**Operator:**

It is now my pleasure to turn today's program over to Liz Olson with the American Heart Association. Ms. Olson, the floor is yours.

**Liz Olson:**

Thank you so much. Good afternoon and welcome, everyone. On behalf of the American Heart Association, Get with the Guidelines Heart Failure, and our webinar series sponsor, Amgen Cardiovascular, we welcome you to our webinar series Heart Science Amplified. Today's presentation in the third in our series of three offerings intended to amplify the conversation around key topics in heart failure. We invite you to join us at Scientific Sessions in New Orleans on November 13th for our final webinar live event in HeartQuarters. And for more information on attending Scientific Sessions, you can visit our website, professional.heart.org. You can also now view the archived recordings and downloadable content from this webinar series by visiting heart.org/qualityHS. On today’s webinar, we have the pleasure to hear from Dr. Nancy Albert, who will discuss the importance of transitions in care for heart failure patients. It’s my pleasure to introduce our speaker for today. Dr. Albert is associate chief nursing officer of Nursing Research and Innovation for the Cleveland Clinic Health System, and she is a Clinical Nurse Specialist in the Heart and Vascular Institute of the Kaufman Center for Heart Failure at Cleveland Clinic in Cleveland, Ohio. Additionally, she is an adjunct associate professor at Case Western Reserve University in the School of Nursing in Cleveland, Ohio, and full professor at Aalborg University in Aalborg, Denmark. Dr. Albert has four fellowships through American Heart Association, the Society of Critical Care Medicine, the Heart Failure Society of America, and, in October 2015, she became a fellow of the American Academy of Nursing. Nancy works as a nurse leader, nurse scientist, and advanced practice nurse in an ambulatory heart failure clinic. She is also a consultant and educator, most often in heart failure or nursing research. She has 250 peer-reviewed publications in medical and nursing journals, over 15 book chapters, and she is editor of a 2016 book titled "Building and Sustaining a Hospital-Based Nursing Research Program. Dr. Albert volunteers for many healthcare organizations, including the American Heart Association, and she presents most often on nursing research, nursing innovations, and cardiovascular and heart failure topics locally, nationally, and internationally. It’s now my pleasure to turn today’s presentation over to Dr. Nancy Albert.

**Dr. Nancy Albert:**Thanks so much, Liz. I think we just need you to -- okay. Here we go. All right. My topic today is Transitions in Care, and it’s a very timely topic for us so that we can keep up with what's going on currently. And you can see on this slide that I do not have any disclosures. My objectives are three. We're going to explain why transition in care are needed, especially from hospital to home, and this may be a reminder for many of you. We're going to describe transition care programs that work and also talk about some that do not work. We have to keep in mind that not everything we try works. And we’re going to discuss what transition care factors seem to be the most important.

So let's start off talking about why there's a need for transition care. Now, if we look between 2009 and 2013, we can see that the rate of readmission for congestive heart failure has decreased slightly, looking at Medicare data. But when we look at the big picture, we can see that we still have a long way to go. We decreased from 25.1% to 23.5%. Since that time, we've come down more. We're close to 20% currently, but we are still spending a lot of aggregate costs on treating patients with heart failure, and, again, on this slide you could also see, treating patients after an acute myocardial infarction. And when we look at payers and look at the change in dollars from 2009 to 2013, we can see that we're doing a little bit better on the Medicare and Medicaid side. We're doing much better on the private side. So private insurers are spending less money caring for patients with heart failure, but for our uninsured patients, the change in dollars has actually gone in the wrong direction. It has actually gone up instead of down. So we still have some problems that we need to contend with in terms of decreasing costs for care -- of care for our patients.

When we think about cost of care, one of the big issues is rehospitalization itself. And this is a very large study here, over a million patients were involved. And you can see that at the time the rehospitalization rate was 24.8%, or over 300,000 patients. And what this slide depicts is the first 30 days after hospital discharge, and when was the highest rate of rehospitalization. And if you look on the left of the slide, you'll see that days 3, 4, and 5, are actually -- or 2, 3, and 4, I'm sorry, are actually the highest days of rehospitalization after a hospital discharge. So for those of you wondering why we have programs in place like seven-day follow-up or early follow-up, 24-hour phone call, or within 48-hour phone call, or sometimes some kind of connection with patients, it's to try to slow down the percentage of 30-day readmissions. But more importantly, it's to try to slow down this percentage of very, very early readmissions that we see maybe even before we can get a patient scheduled and get them to come back into a doctor's office.

