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Evidence-Based Resuscitation Medicine

### NEW TRENDS IN EMS MANAGEMENT

Evidence based medicine has changed resuscitation in the field and in the ED. How well do you know the new tools in the trade? I am your host Dr. Shira Johnson and joining us today to discuss what is new in EMS is Dr. Chris Colwell from Denver Health Medical Center. Dr. Colwell is an Associate Director in the Department Of Emergency Medicine and he is Medical Director of the Denver Paramedic and Fire Department.

**DR. SHIRA JOHNSON:**

Dr. Colwell welcome to ReachMD.

**DR. CHRIS COLWELL:**

Thank you, thank you for having me today.

**DR. SHIRA JOHNSON:**

So in all the years that you have been teaching and practicing prehospital care, tell us some of the ways that it's changed.

**DR. CHRIS COLWELL:**

Well, I think prehospital care and emergency care has changed dramatically in the last 10 or 15 years and I think in particular we talked about EMS and we focused on pre-hospital issues, what we have done that I think is very exciting is that we have started the challenge the mantra that we have always lived by. So if you talk to EMS providers and medical directors 20 years ago, there were certain things that they said this is core of EMS. This is the core what we do and really always, but particularly recently we have challenged some of that mantra, some of things that we were doing does it makes sense under what circumstances and I think that is made for some exciting updates and changes.

**DR. SHIRA JOHNSON:**

What's one of the biggest advances or changes that we have seen in the way we administer CPR?

**DR. CHRIS COLWELL:**

Well CPR has gotten quite a bit of attention particularly in the last several years and I think what we have started to learn is that way back when we emphasized CPR, we were probably right to do that and as we de-emphasize CPR as we moved along may be that was a wrong direction to go. More recent articles have really emphasized good CPR and good early CPR may be the most important thing in terms of survival for the patients that have undergone cardiac arrest. We sometimes get too bogged down with 4 and 5 and 6 hour training courses for CPR, it does not need to be that difficult. Fast 100 compressions a minute, do it first, do it often, if you are doing it well, we may have more impact on saving lives and essentially anything else we do other than perhaps electricity.

**DR. SHIRA JOHNSON:**

With the changes in CPR and I guess I am referring to we are doing more compressions and less ventilation have we in terms of numbers or have you personally either 1 seen a resultant change in survival and outcome.

**DR. CHRIS COLWELL:**

Both I think the most impressive data is what's been published in this area and it started with a Norway study back in 2003. Actually, some Seattle studies that looked at this earlier than that, but it really generated some excitement in 2003 when they found that doing CPR first even before we looked at what rhythm the patient was in and before we considered electricity in the unwitnessed cardiac arrest and when it wasn't witnessed by prehospital providers it really resulted in increased survival and studies that have come out recently since then have reemphasized that issue and when you have instituted a 2-minute of CPR before doing anything else in the unwitnessed cardiac arrest we are saving lives and this is resulting in having more patients walk out of the hospital neurologically intact then when we were not doing that.

**DR. SHIRA JOHNSON:**

I guess the numbers of unwitnessed cardiac arrest prodismal, I mean there is 0 or in the negative.

**DR. CHRIS COLWELL:**

They have been bad and is not like we have been able to turnout round and now they look good, but they certainly are looking much better when we are paying attention to detail such as when we do CPR and how well we do it. We are still not doing it well, consistently enough.

**DR. SHIRA JOHNSON:**

What about the role of hypothermia after a cardiac arrest?

**DR. CHRIS COLWELL:**

So this has been an interesting development really over the last several years. There was 2 articles published in New England Journal of Medicine in 2002 that looked at therapeutic hypothermia in specific cases of patients who were found to be cardiac arrest, resuscitated from that and had return of spontaneous circulation, but did not return their neurologic recovery. In other words they remained comatose even though they had spontaneous circulation and in those groups of patients particularly if they had an initial witnessed ventricular fibrillation they seemed to do better and survive in higher numbers when therapeutic hypothermia was instituted. So a lot of institutions either in the ED or certainly in the ICU have instituted this idea and are doing this. The question is whether or not EMS should be doing it and I think the answer to that is we probably should not because it needs to be done immediately both of studies and study since have suggested that if its instituted within an hour may be 105 minutes is what the 1 study looked at and certainly by 6 hours have the patients cooled then you may get your impact. So doing it in the pre-hospital setting, when you only have 10-minute response times isn't necessarily where we are going to make our difference, but I am a firm believer that if we are able to institute something like this in the field it sends a message (a) that we have identified this patient as a potential candidate for this and (b) once its started its much easier for hospital to continue that process and I think that's what exciting about prehospital potentially doing this and they are doing that in some areas in the country.

