Magazine *2016*

LIVING

We work for people who rely on dialysis to live. We are aware of this responsibility. That is why we exchange our ideas globally. We share our knowledge to continuously improve. For our patients.

KNOWLEDGE

FRESENIUS
MEDICAL CARE

Magazine *2016*

LIVING KNOWLEDGE

In 2016, Fresenius Medical Care celebrated its 20th anniversary. For 20 years now, we have been committed to giving people with kidney disease a better life. From the very beginning, this has been our motivation for achieving advances in dialysis and providing our patients with the best possible medical care. We have continuously risen to this task over the years and have established ourselves as the technology and market leader. By stepping up our investments in other medical areas in the future, we build out our medical expertise even further – for the benefit of our patients.

CREATING A FUTURE WORTH LIVING

YEARS

In the 20-year history of Fresenius Medical Care, we have achieved a great deal, always driven by the desire to create a future worth living for kidney patients. We currently operate around 3,600 dialysis centers in over 45 countries and treat more than 300,000 patients; every 0.7 seconds, we perform a dialysis treatment somewhere in the world. All this would not have been possible without the Company's 100,000-plus employees, who help to drive us forward with great courage and energy every day. This is also the reason why we now produce annually nearly eleven times more dialyzers, and have increased revenue thirteenfold and our net income fourteenfold.

THE STARTING POINT

Without courage and energy, Fresenius Medical Care would not even exist. In 1996, Gerd Krick, Fresenius AG's CEO at the time, had the idea of taking over the much larger U.S. dialysis specialist National Medical Care. Thanks to his keen instinct for the right moment, his technological know-how, commercial vision and strategic skills, he quickly won allies to support his plan. Together with Ben Lipps, who later became CEO of Fresenius Medical Care, he ultimately succeeded: Fresenius's dialysis division was merged with National Medical Care, and Fresenius Medical Care was born. "We had regular visitors to the Company during this period, from bankers to delegations from the U.S. They all wanted to see for themselves what our work involved and how the site operated," recalls Erwin Franiek, who has been with the group for 36 years and is now in charge of quality control at the dialyzer production site in St. Wendel, Germany.

FROM TECHNOLOGY LEADER TO MARKET LEADER

"In actual fact, we were already the technology leader back in 1996," says Franiek. The groundwork was laid long before. In 1983, we introduced the polysulfone filter, which is now standard. In the following years, we succeeded in fine-tuning the key components of a dialysis system – the blood filter (dialyzer), pump, and balancing chamber. "By developing these three key components in parallel, we were ultimately able to secure our position as technology leader," explains Reiner Spickermann, who has been in charge of development activities for hemodialysis machines at the Schweinfurt site in recent years.

The reward for all this hard work came in 1992 with the market launch of the 4008 product line, according to Spickermann. "We all felt an incredible sense of euphoria when we unveiled the system at ERA-EDTA, the annual conference of the European Renal Association – European Dialysis and Transplant Association in Paris," he recalls. The response was overwhelming. Boosted by this success, the Company continued to build on its technology leadership in both, the area of dialyzers and the actual dialysis machine itself, in the years that followed.

RICE POWELL
is Chief Executive Officer and Chairman of the Management Board effective January 1, 2013. He joined Fresenius Medical Care in 1997 and has over 36 years of experience in the healthcare industry.

Another milestone was the market launch of the 5008 therapy system in 2005. This offered considerable benefits for patients, including one that was particularly significant: It increased the survival rate by 35 percent.

Continuous improvements to the dialysis equipment ultimately paved the way for market leadership. By 1999, the 100,000th dialysis machine had rolled off the production line in Schweinfurt, Germany. Just four years later, we were treating well over 100,000 patients a year and annual production had grown to more than 50 million dialyzers. Dialyzer production passed the 500 million mark in 2007 and reached the one-billion threshold six years later.

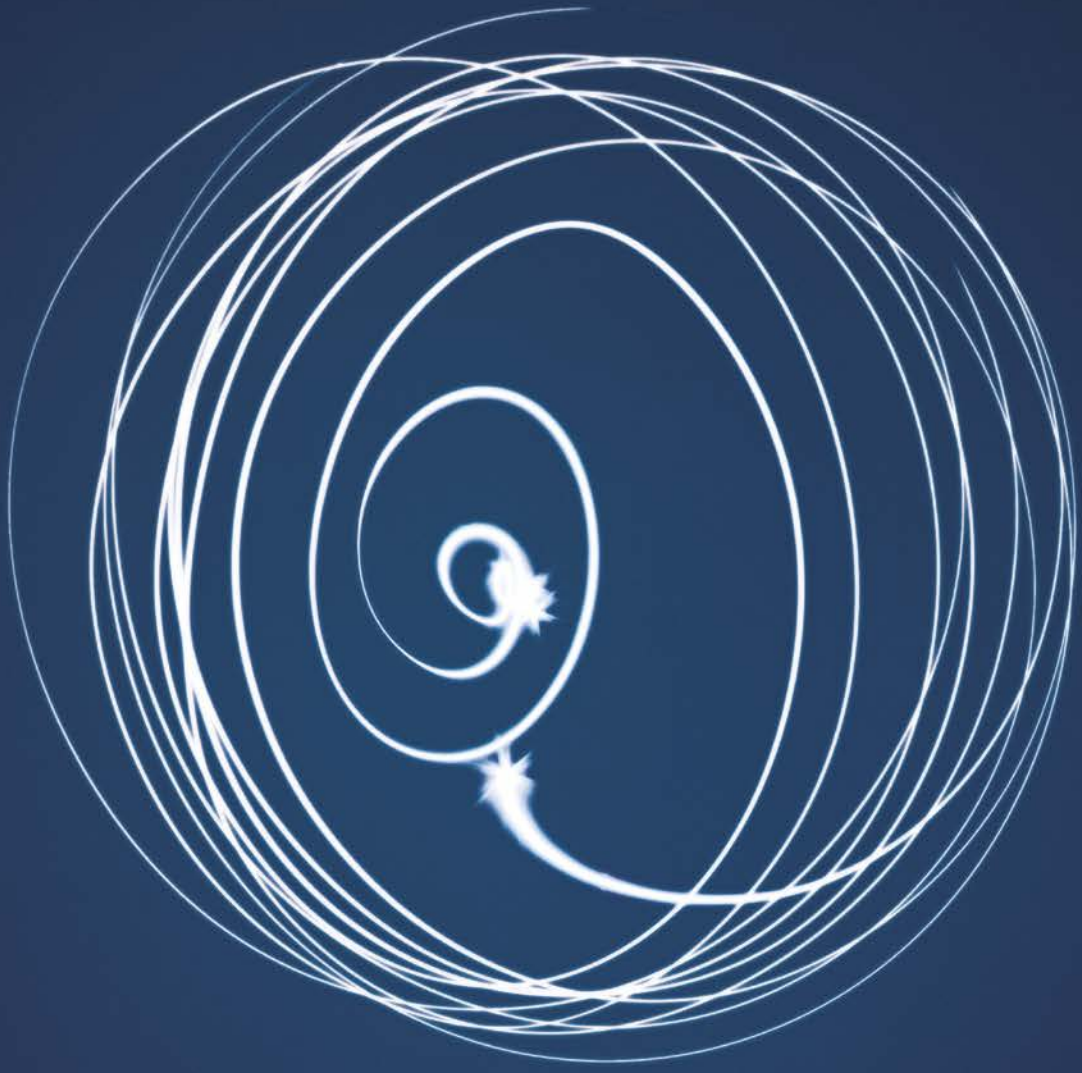
CONTINUITY DESPITE COMPLEXITY

Our defining feature is continuity. This applies to both, the Company's growth and the ongoing improvements to the actual machines. Of course, they are often only small achievements, but every little step gives patients a better quality of life and a longer life expectancy. "There's no better motivation in my eyes," stresses Spickermann. "The biggest challenge is reproducing the complexities of renal function as effectively as possible."

The design of the dialysis machine is correspondingly complex. It consists of around 8,000 components, some of which are made from highly specialized materials and have special features. For example, they need to be biocompatible. In other words, the components must not pass on any impurities to the blood. They also need to withstand high temperatures, acids, and alkalis. The valves are another key component that must work with absolute precision and reliability over a long operating period of around 5,000 hours per year with an average service life of ten to twelve years. "It's also important that the individual components operate in perfect harmony, like clockwork, so that the blood parameters, such as temperature and pH value, and the patient's circulation remain stable during treatment," emphasizes Spickermann.

3,624

We treat 308,471 patients in 3,624 dialysis clinics in more than 45 countries.