The other thing we have to keep in mind is that the Centers for Medicare and Medicaid pay attention to all-cause readmission after a patient is discharged from the hospital. And when we look at the reason for readmissions within 30 days, on the top of the slide, no matter how -- I'm showing you two different ways the data was adjusted here. On the left, you can see cumulative periods after discharge, and each period was cumulative, so because it was cumulative, it all starts at zero, and the different colors depict over time. On the right side, you can see consecutive periods. And what I want you to notice is that heart failure hospitalization accounts for about 30% of all hospitalizations. It doesn't matter if you look at the data consecutively or cumulatively. And the second most important discharge or problem seems to be renal disorder, so our patients that have chronic kidney disease, and then respiratory disorders. And you can see here, pneumonia coming up. So we need to keep in mind that there are many different conditions that bring our patients back into the hospital. So, while we need to focus on heart failure globally, we also need to keep in mind that there are other problems, such as COPD and pneumonia and chronic kidney disease or infection, that could lead to a patient being readmitted. So we do need to look at the big picture overall.

Oftentimes, nurses and physician providers come up to me and say, “Nancy, tell me about a good risk model out there. How can I tell when my patient's admitted if they're going to be a high risk for readmissions?” So I thought I would just put together this slide. This just represents four studies out there of patients with heart failure. And what I wanted you to really notice is that except for either an increase in creatinine or chronic kidney disease, which showed up as a factor in all four studies, that whether you're looking at Get with the Guidelines, which is an American Heart Association quality improvement initiative -- you can see a large volume of 33,000 patients there -- whether you're looking at Medicaid patients, whether you're looking at a study that just focused on elders, or whether you're looking at a large registry from Alberta, Canada, that the factors that led to rehospitalization or the factors that put patients at risk, highest risk for rehospitalization varied dramatically between each of these different studies. And so we're having a hard time trying to figure out what really are the most important factors that will help us recognize when our patients are coming into the hospital that they may be at high risk for rehospitalization. Again, here in this table, you can see that only -- the only thread that really goes through all of the projects is chronic kidney disease. In all of the others, the factors varied based on the study that was looked at.

So, what else do we know about rehospitalization? Well, I thought that this study from 2013 was a very telling report. This was a qualitative research study. Twenty-eight patients interviewed. You can see 20 were from academic medical centers, the other eight from community hospitals, and they were asked to discuss the reasons of why they believed they were rehospitalized after a heart failure hospitalization. And you can see that five themes emerge: distressing symptoms; unavoidable progression of illness; influence of psychosocial factors; good but imperfect self-care; and health system failures. And so I want you to understand that it's not always the patient's fault for coming back into the hospital. As healthcare providers, I hear us often say, “Well, if our patients would just be more adherent, we would solve all or problems.” But, you'll notice, of the five themes, one of them has to do with maybe adherence, but one also has to do with health system failures. So we need to do a better job on our end of helping to keep patients out of the hospital. I thought you would find it of interest that there were no differences in themes between those admitted less than 30 days versus those admitted over 30 days. So while we spend a lot of time these days on the term "transition care," what we really need to be considering for our hospitals are what systems, what programs, what processes, and what structures we can put in place to look at the big picture over time because if we can fix early-day rehospitalization, the odds are we may also be solving our problem of later rehospitalization, on day 31 and beyond.

And so when we look at other predictors of 30-day rehospitalization, this was a study that, instead of using medical records and just pulling up variables or factors easily found in a medical record, researchers looked at five themes. They looked at service decline or refusal, non-adherence, dementia, depression, and missed appointment. And what I want you to notice is, if you look on the left side, you'll see the univariate regression. But if we look over on the right side, and we use multi-variate regression, after controlling for factors that were associated with 30-day rehospitalization, you can see very clearly that three factors of the five remained important: A missed appointment remained important; patient non-adherence remained important; and service decline or refusal. So we do need to keep in mind that one of our definitions of evidence-based practice includes patient preferences. And so I think we as healthcare providers need to do a better job talking with our patients and discussing what the expectations for care are, how activated they are to take care of themselves. And we need to do more of shared decision-making when we're having our discussions with patients so that we can set them up for success rather than failure.

This slide just is a very busy slide. I don't expect you to read all the little lines on this fish plot here. The whole point of this slide is just to remind us that heart failure is very complex, and patients' social, economic, psychological, cultural, religious, and other factors add to that complexity. And so when we're dealing with our patients with heart failure, there is a lot to consider, not only just their heart failure diagnosis and all the comorbidities we talked about earlier that get them in trouble, but also a lot of other factors. A lot of our patients are aging, and they may have transportation issues, cognition issues, health literacy issues, social support issues, et cetera that we need to be cognizant of.

When we looked at the research I showed you earlier, with the 28 interviews, I just wanted to go over what the themes were under the rubric of self- -- of health system failures. There were actually five themes that emerged, and I think these five themes can help us as healthcare providers better understand what we need to think about when we're thinking about transitions of care. So the first one was suboptimal healthcare delivery, and I thought this was an interesting phenomena. Patients actually reported when they were being interviewed that they were prematurely discharged, and they knew they were prematurely discharged because when they did get readmitted, the healthcare provider would say something like, “Oh, we sent you home too soon,” or, “Oh, we didn't get you stabilized on a diuretic program.” So the patients were parroting back what they were told when they were readmitted to the hospital. So the perception of the patient was that we provided service, but we didn't finish that provision of service before we sent the patient home, and we sent them home prematurely. So, this may be a message for us to really consider, do we have good discharge planning going on in our hospital? Are our patients really ready for discharge?

