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CHF Solutions, Inc. (CHFS)
Investor Update Conference Call
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Company Participants
Stuart Goldstein - Cincinnati Children's Hospital Medical Center
David Askenazi - Children's Hospital of Alabama
Shina Menon - Seattle Children's Hospital

Conference Call Participants
Jeff Cohen - Ladenburg Thalmann & Co.

Presentation

Operator
Good afternoon, and welcome to the CHF Solutions Investor Call. All participants will be in listen-only mode. [Operator Instructions] After today's presentation, there will be an opportunity to ask questions. [Operator Instructions] Participants of this call are advised that the audio of this conference call is being broadcast live over the Internet and is also being recorded for playback purposes. A replay of the call will be available approximately one hour after the end of the call.

During this conference call, the speakers will be referencing slides that are available on the Investors tab, Events & Presentations section of the Company's website at www.chf-solutions.com.

Please take a moment to find the presentation and follow along the prepared remarks from our panelists. I would now like to turn the call over to Jeff Cohen, Managing Director, Equity Research at Ladenburg Thalmann & Co., who will be moderating today's call.

Jeff Cohen
Thank you, Cydney. Thank you all for joining us today for conference call. There is a PowerPoint that's been posted on the Company's website on the Investor Relations section regarding this call.

As stated on slide one, we're going to be discussing a multicenter retrospective study, titled Kidney Support in Children Using Ultrafiltration Device, which involved the use of the Company's Aquadex FlexFlow system, manufactured by CHF Solutions. The study results were published in the Clinical Journal of the American Society of Nephrology on August 28, 2019.

Before we begin the discussion, I would like to take the moment to cover certain matters. On slide two, during the course of the conference call, forward-looking statements may be made on behalf of CHF Solutions. Except for historical information mentioned during the conference call, statements are forward-looking statements that are made pursuant to the safe harbor provisions of

the Private Securities Litigation Reform Act of 1995. Forward-looking statements may involve known and unknown risks and uncertainties which are based on beliefs, assumptions, expectations and information currently available.

By providing this information, the Company undertakes no obligation to update or revise any projections or forward-looking statements, whether as a result of new information, new developments or otherwise. You should take time to review the cautionary statements and risk factors that are included in the Company's 10-K and other subsequent financial reports filed with the SEC under risk factors or cautionary statements related to forward-looking statements for additional risk factors which cause actual material information and discussions which differ from what the Company's posted. Please look at chf-solutions.com.

Also, we want to remind the audience that the use of Aquadex FlexFlow system is currently not cleared by the FDA for use in pediatric patients. Therefore, the Company does not promote the use of Aquadex FlexFlow system in pediatric patients. Based upon the clinical experience and medical judgment, physicians are permitted to prescribe the device for use in pediatric patients.

As previously disclosed, CHF Solutions expects to submit an application to the FDA requesting a modification to the current 510(k) clearance for Aquadex FlexFlow system to include pediatric patients above 20 kilograms of weight in the near future. The study discussions today involve pediatric patients in all weight categories.

On slide three, you'll see disclosures relating to the relationship between the Company and Ladenburg Thalmann & Co.

I'd like to introduce our three speakers. I'm on slide four. With us today are Stuart Goldstein, David Askenazi, and Shina Menon.

Dr. Goldstein is pediatric nephrologist at Cincinnati Children's Medical Center in Cincinnati, Ohio. He's been the Director of the Center for Acute Care Nephrology, Medical Director of the Pheresis Service, Co-Director of the Heart Institute Research Core, and a Professor in the University of Cincinnati Department of Pediatrics. He received his medical degree from Columbia College of Physicians and Surgeons.

Dr. Askenazi is a pediatric nephrologist at Children's Hospital of Alabama. He's the Director of the Pediatric and Infant Center of Acute Nephrology, and Professor Pediatrics at the University of Alabama at Birmingham. He received his medical degree from University of Texas Medical Branch. He also holds a Masters degree in Public Health from the University of Alabama.