"Our expertise in dialysis and the areas of business involved in Care Coordination enables us to actively shape changes in the health care market."

RICE POWELL
Chief Executive Officer and Chairman of the Management Board of Fresenius Medical Care

2

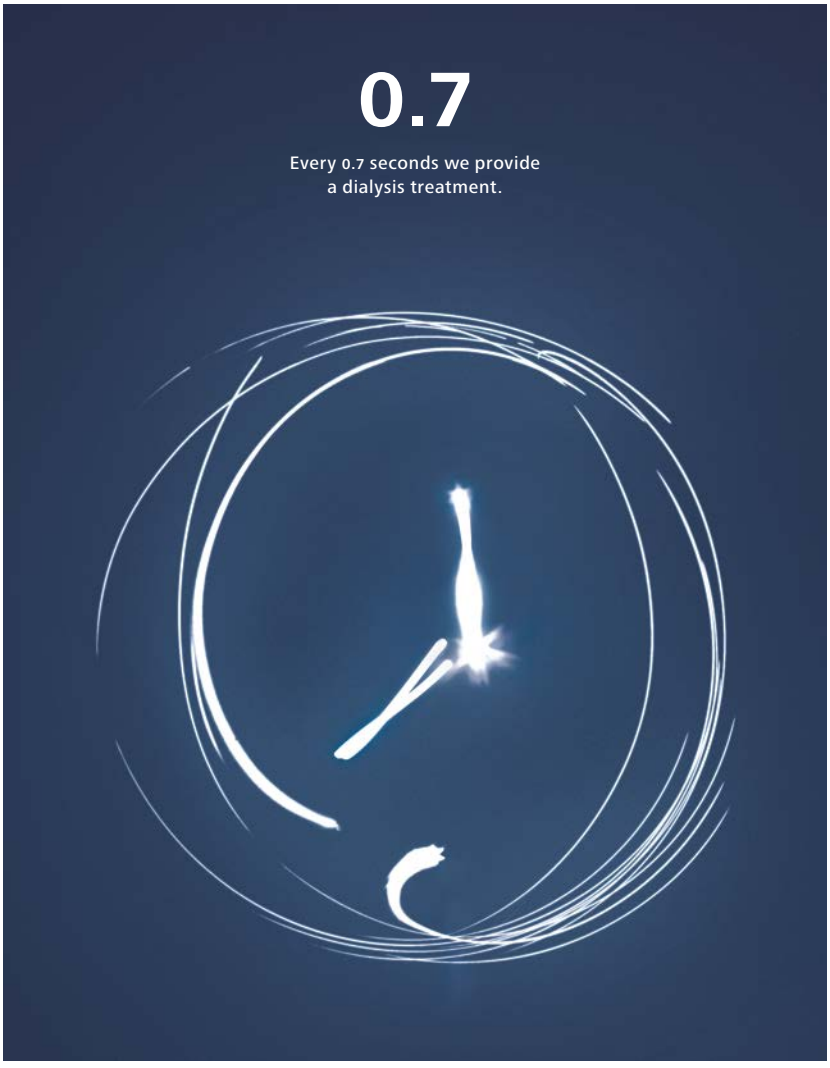
One in two dialysis machines
worldwide is made by
Fresenius Medical Care.

"The biggest challenge is reproducing the complexities of renal function as effectively as possible."

REINER SPICKERMANN
Responsible for the development of
hemodialysis machines in Schweinfurt, Germany

"We need to look at patients' overall situation and grasp every opportunity to improve their quality of life."

PROF. BERNARD CANAUD
Medical Director for the region Europe, Middle East and Africa



REINER SPICKERMANN
has been working for the Company for more than 20 years and is responsible for the development of hemodialysis machines in Schweinfurt, Germany.

PROFESSOR BERNARD CANAUD
is nephrologist and Medical Director for the region Europa, Middle East and Africa at Fresenius Medical Care.

All this has to happen despite the fact that blood is being removed from the body to be cleaned and returned in a purified state over a period of several hours. In addition, the blood's composition must not be changed too rapidly and any clotting must be prevented. "The fact that we master this complex challenge sets us apart," says Spickermann.

ADDED VALUE REMAINS IN-HOUSE

Handling complexity carefully is just one aspect of our work, though. Patient safety and top quality are absolutely essential for us. "When it comes to patients' health and safety, compromises are out of question," stresses Franiek, who, together with his team, ensures the consistently high quality of materials and processes. "That's why we're continuously improving the compatibility of products and automating numerous control processes in production to minimize errors," he adds.

Given the importance of quality, vertical integration has been a feature of our Company from the very beginning. This means that we offer the entire value chain under one roof – ours – from production of the membrane and the entire machine to software development, all dialysis-related services, and accompanying treatments. Vertical integration has a further advantage: It means that all the relevant know-how is concentrated in-house. What's more, through their day-to-day dealings with patients and users, our developers gain valuable information that helps us to continuously improve our products and services for our patients and make processes simpler, safer and more efficient.

We moved into the hospital and service sector back in the 1990s and then gradually expanded our activities in these areas. For example, we acquired the Renal Care Group, Inc. in 2005, a majority shareholding of 51 percent in the Taiwanese dialysis service provider Jiate Excelsior Ltd. in 2007, Asia Renal Care Ltd. in 2010, Euromedic in 2011, and Liberty Dialysis Holdings, Inc. in the U.S. the year after.

ERWIN FRANIEK has been working for the Company for 36 years and is in charge of quality control for dialyzer production at Fresenius Medical Care's production site in St. Wendel, Germany.

PUSHING THE BOUNDARIES

"Despite all our efforts and constant improvements, even we have our limits," says Professor Bernard Canaud, Medical Director for the region Europe, Middle East and Africa at Fresenius Medical Care. "Dialysis prevents the certain death of people with kidney disease. A huge progress has been made over the past 50 years, but it's a Herculean task to precisely reproduce the way the kidney works. It's not the effectiveness of the method that restricts us, but the time limits of dialysis," he explains. Human kidneys work round the clock and purify 1,500 liters of blood each day, in passing, so to speak. A dialysis machine, on the other hand, can only transport and purify 120 liters of blood in three to six-hour sessions, three times a week – that is the most that can reasonably be expected from patients. In view of this and the fact that the number of kidney patients will continue to rise as society ages, Professor Canaud demands that other approaches to treatment be considered in addition to dialysis. "We need to look at patients' overall situation and grasp every opportunity to improve their quality of life," he says, adding that prevention and early detection of factors that lead to kidney disease are also vital.

THINKING BEYOND DIALYSIS

The key to future patient care is in understanding medical relationships down to the last detail. We will therefore continue to strengthen our expertise in the area of Care Coordination and step up our investment in medical services related to dialysis. Rice Powell, CEO of Fresenius Medical Care, derives important strategic goals from this development, saying "Our expertise in dialysis and the areas of business involved in Care Coordination enables us to actively shape changes in the health care market." This offers Fresenius Medical Care the opportunity to focus on holistic patient treatment and, by doing so, to lay the foundation for further growth.

109,319

109,319 employees in more than 50 countries work for Fresenius Medical Care.

"When it comes to patients' health and safety, compromises are out of question."

ERWIN FRANIEK
Head of quality control for dialyzer production at Fresenius Medical Care in St. Wendel, Germany

MORE CARE. LESS COMPLEXITY. 6008 CARESYSTEM.

The dialyzer and the dialysis machine are the two most important products in hemodialysis. While the dialyzer filters the patient's blood, the dialysis machine pumps it and monitors its circulation outside the body. Dialysis treatments generally last several hours, and are usually carried out three times a week.

"It takes visionary and dedicated people to develop such an innovative system."

DR. JOACHIM NOACK
Technical Project Manager for Research and Development

Fresenius Medical Care's new hemodialysis system not only provides the highest therapy standards, but also minimizes risk-related handling steps and simplifies the work flow for clinical staff. A major asset of the 6008 CARE-system, which was developed by interdisciplinary teams, is the high-tech interface between the machine and the 6008 CAREset disposable with pre-connected bloodlines for all treatment modalities. This reduces the number of connections and the associated infection risk.

At the same time, the 6008 CAREsystem responds to broader trends in health care. These include the aging population – which means not only more patients, but also a higher percentage of patients who are difficult to treat – and cost pressure resulting from constraints on health spending.

In addition, the built-in technologies of the 6008 CAREsystem enable cardioprotective therapies – a huge benefit, since almost half of all patients with chronic kidney failure die from cardiovascular disease.

The new hemodialysis therapy system was introduced in 2016 following clinical trials involving more than 160,000 individual treatments.