The second of the five themes was highly variable contact with healthcare providers in between hospitalizations. We need to remember that our -- that typically, in a hospital system, many healthcare providers are walking in and out of the patient's room during their five-day stay, and they may not know who the provider of record is, or they may not be sure who to contact when they're getting into trouble. Patients had questions about the nature and timeliness of their appointments, so somebody could have made an appointment but not explained to the patient why it was necessary, and then the patient really didn't understand. Acute care was often needed before the appointment. So how long are we waiting between discharge and that first appointment? When the appointment happened, it was difficult to determine if the provider was able to recognize and reverse events. So did the provider have the right information about the hospital stay to understand what was expected of care, and were they ready, and able to jump in and take over? And then home care, palliative care, and hospice care were rarely mentioned. So we need to consider, do we have the right services during our hospital stay so that patients who may meet criteria for these services can receive them at discharge?

You can see the other three sub-themes here. One was broad general issues, and that falls under better care coordination and better communication between patients and providers. And then, also, attitudes and insensitivity of providers. Again, are we really supporting our patients? Are we using shared decision making to help us decide what the next steps are? Are we sensitive to our patients’ needs? Education continues to be a theme that comes up by patients, and, again, education is one of the areas that we actually have very solid evidence on in terms of being able to reduce rehospitalization when our patients understand what to do and can demonstrate or give us teach-back that they're able to carry it out. So patients need assistance with menu planning. They need better communication about test results. They need better use of resources, and we need to help them understand how to live with heart failure. I believe one of the biggest mistakes we make as healthcare providers is we tell our patients what to do. We tell them things like, “You need to quit smoking. You need to be on a low-sodium diet. We want you to be more active.” What we fail to do is teach patients how to do it. And that's really where the messages are the most important. How do you live on a low-sodium diet when your favorite food is Mexican food? You can't tell patients never to eat Mexican food. So what we need to do instead how we can give the depth and breadth of information to our patients so they can go off and live their life and live it well and not get into trouble. And then finally, providers need to be more efficient and knowledgeable about managing heart failure. So are all of our providers giving optimal care? Are we giving the right drugs at the right doses? Are we using newer therapies when our patients meet criteria? Are we using older therapies that historically have been underutilized -- for example, aldosterone receptor antagonists -- in patients who meet the criteria for receiving them?

So when we look at this slide over here, this is a broad figure, looking at transition of care. And what I want everybody to understand is that there are many different models out there. You can see many different programs listed on the left side. This literature review was completed in 2013. There's been a few new models that have cropped up since that time. And even if we look at these older models, if we look at the healthcare providers, you can see there is three different columns for healthcare providers, nurse, social worker, and interdisciplinary. And you can see among them how variable it is in terms of who those providers of care are. And then even more variability exists under the intervention themes. So just keep in mind that you can see there are eight different themes listed here. The most prevalent may be education, patient education, including teach-back and telephone follow-up and early follow-up. But you can see that there is a lot of variability, not just in who delivers transition care, but also how the bundled program actually will look. One of the things to notice is that no program just had one intervention. All of the programs had multiple different interventions included in their bundled program. Unfortunately, today, even years after many of these programs were first discussed in the literature, we don't know if there's one element of a bundled program that is the shining star and it's all that is needed, or if, indeed, we need to have a bundled program. Likewise, we don't know if most patients can have the same bundled program and do well, or if the bundling really needs to be individualized.

So what I want us to remember over here is that heart failure readmission risk factors are many. There are clinical risk factors such as comorbidities and other factors. There are behavioral factors, whether it's depression or cognitive decline. And then there are patient-centered factors that could be related to culture or social issues, transportation, et cetera. So keep in mind there are a lot of considerations going on.

What I'd like to do now is talk about some multi-disciplinary programs that are considered transition care programs and tell you a little bit about the research and what the results were. So, when we talk about transition care, certainly we've all heard about multi-disciplinary heart failure clinics. Heart failure clinics are not very new to us. They've been going on decades now. But I have been seeing more and more crop up recently in an effort to reduce readmissions. Most of the reports on multi-disciplinary heart failure clinics looked at six-month, one-year, and greater timeframes. There are really no reports in the literature that really focused on the immediate post-discharge period and really looked to see what happened with patients in the first 30 days after admission, if they were placed in a heart failure disease management clinic. So you can see, this is a retrospective cohort study, 277 patients. They used controlled patients from 2009 and compared them to patients that were seen in the clinic from 2010 to ‘12. It involved a physician assistant, a pharmacy specialist, a case manager, and the clinic was overseen by Cardiology. And you can see here that there was many interventions during the clinic period. The team optimized treatment, titrated medications, offered education, assessed medication adherence, and considered hospital factors that got patients into trouble. And again, in this study, you can see that they did 90-day readmission assessment, but we don't have 30-day readmission assessment. At 90 days, there was a statistically significant reduction in readmission to the hospital, highly statistically significant. And it looks like this was a 23% risk -- or an 83% risk reduction, so a really huge hit. They also looked at clinic patients had lower 90-day time to first heart failure hospitalization or all-cause mortality. So again, getting patient into a multi-disciplinary heart failure clinic that provides the type of services needed to get patients to understand what they need to do at home and then to be able to carry out self-care adequately may be a very valuable factor.

