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Table of Contents

Emergency Preparedness for Dialysis Clinics

Posted by Deborah Brouwer-Maier RN, CNN on Oct 31, 2018 7:30:00 AM

One of the most devastating hurricanes in the history of the United States, Hurricane Katrina **caused $75 billion in damage** in New Orleans and along the Mississippi coast. Beyond its toll on infrastructure and the lives of the area's citizens, the hurricane emergency preparednessexposed several **gaps in emergency preparedness for hemodialysis patients**. Many clinics in the area didn't have sufficient emergency preparedness plans in place; patients didn't know how to adequately prepare for the storm; and public health officials were unaware of how much of the population was dependent on dialysis.

In the Gulf Coast area, the hurricane caused 94 dialysis facilities to close and around 6,000 patients to look for dialysis care elsewhere. Though hurricanes account for many disasters dialysis clinics face, they're also vulnerable to other weather events and power outages.

EMERGENCY PREPAREDNESS FOR DIALYSIS CLINICS: WHAT TO INCLUDE

To be eligible for Medicare reimbursement, **all dialysis clinics must create an emergency preparedness plan** that must be updated or reviewed annually. Each annual review must be documented to include who reviewed it and when, as well as any updates that were made.

An emergency plan, however, is only a portion of what your clinic needs to stay safe. Your clinic's full emergency preparedness plan should include:

- An assessment facility-based and community-based risks that can help you address the needs of your patients during an emergency
- How you will identify the continuity of the business operations that will provide support during the emergency
- The particular hazards likely to occur in your area, including whether you are at risk for hurricanes, severe winter weather or flooding
- Non-weather related disasters that could occur, including power outages, cyber attacks and loss of water or heat

EMERGENCY PREPAREDNESS FOR DIALYSIS CLINICS: FOR PATIENTS

Patients should also have their own dialysis emergency preparedness plans and review them with clinic staff annually. When reviewing, make sure your patients' plans include:

- An understanding of an emergency renal diet
- A list of medications
- Their current status
- A copy of their dialysis treatment plan

EMERGENCY PREPAREDNESS FOR DIALYSIS CLINICS: STAFF READINESS

In addition to ensuring your facility has the proper safeguards in place to protect its operations and buildings, your staff should receive training. And like the clinic's emergency preparedness plan, staff training and review should occur annually. Staff should be able to demonstrate emergency procedures, including training patients on what to do, where to go if the facility is evacuated, how to disconnect themselves from a dialysis machine, and who to contact if the patient is not in the facility when an emergency occurs, including an alternate phone number where the dialysis care team can be reached.

For More on Emergency Preparedness Planning, **read CMS' guide for chronic dialysis facilities**.

EMERGENCY PREPAREDNESS FOR DIALYSIS CLINICS: ADDITIONAL PLANNING

If there are nearby dialysis facilities, check with them to see if you can form a cooperative disaster planning organization. If you're unsure if any other clinics are nearby, you can contact ESRD Network or visit **www.medicare.gov**. You'll also want to contact your county's EMS agency, which can include your facility in its list of county medical emergency plans.

Researchers: Don't Overlook Emotional Health in Kidney Care

Posted by Deborah Brouwer-Maier RN, CNN on Oct 1, 2018 7:30:00 AM

Not surprisingly, many patients undergoing care for chronic kidney disease often experience an emotional toll along with their physical symptoms. The emotional health of patients is often overlooked by their care teams, though they are either unaware patients are experiencing these issues or are focused entirely on maintaining patients' physical health. emotional-health-kidney-care

Researchers found that, in order to improve patient care and provide more patient-centered care, dialysis and medical staff should better understand the source of patients' negative emotions and how they can combat them.

EMOTIONS ASSOCIATED WITH KIDNEY CARE: 3 THEMES

Three themes emerged among patients with chronic kidney disease. They were:

- Feelings of mistrust, alienation, abandonment and isolation from providers who displayed little concern for the patient's experience of illness.
- Feelings of mistrust, alienation, abandonment and isolation from healthcare institutions or teams who improperly organized care, or "dropped the ball" during the course of care.
- Feelings of personal responsibility for their own illness, and struggling to make sense of their illness experience.

Many patients reported that their providers may have even been oblivious to their emotions. In other cases, patients reported mistrust in their providers as their disease progressed, making them question whether the care they received earlier in the disease was sufficient or correct.

"One man reflected on how little his provider had told him about preventing progression of kidney disease despite the dramatic implications this had for him: "Try to keep my BP down and try and stay away from … sodium and salt and sugar. And that's about all he said, really." Another patient spoke of how one doctor had failed to inform him about his worsening kidney function," the **study authors wrote**.

Another man relayed how, during the course of his disease, his physician retired and he was left in the care of a series of nurse practitioners who "dropped the ball" during his care. A woman who was being evaluated for a kidney transplant described being reduced to tears after having a scan cancelled by a radiologist over concerns about contrast nephropathy. This was despite the fact she had already discussed these concerns with her nephrologist and wanted to proceed with the study.