Dr. Menon is a pediatric nephrologist at Seattle Children's Hospital and Seattle Cancer Care Alliance. She's Director of the Acute Dialysis Program at Seattle Children's Hospital, and Assistant Professor in the Department of Pediatrics at the University of Washington. Dr. Menon received her medical degree from Maulana Azad Medical College in Delhi, India.

Slide five shows the agenda for today's discussion. I'd like to turn to slide six, at which point, we will be turning the call over to physicians. And I will turn this over to Dr. Goldstein to begin. Thank you.

Stuart Goldstein
Thank you, Mr. Cohen. And good morning, afternoon, or evening, depending on where you are. And I'm going to start off discussing the challenges of neonatal replacement therapy, which is the term we use for all forms of dialytic therapy.

Here are my disclosures for you to review. And the relevant one are that I do consult for Baxter Healthcare, which makes the device that provides renal replacement therapy, as well as Medtronic, which has acquired a company that also has a device that provides renal replacement therapy or dialysis for patients.

On slide number eight, the objectives of my talk or my portion of the talk are to describe ultrafiltration, which is the medical term for fluid removal for pediatric patients who weigh less than 20 kilos in weight. And the overarching objective here for my talk is to discuss why there is a large gap in the device world, in the United States, especially for machines and devices that are really not designed for children that we have to use in an off-label way, as was discussed by Mr. Cohen before; discuss why heart failure is not just an adult problem, and the Aquadex machine was initially designed for patients who had fluid overloaded and heart failure; and then, at a high level, the approach and challenges to providing CRRT, which stands for Continuous Renal Replacement Therapy, so a form of therapy that is provided for a prolonged period of time or even continuously for 24 hours prior to 2014; discuss a little bit about the future of neonatal CRRT and what is needed; and discuss how the enhancement of the current device will optimize our ability to support babies.

So, now, we're on slide number nine. And so, the traditional use of the Aquadex FlexFlow system is depicted in the diagram below. The term SCUF for Slow Continuous Ultrafiltration again slow continuous fluid removal for adults who had diuretic resistant heart failure was the primary indication. Adults who have heart failure will develop fluid overload that compromises their heart function and their kidney function. And the Aquadex is a very precise machine to remove fluid from a patient without necessarily clearing waste products or toxins. You can see here that it's a very simple device in which heparin is used in standard dialysis to anticoagulte the blood, so the blood is not caught in the filter and fluid is removed as depicted by the yellow box below. This was approved for ultrafiltration in adults in 2007. It has a very small circuit volume, so a 33 cc circuit volume is about an ounce of fluid, and that's the amount of the patient's blood at any one time that is continuously going through the extracorporeal circuit. 4 kilograms, so for a patient who is 4 kilograms, which is about 9 pounds in weight, that circuit volume would comprise 10% of that patient's blood volume. And that's important, because patients who have more than that percentage of their blood outside the body are at risk for low blood pressure and other sequelae or other comorbidities from having that amount of blood outside.

However, this is a device that because of this relatively small circuit volume compared to other devices that have circuit volumes of 100 milliliters or even 150 milliliters, this is a relatively small circuit and therefore can be used, again off-label, potentially more safely in smaller children. This

is a study just to identify why heart failure is still a problem even in children. So, this is a study that I participated in Texas Children's Hospital with Jack Price, a cardiologist.

And children who had worsening renal function, so who had changes in their kidney function, and that's what WRF stands for, their risk of either dying or needing to go on to a ventricular assist device, a mechanical assist device to help their heart pump, was significantly greater than those children, who did not have worsening renal function. So, you can see in the graph there, the patients are depicted with the graph, line that goes down with worsening renal function. And you can see that by 3 months, more than half of those children who had heart failure and fluid overload, worsening renal function, more than half of them died or needed to go on to a mechanical assist device for their heart.

As we move to CRRT in provision for neonates, there are a number of challenges. First, acute kidney injury itself, so acute decompensation of kidney function and volume overload are common and are associated with both morbidity and mortality in critically ill neonates and children. And I'll show you some data from that in the next few slides.