Here's another program. This program was a mobile health intervention, and I like this program because these days, not only us, but our patients want mobile technology. They don't want to have to drive to a doctor's office and be seen. They want to be seen in a mobile system if they can. This -- the importance of this study was that it wasn't just involving the patients. It involved their informal caregivers. So what I want you to notice is that the usual care group was really the receiving standard mobile health, 165 patients were included. These patients got 12 months of weekly interactive voice response telephone calls, including health and self-management questions. They also received tailored self-management advice, and they had a healthcare team alert if they had a serious concern. The second group was mobile health plus care providers. So there was automated emails to the care provider after each voice response call, and it included feedback on the patient's status and suggestions of how the care supporter can offer supportive care to their loved one. And the outcome was self-care and symptoms. So if you look at the top left panel over here, over a 52-week period, the left bars are standard M health, and the right bars are M health plus the care provider. And the top left panel is medication adherence. You can see very clearly here that medication adherence was higher when we get our care providers involved. So if patients do need extra support, the care provider is there to help out. If you look at the lower left panel, that's about weight gain. If you look at standard health compared to M health plus care provider, you can see there was a statistically significant improvement, or a reduction in weight gain over the 52 weeks, in patients who had care supporters who understood the problems and were able to support that patient. If you look at the upper right panel, if we look at shortness of breath, again, shortness of breath was statistically significantly reduced in patients whose care supporters also received information via the mobile health network. The only non-difference between groups was looking at health in general, and they asked patients about -- to rate on a Likert scale what their health was like, and they combined “very good or excellent.” And there were no differences in “very good” or “excellent” responses over the 52-week period, even though, if you just look at the bars, it kind of appears as if the trend is in the right direction with the care provider arm. So one of the important messages for us to think about with our transition care programs is, are we involving care supporters? Are we making sure they're included? Are they available in the patient's room before discharge so that they can actually help support the patient after discharge?

So, this slide over here looks at a care transition pharmacist intervention. I know, at the Cleveland Clinic, we love using our Pharm Ds to help us with our plan of care in our patients with heart failure. They’re very supportive in educating our patients about their medication regimens while they're in the hospital. They do this two times. This was a transition program where the pharmacist gave follow-up with patients by telephone within 72 hours. During that time, they reinforced the plan of care, addressed specific medication-related issues, they contacted the physician as needed for clarifications, they reinforced scheduling with the patient's primary care provider for follow-up appointments, and they actually performed some referral to another caregiver when needed. And the primary outcome was a decrease in 30-day hospital admission or ED visit. And you can't see the results. I'm sorry. It got messed up somehow. So the results of that study were that there were statistically significant improvements in patients -- well, you can see it on the last one, a decrease in 30-day hospital admission or ED visits. So the patients did perform better when they had the care transition pharmacist on board versus without a care transition pharmacist.

This study over here was an interesting study. This was a shared group multi-disciplinary visit. Now, for this study, they did not -- it wasn't what I would call a transition care program, only because the first shared multi-disciplinary visit occurred eight weeks after discharge. So by this time, they've already passed up the 30-day rehospitalization time point, and we were looking out longer over time. But I thought it was intriguing and worth discussing. Nurses had a multi-disciplinary group appointment. The group appointment was led by advanced practice nurses and also other specialists, such as a nutritionist, a pharmacist, et cetera. In the clinic, they provided education. The focus of the clinic was not to really do drug-up titration, to add on or take away other drugs. That was left for the physician in the primary care provider appointment or the cardiologist appointment after discharge. The multi-disciplinary group visits was all about heart failure self-management skills. The patients were started eight weeks after discharge. They had four weekly clinic visits, so over a one-month period, four visits where the same group of patients got back together. And then, at six months out, they had one booster clinic visit where they gathered back together. And you can see by the slide on the right, the figure on the right, that from two to seven months post-randomization, there was a longer hospital-free time. So whether it was a Hawthorne effect because the group was together, or whether it was because they were actually putting in place the self-management skills and, again, wanting to make sure that when they came back in for the next multi-disciplinary group visit, they were still following the rules, they did a good job over the first six months. The problem really became after the six-month period. By month number seven, the intervention group, which is the small dotted lines, exceeded or went above the control group in terms of rehospitalization. And so at the end of 12 months, there was no difference in rehospitalization between groups. So I think what we really need to figure out with this type of study is, what were the factors that led to success early on, and can we duplicate those factors and also extend those factors so that when the research is over, patients still are interested in carrying out those actions that they did early on that kept them out of trouble?