When it came to meaning-making for their illness, many patients wanted to know who was responsible for their disease and felt primarily responsible for their conditions, citing maybe it was "something they had or had not done."

HOW TO IMPROVE PATIENT CARE

When a patient feels at ease and understood during his or her dialysis treatments, they're more likely to continue the course of treatment.

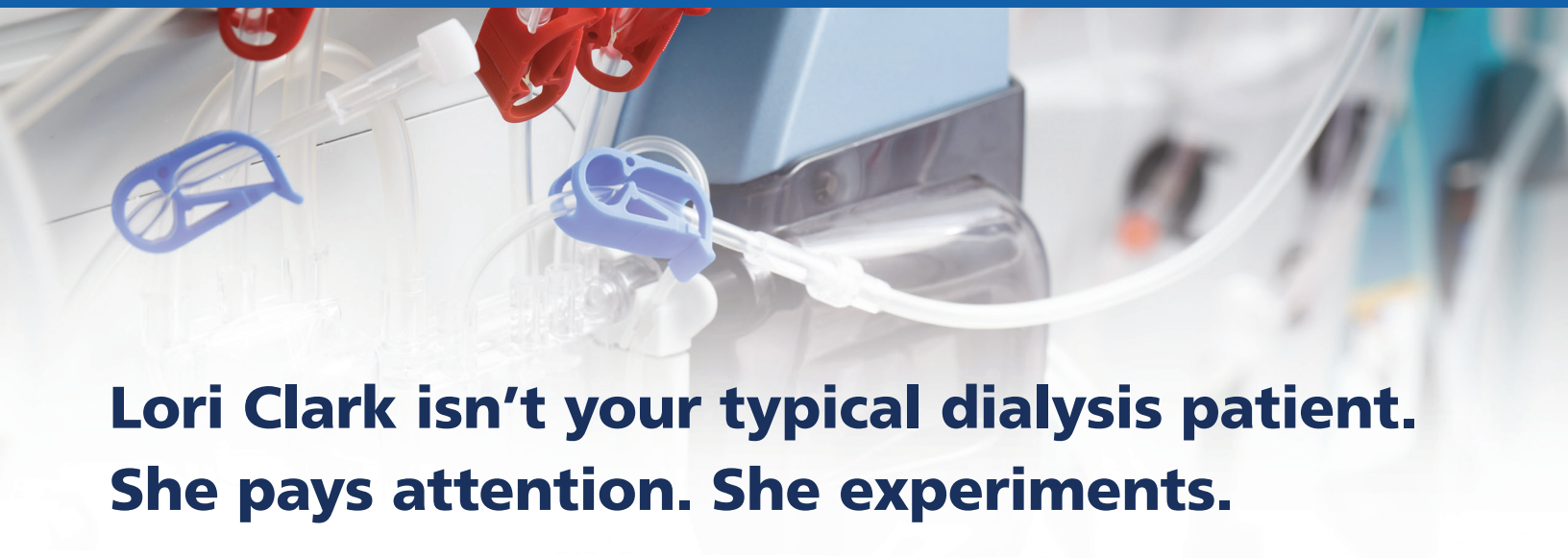
Researchers suggest the first step could be improving education and health literacy among patients with CKD. To help improve patient education, ask if they have any questions about their care or condition during their appointment. You could offer **handouts to help educate them on the importance of access monitoring and other health tips**.

In addition, finding ways to improve communication in fragmented healthcare systems, improving teamwork among providers and attempting to be mindful of the patient's perspective can all help **improve patient care and their sense of wellbeing**, researchers noted.

eBook

THE HEMODIALYSIS **PROFESSIONAL'S GUIDE** TO

DIALYSIS PATIENT EMPOWERMENT



Lori Clark isn't your typical dialysis patient. She pays attention. She experiments.

One day, during her session, a nurse brought over a machine she had never seen before. It was the Transonic HD03 monitor. The nurse hooked up the monitor without explanation, which left Lori wondering what this new machine did.

> "I didn't know it could help me," she said of the HD03. "One time I got curious and asked, 'What is it saying?' The nurse told me, 'Well, it says your number is 1400. That's good because below 600—that means you have a clot.'"

That simple information made Lori feel empowered.

> "I realized that if I went down to 600, they were going to operate on me. And it's painful. So, I need to take care of my graft. So every month I watch the numbers, and I always ask about them. But most patients don't know how to use this information."

Patients like Lori may be few and far between, but educating and empowering patients to be active in their dialysis sessions and care has the potential to not only improve outcomes but also reduce costs, according to the New England Journal of Medicine.

This guide will explore why and how dialysis patient empowerment benefits both your clinic and your patients—and what you can do to help patients take a more active role in their care.

PATIENT CARE:
Why Create Empowered Patients?

