

2012

C O N T I N U I T Y

Magazine



2

INTERVIEW WITH
RICE POWELL AND
DR. BEN J. LIPPS

10

CONTINUITY

22

TREAT YOUR
KIDNEYS RIGHT!

26

WHEN YOUR
KIDNEYS FAIL

30

DIALYSIS
AT HOME

38

FOOD & DIALYSIS

44

500,000TH
DIALYSIS MACHINE

52

GROWING
TOGETHER

56

FACTS
AND FIGURES

62

REVIEW 2012

2 0 1 2

C O N T I N U I T Y
Magazine

RICE POWELL DR. BEN J. LIPPS

IN AN INTERVIEW ABOUT THE
CEO TRANSITION AND
THE MEANING OF "CONTINUITY"
AT FRESENIUS MEDICAL CARE

On January 1, 2013, Rice Powell succeeded Dr. Ben J. Lipps as Chief Executive Officer (CEO) and Chairman of the Management Board of Fresenius Medical Care. Rice Powell previously served as Vice Chairman of the Management Board and Member of the Management Board responsible for the region North America. In an interview, they both describe their personal view of ongoing developments at Fresenius Medical Care as well as the challenges and opportunities arising from these, and why the Company is well positioned for long-term success in the future.

CON-
TINUITY

3

I
N
T
E
R
V
I
E
W



**HOW WOULD YOU ASSESS THE PERFORMANCE
OF FRESENIUS MEDICAL CARE IN FISCAL YEAR 2012?**

2012 was a very successful year for Fresenius Medical Care. We achieved record results yet again – for the 16th year in a row. We continued to expand our strategic growth initiatives, specifically our global clinic network. But more importantly, we are very proud of the continued progress we are making to promote the best possible patient care and the highest product quality, while growing the business profitably and in line with our values.

It has also been a rewarding year for North America. We successfully grew our core business and achieved our key quality goals. We made significant progress with the integration of the acquired Liberty Dialysis business and worked through the new u.s. reimbursement system for dialysis that was introduced in 2011. We also provided support for our dialysis patients and fellow employees who were affected by Hurricane Sandy. Nevertheless, we can never be complacent about what we have achieved in the past since we know that the overall environment will not get any easier. I think we are very well positioned to meet potential future challenges and opportunities on the product as well as on the therapy side of our business.

**DR. LIPPS, CAN YOU COMMENT ON
FRESENIUS MEDICAL CARE'S FINANCIAL PERFORMANCE
IN THE PAST YEARS IN MORE DETAIL?**

Since Fresenius Medical Care was founded back in 1996, we have been able to build our business organically as well as through acquisitions from about \$1 billion in revenues to very close to \$14 billion in 2012. At the same time, our net income has grown from less than \$100 million to \$1.2 billion. But more than that, we have treated countless patients in our clinics over the years. Today, we provide more than 38 million dialysis treatments a year to nearly 260,000 patients worldwide in our clinics; that's about six times as many as in 1996.

**DR. LIPPS, YOU HAVE MORE
THAN 40 YEARS OF EXPERIENCE IN THE DIALYSIS INDUSTRY.
DO YOU HAVE ANY PERSONAL HIGHLIGHTS?**

I remember most clearly when – after a number setbacks – we built the first artificial kidney and were

able to treat the first patients. You have to consider that up to the early 1970s, kidney failure was a death sentence. Soon, we were able to increase the life expectancy of patients with the help of dialysis and the artificial kidney by a month. One month became two, then years. And of course today, we have thousands of patients living on dialysis for decades. In the U.S., for example, we have been able to reduce the mortality rates in our clinics by 35% in the last ten years. So it has been a real pleasure for me to see all the efforts in the industry to improve the quality of life of patients. Today, products that are used for dialysis really differ in quality compared with those available when I started. I am proud to be part of the company that has spearheaded these advancements for patients.