**DR. SHIRA JOHNSON:**

What's new in airway management that may be our listeners don't already know?

**DR. CHRIS COLWELL:**

There is a lot of interest focused on airway management and a lot of debate as to whether airway should be managed in the field and if so under what circumstances and should be using medications to assist in this rapid frequent intubation those types of things and there is debate and virtually everyone of those areas. What I think we are really progressing in is alternatives to airway management. First of all we are learning the good skills are important and secondly we have some more tools that are disposal now. So things like CPAP is much more universally used now in the field than it ever has been. BiPAP is still probably a little too expensive and I haven't seen that a whole lot, but I have seen lots of areas where CPAP has been introduced and it has resulted and we have some studies now that are showing that it result in fewer intubations in the field and better outcomes. We also have other alternatives in terms of rescue airway devices. So, things like the Combitube, like the LMA, like what we are using in Denver which is the King airway can be very effective in terms of ventilating patients and although its not a definitive airway it may accomplish everything that we need to accomplish in the field and having these other alternative should be considered and should be offered in many cases incorporated into prehospital practices. Not as necessary the only thing, but certainly as an option.

**DR. SHIRA JOHNSON:**

That's a big change. CPAP used to be a last resort while you are waiting on anesthesia in the ER on the floor and now you are suggesting it should be a first resort and should be taken into the field.

**DR. CHRIS COLWELL:**

I think absolutely, in fact we are doing it in the field now in Denver have had wonderful results. Its not on all respiratory patients obviously, its on reactive airways disease, COPD, asthma, CHF patients those types of things, but we have had success similar to what the published articles have shown in terms of fewer intubations and better outcomes.

**DR. SHIRA JOHNSON:**

If you are just tuning in, you are listening to The Clinician's Round Table. I am your host, Dr. Shira Johnson, and joining me today is Dr. Chris Colwell from Denver Health Medical Center who is also the medical director for the Denver EMS System.

Let's talk about drugs, have we expanded the toolbox of meds used by our paramedics in the field. What drugs have had newfound success?

**DR. CHRIS COLWELL:**

We have expanded the toolbox fairly significantly. Sometimes with very good results. Sometimes with perhaps not as good results as we had hoped for expected and we have done it in many areas as well. Things like emesis treatment for nausea and vomiting in the field were as for long time, I didn't use any thing or when we did use it, it had some really significant downsides of sedation, dystonic reactions those types of things. We are now seeing studies that in particular ondansetron since it has become generic and is now much less expensive has very few side effects such as sedation or dystonic reactions, its not expensive. Some people have argued how effective is it. My personal anecdotal experience is that it has been very effective. I know some of the studies haven't been overwhelming, but they certainly have found it to be reasonable and I think it is a nice new option in that in particular it doesn't have the side effects that we have traditionally seen with antiemetics.

**DR. SHIRA JOHNSON:**

And you have it available to your paramedics.

**DR. CHRIS COLWELL:**

We do we are using ondansetron in the field in Denver and I know a lot of places across the country that are using it as well.

**DR. SHIRA JOHNSON:**

Adenosine has always been 1 of my favorite drugs. Can you tell our listeners who may not this how it's used in the field if it's used in the field, its role in the ER?

**DR. CHRIS COLWELL:**

It is used in the field and its gotten some interesting attention of late and particularly there have been some questions as to how accurately we are using it in the field and how there are times when perhaps we shouldn't be using that we have been and I think more importantly we do have it in Denver and I know lot of systems that do have and I think it is appropriate to have it in the prehospital setting, but I think what the articles are doing is a very good thing in terms of they are reminding us that there are some downsides to adenosine. It's not a completely infallible drug. Its not something that can be used with impunity all the time and there is something we really need to be thinking and critically evaluating how we are using it, under what circumstances, how certain are we that we have good identifiable rhythm that we are treating and what situations is it particularly effective and what it has not been good idea to use that in the field and I think we need to question that about everything we do. There are not so much can way because a lot of our literature has

focused on can this be done on the field, I believe just about anything can be done on the field, but next question to me is more important should we and I think there are sometimes when adenosine is appropriate to use in the field, but there are also sometimes when its not and we need to be careful about differentiating that.