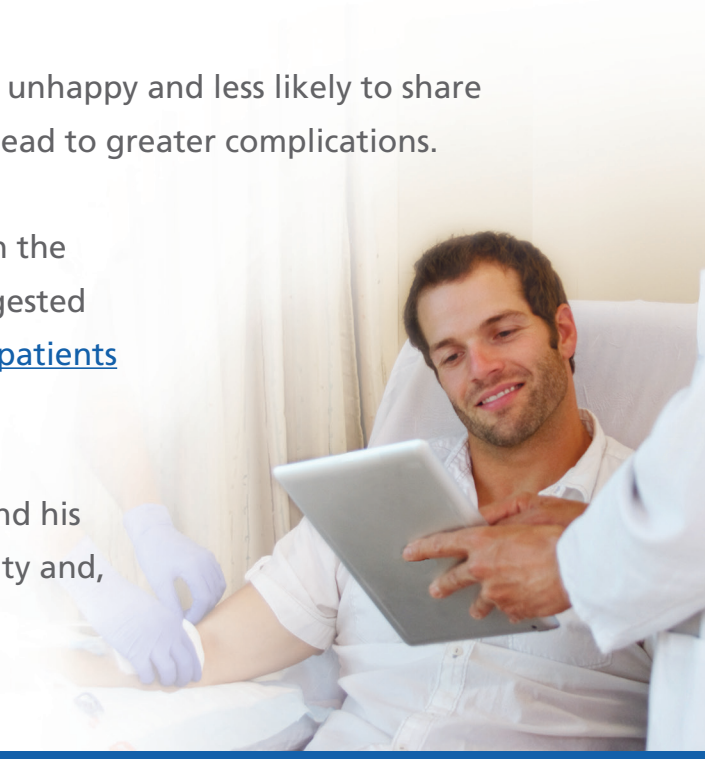
Dialysis patient care has been the same for decades, according to Dr. Richard Gibney, a nephrologist practicing in Waco, Texas.

"It was, 'Come in, sit down, be quiet, don't touch anything,'" he explained. "You can imagine, basically they're helpless, they're learning how to be more helpless, they're bored, they're depressed, and we missed that whole point."

Lori's story—and that of many other dialysis patients—involved a nurse wheeling a machine up to her, turning it on, and that was that.

It's this passivity that Dr. Gibney asserts makes patients unhappy and less likely to share symptoms like pain during their sessions, which could lead to greater complications.

Patient empowerment professionals, who worked with the first patient in Sweden to do empowered dialysis, suggested to Dr. Gibney that the machines be turned to face the patients and that they be allowed to touch them.



"Those were radical, big changes," he explained. He and his staff implemented the changes in one unit of the facility and, as a result, "everything was a thousand times better."

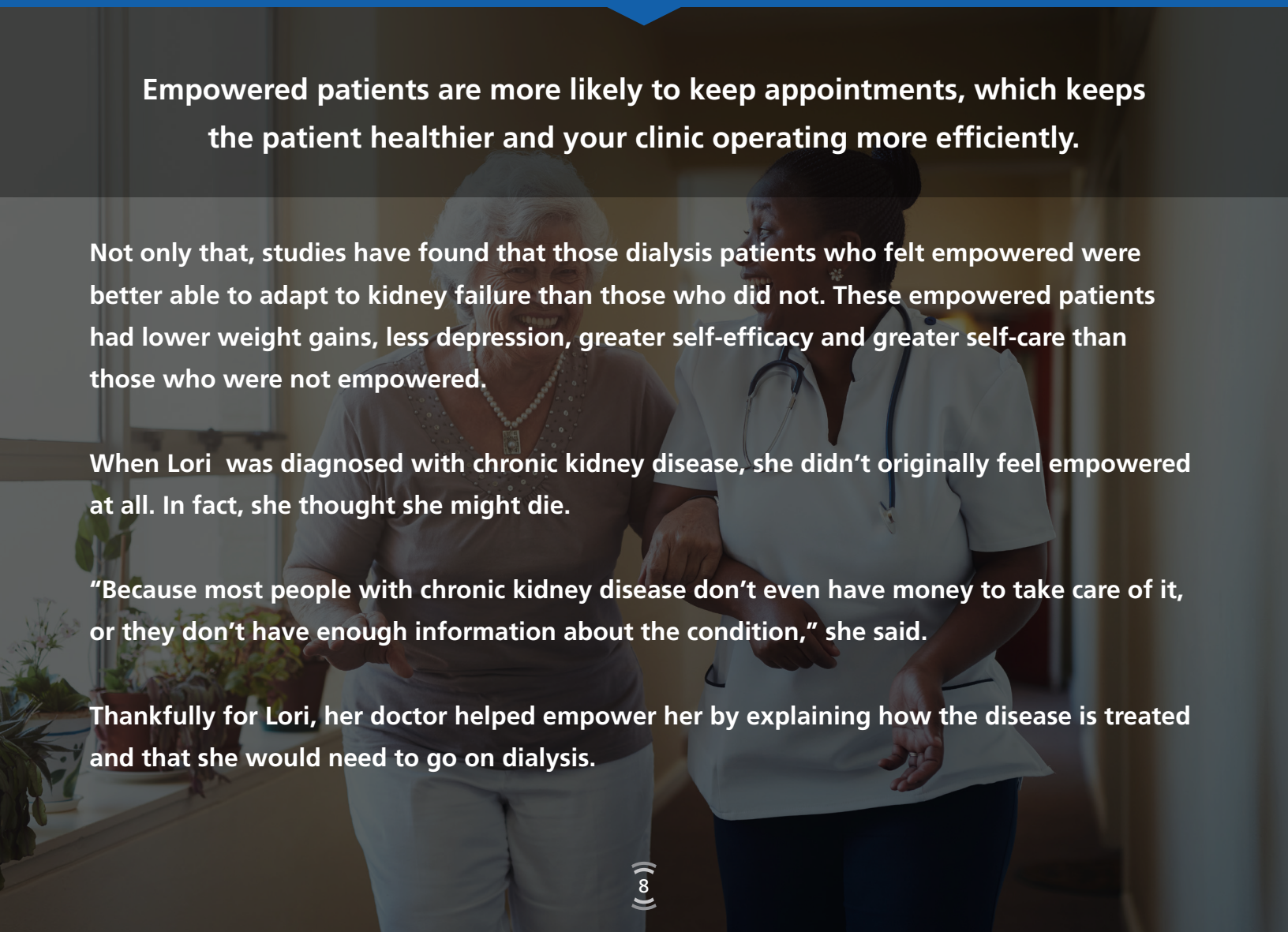
In patients who participated in "self-care" dialysis, the hospitalization rates dropped to half of what they were before Dr. Gibney's clinic implemented the empowering changes. Not only that, his staff saw the mortality rate decrease by one third.