5

MR. POWELL, YOU HAVE BEEN WITH THE COMPANY SINCE 1997, THE PAST EIGHT YEARS AS A MEMBER OF THE MANAGEMENT BOARD RESPONSIBLE FOR NORTH AMERICA. WHAT HAS STOOD OUT FROM YOUR PERSPECTIVE?

For me, it is the scope of our business and how it is grown. Throughout its history, Fresenius Medical Care has been the market leader in an industry that is expected to carry on growing steadily in the future. One key reason for this is our vertically integrated company structure. This means, for instance, that we can introduce and study new products, therapies and additional services in our Fresenius Medical Care clinics. Our own staff there are encouraged to look critically at new products and give us feedback immediately. On the one hand, this guarantees very high success rates for Fresenius Medical Care, while improving efficiency in delivering health care on the other.

DR. LIPPS, YOU HANDED OVER CHAIRMANSHIP TO RICE POWELL ON JANUARY 1, 2013. IS THERE ANY ADVICE YOU WOULD LIKE TO GIVE YOUR SUCCESSOR?

First of all, I have to say that I am really proud that Rice joined Fresenius Medical Care back in 1997. He has done an excellent job of running our business in North America. I think Rice and myself, we both share the same dedication to the quality of care that we provide to patients, and that has paid off over the years. So it was a real pleasure for me to pass over the baton to Rice at the beginning of 2013. I have total confidence in him and in the whole management

team. But we have been working together for over a decade. So there is no advice I can give him from a business perspective that he does not already know. Maybe one personal tip: I have realized over the years that the quietest time of the day in any office around the globe is 4:30 am in the morning.

**IS IT TRUE THAT YOU YOURSELF HIRED
MR. POWELL BACK IN 1997?**

Absolutely, I still remember the interview. We had some interesting discussions and, after a short time, we decided that it would work for both of us and the Company. I literally locked the door so that he couldn't get away, got a contract and Rice signed it before he left.

**MR. POWELL, WHERE DO YOU SEE THE BIGGEST PERSONAL
CHALLENGES IN YOUR NEW POSITION AS CEO?**

Obviously, running global operations means that a lot of responsibilities are being added to my daily schedule. We are a decentralized vertically integrated company with a global footprint and a very international



management team. I think that sounds like a challenge in itself. Creating trust is a major task – internally as well as externally – with any kind of CEO transition. I am very thankful to have such deep support from my colleague and predecessor Ben Lipps. And being in the office at 4:30 am certainly sounds like a challenge for me as a father with two daughters.

**AND FROM THE COMPANY'S PERSPECTIVE,
WHERE DO YOU SEE THE MAJOR
CHALLENGES IN THE YEARS AHEAD?**

Let me give you a couple of examples relating to our service and our product business. On the service side of our business, we are, of course, keeping an eye on how reimbursements develop globally. In the U.S. we have already successfully transitioned to the bundled reimbursement system. With our main focus on quality and our vertically integrated company structure, we have built a solid base to deal with any further developments in reimbursement schemes. On the product side, we are paranoid about product quality – you have to be in the health care industry. We regularly review our global production management systems and try to identify any irregularities in the production process that could cause harm to patients. Obviously no one can guarantee that there will be no issues, but I think our strength is that we do everything we can to eliminate any problem as soon as possible. Additionally, Fresenius Medical Care is in a strong position with a long-standing and proven management team that has extensive and unique experience in the global renal industry.

**DR. LIPPS, WHEN YOU LOOK BACK –
WHERE DO YOU SEE FRESENIUS MEDICAL CARE'S
KEY ACHIEVEMENTS?**

I feel blessed to have been part of this industry for 46 years, 13 years of which I served as the CEO of Fresenius Medical Care. The tremendous support and dedication of all our employees in providing the best care in our more than 3,000 dialysis clinics, along with the best dialysis products, has allowed our Company to be highly successful and become a unique global company. I am so proud of Fresenius Medical Care's many achievements over the past years. More than 1.5 million dialysis patients around the world depend

on our life-saving products. Every 0.8 seconds we provide a dialysis treatment somewhere on the globe, and over four million people rely on Fresenius Medical Care to some degree.