Now, here's another study that I just want you to be aware of. This is a patient navigator intervention. This was a randomized controlled study, and they focused on high-risk safety net adults with one or more risk factor. And you can see the four risk factors here: Age greater than 60 years; previous admission in the last six months; length of stay greater than three days; and admission diagnosis of either heart failure or chronic pulmonary disease. And this was a very complex intervention, what I would call a high-dose intervention. They offered coaching and assistance with a navigating from hospital to home; they offered hospital visits and weekly phone outreach; they completed discharge prep, medication management; They scheduled follow-up appointments; they communicated with the primary care provider; and they offered symptom management. Interestingly, even though it was a more complex intervention, had a lot of bundled elements in it, there was no difference in 30-day readmission rates. So the intent was to keep people out of the hospital, and it really didn't succeed. Of note, though, when they took the patients and grouped them by age, those greater than 60 years of age and those who were age 60 and younger, they found a difference in results. So, if you look at the second bullet, those over the age of 60 had an adjusted absolute 4.1% in readmission, with an increase in 30-day outpatient follow-up. So they showed up for their early follow-up appointments and did better over time. The patients who were younger, under 60 years of age, had an increase, an 11.8% absolute increase, in readmission and no change in 30-day outpatient follow-up. So, these are patients that either believed on their own that they did not need to attend follow-up appointments or chose to be not adherent to the follow-up appointments, and they actually did not improve over time.

And then, I wanted to just mention another study that was text messaging intervention. This was a pre/post pilot study, and it was a very short message service. It was automated cell phone messages just to remind patients about self-care, to provide snippets of education on diet, symptom recognition, and healthcare navigation. And you can see that over a four-week period, patients were more likely to have better self-care maintenance and management skills. But heart failure hospitalization was not assessed in this study. So again, more work would be needed to really see if this type of text messaging could help our patients out.

In a multi-center -- in a multi-site randomized controlled trial of 392 patients that received a collaborative care multi-disciplinary team intervention to help with transition care, researchers were interested in looking at quality of life after discharge and also looking at patients that had heavy symptom burden and impaired New York Heart Associational Functional Class. Again, they offered this very intense program, nurse coordinator, cardiologist, psychiatrist, and primary care provider services. They offered tele-monitoring, patient self-management support. They also screened and treated for comorbid conditions, especially depression, since they had a psychiatrist on board. You can see here that, in the results after one year, when they compared the intervention group to usual care group, that Kansas City Cardiomyopathy Questionnaire scores improved in both groups. So over time, patients do have better quality of life, whether they're getting special interventions or not, after discharge from the hospital. But there were no differences when analyzing the effect over time at three, six, or 12 months. So once patients improved originally after discharge, they stayed at a steady state. There were fewer deaths with this multi-disciplinary high-intensity intervention, and there were greater improvement in depression scores. But there were no differences in hospitalization rates. So, now I've showed you two transition care programs that did really not improve early hospitalization rates, even though they were a bundled intervention that had a lot of components in it that really targeted a lot of areas for our patients.

So, what are the strengths and issues of our current knowledge today? Well, programs that worked and didn't work have some of the same features. And some larger randomized controlled trials were ineffective in reducing three- to 12-month heart failure readmissions. Some effective research interventions used pragmatic study designs. So it may be better for us to think about what really is important to our patients individually versus trying to develop some bundled intervention that everybody is going to get that maybe will not be effective, based on patient needs and issues. Some of the studies were small proof of concept studies, and so we have to question whether they're going to evolve into large-scale, multi-center, randomized controlled studies that will allow us to really get answers to our questions.

So what are the recommendations for research related to all of this? Well, first of all, we need to consider that we have to find the most effective, economically sound, and broadly applicable transition of care interventions because we know that, right now, we're not really sure of what are the best things we should be doing for our patients. We need to include cost-effective or cost-saving analyses in our assessments of interventions. We need to choose outcomes after discussion with multiple key stakeholders, including our patients. So again, we need to think about our patients, think about what kind of decisions they're making when we do have shared decision making discussions, and then figure out what are the best interventions that are going to be most agreed upon by our patients. And then we need to minimize site contamination by using site level randomization so that we can ensure that when we're publishing and sharing our results, that they are more generalizable to other populations.