THE BENEFITS OF
Empowered Patients

Your patients need to become experts about their care and bodies, note authors Dori Schatell and Beth Witten, because they're only in your clinic about 14 hours—or 8 percent of their time—per week. That means the other 92 percent of the time they're on their own, managing their symptoms, care and diet.

> "The reality is, care provided by the clinic is only half of the outcomes equation. Patient involvement and follow-through is the other half," Schatell and Witten write.

CONSIDER THIS



Empowered patients are more likely to keep appointments, which keeps the patient healthier and your clinic operating more efficiently.

Not only that, studies have found that those dialysis patients who felt empowered were better able to adapt to kidney failure than those who did not. These empowered patients had lower weight gains, less depression, greater self-efficacy and greater self-care than those who were not empowered.

When Lori was diagnosed with chronic kidney disease, she didn't originally feel empowered at all. In fact, she thought she might die.

"Because most people with chronic kidney disease don't even have money to take care of it, or they don't have enough information about the condition," she said.

Thankfully for Lori, her doctor helped empower her by explaining how the disease is treated and that she would need to go on dialysis.

HOW EMPOWERED PATIENTS
Benefit Your Clinic

Fewer hospital stays

An empowered patient is a healthier patient. And a healthier patient is less likely to have hospital stays, which benefits your clinic by allowing patients to keep their appointments.

Happier staff

Any program used to enhance patient knowledge and emotional well-being during dialysis has been shown to create happier patients, which makes staff happier—which, in turn, reduces turnover.

Better coverage

Empowered patients are more likely to remain employed during their treatments. Employer-sponsored health coverage pays significantly more than Medicare and pays higher amounts for reimbursable supplies and medications.

ENCOURAGE PATIENTS TO Participate in Their Care

DURING DIALYSIS

A simple way to begin empowering your patients is to encourage them to participate in their care. This can be done by making some tweaks in the way your staff communicates with patients. Instead of hooking a patient up to a machine and walking away, encourage staff to explain what's happening and why and to ask the patient if he or she has any questions.

ACCESS CARE

While Lori knew that caring for her access was important, it wasn't until she had the numbers from the HD03 monitor that she really understood how she could be active in protecting her access. In one instance, Lori was alerted to an issue after she saw her number decreasing.

> "When the numbers started going down, I knew something was wrong," she said.

It turns out she was wearing a tight fitting jacket while on dialysis, and by removing the jacket, her number went back up. In Lori's case, her tight jacket was acting as a tourniquet and may have closed off blood flow to her access.

"If the jacket's not obviously that tight, a clot will build up in time," Lori surmised. "And you won't know where it came from. This is all guesswork for a patient because there's no way to know for sure. Having the Transonic machine helps a lot. Otherwise there will be no basis for me to even guess anything. It's helped me take better care of my access."

Additional patient self care tips include:

- Don't use the access arm for heavy lifting or carrying purses
- Ensure your access arm isn't constricted by heavy clothing, which can act as a tourniquet to your vascular access

ENCOURAGE PATIENTS TO BE MENTORS

New dialysis patients often feel overwhelmed, scared and/or angry, which can affect their health. Ask those patients who are knowledgeable about self-care to mentor new patients. This can help reduce new patients' fears and set a good example.

Communication Resources to Empower Patients

PATIENT TIP SHEET:
What Happens During Hemodialysis?