"We welcome the extra safety, tranquility and effectiveness that the system grants our patients."

DR. THEOHARIS TSOBANELIS
Medical Director of the Center for Renal Diseases and Hypertension (CfNH) in Frankfurt/Main, Germany

THE BENEFITS

2

LESS COMPLEXITY
Minimizes the number of handling steps, thus reducing complexity in the delivery and cost of therapy.

1

MORE CARE
Gives nurses more time to provide direct patient care, enabling more patients to benefit from a higher level of treatment quality and improved outcomes.

3

ALL-IN-ONE DISPOSABLE
Features completely pre-connected bloodlines, meaning fewer connections and lower associated risks.

KNOWLEDGE TRANSFER

chez Fresenius Medical Care

Fresenius Medical Care SMAD, known until 1987 as Société de Matériels Annexes pour la Dialyse (SMAD), has a fascinating history. The manufacturer of dialysis products was established by a nephrologist, and initially only employed dialysis patients.

DR. GUY LAURENT, NEPHROLOGIST AND FOUNDER OF SMAD

French nephrologist Dr. Guy Laurent is a pioneer of dialysis in France. He treated his first patients in Lyon back in the early 1960s. "But we didn't have the right material," the 82-year-old recalls today. "We had to use machines from the U.S. that were built for a mains voltage of 110 Volts. And the tube connectors were different to those used in France." A bottle factory in Lyon produced the first connecting pieces, but Laurent could not find a manufacturer for many other essential products. "The liability risks for medical products were too high for small businesses, while the volumes and margins were too low for large firms." So he took matters into his own hands. Several dialysis patients, who had moved to Lyon to receive the treatment they needed, were living in two apartments in the suburb of Sainte-Foy-lès-Lyon. Most had neither a job nor financial support. So they became the first employees of SMAD, or Société de Matériels Annexes pour la Dialyse, established in 1967. "The first eleven members of staff were all patients," Laurent confirms. One of the two apartments was also used as a workshop for manufacturing the first dialysis products, which were sold to hospitals in the region. When the space was getting scarce, Dr. Laurent bought a farm in nearby Tessin, the city where he also founded his first private dialysis clinic in 1969. This farm became the first dedicated production facility before the company eventually moved to L'Arbresle in 1974. Despite his diverse activities, Dr. Guy Laurent always remained a physician; he consistently delegated the running of SMAD, which has belonged to Fresenius Medical Care since 1987, to others.

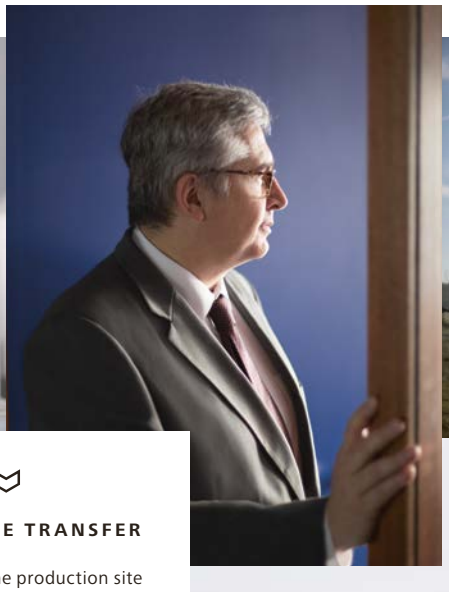
DR. CHARLES CHAZOT, MEDICAL DIRECTOR OF FRESENIUS MEDICAL CARE IN FRANCE

"As well as being a pioneer of medicine, Dr. Laurent is a true entrepreneur," acknowledges Dr. Charles Chazot. Both physicians have known and respected each other for many years. Between 2007 and 2014, Chazot ran dialysis clinics from Fresenius Medical Care in Lyon, including the facility founded by Dr. Guy Laurent in 1969 under the name Centre de Rein Artificiel de Tassin. Later on the dialysis clinic was renamed to Nephrocare Tassin-Charcot. According to Chazot, the shared roots of SMAD and Tassin-Charcot still shape the relationship between the two organizations to this day. "Tassin-Charcot and SMAD cooperate on several research projects," explains the current Medical Director of Fresenius Medical Care in France. For instance, they are currently exploring how to add amino acids to dialysis concentrates to combat malnutrition in patients. During his time as clinic manager, the 59-year-old nephrologist also encouraged reciprocal visits: Dialysis patients and clinic employees went on plant tours, and in turn, SMAD staff visited the dialysis facility to see first-hand how the products they make benefit people. "We continued this long-standing relationship, and it was important for everyone involved to gain these insights," recounts Chazot. He says that the close link is very special. "You probably won't find anything like it elsewhere."

L'ARBRESLE CENTER OF EXCELLENCE

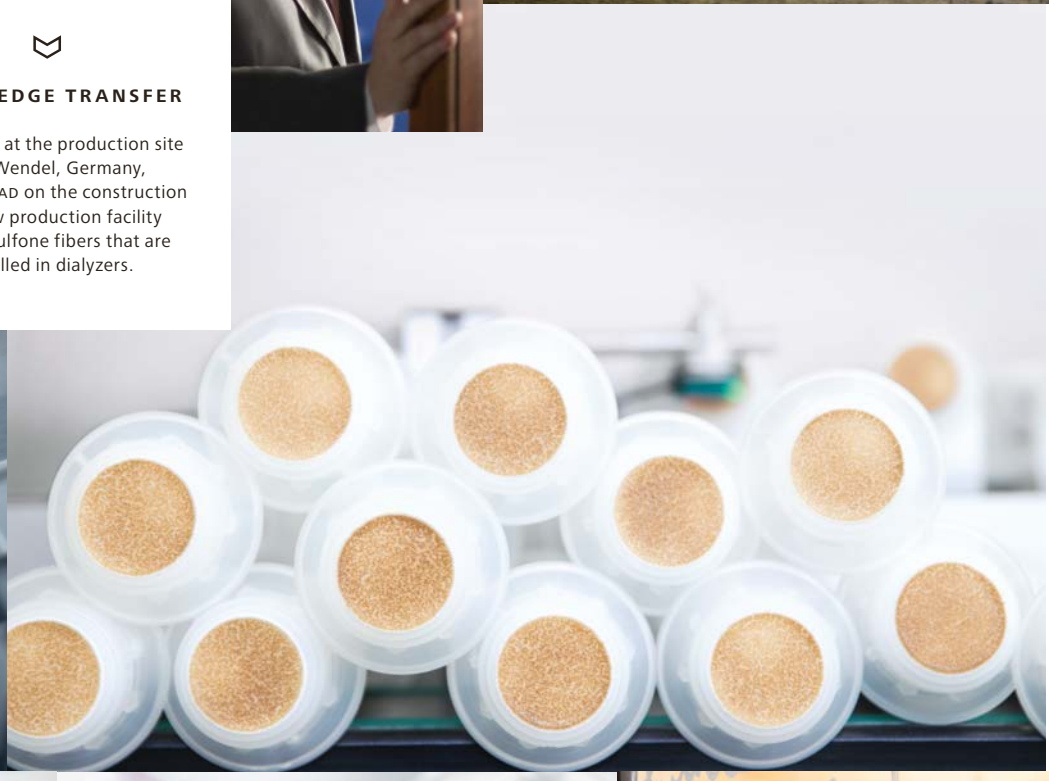
Fresenius Medical Care manages its global activities for dialysis concentrates from here as well as manufacturing further dialysis products at the location.

Fresenius Medical Care SMAD supplies dialyzers and concentrates to more than 120 countries.



KNOWLEDGE TRANSFER

Employees at the production site in St. Wendel, Germany, advised SMAD on the construction of a new production facility for polysulfone fibers that are installed in dialyzers.



THIERRY EYRARD, PLANT MANAGER AT FRESENIUS MEDICAL CARE SMAD

"It's not too common for a German company to invest in France to produce for the global market," says Thierry Eyrard. The senior SMAD manager is clearly proud of the recently concluded expansion of the plant in L'Arbresle. Production of polysulfone fibers, a core component of a dialyzer, is set to start here in spring 2017. "The expansion of the location was one of the most important projects in SMAD's history," Eyrard points out. He is not only responsible for the French plant, but also for the global production of Fresenius Medical Care's concentrate, including the Bibag, a key product. The concentrate is sold in more than 120 countries. All production facilities around the world benefit from the expertise in L'Arbresle. Thierry Eyrard's experience is important, as SMAD has made substantial technological advances in recent years: Many formerly manual tasks are now performed by robots and machines. "Our factory is one of the most automated and efficient in the Fresenius Medical Care Group," says Eyrard. "The whole team is proud of this development." SMAD prepared employees for the changes with numerous training programs and courses. The new polysulfone fiber production facility has also created additional jobs. He intends to continue sending his employees to visit the dialysis clinic Tassin-Charcot. "The memory of SMAD's special past lives on." This is the reason why there are pictures of patients on every single wall in the factory. These show real patients, photographed at the clinic Tassin-Charcot. "Our machines are so abstract, which is why we need to constantly establish this connection," says the manager. "We help these people – that's why we work here."