And I'm on slide 11 now. In recent years, continuous renal replacement therapy has emerged as the preferred modality to provide kidney support to such children. There are three other forms of renal replacement therapy intermittent hemodialysis, which requires large blood volumes, fast blood flows and is done intermittently; peritoneal dialysis in which a catheter is placed in the abdomen, and we use the body's natural membrane to try to remove fluid. And that's very inaccurate. And then, as I mentioned before, slow continuous ultrafiltration, which allows us to remove fluid, but there's not too much in terms of clearing waste products.

So CRRT has emerged as the preferred modality, because it's continuous, it's gentler, and we can make changes on minute to minute, hour to hour, based on the needs of a critically ill child.

However, CRRT has been used sparingly in neonates that have been associated with worse outcomes compared with larger children as the designed and approved for adult type machines require larger catheters, larger tubing, bigger filters, which result, as I mentioned before, in a higher extracorporeal volume relative to patient size.

In fact, a recent single center study demonstrated significant hemodynamic instability in 8 patients after CRRT initiation showed that 55% of the sessions had intradialytic low blood pressure, which occurred mostly -- which mostly occurred shortly after CRRT initiation. So again, very large volumes of these circuits that are made for adult machines cause problems in children, in small children who require CRRT and might prevent people from using the therapy.

I'm on slide number 12 now. And this is a study from the multicenter prospective registry that both Dr. Askenazi and I participated on in the middle part of the last decade. This study, called the Prospective Pediatric CRRT Registry enrolled 370 patients from 13 centers around the U.S. over a five-year period. And what you can see here, especially in the fourth line, is that patients who became more volume overloaded, greater than 20%volume overloaded, had a near five times odds ratio for mortality, even controlling for underlying severity of illness, patient size, and other patient related factors. So, the ability to prevent or even remove fluid would be helpful in these patients

and potentially decrease mortality. Again, we didn't have a machine that was made for children this size and had to use machines off-label in an adaptive fashion.

I'm now on slide number 13. And just to highlight this even greater -- to the greater extent from Dr. Askenazi's study. If you look at the ppCRRT registry, again 370 patients in the total registry, 84 of them were less than 10 kilos of age -- or size. And what you can see is that there was a significant survival disadvantage to being less than 10 kilos, which is about 22 pounds in weight. Encouragingly though, there was no difference in the survival between the very small kids who were less than 5 kilos of weight, so about 10 pounds than those 5 to 10 pounds -- 5 to 10 kilos.

So, this was helpful in a sense that even though the survival was lower, it wasn't zero for the small children. And so, CRRT people become somewhat more comfortable in providing CRRT, albeit again with machines that are not designed or not well suited for small children.

So, my neonatologist used to hate CRRT. The machines don't run very well, alarms are going up all night, circuits clot all the time for these machines that require higher blood flows and are not designed to deal with -- to have the safety that's needed for small changes and errors.

Nurses are often very confused about the therapy in the neonatal ICU. This is a high risk, low volume procedure. And many centers often need to transfer patients to the pediatric ICU where CRRT is performed far more often.

These children, as I mentioned, always crash and demonstrate hemodynamic instability, hypotension and tachy cardia when they start. Catheters are a pain to put in and manage. We do not have catheters that are designed for the small size of these children. So, there are bleeding risks and challenges with occlusion of the vein. It was often used as a last resort, sometimes unless you are at centers like the three of us participate in; often thought to be too risky.

So, whenever we're thinking about the future or how we need to move forward with a new device or therapy, it's all based on weighing the potential risk versus benefits of the options. There's therapy A, which is likely the standard of care; therapy B, which would be a new intervention or doing nothing. And what we've all worked on over the last few years is demonstrate that doing nothing is not an option, but also standing with the current -- what was then, the current modalities available to us, is also not optimal. And even though we still see 40% survival rate, we think that we could certainly do better and we could hopefully decrease the morbidity associated with the therapy.

Up until 2013, the risks for these babies were so high that we rarely provided kidney support to these small babies, and often did this as a last ditch resort.