MR. POWELL, WHAT TARGETS HAVE YOU SET FOR THE YEARS TO COME?

As we have tried to show with the guiding theme of this year's report, we will be focusing on continuity. That also means we cannot stand still since our environment is not static. There are so many opportunities but also challenges to meet in the future and my goal is to make sure that we are in a position to deal with them as well as we have in the past, or even better. Of course, we give top priority to providing the best-quality products and services. You cannot be in the health care business without putting quality first. Lots of people count on us delivering on our promises: patients, employees, shareholders. So that will be a focus of mine, as it has been Ben's.

DR. LIPPS, WHAT HAS INFLUENCED YOU THE MOST DURING YOUR TIME AS CEO?

I derive my strength from the dedication of our employees. Some of them have been working with us for over two decades now and lots of strong relationships have evolved during that time. Also, as CEO of a company that is committed to taking care of patients, you have the opportunity to meet patients who have managed to survive on dialysis for many years. That is really satisfying to see. One example I remember very well was meeting a patient who had been on dialysis for more than 30 years. I handed over an award created for patients who are on dialysis that long. The patient's reaction and his feedback showed me that all the energy and time we invest as a management team and as a company is worthwhile.

MR. POWELL, WHAT ARE YOU ESPECIALLY LOOKING FORWARD TO AS CEO OF FRESENIUS MEDICAL CARE?

It is very impressive to see how Fresenius Medical Care has expanded and in particular to see how many employees have grown in their work and in their teams. I am really looking forward to promoting further growth – for Fresenius Medical Care and for our employees. I want to be a builder, not a renovator, and look forward to building or adding new businesses. Moreover, in the last 15 years and especially during my time as a Management Board member, I have had the opportunity to meet many people, mainly in North America. Now, I am really looking forward to meeting people from all the divisions worldwide and spending more time understanding the cultural differences in our businesses.



**MR. POWELL, DR. LIPPS,
THANK YOU FOR THE INTERVIEW.**

CON-
TINUITY

10

S
T
A
T
E
M
E
N
T
S

CONTINUITY



The treatment of chronic kidney disease is a medical success story that Fresenius Medical Care has contributed to substantially in the past few decades through new and improved treatment methods, innovative technologies, and a global network of dialysis centers. But new challenges are always around the corner. Continuously enhancing therapies, technical possibilities and the infrastructure remains a huge task.

Two long-serving employees and a clinician and scientist from Fresenius Medical Care, a nurse, and a dialysis patient share their personal experience and tell us what they see as the greatest advances in the past and the main goals for the future.

WHAT'S THE FIRST THING THAT COMES INTO YOUR HEAD WHEN YOU HEAR THE WORD "DIALYSIS"?

PROF. BERNARD CANAUD

*Nephrologist, Chairman of the EMEALA Medical Board,
Fresenius Medical Care*

"Dialysis" immediately implies to me the most successful life-sustaining therapy in the field of medicine. Today, more than 2.2 million patients owe their survival to well-established dialysis treatment modalities.

GUNTHER KLOTZ

*Executive Vice President Central Europe,
Fresenius Medical Care*

At Fresenius Medical Care, we have always made every effort to put the patient first. That's why the first thing that comes into my head is the large and ever-growing number of dialysis patients who need constant intensive medical care in order to survive. But it also makes me think about the 19 years I have spent working for the Company. In this time, we have launched numerous projects to improve the care of dialysis patients.

JÜRGEN F. MARTIN

*Nursing manager, Bensheim & Bürstadt Center
for Kidney and Hypertension Disorders*

Dialysis is an effective treatment for prolonging the lives of our patients. For younger patients, it can bridge the gap until they get a transplant, whereas for older patients, dialysis usually means treatment for the rest of their lives.