DAVID RIEU, HEAD OF QUALITY ASSURANCE, FRESENIUS MEDICAL CARE SMAD

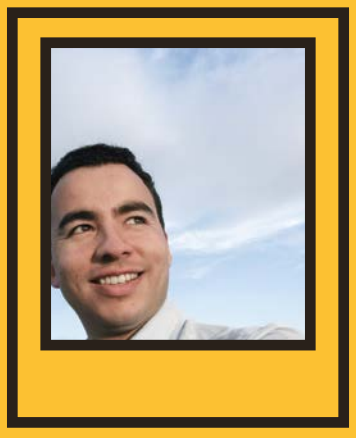
Products made at Fresenius Medical Care SMAD in L'Arbresle are used in around 30% of all dialysis treatments worldwide. David Rieu is aware that this is "a huge responsibility". This is why the man in charge of quality at SMAD is immediately informed if anything goes wrong in the production process. However, plant automation has increased the safety level even further. Sensors and cameras monitor most aspects of product quality. As 95% of all products are exported, the 47-year-old has to deal intensively with the regulatory requirements in place all over the world. "For example, one of our core products, the Bibag, is regarded as a medical device in the European Union, but as a drug in Canada," explains Rieu. Consequently, the production facility has to meet different requirements. "I spend far too much time sitting in my office trying to find out all about these requirements and then implement them," adds Rieu, who would prefer to interact more with production employees instead. "A neighbor of mine has been a dialysis patient at a Fresenius Medical Care clinic for a long time, and I often chat with her," Rieu says. Beyond all the regulatory requirements, these discussions constantly remind the manager that what ultimately matters is the well-being of patients.

**SOPHIE PRIVAT,
HEAD OF CORPORATE COMMUNICATIONS,
FRESENIUS MEDICAL CARE FRANCE**

When Sophie Privat joined Fresenius Medical Care in 1998, the Company had no more than 60 employees in France. "We just had one clinic – everything was very informal," she recalls. These days, Fresenius Medical Care looks after dialysis patients at over 30 facilities in the country. "Although we now have around 1,000 employees in France, we try to promote contact within the Company," says the 45-year-old, who has supported and shaped this two-decade-long growth phase. The communications manager places great value on the dialog between dialysis clinics, the French headquarter and the production location at L'Arbresle. That's why all new employees at Fresenius Medical Care in France visit one of the dialysis clinics; L'Arbresle will welcome sales and marketing employees again in 2017. "Fresenius Medical Care products and services are renowned in France for their high quality," says Privat. To keep on improving these standards, it is important that staff get a complete picture of the manufacturing and application conditions as well as the benefits of the products and services.

KNOW WHAT MOTIVATES US EVERY DAY

Our employees are crucial to our success. We pool their expertise, dedication, and experience and take advantage of cross-cultural collaboration. Fresenius Medical Care employs more than 100,000 people in over 50 countries. We asked: What drives our employees every day?



JORGE
SALES PLANNING
COLOMBIA

"Expanding our business in growing markets is a major challenge. Our common goal is to provide high-quality care to as many patients as possible."

JANINA
MARKETING
GERMANY

"Interesting career opportunities for young professionals offer me numerous possibilities for my personal development."

SIEMPRE MEJOR

CARLOS
DIALYSIS SERVICES
SPAIN

"The special challenge of achieving the Company's ambitious goals spurs me on every day."

SIVANESAN
TECHNICAL DEPARTMENT
INDIA

"Being able to actively contribute to improving our patients' quality of life makes me proud."

ANDRE
CALIBRATION DEPARTMENT
U.S.

"Career and private life go hand in hand. Flextime models offer me a proper balance between work and social life."

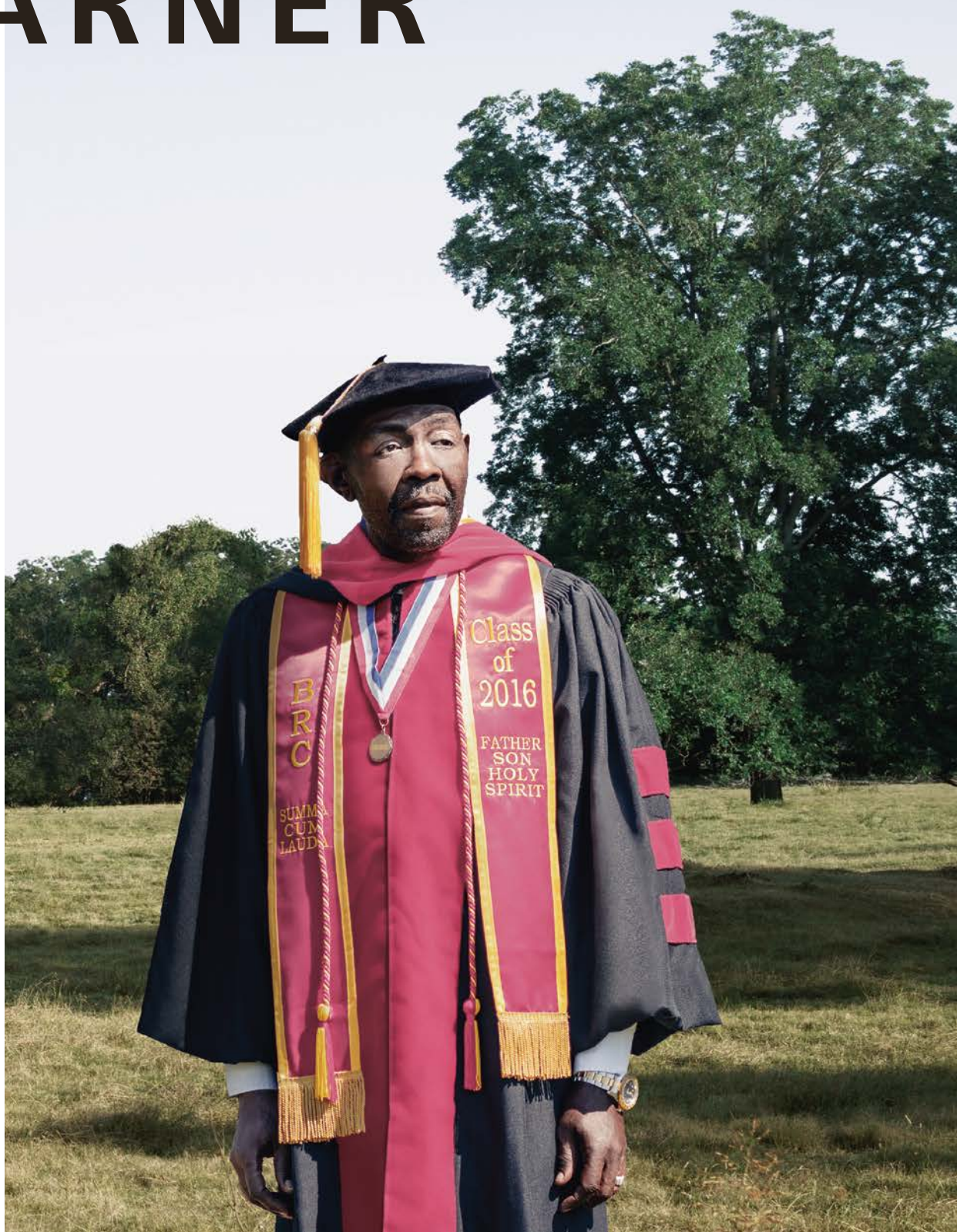
SITI HANIZAH
PEOPLE AND CULTURE
MALAYSIA

"The pioneering spirit, intercultural expertise and transfer of knowledge between people from all over the world are key to our success."

DANIEL, CAMILA & AMANDA
SALES & MARKETING
BRAZIL

"We are shaping the market with passion and joy. We love working with colleagues who share the motivation to constantly enhance our innovative solutions."

THE LIFE-LONG LEARNER



Bobby Claiborne was in his early 50s when his kidneys failed. He decided to use the many hours he spent in his Fresenius Medical Care dialysis center to earn a doctorate degree. We spoke with him about the challenges of life on dialysis and his motivation to earn a doctorate degree.