I'm on slide 16 now. So, the accuracy issues with the current devices. Even the most accurate CRRT devices we use in children have limitations that create challenges for neonatal or infant CRRT. The lower limit of blood flows are not necessarily accurate, or they're not refined enough. We need to sometimes go down to 10 milliliters per minute or 20 milliliters per minute. And we often can't maintain our circuit flows on these larger machines with the small -- at these low blood flows.

And the fluid balance -- the fluid balance, the safety parameters are just not geared for small babies. So, the most accurate device currently on the market in the United States can guarantee no more than a 70 ml error over three hours. But 70 ml is about 2.5 ounces or so. And for a small baby, if the error was in the positive direction, meaning more fluid was taken off than was prescribed, then that could lead to intravascular dehydration and shock for the baby or if it was in the negative direction and more fluid went into the baby, the baby could become volume overloaded and develop heart failure. So, this necessitates more strict manual processes instead of relying on the technology itself to ensure safe volume balance. And the Aquadex has a non-invasive monitor of hematocrit, which allows us to look at the changes in intravascular volume while we're taking fluid off. And this type of monitor is not available in an integrated fashion on other CRRT machines available in the United States.

So, I'm on slide 17 now. And I'm going to turn this over to my colleague, Dr. David Askenazi for the next part of the presentation.

David Askenazi
Thank you, Dr. Goldstein, and thank you, Mr. Cohen. And thank you, guys, for participating in this conference call.

So, as far as disclosures, I also have some relationships with Baxter that you see there.

So, the objectives for the next 10 minutes or so for me is to show you guys how we adapted the Aquadex FlexFlow to perform the dialysis portion of what we need to do. I'm going to show you just briefly our experiences in the NICU; and then talk a little bit about where I think the future is for the neonatal CRRT; summarize, I think all big programs who have a dedicated pediatric nephrology team who understand the need for this therapy in pediatrics are going to warrant and are going to need a neonatal device.

So, I love this quote from Albert Einstein. "A clever person solves a problem. A wise person avoids it." So, our big problem in taking care of babies, when they were going on the circuits is that they were crash. And we had all sorts of different ways that we could try to adjust things and be conscious of it, we would stand at the bedside, we would have medications drawn up so that when the patients would crash, we would have a protocol of what we would do. Our approach was, well, maybe if we had a smaller circuit, we can avoid all of these problems. And so, that's what we did.

So, what you see on the next slide where it depicts the little baby with the Aquadex FlexFlow machine is kind of the schematic of what we did. Essentially what we've done is we've moved the heparin and connected it to our circuit with what we call the Y connector, and we used these big bags of fluid to provide the clearances that we need. And so, we have this machine and now with this fashion, we have the ability to balance the electrolysis we need to do, remove waste products as we need to do and remove fluid from the baby as we need to do.

So, the next slide shows some of the things that we could do, now that we have a smaller circuit. And this was back in 2003 -- I mean 2013, when we first started using it. These are really kind of hypothetical. And what I could tell you is that now we've been able to show this.

So, we post a question, well, maybe we could use smaller access, because you have a smaller blood volume. And we've been able to show that we can use smaller access. Maybe we could use smaller blood flows in relation to the body size of the patient. In some of the other machines, we have used really fast flows. And so, now, we're able to use kind of more kind of reasonable flows for these babies. And we could avoid the blood prime. Dr. Goldstein talked about some of the challenges to doing the blood prime. If you have a smaller circuit that only has 33, or about an ounce of blood outside the body, well, in a term baby, who is 4 kilos or about 8 pounds, a healthy or a newborn baby size, we can many times avoid having to do those extra blood priming. And even if you dilate down to a baby who's half that size, doing a blood prime where the small circuit is less complicated and comes with less problems than doing a blood prime on a much bigger circuit.

So, the next slide shows some of the specific data from our clot improvement database. We track all the babies that go on our circuits. And this is data specifically to the neonatal intensive care unit. What you could see are several things. So, on the left side, you could see the number of circuit days that we've used from 2013, in orange, you could see that's kind of with the old machine. And then as we started to use this in 2014 all the way to 2018, you could see that we no longer use the other machine in our NICU. And you could see that our numbers have ramped up exponentially.