MARTINA HEUMANN

Dialysis patient

What first comes to my mind is being dependent on a machine. And then, of course, the restrictions on my lifestyle. It is a big change in life that requires a lot of support, also on a personal level. It is especially important to have your partner behind you.

WOLFGANG WEHMEYER

*Senior Vice President International Marketing & Medicine,
Fresenius Medical Care*

We can't cure with dialysis. All we can do is preserve life. That is a big difference compared to many other areas of medicine. Once patients lose their kidney function, it cannot be restored. Unless we dialyze, the patients will die within a few days. That is a pretty big psychological strain for patients. They generally regard time on a dialysis machine as lost time. The more strain dialysis puts on them, the more important the time between therapy sessions is. Quality of life moves into focus. We have to ask ourselves, what can we at Fresenius Medical Care do to help here?

**LOOKING BACK AT YOUR PERSONAL
EXPERIENCE WITH DIALYSIS,
WHAT HAS CHANGED THE MOST?**

12

WOLFGANG WEHMEYER

*Senior Vice President International Marketing & Medicine,
Fresenius Medical Care*

The most important change for me is that international quality standards have been introduced. As a result, the quality of dialysis has increased worldwide on a broad basis. In addition, innovative therapy methods such as hemodiafiltration (HDF) have been introduced that have been a key factor in reducing the strain of dialysis on patients.

PROF. BERNARD CANAUD

*Nephrologist, Chairman of the EMEALA Medical Board,
Fresenius Medical Care*

Dialysis has continuously evolved and is now standard in the field of renal replacement therapy. Looking back on my work in the 1960s, dialysis was largely experimental, but the treatment has progressed towards now being very much part of routine clinical practice. Dialysis has not only become more efficient but also significantly more reliable and much better tolerated due to decisive advances in technology. Importantly, the life expectancy of patients has also increased substantially. Furthermore, a major breakthrough around 20 years ago was the use of drugs to treat anemia, which afflicts many dialysis patients.

MARTINA HEUMANN

Dialysis patient

I first started dialysis in 1983. Back then, we were instructed on how to help set up and dismantle the machine, and afterwards we had to wash everything and clear away the bed. It was very strict and impersonal. There was no conversation at all. We were not allowed to go into the treatment room in street clothes, so I always had to get changed first. It was a very difficult time for me. I had major problems with my circulation. When I got home after treatment, I couldn't manage the stairs to the first floor without stopping. Things are different now. I feel less stressed, I've got more energy and suffer fewer side-effects. Also, everything is much friendlier these days. I can talk to the doctors, which matters a lot to me.

JÜRGEN F. MARTIN

*Nursing manager, Bensheim & Bürstadt Center
for Kidney and Hypertension Disorders*

I started working in the dialysis sector 22 years ago. I'm now experiencing the fourth generation of dialysis machines. There have been huge advances in their development over the years. The treatment methods have improved, such as automatic blood-pressure measurement and blood-volume measurement. The latest dialysis machines now automatically detect dangers and warn users, which was rarely the case before. This is a big improvement in the safety and effectiveness of dialysis treatment to the benefit of our patients, who can be treated more individually.

GUNTHER KLOTZ

*Executive Vice President Central Europe,
Fresenius Medical Care*

The most important thing is that the quality of treatment has improved. In hemodialysis, for example, open-pore high-flux membranes are now the standard. Their filtration characteristics are similar to those of a kidney. The membranes used are more biocompatible, especially those made of polysulfone. Fresenius Medical Care was one of the driving forces behind the use of these membranes. The major technical advances in the last two decades have led to the availability of peritoneal dialysis, an alternative, effective and safe renal replacement method that has significantly increased the range of dialysis treatment options. Our Company has steadily evolved, too. For example, there always have been – and still are – new challenges that make it exciting and interesting to work here. This is certainly one reason for the low staff turnover rate. For instance, there are still lots of employees here who I have known since I started working here 19 years ago.