LIFE GOES ON, EVEN ON DIALYSIS

It's shortly before dawn, and the country roads winding through the fields and pine forests of northwestern Louisiana are still empty as Bobby Claiborne leaves his house in the woods to make the 30-minute drive to the Fresenius Medical Care dialysis center in the small town of Coushatta. Every Monday, Wednesday and Friday, Claiborne arrives at the clinic shortly after 6:00 a.m., carrying a backpack with books and his laptop or tablet. Once he has settled into one of the treatment chairs to have his blood cleaned via hemodialysis, he connects to the clinic's guest network and is soon engrossed in his studies.

Having something to focus on helps to make the four-hour-long treatment session pass more quickly, explains the 57-year-old from Louisiana, who has been undergoing dialysis since September 2012. Kidney failure brought on by high blood pressure forced Claiborne into disability retirement and changed his lifestyle dramatically. Yet it has not deterred him from leading an active life and pursuing an academic degree while in treatment. "Dialysis hasn't kept me from doing what I want to do. I'm in good hands at the Fresenius Medical Care clinic, and I do my best every day to stay healthy, so I can enjoy life and even travel occasionally," he explains.

"I knew I had to be ready for dialysis and got in shape well before starting treatment," recalls Claiborne. "That's probably why I don't experience it as being that exhausting." He sticks to a daily routine that would be demanding for most healthy men his age. Claiborne gets up at 4:30 a.m., checks his e-mails and the news over a cup of coffee before driving to the clinic. After returning home, he goes for at least an hour-long walk or works in his garden.

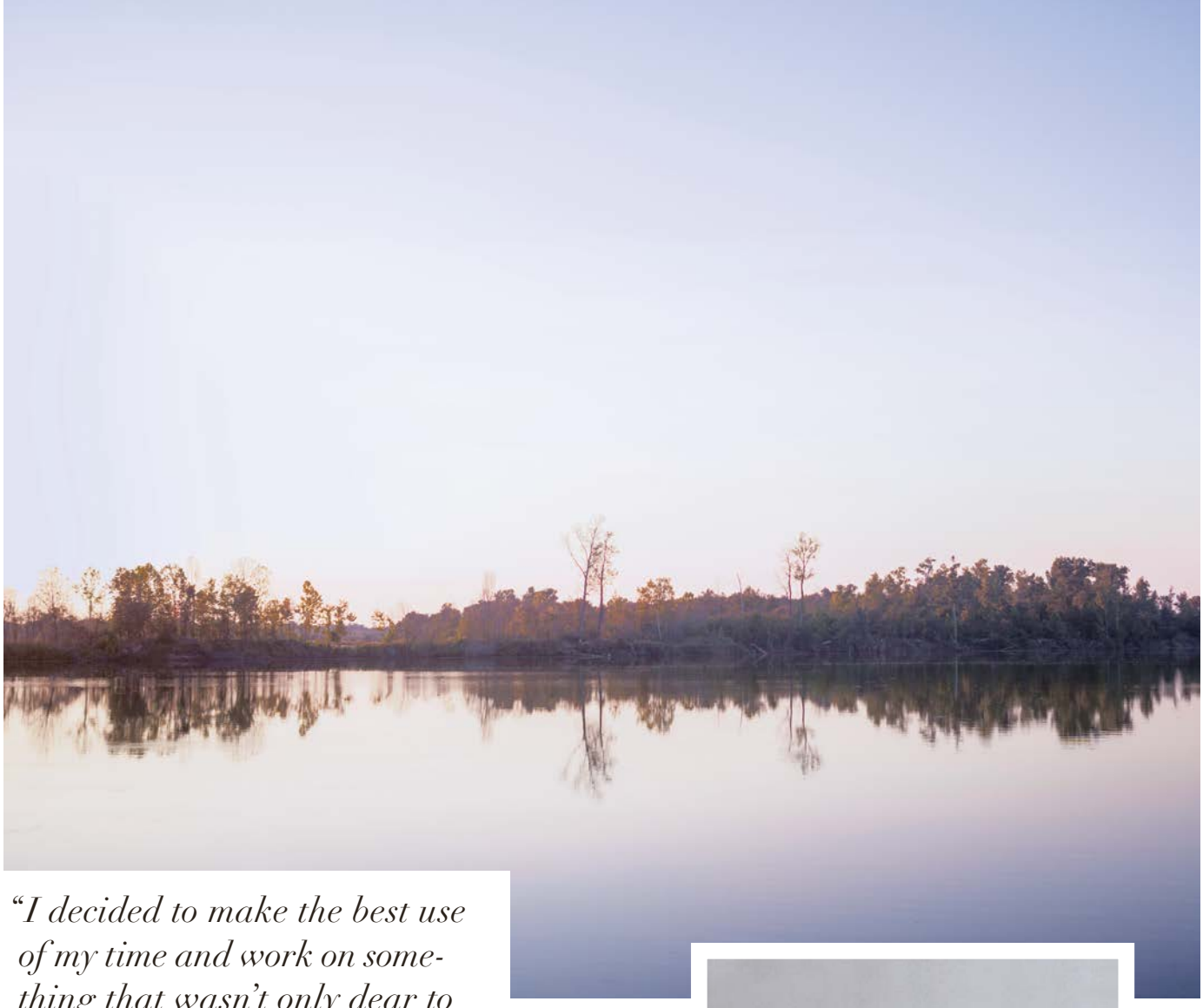
BECOMING REV. DR. CLAIBORNE

Giving up has never been part of Bobby Claiborne's vocabulary. A military veteran in his fifties, he chose not to waste his time at the dialysis clinic watching TV or napping, but instead signed up for an online course to earn a doctorate degree in theology – in record time and with honors.

"I decided to make the best use of my time and work on something that wasn't only dear to my heart but also one of the last wishes of my late mother," explains Claiborne, who started his degree program in 2015. Putting in long days for this endeavor even after his dialysis appointments, he finished the coursework and received a summa cum laude doctorate degree. "I've always enjoyed putting my mind to something and accomplishing that goal," says Claiborne.

His story is a remarkable journey that he obviously enjoys retelling as he sits in the living room of his home. It is a comfortable three-bedroom house situated on 240 acres of grassland and pine forest that teems with wild boars and deer. Right next to the red dirt road leading up to his house, a small group of horses and a lone donkey are grazing in the sun.

Every Monday, Wednesday and Friday, Bobby Claiborne arrives at the dialysis center in the small town of Coushatta, Louisiana, shortly after 6:00 a.m. His work as a pastor at local Baptist churches for close to 20 years set him on the path to pursue a degree in theology during his dialysis treatments.



"I decided to make the best use of my time and work on something that wasn't only dear to my heart but also one of the last wishes of my late mother."

BOBBY CLAIBORNE

Together with his wife Edna, Bobby Claiborne lives in his house in the woods outside the small town of Coushatta in Louisiana.

"Such commitment is rare among patients," says Nikki Bryant, clinical manager at the local Fresenius Medical Care facility, which opened in 2001 and has a total of 16 dialysis stations. "We have a patient census of 38, mostly African-American males in their 50s, who come in two shifts on alternating days. I've never met anyone so focused on making the most of their time as Bobby," adds Bryant. "He's a role model."

Hemodialysis treatment is more than a draining experience since it requires patients to change their lifestyle and diet, undergo three to six-hour-long dialysis sessions usually three times a week and take multiple medications. In a healthy human, the kidneys clean the blood incessantly, around 300 times a day. If they do not function properly, though, water and waste materials can build up in the body. For patients like Claiborne, a dialysis machine replaces the kidneys, removing metabolic toxins, excess salt and fluids from the blood stream.

Through its network of dialysis clinics in more than 45 countries worldwide, Fresenius Medical Care provides treatment to over 300,000 patients, almost two-thirds of them in the U.S. Facilities such as the one in Coushatta not only offer regular treatment, but also serve as a community hub. "We give advice on better food and drink choices and how to stay active. We do everything we can to improve our patients' quality of life," explains Bryant.

Her staff of 14 even organizes fun competitions to teach patients how to manage their phosphorus levels, an element found in many foods as well as soft drinks, and fluid intake, which for dialysis patients is generally limited, in Bobby's case to 16 fluid ounces (half a liter) a day. "I've had to adjust quite a few things since beginning treatment," admits Claiborne one Wednesday morning at the clinic. "I keep a shopping list of recommended food items on my fridge. It keeps me healthy."