So, with that as background, what do we know today about discharge planning and about transition care? Well, our current American College of Cardiology and American Heart Association Heart Failure Guidelines offer some support for us, so I thought I would at least discuss what we have got in our guidelines today. We know the guidelines are being addressed and updated, and we'll be able to see soon how much of this stays exactly the same. The I, II, III, and IV are class of recommendation. Class I, of course, means do it. It means that it's recommended, and we ought to go down that path. A class IIa means that it's reasonable to do. A class IIb means we should consider doing it. And a class III means it's harmful and we should not do it. And then the level of evidence is the big letter inside the box, and you can see this is a B. A B-level evidence means we have at least one randomized controlled trial that's giving us guidance in this recommendation. A, of course, means that we have multiple randomized control trials or meta-analyses or systemic reviews, and level C means we've got expert opinion and case studies and other single center reports. So, when we look at initiating guideline-directed medical therapies, again, it's a level Ib, which means we should be doing this. We should be using heart failure doses that may be reduced in the hospital. We may need to either reinitiate them or up-titrate them before discharge or early after discharge so that our patients are receiving the right drugs and also the right doses of the right drugs. We need to try to fill prescriptions before discharge or call the prescriptions in for our patients, because that may be a barrier for our patients, just getting to a drug store and getting the prescription filled. We need to consider that we've got some new drugs out on the market today. An example would be an ARNI, an angiotensin receptor neprilysin inhibitor. And when we consider guideline-directed medical therapies, for example, we have to be sure not to use BNP but to use interminable proBNP if we are going to use biomarkers to assess our heart failure patients’ status so that we can understand how well the drugs are working and how our patients are stabilizing over time. And then we need to remember that mineralocorticoid receptor antagonists, or aldosterone antagonists, if you prefer that term, and hydralazine nitrate are underutilized in patients that they’re recommended for. So for our African-American patients in functional class III through IV, hydralazine nitrates are underutilized, and for our patients in heart failure reduced ejection fraction, again, functional class II through IV, based on meeting criteria, we need to offer aldosterone antagonists more often. And then we need to address heart failure cause, the barriers to care, and limitations in support. I've hopefully given you enough information to share the complexity of figuring out the barriers to care and limitations in support and even the cause of what brought our patients back in. So we do need to ask a lot of questions and actually spend time talking and having these discussions with our patients.

We also need to assess volume status and blood pressure and adjust heart failure therapies based on that. We know that a lot of our patients go home, and they may still be a little hypervolemic. They may have gotten rid of some of the tissue congestion, but they may still have hemodynamic congestion, or too much fluid in their blood vessels. And so we need to be very careful to assess our patients, using the right methods to determine if our patients are still fluid overloaded and then making sure we're giving the right drugs to get them out of that state. We also need to keep in mind that a low blood pressure does not define heart failure medication use unless they're symptomatic with that low blood pressure. So we're not going to withhold beta-blockers or withhold renin angiotensin aldosterone system antagonists just because the blood pressure is under 100 millimeters of mercury. And then we need to optimize chronic heart failure oral therapies. Again, they require a low potassium diet or a potassium inhibitor to make sure we can get the patient on the right drug. We need to consider medication preauthorization and costs so that we can help our patients get on drugs in an affordable way.

And then, before discharge and at each post-discharge visit, we need to assess renal function and electrolytes, especially in our patients who had their ACE inhibitors or their angiotensin receptor blockers titrated or if we are starting a patient on an angiotensin receptor neprilysin inhibitor. Here, I'm showing you the PARADIGM heart failure trial, and that there was a slight bump -- about 50% of patients had a slight increase in creatinine. But when we looked at the dose -- when we looked at renal dysfunction between groups, after the run-in period in the double-blind period, on both agents, it was exactly the same. So we need to keep in mind that what we expect to see with ACE inhibitors and angiotensin receptor blockers may be very likely what we see with our patients on ARNIs. The other thing we need to remember is that we want to make sure we avoid the triple combination of an ACE inhibitor plus an angiotensin receptor blocker plus an aldosterone antagonist so that we can overshoot our renin angiotensin system and cause severe hypotension, and we want to make sure we don't get our patients into trouble that way.

The other thing is we need to manage comorbid conditions. I showed you very early in the slide deck all of the comorbidities that may lead to getting patients rehospitalized. So are we treating the other comorbid conditions that could be worsening the heart failure or could mimic the heart failure symptoms? We need to ensure heart failure education. And again, I mentioned earlier, not just what to do, but how to do it. How do we help our patients live their life every day with heart failure? And we need to discuss palliative care and hospice care with our patients, especially if we have never had those discussions before, just so we could understand what their preferences are and so we can provide the best care based on what their needs are.

And then, if you look at guidelines at end of life, we don't really have very clear, specific guidelines by either the American College of Cardiology and American Heart Association, or the Heart Failure Society of America. So what you can see here is the ACC/AHA recommend using clinical risk prediction tools and/or biomarkers to identify who are patients at high risk. And it's reasonable to then go ahead and suggest either palliative care or hospice care based on the patient's scenario. The Heart Failure Society of America, back in 2010, asked us to consider frequent rehospitalizations, chronic poor quality of life, and need for continuous IV support as markers of patients who are getting near end of life and considering consulting with palliative care or hospice care.