GUNTHER KLOTZ
*Executive Vice President Central Europe,
Fresenius Medical Care*

CON-
TINUITY

13

S
T
A
T
E
M
E
N
T
S

*The Company's continuous development
is one reason for the low staff
turnover rate.*

*Executive Vice President Central Europe, responsible
for the operations of Fresenius Medical Care in
Germany, Austria, Switzerland, Belgium, Luxembourg,
and the Netherlands.*

JÜRGEN F. MARTIN
*Nursing manager, Bensheim & Bürstadt Center
for Kidney and Hypertension Disorders*

CON-
TINUITY

14

S
T
A
T
E
M
E
N
T
S



*Major technical innovations have been made
so that patients can be treated
more effectively and individually.*

*A nurse who has been working in dialysis for 22 years.
As nursing manager at the Bensheim & Bürstadt
Center for Kidney and Hypertension Disorders, he is now
responsible for the care of around 60 dialysis patients.*

**IF YOU HAD ONE WISH, IN WHAT SPECIFIC
AREA WOULD YOU LIKE TO SEE PROGRESS BEING MADE IN
THE TREATMENT OF KIDNEY DISEASE?**

GUNTHER KLOTZ

*Executive Vice President Central Europe,
Fresenius Medical Care*

The actual dialysis technology is very sophisticated nowadays. If I were a patient, I would wish for easy, safe, and pain-free vascular access. That still has not been solved yet. Usually, to obtain vascular access in patients, we have to use thick dialysis needles that enable a blood flow of up to 400 ml per minute. This is extremely unpleasant for patients. And it also puts a psychological strain on them, as problems with the access can be life-threatening.

MARTINA HEUMANN

Dialysis patient

Over the years, you learn to be content with what you have. After all, dialysis means living. I can grow old on it if I follow the rules. That makes it different to other severe illnesses. But sometimes, I do wish I could have a slightly better quality of life. For example, I would love to go swimming again. And of course, I hope that research continues making improvements for patients.

JÜRGEN F. MARTIN

*Nursing manager, Bensheim & Bürstadt Center
for Kidney and Hypertension Disorders*

Vascular access is a major topic for dialysis patients. We are treating increasingly older patients whose blood vessels are in poor condition. I would hope for progress to be made here. Everything else has already steadily improved.

WOLFGANG WEHMEYER

*Senior Vice President International Marketing & Medicine,
Fresenius Medical Care*

I would welcome every extra hour that patients get to themselves. We cannot reduce the actual dialysis time any further, but we can cut down the time before and after dialysis. To do this, we need to move the treatment closer to the patient. All aspects of renal replacement therapy have been created for a hospital environment. The technology is designed for use by specialist staff. Although there are dialysis machines with simplified operating functions, the entire system still needs to be easier for patients to use themselves. That is a technical challenge. It is a matter of incorporating dialysis staff's specialist knowledge into the development of the machine, also with regard to emergency situations.

PROF. BERNARD CANAUD

*Nephrologist, Chairman of the EMEALA Medical Board,
Fresenius Medical Care*

Ever since my early days of treating patients with end-stage renal failure, I realized that these patients had a clear need to thrive, and not just to survive. As a doctor, I dream of changing the fortunes of renal patients suffering from a devastating and life-long disease. Therefore my particular wish would be: firstly, to detect signs of kidney disease even earlier to prevent kidney deterioration; secondly, to develop new therapy approaches for combatting uremic toxicity; and finally, to enhance immunotolerance of kidney transplants and make advances towards finding a cure with methods such as regenerative medicine.

**DIALYSIS TREATMENT IS REGARDED
AS BEING TECHNICALLY MATURED AND RELIABLE.
EVEN SO, ARE THERE ANY AREAS IN WHICH
YOU EXPECT FURTHER PROGRESS TO BE MADE?**

16

WOLFGANG WEHMEYER

*Senior Vice President International Marketing & Medicine,
Fresenius Medical Care*

We are only at the beginning in terms of research and development. The kidney is our role model. So far, we have only invented individual components and tried to minimize their side-effects. However, a real artificial organ only works if there is a connection between these elements. The next major step would be to close this loop so that it works without any external assistance, as is the case with the kidney. That is still some way off, but we are making progress in all areas and are learning to bundle this knowledge. This is the future: How can we link all information to ultimately create an artificial organ? Information technology is a particularly important factor in this process, especially in terms of assessing individual patient data and linking it up with the reference data documented in the scientific field.