Born in the historic town of Natchitoches, Claiborne joined the U.S. Army in 1977 and was chosen to serve in the prestigious Washington D.C. based 3rd Infantry Regiment, known as the "Old Guard", which acts as a ceremonial and escort unit to the President. He witnessed the signing of the Camp David Accords, Ronald Reagan's inauguration and several high-profile funerals. Claiborne left the service in 1986 to become a police officer in his hometown, after which he worked for the U.S. Postal Service until his failing kidneys forced him to take disability retirement in 2011.

His work as a pastor at local Baptist churches for nearly 20 years set him on the path to pursue a degree in theology, which required more than just discipline. Claiborne also needed a table for his laptop and books during his dialysis treatment. The clinic staff in Coushatta had to cast a wide net to find an adjustable side table, something usually only found in hospitals.

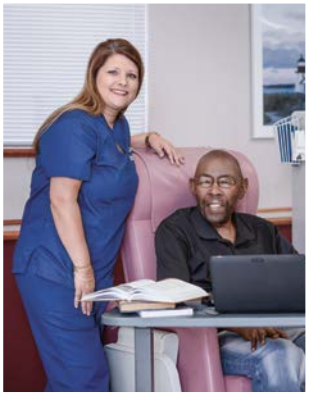
Claiborne admits he couldn't have done it without the loving support of his wife, Edna, whom he married in 2013 on New Year's Eve. "She is a cancer survivor, so we're a perfect match because we know the challenges of living with a chronic condition all too well." He can also rely on his five grown children and nine grandchildren, who all live a short distance from his house and visit him almost every week. And then there's his father, who still lives in Natchitoches.

True to his character, Rev. Dr. Claiborne already has major projects lined up to keep himself busy. He loves to cook and is currently working on perfecting his skills as a grill master. "I'm buying myself an electric grill for Christmas to up my barbeque game," he runs down the list. "But my biggest goal is to find a new challenge and be productive again. I'm in a unique position to counsel people in crisis situations."

Even more important is the fact that he is waiting for a kidney transplant and expects to hear some good news soon. "The future looks good," says Claiborne with the smile of a man who's been through a lot but has so far turned every obstacle into an opportunity. "And I plan to be around to enjoy it with my family."

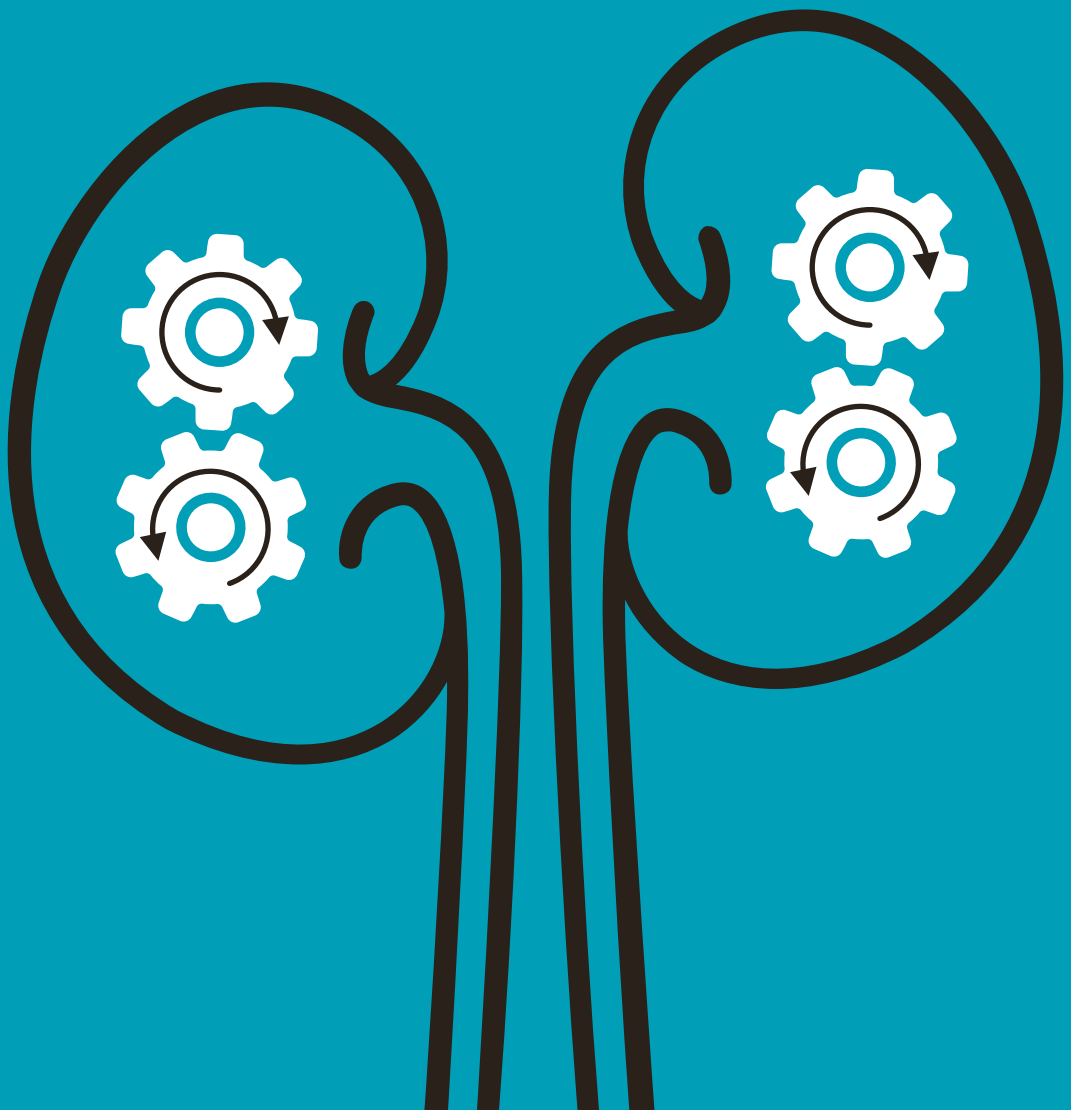
"I've never met anyone so focused on making the most of their time as Bobby. He's a role model."

NIKKI BRYANT,
CLINICAL MANAGER



Bobby Claiborne decided to make the best use of his time during dialysis and signed up for an online course to earn a doctorate degree in theology – in record time and with honors.

TWO SMALL FACTORIES ARE HARD AT WORK IN OUR BODY: OUR KIDNEYS.



THEY REMOVE TOXIC SUBSTANCES
FROM OUR BODY.
THEY REGULATE OUR WATER **AND**
ELECTROLYTE LEVELS.

THEY PRODUCE HORMONES,
CONVERT
VITAMINS, **AND CONTROL OUR**
BLOOD PRESSURE.
WE NEED OUR KIDNEYS **TO**
LIVE.

BUT WHAT HAPPENS IF OUR

KIDNEYS

STOP **WORKING?**

THEN THEY NEED HELP **TROUGH**

DIALYSIS TREATMENT,

SUPPORTED BY ARTIFICIAL HORMONES, VITAMINS, **AND OTHER DRUGS.**

THESE ARE THE MOST IMPORTANT DRUGS:

ERYTHROPOIETIN

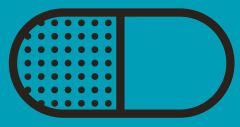
The hormone stimulates the formation and maturation of red blood cells.

In healthy bodies, it is produced by the kidneys. If the kidneys no longer work, the hormone must be supplied in drug form, otherwise there is a risk of anemia.

ACTIVE VITAMIN D

Together with the liver, healthy kidneys ensure that sunlight on our skin is converted to vitamin D3, an essential substance for the body. In patients with chronic kidney disease, this process is impaired. As a result, the calcium level falls, leading to bone disease.

Dialysis patients can take vitamin D orally to make up for this deficiency.



PHOSPHATE BINDERS

Healthy kidneys keep phosphates at a stable level. Diseased kidneys can no longer excrete excess phosphate. Patients with kidney failure therefore need phosphate binders.

Nearly all foods contain phosphate. A balanced diet alone is often not enough to regulate the phosphate level. The quantity and type of phosphate binders is determined by the physician. Dialysis patients usually take phosphate binders with their meals.

USING KNOWLEDGE TO HELP PEOPLE

The journalist Anja Reiter spoke with Dr. Franklin W. Maddux, Chief Medical Officer of Fresenius Medical Care in North America about medications and vascular access for dialysis patients.

DR. FRANKLIN W. MADDUX
Executive Vice President for Clinical and Scientific Affairs and Chief Medical Officer of Fresenius Medical Care North America

Dr. Maddux, statistics show that the number of people with chronic kidney failure is rising steadily. Why is this?