You need dialysis when your kidneys are no longer able to take care of your body's needs—which is usually end stage kidney failure. During end stage kidney failure, your kidneys lose between 85 to 90 percent of their function.

HOW HEMODIALYSIS WORKS

Hemodialysis uses a hemodialyzer, which acts as an artificial kidney, to remove waste and fluid from your blood. Your blood enters the hemodialyzer through an access—an entrance to your blood vessels—usually on your arm or leg. This access is one of three kinds:

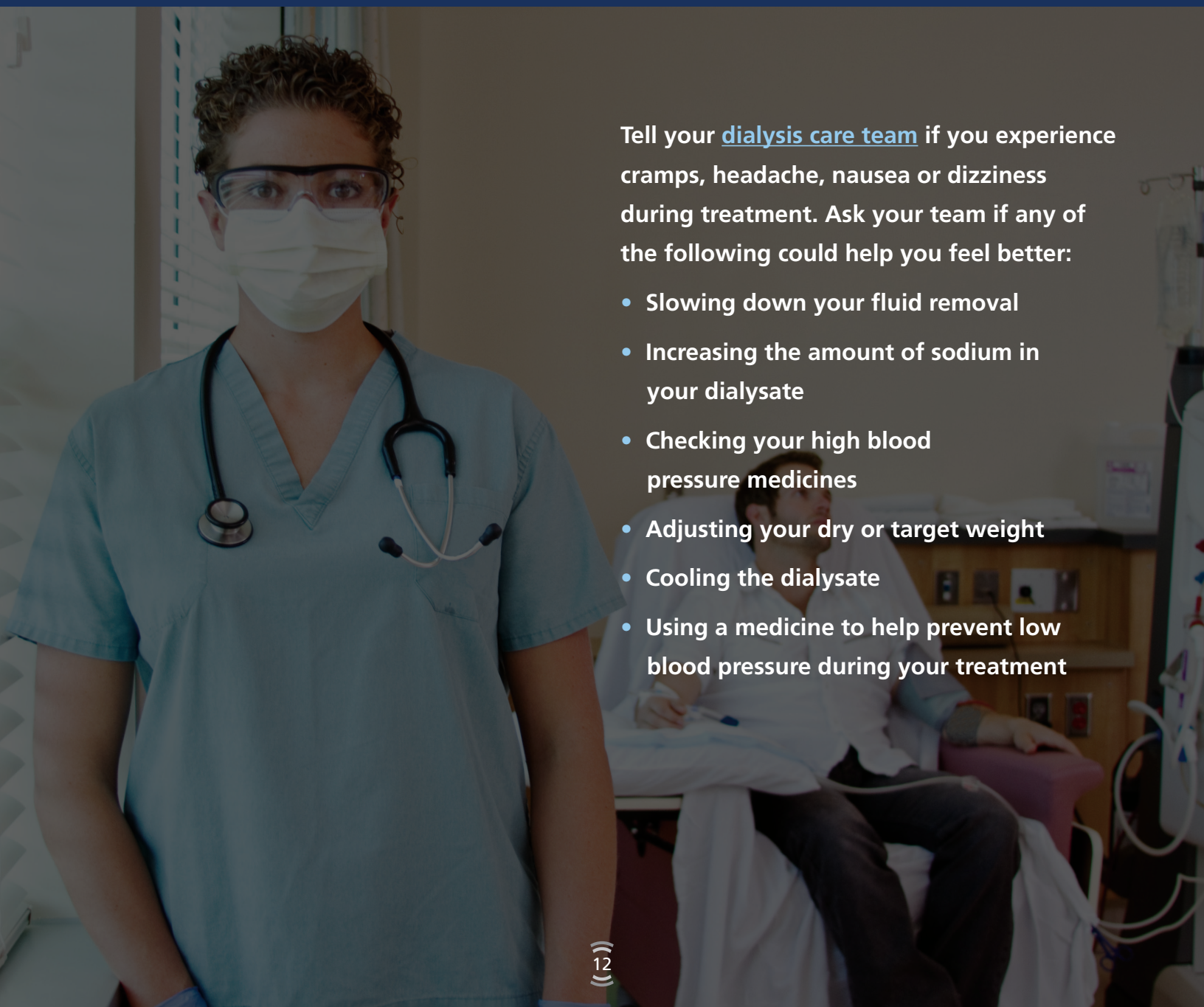
Catheter: This is an access that is ready right away but is generally used for temporary purposes while a graft or fistula is created. Catheters have a higher infection rate, so it is *very* important you make sure all contact with your catheter access is done using aseptic techniques.

Graft: This is a connection between an artery and a vein made with a synthetic graft material. Grafts are usually ready in 3-6 weeks, but they can have more frequent rates of clotting than fistulas, so knowing your flows and following correct care techniques is key to keeping your graft healthy.

Fistula: This is an access connection made using a patient's own artery and vein. This is the preferred access method as it has a lower clotting rate, but creating a fistula can take from 1-4 months until it is ready to use.

You can review all of these with your doctor to learn more about each different type of access and to find out which kind your doctor feels is the best choice for your unique situation.