GUNTHER KLOTZ

*Executive Vice President Central Europe,
Fresenius Medical Care*

State-of-the-art, highly efficient and patient-friendly technology is still used all too rarely. Take hemodiafiltration, for example. Worldwide, there are still many suitable patients who are not being treated with this very effective method. Many people still have the impression that the necessary technology is expensive and cumbersome. This has not been the case for a long time.

We need to communicate this even more clearly.

PROF. BERNARD CANAUD

*Nephrologist, Chairman of the EMEALA Medical Board,
Fresenius Medical Care*

Currently, dialysis therapies cannot mimic the natural kidney. In future, innovative technologies will facilitate the implementation of applications including integrated monitoring and feedback systems particularly for the treatment of sicker and more fragile patients. Simultaneously, advances are required in drug and concomitant therapies.

JÜRGEN F. MARTIN

*Nursing manager, Bensheim & Bürstadt Center
for Kidney and Hypertension Disorders*

Our patients who are increasingly older and extremely ill are a major challenge for the nursing staff. These patients often suffer from many secondary diseases such as diabetes and all the associated complications. This has to be taken into account when fitting out a dialysis center. The requirements have been fulfilled extremely well at our new center in Bürstadt. The patients are aware of this and feel very much at ease.

WOLFGANG WEHMEYER
*Senior Vice President International Marketing & Medicine,
Fresenius Medical Care*

CON-
TINUITY

17

S
T
A
T
E
M
E
N
T
S

*I would welcome every extra hour
that patients get to themselves.*

*The manager has been involved in the field of dialysis
technology for 26 years. As Senior Vice President,
he has been responsible for International Marketing & Medicine
at Fresenius Medical Care for the past nine years.*

PROF. BERNARD CANAUD
*Nephrologist, Chairman of the EMEALA Medical Board,
Fresenius Medical Care*

CON-
TINUITY

18

S
T
A
T
E
M
E
N
T
S

*As a doctor I have a dream to
change the fortunes of renal patients.*

*Nephrologist and Chairman of the Medical Board of
Fresenius Medical Care for Europe, Middle East,
Africa and Latin America (EMEALA) since 2012 and
Professor of Nephrology at Montpellier University School
of Medicine since 1990.*

**WHERE DO YOU SEE THE BIGGEST
CHALLENGE IN THE TREATMENT OF KIDNEY DISEASE
IN THE NEXT FEW YEARS?**

GUNTHER KLOTZ

*Executive Vice President Central Europe,
Fresenius Medical Care*

One of the biggest challenges of our aging society is to ensure that the growing demand for healthcare services remains affordable overall. With greater public awareness, kidney disease could be detected at an earlier stage, thus delaying the use of renal replacement methods. At the same time, renal replacement therapy ought to be structured in such a way that all patients in the world in need can have access to suitable treatment.

WOLFGANG WEHMEYER

*Senior Vice President International Marketing & Medicine,
Fresenius Medical Care*

The biggest challenge are the patients who are not yet on dialysis. By no means all patients with end-stage renal disease around the world are being treated. Many people die because the right care is not available to them. The best quality is worthless if it doesn't reach the patients. The aim must be complete care for everyone worldwide. With our innovative strength, we should be able to provide this from an economic and organizational viewpoint.

MARTINA HEUMANN

Dialysis patient

I find that early detection of diabetes and precautionary monitoring of kidney levels are important. People should think about adopting a healthier lifestyle, as kidney failure is often also a lifestyle illness.