Firstly, the number of unreported or unrecognized cases is no longer as high as it used to be. Medical advances have made kidney failure much easier to diagnose. Another reason is the aging population: The percentage of people suffering from kidney failure increases with age. In addition, in many parts of the world, more and more people are suffering from diseases that can lead to kidney failure, such as diabetes, obesity, and high blood pressure. A combination of all these factors is pushing up the number of patients with kidney disease as a public health condition. Fortunately, though, we are now in an ever better position to effectively help these patients with their care.

Through dialysis, for instance. How does dialysis work?

In dialysis, a machine connected to an "artificial kidney" cleanses the blood. In this process, the blood is transported out of the body, runs through the dialyzer, where it is cleansed, and is then returned safely to the body. The physical principles of diffusion and ultrafiltration play a key role in this.

Patients need a vascular access before they can receive treatment. Why is this access so important?

Because it isn't a one-time treatment. We have to be able to perform blood cleansing and purification every one to two days on a long-term basis, which is why choosing the best access to the blood stream is crucial. Safety and efficiency are our top priorities; so a stable vascular access that is placed in the arm must be regularly checked and well maintained.

What different types of access are there?

There are three types of vascular access: an AV fistula, an AV shunt, and a central venous catheter. The fistula is always the first and best choice. In a minor surgical procedure, a vein and an artery are joined together on the patient's wrist, arm or leg. This "bypass" causes the blood to flow particularly fast and profusely. A well maintained, clean, and patent fistula can be used for decades. We train our patients to take close care of this lifeline and check that the fistula is working properly on a regular basis.

Some patients' veins are not strong enough for this kind of vascular access. What happens then?

In this case, physicians usually revert to the arteriovenous (AV) shunt. This is a small plastic tube that is inserted between an artery and a vein. We use a material similar to material found in winter clothing: Goretex. This method is the second-best option. Artificial AV shunts are somewhat more susceptible to infection and get blocked more quickly than fistulas with natural blood vessels. The third option is a central venous catheter. In this case, a plastic tube is inserted in the neck under local anesthetic into the large blood vessels, and can be used for dialysis treatment afterwards. The advantage is immediate access to the bloodstream. The disadvantage is the far greater danger of infection and the risk of catheter blockage with lower rates of blood flow.

How does the physician decide which access method is best for the patient?

The physician and the patient jointly decide on the most suitable access method on a case-by-case basis. The most important criteria are the patient's general state of health and possible vascular disease. However, timing is also a factor: The catheter can be used on the same day, whereas the fistula usually takes four to six weeks to develop. In an emergency situation, that is too long.

For dialysis patients, choosing the right medications and dietary supplements is also crucial. What is an example of medications that patients with kidney disease need?

Many dialysis patients suffer from anemia. This is because healthy kidneys produce the hormone erythropoietin, which stimulates the formation of red blood cells. If the kidneys don't work properly, anemia leads to reduced transportation of oxygen to the organs. Consequently, patients feel fatigued, have trouble concentrating and can have substantially reduce levels of energy. For dialysis patients, it is therefore important to replace the hormone with medications to avoid becoming dependent on blood transfusions. The body also needs sufficient iron for the production of red blood cells. Blood transfusions can often be prevented through a combination of good medication, a balanced diet, and regular monitoring of blood cell and iron levels.

Fresenius Medical Care recently reorganized the medication of dialysis patients at its own clinics for the management of anemia. What have you improved?

Previously, we treated our patients in the U.S. with a short lasting erythropoietin medication, which was administered every time the patient underwent dialysis. The drug had been well received for many years. However, for some time now, we have been looking for a more efficient, longer-lasting formula. The new drug only has to be dispensed once every two weeks or every month instead of during each dialysis treatment. This makes things a lot easier for physicians, staff and patients while maintaining a smooth control of the blood cell production for patients.

Kidney failure often also leads to bone disease. What medications help to combat this?

A key vitamin in the calcium and bone make-up is vitamin D; this is normally activated by the healthy kidney. Generally, kidney failure patients can no longer activate enough vitamin D, which often results in an insufficient control of the bone and mineral chemicals within the body. To compensate for this deficiency, the body extracts calcium from the bones weakening them. To stop the bones from becoming diseased, we have to ensure that patients have enough active vitamin D, which is then administered orally or intravenously. Ensuring the right medication and diet takes time and, above all, lots of discussions between patients, dietititans, and nephrologists. We are constantly working to optimize the therapy and treatment outcomes and the efficient use of these therapies.

Treatment of kidney failure has a long history. Some things have certainly changed for the better compared to the early years – what were the most important milestones?

Kidney failure used to be a fatal disease in almost all cases, whereas today, we can treat lots of people with kidney failure successfully. Dialysis as a machine-based process goes back to the 1940s. Back then, the Dutch internist Willem Kolff noted that if two fluids are separated by a semipermeable membrane, the fluids will have the same chemical composition over time. Based on this knowledge, he built the first "artificial kidney" for blood purification. Another major step was the development of the Scribner shunt. Belding Scribner developed the first long-term use shunt, a vascular access device for dialysis treatment that takes his name, at the University of Washington in Seattle in 1960.

Some of the key innovations in dialysis over the last 50 years have come from Fresenius Medical Care …

That's right. Machines that can control and precisely determine the fluid status are among the most important innovations by Fresenius Medical Care. The use of bicarbonate as a buffer substance in the dialysate fluid was equally innovative. This has the advantage of reducing the side effects of treatment, such as lower blood pressure, nausea, or cramps. Other innovations have included the evolution of blood volume devices like the BVM and CritLine devices that help maintain safe leves of fluid removal during dialysis, devices to assist in forms of home dialysis, and the evolution of the hollow fiber dialyzer from the original flat plate dialysis with biocompatible dialysis membrane in these dialyzers.

You and your wife set up the "Nephrology Oral History Project". Tell us about this.

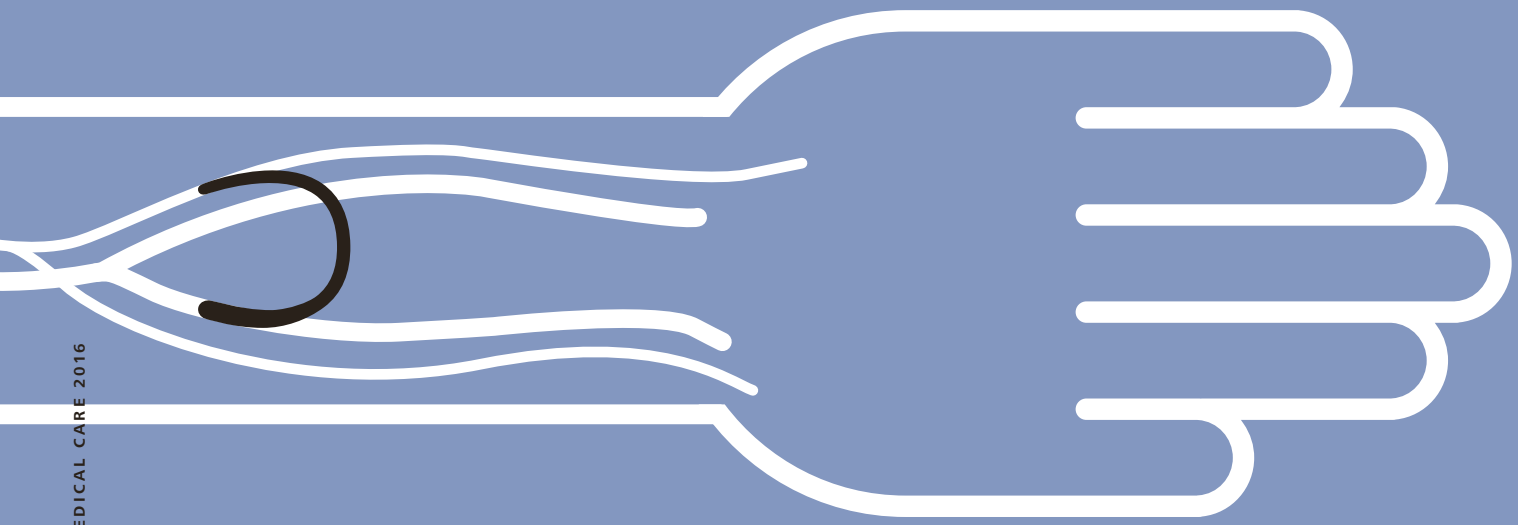
My wife is a nephrologist working on a variety of Kidney Diseaes Initiatives for Fresenius Medical Care. Many years ago, she started recording the voices of early pioneers of dialysis. Together, we collected interviews with physicians, nephrologists, patients, and nurses and put them on a website. We are particularly interested in what motivated them – and their courage was simply remarkable.