Needles are put into your fistula or graft at the beginning of treatment. Then, tubes will be connected from your access to the dialyzer. During hemodialysis, your blood and a solution called dialysate flow through the machine, but never touch. The hemodialysis machine mixes the dialysate solution, which is a combination of purified water, bicarbonate and an acidified solution. Any impurities in your blood are filtered into the dialysate. Any dialysate containing waste products leaves the machine and goes down the drain.



Tell your dialysis care team if you experience cramps, headache, nausea or dizziness during treatment. Ask your team if any of the following could help you feel better:

- **Slowing down your fluid removal**
- **Increasing the amount of sodium in your dialysate**
- **Checking your high blood pressure medicines**
- **Adjusting your dry or target weight**
- **Cooling the dialysate**
- **Using a medicine to help prevent low blood pressure during your treatment**

PATIENT TIP SHEET:

Caring for Your Access

FISTULAS AND GRAFTS

While you're less likely to have problems with infection if you have a fistula or graft, they can still become infected or develop problems with flow. And if you have a catheter, you face an even greater risk of infection. Keep your access free from infection and working properly by watching for these problems:

- Pain
- Swelling
- Fever
- Redness or pus around your access site
- Bleeding from the access site
- Coldness, weakness or numbness in your hand

If you notice any of these problems, contact your dialysis center or your care team right away.

In addition to keeping your access clean and monitoring it for signs of infection, you'll want to not put any excess pressure on the area. This can be done by:

- Not sleeping or resting on the arm or area of the body where you have the access
- Not carrying heavy packages or placing purses on the arm with the access
- Not wearing tight clothing or jewelry on your access area

CATHETERS

Venous or tunneled catheters raise your risk of infection or blood clots. Here's what you can do to keep the area healthy and functioning well:

- Wash your hands before you touch your catheter or the incision area.
- Keep the clamps on your catheter closed, unless it's in use.
- The dialysis staff will flush your catheter as often as your doctor recommends to help prevent blood clots.
- Change the dressing over your incision as often as your doctor recommends.
- Keep the area around your incision dry.
- Contact your doctor or dialysis center if you notice any signs of infection, which include pain, swelling, discharge, redness and fever.

CARING FOR YOUR ACCESS: DAY-TO-DAY TIPS

These tips can help you avoid infection and the development of blood clots.

Do:

- ✔ Wash your hands before and after touching your access.
- ✔ Ask your healthcare provider to show you how to check the thrill in your access. Once you've learned how to do this, check everyday. If the thrill decreases or isn't there, call your healthcare team right away.
- ✔ At each dialysis treatment, change where the needle enters your fistula or graft.

Do Not:

- ✖ Let anyone take blood pressure, place an IV or draw blood from your access arm or area.
- ✖ Let anyone draw blood from your tunneled central venous catheter.
- ✖ Use your access for anything but dialysis.
- ✖ Bump or cut your access.

PATIENT TIP SHEET:

How the HD03 Works

The HD03 monitor helps your dialysis care team keep you and your access healthy by measuring the flow of your access. In addition to monitoring the health of your access, the monitor measures delivered blood flow and cardiac output.

WHY SHOULD YOU CARE ABOUT YOUR ACCESS FLOW?

You may have heard the phrase "your access is your lifeline for a lifetime." That's because without a properly functioning access, you cannot have adequate dialysis. So, knowing your flow numbers can help alert you to a potential problem with your access that you or your dialysis team can quickly address.

Take dialysis patient Lori Clark, for example. She uses the data provided from the HD03 to not only track the health of her access, but to see if there's anything she may be unwittingly doing that could be impacting it.

> When the numbers started going down, I knew something was wrong," Lori said.

It turns out she was wearing a tight fitting jacket, and by removing the jacket, her number went back up.

"If the jacket's not obviously that tight, a clot will build up in time," Lori surmised. "And you won't know where it came from. This is all guesswork for a patient because there's no way to know for sure. Having the Transonic machine helps a lot. Otherwise there will be no basis for me to even guess anything. It's helped me take better care of my access."

My Vascular Access Record

Date	Vascular Access Flow (ml/min)	Recirculation (%)	Cardiac Output (L/min)

Transonic's HD03 Monitor can help your clinic save time, money and even patient lives. Debbie Brouwer-Maier, RN, our Product Manager as well as an experienced vascular access coordinator, is ready to answer any questions you have. **Schedule a time to talk to Debbie today.**

eBook

HOW TO IMPROVE PATIENT RETENTION IN DIALYSIS CLINICS

Attracting new patients will always be a valued effort across dialysis clinics. But when most of your time and energy is centered around this, it becomes easy to overlook the importance of retaining existing patients—the foundation of long-term success.

The incentives for making patient retention a priority are abundant. Your profitability will increase significantly through loyal relationships with current patients, while a proactive environment will soothe the potential for patient conflict. A lower patient turnover rate also translates into fewer unknowns about the treatment of patients, as well as a staff that is more motivated and satisfied.

