen literally and figuratively. And so you're competing with that. I would say that the impact to QI, you can take one or two approaches when you can say, "We're not doing anything except just trying to survive this right now." In which case not a lot of QI happens. On the other hand, what you see is that there are certain things that end up rising to more important. For those of us who care about resuscitation, COVID actually shines a spotlight on it because where it's increasing, unfortunately the incidents of cardiac arrest and certainly changes the etiology of these events.

Even in my own institution, We debrief every cardiac arrest that occurs outside of the ICU or the ER, and try to understand what the etiology of these events. We're seeing arrests that happening just different than we used to see, because these COVID patients who are just suddenly having events who look okay, and suddenly aren't. And there's all this work around how you perform resuscitations in a way that's safe for providers. And so there's interest around that too. Things like leaving crash cards outside of rooms, limiting the number of people in the rooms, making sure the PPE is available and being used appropriately. And so all of those sorts of things, because they're important around COVID. I think other programs like, other colony improvement initiatives like, falls, pressure ulcers, things like that, maybe taking a hit right now from an attention standpoint, resuscitation hopefully is not because it's so tied into COVID.

Liz Olson: 12:38 So switching gears a little bit Targeted Temperature Management is in our guidelines set at 32 to 36 Celsius for at least 24 hours, and is currently recommended for all cardiac rhythms in both out of hospital and in hospital cardiac arrest, many uncertainties within the topic of TTM remain, including whether temperatures should vary on the basis of patient

characteristics, how long TTM should be maintained, how quickly it should be started. There are ongoing trials that address TTM. And I'm wondering what effects do you think these ongoing trials will have on the current TTM recommendations?

Dana Edelson: 13:16

There was a big study that was published in 2019, another randomized controlled trial that supported some of the prior work that had been done in this latest trial. All of these studies have been set up a little bit differently and so we have to read between the lines to try to understand what's actually going on here. Our initial studies looked at hypothermia versus nothing, and they were promising that hypothermia looked good. The randomized control trial that we saw a few years ago at this point and actually have to remember what year that was, when we stopped talking about hypothermia versus Targeted Temperature Management, did a study looking at fixing temperature at 32 versus 36 degrees and found that there really wasn't a big difference between those two ideas. And so then, there was this question of, okay, well, is the big benefit that we're seeing here that we're preventing fevers, for example. And so the 36 is actually... When we set it at 36 what we're doing is actually preventing fevers.

What ended up happening. And I think that some of the interpretation around that came down to the idea that Targeted Temperature Management at 36, I think somehow got interpreted as not an intervention that, that was leave people alone and that actually wasn't the case. And so the question really, there's two questions we had 36 is actually keeping someone cooler than normal and 32 it's possible was on, was it possible that when you get too cold, there's actually a downside. So that the latest study that was published was comparing temperatures of 33 and 37. And that one showed a clear benefit for a temperature of 33 over 37. And so, in terms of where that's going and ultimately... The recommendation is for Targeted Temperature Management, it's that, that study still only had 500 and some patients in it.

And so we're left with the concept that certainly not allowing people, leaving them alone and not managing their temperature, does seem to be associated with worse outcomes. Whether it's how cold we need to do it and how long we need to do it, we have no idea because we really haven't done. We haven't done enough studies with enough patients to be able to understand what's the impact of eight hours, 12 hours, 24 hours, 72 hours, should it be 32, or 33, or 34, 35 or 36. So all questions that still remain to be answered. I think that what

we're seeing consistently is that that patients left to their own devices. After a resuscitation event will show signs of an inflammatory response and that keeping their temperature fixed at something lower than a normal body temperature consistently seems to be associated with better outcomes.

Liz Olson: 17:23 So for a hospital, looking at the 2020 guidelines, what would you say is the best way to take this new information and incorporate it into their hospital processes?

Dana Edelson: 17:37 I wear two different hats. And so I live in the world of people who consume these studies, participate in these guideline writing groups and geek out on all of the latest science and these recommendations. And the people who write these guidelines are of that mindset. And it's great because ultimately we produce guidelines that are very thoughtful, and careful, and detailed and grade both the strength of the recommendation and the level of evidence on which those recommendations are made. If there's any specific question that you have on something and you want to understand where that recommendation came from, it is very easy to trace that back and to be able to know where it came from and how confidently the people who made those recommendations feel about it. What are the things that are reinforced in the set of guidelines and what's new or different. And there usually aren't that many things in either of those columns.

For this set of guidelines, if you're distilling it out, the key on this really is that most of what was in the guidelines before is supported in this current set of guidelines, we should keep doing what we're doing, which is focusing on high quality CPR, early defibrillation. That is good stuff. And focus on post-resuscitation care in terms, the key changes in here, we talked about like really in terms of, at the bedside taking care of patients that from the adult side, the key difference I would say is making sure that you're giving epinephrine and that you're giving it early. If I was going to walk away with one big change.

On the [PID 00:19:44] side, the big change I think, is probably the focus on respiratory rate prior to these guidelines. The recommendation for respiratory rates in the pediatric population was extrapolated from adult data. We now have data this year that suggests that that may not be safe from when it comes to respiratory rates. And that's actually, again, of the places where things tend to be different between adult and kids. Ventilation is often different. Kids breathe at faster rates. They're more likely to have respiratory etiologies for their cardiac arrest. And so the recommendation that they should be

		ventilated at 20 to 30 times a minute, as opposed to the 10, which had been the recommendation prior based on adult data is new and important.
Liz Olson:	20:42	Dr. Edelson thank you so much for joining me. Thank you for listening today and share this show with someone who needs it. To view our previous webinars on Targeted Temperature Management, and learn more about the American Heart Association and its quality improvement efforts, visit us at heart.org/resuscitation. Today's podcast is made possible through the support of Becton, Dickinson and Company.