So much for the past. What will the future bring, in your opinion?

In the future, we aim to give our dialysis patients even better and more wide-ranging opportunities to live productive lives with their disease and to use our resources to improve their quality of life with kidney failure or chronic kidney disease. They spend so much time of their lives with their disease that we feel an organized system of care that recognizes each patients unique needs will provide a way to constantly improve the opportunity to meet their goals through coordinated therapies. Our aim is to provide them with the best treatment and to help them with practical aspects of their daily life.

Dr. Maddux, thank you for talking to us!

THE FISTULA IS A LIFELINE.



PATIENTS NEED A **VASCULAR ACCESS** FOR **HEMODIALYSIS.** BLOOD IS **REMOVED** FROM THE BODY AND **RETURNED** VIA THE **FISTULA.**

THE **FISTULA** **CONNECTS** THE PATIENT TO THE **ARTIFICIAL KIDNEY.**

IN CONJUNCTION WITH THE **PATIENT,** THE **PHYSICIAN DECIDES** WHICH **VASCULAR ACCESS METHOD** IS MOST SUITABLE.

TIMING AND POSSIBLE **PRE-EXISTING DISEASES** ARE **CRUCIAL.**

THESE ARE THE THREE METHODS:

1.

ARTERIOVENOUS (AV) FISTULA

This fistula is a connection between an artery and a vein.

\+

Low risk of infection, excellent blood flow, long-lasting if well maintained

–

Cannot be used until a few days or weeks after the procedure

2.

AV SHUNT

A small plastic tube, usually made of Goretex, connects a vein and an artery.

\+

Excellent blood flow

–

Not operational until a few days or weeks after the procedure

3.

CENTRAL VENOUS CATHETER

A plastic tube is inserted in azcentrally located vein in the neck.

\+

Can be used immediately after the operation

–

Higher risk of infection, susceptible to blockages

FROM OUR REGIONS

Fresenius Medical Care is proud of its employees' dedication to helping others and to assume social responsibility.

Braving the forces of nature

1 ECUADOR SOUTH AMERICA

Fresenius Medical Care employees responded quickly when a 7.8-magnitude earthquake struck Ecuador, with many working on longer shifts to ensure uninterrupted treatment for all our dialysis patients. The coastal province of Manabí was hit hardest. Fresenius Medical Care runs five dialysis clinics here in the cities of Portoviejo, Manta, Chone and Jipijapa, with more than 1,000 patients and over 300 employees. One clinic had to be closed, while employees at the others took care of cleaning up, making repairs and securing the water and power supply so that dialysis treatment could be provided as quickly as possible.

Employees take care of their communities

2 THAILAND ASIA

Fresenius Medical Care's employees in Thailand are committed to taking care of their communities in various social projects: As the northern part of Thailand can be affected by harsh temperatures, our employees gave blankets and knitted hats to the children and hill tribe people and donated medicine, candles and dried food to the monks who live there without electricity or water supply. Across the country, employees handcrafted small cushions shaped like elephants for patients who suffer from specific muscle-weakening diseases to train their hand muscles.

Dialysis patients go for gold

3 FINLAND EUROPE

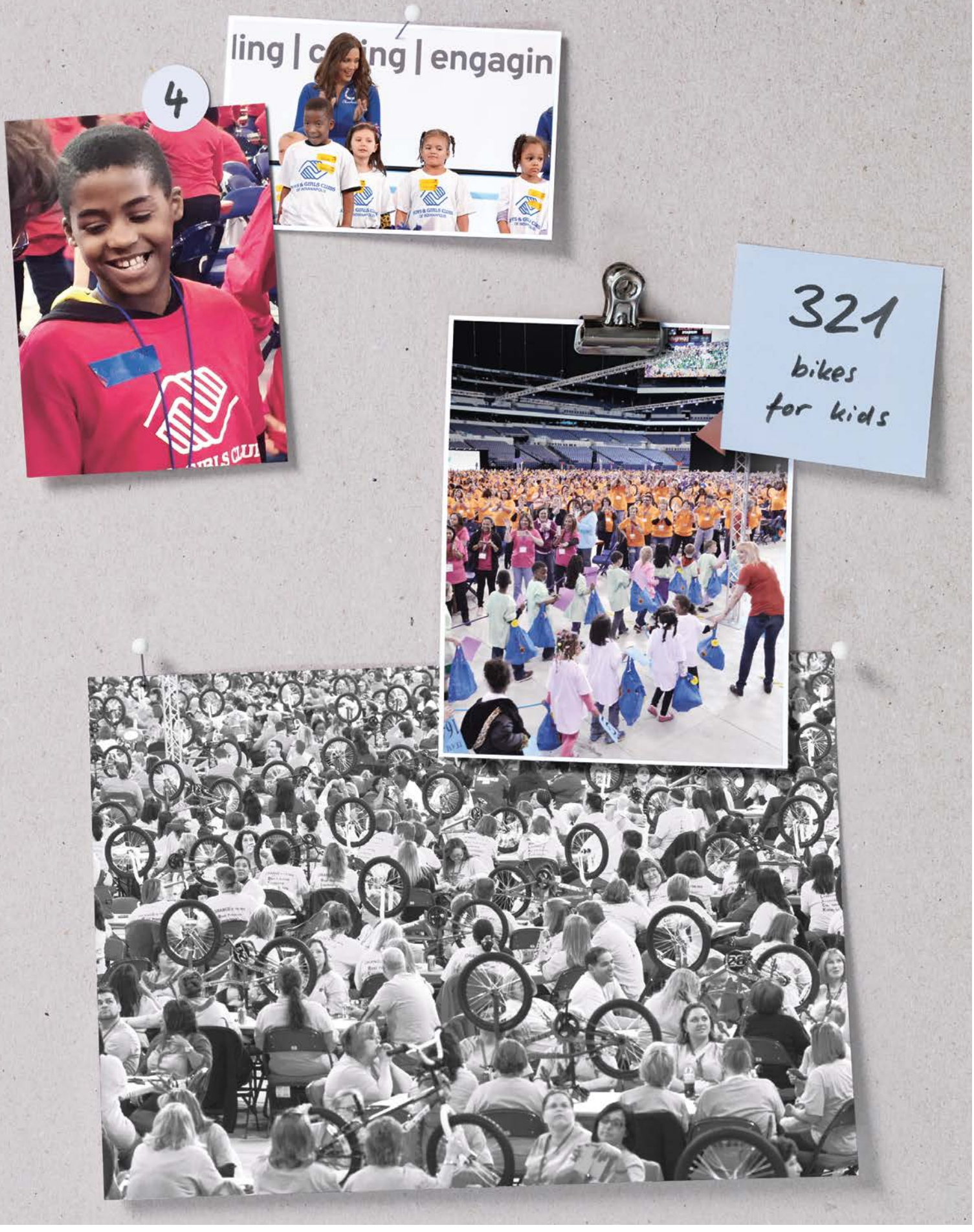
Athletes from all over Europe competed at the ninth European Transplant and Dialysis Sports Championship in Vantaa, Finland. At the 2016 games, three Hungarian athletes demonstrated their outstanding talent: Fanni Kisbakonyi won the mini marathon as the "best female athlete – dialysis", Tímea Persa came second in the table tennis doubles and third in singles, and Kinga Jakob took fourth place in the 3,000 m women's racewalk event. All three are patients at Fresenius Medical Care's dialysis clinics and were supported by the Hungarian Transplantation Association and our employees to ensure that they were able to continue their dialysis treatment during the championship.


ECUADOR
1
Securing the water and power supplies for 1,000 patients
ECUADOR 0° - 0' - 0" LAT.
THAILAND
2
Blankets and hats for children and monks
3
Three Hungarian dialysis patients demonstrate their sportive talent
FINLAND

Bikes for kids

4 U.S. NORTH AMERICA

The annual Clinical Managers Conference brought together Fresenius Medical Care North America employees from across the country to exchange their business experience. They were also given a special team challenge: Some 3,500 members of staff worked together to assemble 321 bicycles for children from the Boys & Girls Clubs of Indianapolis. The event, which took place at a stadium in Indianapolis, was a double surprise: The children did not know they were getting a bike that day until they walked onto the stadium field, and Fresenius Medical Care's employees had no idea that their team-building efforts would benefit local children until they started building the bikes. Providing children with resources to enable them to maintain a healthy, active lifestyle helps to reduce their risk of developing kidney disease and other chronic illnesses.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4
321
bikes
for kids

THANK YOU

We would like to thank our patients and partners for their confidence in us and our employees for their dedication and commitments.

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