PROF. BERNARD CANAUD

*Nephrologist, Chairman of the EMEALA Medical Board,
Fresenius Medical Care*

The greatest challenges are of a social and economic nature. Social, because kidney disease is constantly increasing in an aging society. In fact, kidney failure is a widespread and exponentially growing disease that is putting a strain on healthcare systems – and not just in economic terms. Different approaches should be developed to ensure access to dialysis treatments despite this. These should include integrated services and nursing approaches as well as more effective self-treatment options.

JÜRGEN F. MARTIN

*Nursing manager, Bensheim & Bürstadt Center
for Kidney and Hypertension Disorders*

When treating a large number of elderly and very ill patients, we must ensure that the equipment and care they receive are appropriate. These days, employees need to be trained in aspects that were not an issue ten years ago because there were not so many very old, in some cases even demented, patients. Another point is that more and more patients come from hospitals with multi-resistant bacteria and have to be isolated. This must be taken into account when planning new centers, primarily in the form of special isolation areas. Conservation of resources is another challenge: Waste prevention is a big issue in dialysis. The latest generation of machines already uses less electricity and water. These are savings that don't impact the treatment quality, yet help to lower costs.

**WHERE DO YOU SEE DIALYSIS IN TEN
YEARS' TIME? AND WHAT WILL
BE FRESENIUS MEDICAL CARE'S ROLE?**

20

GUNTHER KLOTZ

*Executive Vice President Central Europe,
Fresenius Medical Care*

In dialysis, as in many areas of medicine, high treatment quality helps to avoid unnecessary costs. High-quality dialysis prevents complications during and after dialysis and leads to fewer concomitant diseases. Dialysis providers should not be paid solely for performing dialysis, but also for the outcomes. This is best done with flat-rate reimbursement, where dialysis providers have to pay all costs associated with dialysis. We must work harder to convey this message to health insurance companies.

PROF. BERNARD CANAUD

*Nephrologist, Chairman of the EMEALA Medical Board,
Fresenius Medical Care*

Dialysis in the next decade will see an ongoing increase in the age and sickness levels of patients treated. Patients for whom a transplant is not an option need high-quality technologies and particularly intensive care in conjunction with their therapy. By offering dialysis products and services from a single experienced source, guided by a holistic philosophy, we at Fresenius Medical Care can play a key part in covering the complete life-cycle of kidney failure patients.

JÜRGEN F. MARTIN

*Nursing manager, Bensheim & Bürstadt Center
for Kidney and Hypertension Disorders*

I hope that dialysis will become even more individual because the machines can gather and evaluate even more information on the patient. This would make it possible to identify the best treatment method and correct settings for every single patient and translate them into suggestions for individual treatment.

WOLFGANG WEHMEYER

*Senior Vice President International Marketing & Medicine,
Fresenius Medical Care*

In future, dialysis will increasingly come to the patient rather than the other way round. This does not mean that the therapy will necessarily move into the living room, but it will be carried out more locally, for example where elderly people live.

MARTINA HEUMANN

Dialysis patient

Perhaps it will be possible to reduce the dialysis time after all. For younger patients, there should be more services like peritoneal dialysis or overnight dialysis. However, patients also need to look into this themselves.