**DR. SHIRA JOHNSON:**

You advised with medical control sake have your paramedics a rapid rhythm undiagnosed, but it is give adenosine to see if it will work, to see if this flutter wave, to use it diagnostically in the field or you try to stress that they use it to treat.

**DR. CHRIS COLWELL:**

No I think it really is more appropriately used in my opinion for treatment. For diagnosis that something that can be done often more effectively in the emergency department not because we are going to do something differently, but we can often have a situation where we can more clearly document exactly what the underlying rhythm is and I am not sure how often we do it just purely diagnostically anyway, but I think in the field I am not sure there is a real indication to do it just a kind of see what happens. I think we need to be very clear as to what rhythm we are treating and why we are using adenosine.

**DR. SHIRA JOHNSON:**

They call it in and they have to get permission to use adenosine or your guys go and use it.

**DR. CHRIS COLWELL:**

They don't, they do have a flexibility to use as a standing order although we do view all those calls and I have got to say our experience is very similar to some of the published literature that is suggestive that in the up to 20% of the cases its not necessarily being used in the right setting.

**DR. SHIRA JOHNSON:**

What about magnesium. What are some of the ways that choose prehospital?

**DR. CHRIS COLWELL:**

Well its been used in a number of different ways and we in medicine, I would say this is emergency medicine and prehospital, have searched for the right use for magnesium for so long I think we are all anxious to find a niche for magnesium because its inexpensive, its easy to give, it does not have very many side effects. We have searched so hard for reason for magnesium and I am not sure we have found a good indication just yet. We have used in reactive airways disease although there is not a whole lot of data behind that. We have used it in strokes and we know we can use it effectively, but we are not showing any real benefit from it and that at least not yet. We used it in eclampsia and that probably is a reasonable use for that rare eclamptic patient that we have although in Europe. They have questioned that data as well so we are still searching for the real indication for magnesium.

**DR. SHIRA JOHNSON:**

What about the interosseous route sorted out just for peds and where are we with that today?

**DR. CHRIS COLWELL:**

I think this is a real exciting advancement in prehospital medicine because we are using now in a lot of different systems including Denver, a bone gun essentially for interosseous access in both peds and adult. It's much better than the old systems that we have used for interosseous access. I think it's far better than trying 3, 4, 5, 10 times for IV access when you just can't get it in a patient who is really sick. I am not sure we should be using it in the awake alert patients that could use IV access, but don't necessarily have it. I think it should be reserved for the situations where we really need it, but it's a wonderful opportunity now for access in the patients that we didn't have very good access before both in the prehospital and in the emergency department.

**DR. SHIRA JOHNSON:**

That's question. So physicians who are listening to us today and they want to follow up on some of the topics that we just touched on, where can we tell them to get more information?

**DR. CHRIS COLWELL:**

If anybody has anything that they would like comments on that I can help with, I can either give them some of the answers that I have found or direct them to places or people that can. My email is [ccolwell@dhha.org](mailto:ccolwell@dhha.org) and I will be more than happy to help either find some of the things that people look in for, direct them the literature that I have found helpful in trying to come over some of these answers or direct them to people that can come up with some of these answers for them.

**DR. SHIRA JOHNSON:**

We want to thank you very much for being on this show today.

**DR. CHRIS COLWELL:**

Thank you very much for having me.

**DR. SHIRA JOHNSON:**

We have had Dr. Chris Colwell today joining us to discuss new trends in EMS management and what you don't know could hurt you.

You have been listening to the Clinician's Roundtable on ReachMD, The Channel for Medical Professionals. For a complete program guide and pod casts, visit [www.reachmd.com](http://www.reachmd.com). For comments or questions, call us toll free at 888 MD XM 157 and thank you as always for listening.