On the right side, you'll see a picture depicting our hypotension that requires intervention. So, we track how often the baby needs to have anything done to them to help them as they go on circuit, whether they need a little fluid or a kind of medicine. And in our program, 96% of the time there's nothing to do to help there when they don't develop blood pressure problems or tachy cardia.

And then, at the bottom is a slide depicting how often we meet our goal, our goal being that we want our circuits to last for 60 hours, not related to the patient issue. And you could see that we indeed can run these machines very smoothly without them having to clot and we have to come back and put them back on. So 70 -- about three quarters of the patients can run -- can be on the circuit for more than two and a half days.

So, what has changed in our hospital between 2013 and now? So, we now offer kidney support therapy to many kids who otherwise we wouldn't have even considered it. I can tell you that we have a few babies that perhaps no other program in the country or very few programs besides us in Seattle and Cincinnati would even blink at the opportunity to try to save these babies' lives. And we now can give some of these babies a chance to live, whereas before, we would have just said it's time to pack up and there's nothing we can do for your baby.

Our neonatologist and cardiac intensivists who are the ones that are ultimately responsible for the patients and who are the ones that are calling us for help, they're no longer afraid of doing this therapy, even in really tiny, really sick infants. And so, their hesitancy to wait, and so there's nothing else to do has really gone away because they do recognize that it's not such a big deal as it was before. Our nurses have become proficient at it. And really, babies hardly know that they're even on the therapy.

So, really to summarize it, I mean it's been a game-changer to our program. And it's easy for me to say it, because this is something that I kind of put together and I strongly believe in it. But, if

you talk to our baby doctors and our cardiac intensive care doctors, I think that they will tell you the same thing.

The next slide, slide number -- what is that? 25. So, slide number 25 depicts where I think the future of neonatal CRRT is going to be in the future, in the United States. Certainly you could translate this to a worldwide diagram. But, initially, you have the innovators, us, Cincinnati, Seattle, who have jumped on board really super early. I think, you could talk to the members of CHF Solutions, and they'll give you a sense to how many other programs are now on board, or how many will be on board by the end of the calendar year? And I think, you're starting to see more than just three programs, starting to see, I'm guessing probably somewhere in the 10 to 15 range. I think that pretty soon, top pediatric nephrology programs are going to have one kind or another of neonatal circuit to kind of help these babies. And then, I think pretty soon after that it's going to be that if you have an ICU who takes care of babies, you're going to want a machine to do this well. And then certainly down the road, there will be the ladders that come through.

So, with that, I'm going to turn it over to Dr. Menon, who was the lead author in the paper that we have recently published?

Shina Menon
Thank you, Dr. Askenazi.

So, over the next 10 minutes or so, I'm going to present some data from our study. Dr. Goldstein and Dr. Askenazi have laid a very nice background for what we did and why we did.

Starting with my disclosures. I am a consultant for CHF Solutions.

So, our objectives today are to discuss the methods of the study; the results; and our main conclusions.

So, as you've heard in the past few minutes, acute kidney injury and volume overload are associated with high morbidity and mortality in neonates, newborn babies and young children. And continuous renal replacement therapy is the preferred way to provide kidney support to these patients. And for all the reasons mentioned by Dr. Goldstein, CRRT is not -- was traditionally not used as much in neonates, primarily because the machines were not designed for them; machines are bigger size; they needed larger catheters; they needed blood priming; and lot of them had low blood pressures when they started CRRT.

When Aquadex FlexFlow system came in, Dr. Askenazi was able to adapt this system to provide CRRT to the very young children. And he first presented some data on 12 babies, infant and neonates at Alabama, who received CVVH through this system. And what he reported was that there were minimal complications at onset of therapy.

So, keeping that in mind, we designed our -- we planned our study. And I'm moving on to slide 30 now. So, what we did was we reviewed data of all patients who received therapy using the Aquadex FlexFlow system, between January 2012 and March 2018. Between the three centers, we had 119 admissions and these 119 patients received 884 circuits. We collected data on that

demographic. So, their age, height, their underlying disease, what kind of complications they had, and what happened at follow-up. Our primary outcome was to look at survival of the patient to the end of the treatment with Aquadex; and secondary outcome was looking at patient survival and kidney function at either at one year or at last follow-up whichever was later.