While the benefits may be clear, what might not be as apparent is how clinics can start improving their patient retention.

In this guide, you'll find a variety of tips on how to keep existing patients happy and healthy—elements that will ultimately attract new patients as well.

Creating the Right Environment for Dialysis Patients and Staff

It's a scenario that no dialysis clinic wants to experience.

With frustrations over late starts to their appointments and a lack of involvement in their care planning, a patient becomes disruptive and decides to file a complaint. As the situation escalates, the facility mandates that the patient leaves and transfers them to a new clinic in the local area.

While conflict in the dialysis clinic may be detrimental to patient retention and staff morale, it's not a new trend. Clinics have struggled for years to effectively manage and decrease conflict—a challenge that has spawned supportive initiatives.

One of these initiatives came about in October of 2003 when 46 ESRD stakeholders from 27 organizations first met to discuss the roots of conflict in dialysis clinics. As they explored the barriers to improving patient-conflict resolution, they designed an actionable plan for better patient-provider interactions: Decreasing Patient-Provider Conflict (DPC).

C reate a Calm Environment

O pen Yourself to Understanding Others

N eed a Nonjudgmental Approach

F ocus on the Issue

L ook for Solutions

I mplement Agreement

C ontinue to Communicate

T ake Another Look

The goal of the DPC is to provide dialysis clinics with the resources they need to **manage and reduce conflict**. While each training step focuses on a different piece of the puzzle, the goal is the same: to create an environment that aligns with the expectations of both patients and staff. Bridging this gap ensures that both parties are confident in the quality of care provided and satisfied with their current clinical relationship.

To create the right facility culture for this purpose and improve patient retention, it's important to weigh the different factors that patients value most.

What Patients Value Most in Dialysis Clinics

OFFER AMENITIES

With hours spent in a dialysis center each week, patients can quickly run out of ways to occupy their time. Investing in amenities for your facility can make all the difference in how this time passes. For instance, with WiFi capabilities and several electrical outlets, patients can get caught up on work, chat with friends or watch movies. Other amenities that can be beneficial to this end are televisions, heated blankets and specialized massage chairs.

PROVIDE COMFORTABLE SPACE

When patients come to a dialysis clinic, they want their experience to be as comfortable as possible. By introducing comfort measures like adjustable chairs, blankets and televisions to your facility, you can generate substantially better patient satisfaction scores.

MONITOR NOISE LEVELS

The mixture of alarms, medical carts and loud conversations can easily create a disruptive patient experience. And when combined with the anxiety of the appointment itself, this can only add further stress to the situation. Posting signs about voice levels, purchasing quieter equipment and responding promptly to alarms are all effective ways for keeping loud noises to a minimum and improving patient retention.

KEEP THE FACILITY CLEAN

The appearance of a facility can speak volumes to patients. So when areas are disorganized or poorly cleaned, it can make individuals wary about a clinic's ability to do its job. Not to mention, it introduces safety concerns about whether or not hemodialysis stations have been properly disinfected. By keeping your facility clean, you show patients you are committed to making their experience an efficient and safe one.

Effective Communication

Effective communication is an important tool for improving patient care and satisfaction. This is true of **conversations between patients and staff**, as well as interactions between employees. Making collaboration a priority can help your facility establish the right lines of communication.

AVOID SILOED INTERNAL COMMUNICATIONS

Operating in silos can place dialysis facilities at a disadvantage. For example, a technician learns about a common patient concern but fails to communicate that information with other departments. This creates a missed opportunity to optimize internal processes and improve patient retention. By breaking down these silos, you can foster greater collaboration between your staff and deliver better care to patients.

EMPOWER PATIENTS TO ASK QUESTIONS

Asking questions in the healthcare setting can be intimidating for patients. They might feel vulnerable based on the education of the clinician or anxious about taking up too much of their time. While avoiding overscheduling can help alleviate some of these issues, it's also crucial to establish an encouraging environment where patients feel comfortable asking questions.

INVOLVE PATIENTS IN THEIR CARE PLANNING

When creating a care plan for a patient, clinicians tend to write things up and have the patient sign the document. While this approach may be efficient, it skips involving patients in the care planning process. Making an effort to go through care plans with patients—as well as their families and significant others—gives them a sense of ownership of their care and builds the foundation for more successful outcomes.

Proactive Safety

While it may not always be apparent, a significant percentage of dialysis patients are fearful of medical mistakes. In fact, one survey showed that **48.6% of hemodialysis patients** "sometimes to always" carry this concern. Creating a culture of safety can help ease patients' worries while keeping them in the chair and out of the hospital.

ESTABLISH PATIENT SAFETY PROGRAMS

Patient safety should be a collaboration between different departments. Establishing a patient safety committee helps build these connections and foster a culture that values proactive safety and education. By closely monitoring relevant metrics, collecting patient feedback and researching industry advancements, dialysis clinics can not only report problems but also develop plans for solving them.