I just want to point out some quality metrics, for lack of a better term, that the American Heart Association and the Joint Commission established for their advanced heart failure certification. I'm hoping that by seeing some of these metrics, it will give you a sense of what these -- this -- the certification process encourages and actually mandates if you want to stay certified for hospitals that we consider when we're getting ready to send our patients home. So one of the things that we need to consider is beta-blocker therapy. And again, we want to use evidence-based beta-blockers, and you can see them listed there. We want to consider post-discharge appointment for patients. The Joint Commission and American Heart Association had established that it should be scheduled within seven days of discharge, and it should be documented, including the date, location, and the time, in the medical records so everybody knows when it is. We want to make sure there's a care transition record transmitted to the next provider within seven days of discharge, and it needs to contain five elements. We need to have documentation of one-time discussion of advanced directives, and then we need to document what that discussion was in the medical record. And we need to have post-discharge evaluation for heart failure patients. How do we evaluate them, and are we assessing for worsening symptoms and treatment adherence within 72 hours? It could be by a home care nurse. It could be by a telephone call. It could be by an in-person visit. But we need to have early communication with our patients so that we know exactly how they're doing.

When it comes to that transition care record and the five transmitted elements, you can see them listed here. So, of course, we want our healthcare providers that are taking care of patients after discharge to understand what happened in the hospital so that they can know what their role is. So we need to explain the reason for hospitalization, what procedures were performed at hospitalization, services and treatments during the hospitalization, follow-up services, and discharge meds.

So, I'm going to leave you with a few slides over here. I want to just explain the H2H. This is the American College of Cardiology Hospital to Home Strategies to Reduce Heart Failure Hospitalization. And one of the very first strategies of the ten is that we all need to have quality improvement programs. And so I would hope that you're asking yourself right now, do we have a quality improvement program in our hospital or for our service that we're really paying attention to that's specific for heart failure? The American College of Cardiology encourages at least one QI team for reducing readmission for heart failure, that we constantly monitor the proportion of discharge patients who receive follow-up appointments, not just scheduled, but receive the follow-up appointments, and are we monitoring for 30-day hospitalization rates.

So when we think about quality improvement practices, I think all of us need to take a deeper look into the actions and practices of our own workplaces. Do we have leadership within our work setting that really encourages and supports quality improvement initiatives specifically for heart failure? Do we have evidence-based clinical decision support algorithms and pocket cards and order sets and other tools that will help all caregivers do a good job, whether they've been on the job one day or whether they've been on the job for one year? Do we have patient education resources, whether it's videos, written handouts, or other media forms, for our patients? Do we have regular review of data and benchmarking so that we know exactly how we're doing as a team and so we can push and encourage improvement? Do we have a process improvement model of change so that when we do need to make improvements, everybody knows how we're going to be going about it? And do we have collaborative care practices so that one person or one group is not an island?

For the other nine H2H or hospital to home strategies, you can see them on the slide here. Three of them are regarding medication management, and the other four are regarding discharge and follow-up. Most of these we’ve already discussed as we've been moving along in this discussion.

And so I'm going to leave you with a few thoughts here. The first one is, when discussing heart failure, understand how patients and families experience heart failure. We really need to assess quality of life for our patient. I'm not suggesting that everybody needs to fill out the Minnesota Living with Heart Failure tool or the Kansas Cardiomyopathy Questionnaire, but we need to ask questions of our patients and our care supporters about quality of life. We need to find out what is the most important for them, and then we need to work with them to understand how they can reach that quality of life goal. We need to have a sensitive communication style. You saw earlier that one of the comments made by patients when they were discussing discharge was sensitive communication. We need to be transparent in showing our best practices, and also maybe our not so great practices, so that everybody on the team can learn what they need to do to improve. We need to remember that there are a lot of pieces of the solution. You can see a bunch of pieces of the solution on this slide over here. I put patients and clinicians in the center because it takes all of us. It takes a little village to make that happen. And then remember, we need to have hospital performance improvement, or quality improvement initiatives, to really help us understand, are we doing everything that we see on this Pieces of the Solution slide?

So we know that heart failure hospitalization continues to be a burden in the United States. We know that value-based care is where we’re really at right now, more than volume-based care. We need to consider the factors that improve value so that we can keep our patients out of the hospital once they're admitted. So, in summary, reduction of heart failure readmission programs should use evidence-based physician-guided medical and device therapies, so consider the guideline-directed medical therapies. We need to facilitate institutional programs for effective care transitions. We need to promote strategies aimed to improve disease management. And we really need to engage our patients in every element of self-care, whether it's maintenance activities, management activities, and activities that will help improve their quality of life so that they can be part of the decision making and can buy into what they need to do to help themselves after discharge.