So, slide 31. This might look complicated, but I'll walk you through this. We divided our patients into three categories. Group one was -- included patients weighing less than 10 kilos, and there were 72 patients in this group. Group two was -- weighed 10 to 20 kilos, there were 13 patients in this group. And group three weighed more than 20 kilos, there were 34 patients in that group.

The median age, as you can see, range from 19 days in our group one to 190 months in group three. Weight of the patient ranged from 4 kilos a median to 60 kilos in group three. Our smallest baby was 1.3 kilo size or less than 3 pounds, and that was in group one.

Most of our children had kidney disease, as their underlying primary problem, and this was similar to all three groups. About one third of them had cardiac disease. Again, in less than 10 kilos, we had 30% cardiac disease, and group three more than 20 kilos, close to 40% had cardiac disease. And volume overload was the primary indication anywhere from 46% in our less than 10-kilo group to 91% in the more than 20-kilo group. The more than 20-kilo group primarily received SCUF or slow continuous fluid removals. Less than 10-kilo group primarily received CVVH or the modified dialysis that was designed by Dr. Askenazi.

When it comes to complication at onset of therapy, in the less than 10 kilo group, only 3% had any kind of competition. So, low blood pressure requiring either extra volume or any kind of medication that was seen in 3% in the less than 10-kilo group; in the more than particular group, none of the patients had any kind of complications at onset of therapy.

Patient survival to the end of therapy was 60% in less than 10-kilo group; and patient survival to hospital discharge was 32%. And this might sound like a very low number, but you have to keep in mind that these are patients who traditionally might not have received any kind of therapy and may not have had any chances of survival. So, 32% was actually way better than what we had hoped for in this patient population. In the group three or more than 22-kilo patients, 97% survived to the end of therapy and 68% survived to hospital discharge.

As most of our complications included just transient low blood pressures, which resolved with giving them either extra volume or stopping the -- or slowing down the rate of fluid removal, the other common complication was a clot in the filter. And that is not an uncommon problem when we do dialysis or renal replacement therapy in young children because we sometimes -- we often use smaller catheters, the blood flows might not be that good. So, the risk of clotting in the filters is not an uncommon thing.

Moving on to slide 32. So, just kind of summarizing that data. As I said, most of the patients who received CVVH in our study were small, young and they were critically ill. And they may not have traditionally received any kind of kidney replacement therapy, primarily because either their providers, the neonatal -- neonatology doctors or the cardiac ICU doctors were terrified of starting

dialysis on these patients. They did not feel comfortable asking us to start dialysis using machines designed for older children. So, this was a game-changer for them.

More than 50% of our patients weighed less than -- weighing less than 10 kilos survived till the end of therapy. And although the mortality was high in that group but it was primarily because they were extremely sick and critically ill children. And survival was better for the group weighing more than 20 kilos, 97% of them survived to the end of therapy. And we saw very infrequent complications, mostly relating to vascular access or the catheters or some low blood pressure or minor bleeding at the catheter insertion sites.

So, our key takeaways overall -- now I'm on slide 33, are that our study kind of highlighted the unmet need for devices specifically designed for younger children. And by using this machine, which has the small extracorporeal volume, the volume of just one ounce or 33 ml, we could initiate renal replacement therapy, safely without causing any cardiovascular decompensation. And if we have more size-appropriate machines, if we pay attention to designing and improving these machines, we can shift the benefit-risk equation such that small children can be supported by dialysis at the same level as older children and adults.

And from an Aquadex perspective, our key takeaways are that renal support using Aquadex is very well tolerated. Using this machine with the small extracorporeal volume allows us to initiate therapy with minimal hemodynamic complications. And physicians are able to provide -- were able to provide dialysis to newborn babies, who had end stage kidney disease, but could not receive any other kind of dialysis. And we were able to support these babies through this critical period, so they could get bigger and receive -- either go on to receiving a transplant or another form of dialysis.

