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RPM in Real Time: Turning Data Into Action

Announcer:
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Dan Bensimhon, MD:
This is CE with GLC, and I'm Dr. Dan Bensimhon. In this episode, I'm reviewing how remote patient monitoring metrics, or RPM metrics, can help identify patients who may benefit from timely outpatient diuresis. I'll also examine practical approaches to integrating subcutaneous furosemide into monitoring and treatment workflows.

What is RPM and what are some of the terminology that goes along with it? So as stated, RPM stands for remote patient monitoring, a strategy that allows internal or external care teams to monitor and manage patients outside of in-office encounters. Some programs do it on their own; some programs partner with another service to help them get the data. In general, the roles of RPM are three: one, it's early detection and that could lead to earlier treatment of decompensation and congestion; two is to help guide titration of GDMT; and three is to increase access and equity of care. So for people who live far away or have challenges with transportation, this RPM often can enable them to get closer care and similar care to people who have access to medical centers.

One distinction I'd like to make, and I think it's coming up more and more as we talk about this, is remote patient monitoring does not equal remote patient management. So in order to be successful, not only do you have to monitor a patient, but you have to figure out how do you use that monitoring to change management and actually influence the outcomes of the patient with regards to decongestion and titration of guideline-directed medical therapy.

As you all know, there are currently growing and growing numbers of RPM devices. You can see the older devices like implantable cardiac defibrillators. You can see CardioMEMS device, an Endotronix device. You can see a Bodyport scale there. You can see the HFAMS device. And you can see in the bottom corner there some newer devices from Acorai, Cardiosense, and a voice recognition device that can early detect our changes in fluid status by changes in voice recognition.

Here are some of the pros and cons about what some of the devices can help and how they've done. I break them down into 4 categories. The first category is daily weight and symptom monitoring. I think we've tried to do RPM with just scales and a blood pressure cuff, and what we found out is that this has not been very effective because these are poor surrogates for congestion, and those symptoms often come late. And people over time have used defibrillators and the ICM, the information that comes through defibrillators.

What I would say is that if you're doing RPM for a heart failure patient application, I think it's important to have a blood pressure cuff. But

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I also think that having objective measurement of volume is important, and you have to figure out what is the best strategy to get that in a biggest population of patients. If you look at the American College of Cardiology scientific statement on remote monitoring and heart failure management, this is dating back a few years, what they point out is telemonitoring of weights and symptoms did not decrease heart failure hospitalizations, as we said before. When managing congestion, a signal that is accurate and actionable with response kinetics for early reassessment is required. So basically, you want a signal that is early on, it's accurate, and also when you give more diuretics and you improve volume status, it changes quickly. Tracking congestion with cardiac filling pressures or lung water content has shown the most impact to decrease hospitalizations in studies to date.

So now as you start out, you've decided to start an RPM program, how do you start? How do you do it? What do the patients look like? Who's going to get involved in your RPM program?

So the first thing is patients who need it most are often resistant or have challenges with access or technology. So you really have to keep it simple. The people who need the most work and the most titration of medicines are often people who are resistant to having a virtual visit or using other devices.

And the benefit appears limited in stable patients due to low event rates. So if you look at various trials, if patients have not had a heart failure event within the past 2 years, there shows no benefit from RPM monitoring to improve their condition. So what you're looking for is people who've had a hospitalization or other high-risk features, they've missed a lot of appointments, they've come to clinic a lot of times for med titration, or they've had previous problems with noncompliance.

Those are the people who seem to do best and benefit most from RPM. And you can see here that getting these patients enrolled in an RPM program where you're really focusing on congestion in addition to guideline-directed medical therapy titration, you can see from the pooled analysis of the CardioMEMS trial is not only do we have a benefit in reducing readmissions, each 1 mmHg decrease in baseline pulmonary artery diastolic pressure from baseline to 90 days is associated with a 3% decrease in mortality risk at 2 years.

So we're seeing more and more that management of congestion is important for symptoms, it's important for readmissions, but it probably also plays a role in improving patients' mortality. Part of an RPM is if you can detect patients early and their congestion early, you can often double their diuretic and they respond well.