So this is my last slide. I think unlocking that key to good heart failure care is very complex, and it may be very individualized. If we don't spend time up front talking to our patients individually, we may never really find out what really works at best for our patients and get to the point where we can really say we're having an effective improvement in the value of care our patients are receiving in the United States. So I'm going to thank you for your time and attention today and for hanging in there, and I'm very happy to answer any questions. I really look forward to hearing from you on the next few minutes. Thanks.

**Speaker:**

Operator, can you remind everybody how to ask a question?

**Operator:**

Thank you. As a reminder, to ask a question from the web, click the “Q&A” button in the lower left-hand corner of your screen, type your question in the open area, and click the “Submit” button. And I'll turn it back for your Q&A session.

**Speaker:**

So, the first question that's come in is, “Have you seen any literature recently that encourages OT in the hospital and as an outpatient follow-up to reduce the cost of heart failure readmissions?”

**Dr. Nancy Albert:**

Say the middle piece of that again. I heard the beginning. I didn't hear the intervention clearly.

**Speaker:**

Yeah. It says encourages -- I believe it's outpatient therapy in the hospital, or OT in the hospital, as a -- yeah.

**Dr. Nancy Albert:**Okay. That's a great question. As our patients continue to age -- and we think that the aging, we're going to see more older patients with heart failure till about 2030, when our Baby Boomers start decreasing in number -- we are going to need to consider more occupational therapy for our patients. Some of these patients may have some memory impairment and will benefit from occupational therapy. Some of them will, even for dexterity, for taking their pills and for holding a cup of water, et cetera. So occupational therapy could be beneficial. Will it decrease rehospitalization? It could, possibly, if part of occupational therapy included interventions to help decrease fall risk, as an example. So, we do need to see more research to find out how valuable occupational therapy can be or if it just needs to be considered for specific patients that we know have occupational therapy needs, especially our patients with cognitive decline or Alzheimer’s who have heart failure.

**Speaker:**

Next question is, “Do you have any statistics that support tele-monitoring?”

**Dr. Nancy Albert:**That's a great question. There have been six large randomized controlled multi-center studies -- a few in Europe; a few were also in the United States -- and none of them showed support for tele-monitoring in heart failure. Now, what I mean by that is there was no improvement in hospitalization over time and no improvement in mortality. Having said that, I also want to put a caveat in here that, as a nation, we're going to expect to see more remote monitoring for healthcare services over time. Think about yourself as a patient instead of a healthcare provider. If you are not feeling well today, you're going to want to call somebody on an iPhone, see them and talk to them live. You're not going to want to drive an hour to the office, wait around for half an hour, get everybody else in the lobby or in the waiting room sick, and then have to drive home. And so I think down the road there's going to be a lot of opportunities for remote monitoring. The goal for us is to figure out what are the magic -- what are the necessary components of remote monitoring that actually can improve outcomes over time? And that's what we have been lacking up until now. So I look forward to seeing more research down the road where we use innovate solutions to see if we can actually turn the negative statistics and the negative outcomes into positive outcomes.

**Speaker:**

“Do you support the use of advanced practice nurses to run programs to provide our early outpatient follow-up based on the current research?”

**Dr. Nancy Albert:**

Actually, many of the programs -- some of the research that I showed you today and some of the other research that is out there have shown that APNs are beneficial in providing early post-discharge care. When I say they're beneficial, what I mean is that the outcomes of an APN are equivalent to the outcomes of an MD. So these are patients that have chronic heart failure, their plan of care has been established, and the APN may tweak that plan of care, may assess the patient and give the education and provide many of the other elements that I talked about under the ACC/AHA recommendations so that the patient's care can be optimized. If an APN is used, that frees up a physician to see new patients, to see more complex patients, to deal with patients who are certainly sicker, who need their time and attention. So I believe that an APN program can be ideal. But, what we need to make sure of is that we have APNs who really understand heart failure. In the old days, APNs -- or nurses became APNs and Advanced Practiced Nurses probably ten to 15 years after they got their RN license. So they had many years to hone those skills and become experts in cardiac care and then went back to become an APN. Nowadays, we see nurses graduating from their basic nursing program, going back to school to become an APN, and within two years of their initial graduation, they're wearing an APN hat now. But they never really became experts in general nursing care or in heart failure care. So we need to support these nurses to really help them move forward very quickly and become the experts they need to be to do a good job.

**Speaker:**

We, unfortunately, are out of time. But we will make sure that the questions that didn't get answered -- we’ll work with Dr. Albert to answer those. Thank you, again, Dr. Albert. And Liz, can you close this out?

**Liz Olson:**

Great. Thank you, Steve. On behalf of the American Heart Association and our webinar series sponsor, Amgen Cardiovascular, we would like to thank Dr. Albert for this fantastic webinar. Thank you so much. And we thank you, our attendees, for your valuable time and participation on today’s webinar. A recording of today's presentation, as well as downloadable content and recordings from our entire Heart Science Amplified series, can be found on our series website at heart.org/qualityHS. Thank you, again, for your participation in today's webinar.