And the other highlight was that we were able to manage a small group of patients in our outpatient dialysis unit. So, because they remain so stable hemodynamically, they did not need to be in the ICU, and they could be managed in the dialysis unit.

So, that's the end of my part of the discussion, and I'll hand it over to Mr. Cohen now.

Question-and-Answer Session

Q - Jeff Cohen

Thank you, Dr. Menon; and thank you, Dr. Goldstein; and thank you, Dr. Askenazi.

I think, at this point, we're going to spend about 10 minutes and go over some questions. I prepared a number of questions for you that I'd like to ask. And we'll also open it up as well to the operator to see if there is any questions in queue. I would just tell the operator to interrupt me, if or when you have any. So, I will jump right into it.

So, I think it was Dr. Askenazi, you were talking about, or Dr. Goldstein, you were talking about the ability of the monitor to look at the intravascular blood pressure while the system is cycling.

Can you talk about that a little bit, and maybe the effect upon hypotension during the time that the machines are active?

A - David Askenazi

Yes. So, I think, what Dr. Goldstein was referring to was the hematocrit sensor. And certainly, the hematocrit is very helpful for us to understand what's going on in the dynamic between pulling fluid and the patient kind of refilling fluid into the vessels. So, I think his point is that, a device that is removing fluid, having that on screen is very valuable to the clinician at the bedside.

Q - Jeff Cohen

Okay, got it. There was a little bit of discussion about -- Dr. Menon, you were talking about the catheter size and some complications at the insertion side. Is it possible that the consumables be made smaller or are you using smaller lines and smaller needles in your indication versus regular indications for heart failure?

A - Shina Menon

No. So, our line -- the size of the lines are based on the size of the patient. So, if the patient is smaller, they can only get a smaller line. The cool thing about Aquadex is that it is able to work with those smaller lines and smaller blood flows.

Q - Jeff Cohen

Go it. Okay. And you were talking about your three centers are certainly way ahead on the learning curve. But, can you talk about in your settings, do you think that the learnings and the data have improved over time? And what would you say as far as some of the other centers that are not yet using the solution as far as the learning curve and the amount of training prior to getting comfortable with the system?

A - David Askenazi

Yes. I can answer that, Jeff. I think that we certainly have learned a ton in four, five years in both in the catheters to use, how to place the catheters, because again, we're starting to believe that if we can improve all the little details of the therapy, we're going to end up with less complications with better outcomes. There's certainly a learning curve in starting. There's a -- you get to develop policies and procedures and educate your nurses and develop systems that are going to function for you. So, there's a little bit of a learning curve for programs as they come on.

Q - Jeff Cohen

Okay, got it. Dr. Menon or Dr. Goldstein or Dr. Askenazi, can you talk about the survival rate? I think initially, when I first went through the data that was presented, it seemed a little alarming as far as the survival rate, but it sounds like the patient population is extraordinarily sick and critically

ill. So, could you touch upon that? And in the case of -- what were you doing a few years ago, when you had a critically ill patient that was very small, what options did you have at that time?

A - Stuart Goldstein

Yes. I'll take that first. This is Stuart Goldstein. So, for us, we were really providing and continue to provide this therapy for neonates who were born either without kidneys or functionally do not have any kidneys. And through a lot of work that's happened on the neonatology and the fetal care side, there are a number of interventions that are now allowing these babies to survive from a lung standpoint where they were not able to survive from a lung standpoint before. But now, while they were still critically ill and still on breathing machines, they were deemed to have the potential to be pulmonary or lung survivors. We tried our standard loads of dialysis, the peritoneal dialysis that I mentioned before where a tube is placed in the abdomen and fluid is put in through that tube into the belly to remove toxins. And for a number of babies we took care of in these situations, they would have intestinal rupture, and unfortunately would perish.

So, the standard way that we would do dialysis for an infant or neonate was not effective for these babies and the work on our fetal care side was pretty cutting edge. Once we saw Dr. Askenazi's experience at Alabama, we adapted what he did, and we now have a standard practice of providing this modified CRRT with the Aquadex device for two to three weeks minimum, while we give intensive nutrition to these babies that they would not otherwise be able to tolerate, because their kidneys couldn't excrete the waste products. By giving them this intensive nutrition, that allows their bowels to mature and not suffer the consequences that we have seen before. And we've successfully been able to get these children, many of them, and we're getting better and better at this as the years go on, to get them to survive out of the NICU.