Ongoing training is also important for fostering improvement and consistency in patient care. One example is the **5-Diamond Patient Safety Program**, an educational, online program available to dialysis clinics across the nation. With 18 different modules surrounding patient safety concepts, the resource helps clinics become more aware of, advocate for and create a safety culture that will improve patient retention.

INVEST IN THE RIGHT TECHNOLOGY

When you invest in the right technology—like Transonic's HD03 Monitor—you invest in a healthier future for your patients. In the case of dialysis, poor vascular access flow can easily lead to discomfort for patients and potential complications. Transonic's HD03 Monitor features surveillance capabilities that alert clinicians to patients with high risk for access failure. These patients can be added to a built-in 'alert' list that ensures they are monitored more frequently to ensure positive outcomes. The addition of intuitive operator guidelines that feature prompts and reminders helps ensure a better quality of care for every patient in your clinic.

What Better Patient Retention Means For Your Dialysis Clinic

INCREASED PROFITABILITY

Patient retention offers significant financial incentives to clinics. Rather than having to focus on continuously bringing in new patients, your facility can leverage the loyal relationships that they've already achieved with existing patients.

FEWER UNKNOWNS

A high patient turnover means always having to adjust to new patients and fill the chair again. Retaining existing patients eliminates many of these unknowns and paints a much clearer picture of how treatment sessions will go.

LESS PATIENT CONFLICT

Conflicts between a clinic and a patient can create stress on both sides. By taking a more proactive approach to establishing a safe and healthy environment, it's less likely that conflicts will occur and more likely that better outcomes will be achieved.

SATISFIED STAFF

When patients are doing well and receiving better care, this has a positive impact on your staff as well. They will feel more motivated when they have the tools and education to make patient-centered care a priority.

Experience the Benefits of Transonic Machines in Your Clinic

Ready to start improving your care clinic? Transonic Monitors can help you achieve safer interactions with your patients, keeping them healthy and happy in your hemodialysis facility. To learn more, **schedule a call with our Product Manager Debbie Brouwer-Maier, RN**.

The Kidney Project Hopes to Change the Face of ESRD

Posted by Susan Eymann, MS on Oct 17, 2018 7:30:00 AM

The need is staggering. Two million people worldwide are estimated to suffer from end-stage renal disease (ESRD), and the number of patients continues to increase at a rate of 5-7% per year. Taiwan, Japan, Mexico, the United States, and Belgium currently have the Screen Shot 2018-10-16 at 11.52.54 AMhighest prevalence of ESRD. Mortality rates vary depending on the ESRD treatment. After one year of treatment, those on dialysis have a 20-25% mortality rate, and a 5-year survival rate of 35%.

The best current treatment for ESRD is kidney transplantation. Its five-year survival rate for transplant recipients is over 80%. However, kidney transplantation requires a donor match, major surgery, and a lifetime regimen of immunosuppressant medications to prevent rejection. Moreover, there is an acute shortage of donor organs. There are more than 100,000 ESRD patients on the U.S. transplant wait list, but, in 2014 there were only 17,105 donor kidneys available for transplant and less than 70,000 donor kidneys available worldwide.

Ten years ago, a group of scientists and clinicians from universities and laboratory across the United States convened to try to find a solution to this problem. They launched The Kidney Project. Their goal is to create a small, surgically implanted, and free-standing bioartificial kidney to treat end stage renal disease (ESRD).

The Kidney Project is now in its third phase with clinical trials slated to begin soon. The coffee cup size bioartificial kidney will process blood continuously for 24 hours per day, which would avert the inconveniences and **morbidities associated with intermittent hemodialysis**.

The bioartificial kidney consists of two modules that work together to get rid of a body's wastes.

- First, a hemofilter module processes incoming blood to create a watery ultrafiltrate that contains dissolved toxins as well as sugars and salts.
- Second, a bioreactor of kidney cells processes the ultrafiltrate and sends the sugars and salts back into the blood. In the process, water is also reabsorbed back into the body, concentrating the ultrafiltrate into "urine," to go to the bladder for excretion.

Surgically implanted and powered by the patient's own blood pressure, the bioartificial kidney does not require anti-rejection drugs as it performs many of the metabolic, endocrine, and immunological functions of a healthy kidney.

It is the hope that the bioartificial kidney will give ESRD patients new hope beyond the short-term solution of renal dialysis and the longer-term, but impermanent, solution of a living kidney transplant for which donor organs are limited.

The project is headed by Shuvo Roy, PhD, a bioengineer and professor in the Department of Bioengineering and Therapeutic Sciences, Schools of Pharmacy and Medicine, University of California, San Francisco (UCSF and co-directed by William Fissell, MD, at Vanderbilt University Medical Center. Team members include scientists, engineers, and clinicians from across the United States who bring together the biological, engineering, medical, and manufacturing expertise needed to create the bioartificial kidney. They work in small private businesses and in labs at the University of CA, San Francisco; Cleveland Clinic; Ohio State University; Pennsylvania State University; University of Michigan and Case Western Reserve University.

Reference: **https://pharm.ucsf.edu/kidney/device/faq**

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