Unfortunately, as patients progress with their congestion, their sensitivity to oral diuretics becomes diminished, whether it's due to gut edema, poor transit time, other effects in the kidney, that we know that oral diuretics lose their predictability as patients become more congested. And what you see here is plasma concentration levels of oral diuretics in a compensated patient, in the blue line, where you see a quick uptake with a high peak, versus the orange line, where in a congested patient you see slow uptake of the diuretic and a lower peak. And this is why patients often become diuretic resistant or oral diuretic resistant, is because they're just not getting the plasma concentrations of diuretics they need in order to relieve their congestion.

So when we think of what kind of products can we use to address these patients, obviously IV diuretics get around this decrease in oral uptake or bioavailability. But we now have a new product on the market. It's subcutaneous furosemide we've had for a few years now, and now we have the injectable form of this. And what you see from both products is you see very similar plasma concentrations and very similar diuretic response kinetics to what you would get with IV Lasix.

So in essence, in these congested patients, we are overcoming diuretic resistance without the need to place an IV. We get the same effect for IV diuresis by using a subcutaneous medicine to get these people decongested when they're having trouble getting decongested and getting them back to a decongested state where their oral diuretics will once again work.

So you see very nice curves here for heart failure patients about similar plasma levels or similar area under the curve and very similar rates of diuresis both in the immediate period and over 24 hours. One thing I tell people is—they often ask, "Well, if I see someone in the office or someone on RPM and they're congested and they have signs and symptoms of heart failure, what does it take to get them back on track?" And one of the things we've learned from studies is that if patients have symptoms, they have weight gain or symptoms of heart failure, they are usually fairly significantly congested. And if you give them 1 dose of IV Lasix or 1 dose of furosemide, you will, you'll help improve their symptoms somewhat, but you won't decongest them.

And 50% of these patients will get admitted within 30 days if you only give them 1 dose of stepped therapy. So when you start these

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therapies, you want to make sure you've adequately decongested before transitioning back to oral. And this is really nice on telehealth, right? Patients can have these—you get an elevated signal at home. A patient has a subcutaneous furosemide at home. They take a dose every day for 3 or 4 doses. You're monitoring their congestion levels daily and seeing them progress. And when you decongest them, you follow the telehealth parameters, and now you get them back on oral diuretics.

Obviously, you're following labs and doing other things, but you can do this all remotely as long as you have a congestion sensor knowing that you're headed in the right direction and you have a diuretic tool that allows patients to do this at home.

So when you're looking to add furosemide with an RPM strategy, what are some strategies for optimizing the heart care of these heart failure patients?

And I'll sort of give it a wrap-up with this slide. So RPM, remote patient monitoring and remote patient management, programs for heart failure work best if tracking of weights and symptoms is accompanied by an objective measure of congestion, whether it's due through ICDs, implantable devices like CardioMEMS, or noninvasive sensors.

Oral diuretics are often less effective as heart failure decompensation progresses, so do not rely on escalation of oral diuretics as patients progress through their symptoms. If an RPM signal suggests fluid overload and the patient is already symptomatic, many of these patients I would not even try titrating their oral diuretics and would just go to a product like subcutaneous furosemide because you know that if this patient does not respond to oral diuretics. We know from our studies in 3 or 4 days the symptoms will progress, and these patients will end up getting admitted.

So as I tell my team, strike while the iron's hot and strike effectively. In these patients who are symptomatic with weight gain and symptoms, it often takes 3 to 4 doses of IV diuretic-like therapy like furosemide to get them back to their baseline.

And then finally, we all know in our program who our frequent flyers are. We've enabled them with RPM devices. We can track them closely. We've now also enabled them with furosemide or ReadyFlow devices at home, where we can provide a subcutaneous Lasix when they need it, much like they would use subcutaneous insulin if their blood sugar is high

So we've enabled patients to react to these signals and help us treat them more effectively.

Thank you for joining us.

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