So, in our institution, we would have had zero percent survival, we would have not offered any care and we'd only offered comfort care to this cohort of patients, and this is where we predominantly use the device.

Q - Jeff Cohen

Okay. I got it. And would you say then, all three of you then that the use of the candidates for the system have grown and proliferated versus early experience when only a certain patient population would be on it, you're now addressing a larger population?

A - Stuart Goldstein

I'll answer that for Cincinnati. So, our data, the first year we used the device, which was really for adolescents with heart failure, we did 20 -- we did 34 treatment days. And that was in 2015 or so. Last year, because of our expanded use of the therapy, we performed over 350 treatment days. And there were times where we had four infants in our NICU on this type of therapy every day. So, we've had a tenfold increase in the number of treatment days. I would expect that to continue to expand.

Q - Jeff Cohen

Okay, got it. And could you come up with any reason at this point, I guess, why some of your other NICU centers should not be using Aquadex, other than the label that we expect in the coming months? The label expansion, I should say.

A - Stuart Goldstein

I personally can't think of a reason. As you mentioned before, at the beginning, Jeff, even though drugs and/or devices may not be cleared for pediatric use, the FDA recognizes that children and other populations have gaps in this care. And we are permitted as clinicians to use any drug or device that we think is in the best interest of the patient. Clearly, we believe in this patient population and technologies like the Aquadex are in the best interest. It would only be -- the only barriers would be as to what Dr. Askenazi pointed out, developing the protocols and support systems to use the device in this very ill patient population and also to have a very good collaboration with cardiac intensivists or pediatric or neonatal intensivists on what the goals of the therapy are and how to manage it. But otherwise, I can't think of a reason why we would not use the device with the appropriate safeguards and protocols of device.

Q - Jeff Cohen

Great. And then, I think I have one more. Hopefully this will grow toward the end. But, could you talk about the role of creatinine and the measurements of creatinine that's out here? And how helpful is that in treating the pediatric patients, if at all?

A - Stuart Goldstein

Creatinine is a standard functional marker of kidney function. It is a late marker of kidney disease and damage. And all of us have participated in single center and multinational studies to demonstrate that even smaller rises in creatinine that are not associated with what you would consider the need for dialysis and that we put patients on chronic dialysis or even a doubling of creatinine, or in some cases 50% rise in creatinine is associated with morbidity and mortality in critically ill children.

Dr. Askenazi led the multicenter study in NICUs, retrospective study called AWAKEN that showed even when controlling for many different aspects of the neonates demographics, their Apgar scores, their weight, their gestational age, that creatinine-based acute kidney injury was independently associated with mortality. And so, none of us in this field really looked at creatinine as a guiding principle or trigger to starting replacement therapy. We look at fluid overload over and over again as a metric, by which we would consider initiating the therapy, because that really tells us what the true function of the kidney is for critically ill patients.

Q - Jeff Cohen

Okay, got it. That's perfect. So, at this point in time, I ask the operator one last time is there any questions besides mine?

Operator

There are no questions in the queue at this time.

End of Q&A

Jeff Cohen

Wonderful. And I'll turn it back to you, Dr. Goldstein, Dr. Askenazi , and Dr. Menon. Thank you very much for providing some background and insight to this very important area. If there's any final remarks you'd like to make or synopsis you'd like to derive, please jump in here now. If not, we will wrap it up. So, I'll give you one second to respond.

David Askenazi

Yes. I think, that on behalf of our team and the patients that we take care of, I think that we are all very fortunate that this device is available for us to use. And it's made a tremendous impact on our program and on the lives of many babies. So, without this machine, I strongly believe many those babies wouldn't have had a chance to live. So, thank you, again.

Jeff Cohen

Thank you very much. This concludes the call. Thank you for joining. And I wish everyone a nice day. And thank you again for your participation.

Shina Menon

Thank you.