MARTINA HEUMANN
Dialysis patient

CON-
TINUITY

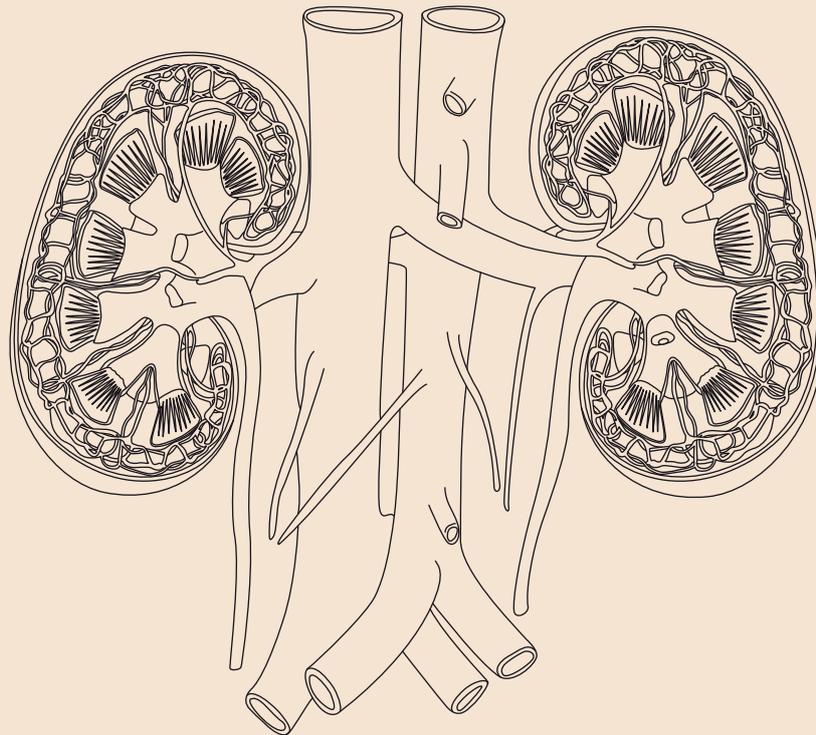
21

S
T
A
T
E
M
E
N
T
S

I feel less stressed now, I've got more energy and fewer side effects!

A patient who first went on dialysis in 1983. In 1996, she received a donor kidney, which she lived with for nine years. Since 2005, she has been undergoing dialysis again at the Bensheim & Bürstadt Center for Kidney and Hypertension Disorders.

TREAT YOUR KIDNEYS RIGHT!



THE VARIOUS FUNCTIONS OF THE KIDNEYS

Water balance

The kidneys regulate the body's fluid and mineral balance.

Formation of red blood cells

The kidneys produce the hormone erythropoietin, which stimulates the formation of red blood cells, and therefore regulates the oxygen levels in the blood.

Blood pressure regulation

Renin, an enzyme that is important for regulating blood pressure, is formed in the kidneys.

Acid-base balance

The kidneys maintain the acid-base balance – the pH level of the blood should fluctuate only to a very small extent.

Bone stability

The kidneys influence calcium levels and play a key part in the formation of vitamin D, which helps to ensure the structural stability of bones.

Removal of toxins

The kidneys excrete waste products (such as urea, uric acid and creatine), toxins and pharmaceutical residues.

**HEALTHY KIDNEYS
CLEAN THE BLOOD AROUND**

300 TIMES

EACH DAY.

**THIS MEANS THAT
ON AVERAGE**

1,500

**LITERS OF BLOOD PASS THROUGH
THE KIDNEYS EVERY DAY.**

SO TAKE CARE OF THEM BY:

→ **EATING A** HEALTHY DIET

→ MAINTAINING **A HEALTHY FLUID INTAKE**

→ **EXERCISING** REGULARLY

→ AVOIDING **OBESITY**

→ **KEEPING YOUR**
BLOOD PRESSURE **IN CHECK**

→ NOT SMOKING

TEST YOUR KNOWLEDGE

1. How many kidneys do people normally have?

- A 1
- B 2
- C 3
- D 4

2. What is a human kidney roughly equivalent to in size?

- A A pea
- B A golf ball
- C Your own fist
- D A football

3. Where are the kidneys situated in the human body?

- A Under the lower ribs on both sides of the spinal column
- B One each on the left and right side of the heart
- C Behind the lungs
- D Below the liver

4. How many liters of blood do the kidneys filter each day?

- A 3 liters
- B 100 liters
- C 1,500 liters
- D 3,000 liters

5. What functions do the kidneys perform?

- A Regulation of fluid and salt levels and the acid-base balance
- B Excretion of waste products
- C Regulation of blood pressure
- D All of the above

6. Approximately how many liters of urine do healthy kidneys produce each day?

- A 0.2 liters
- B 1.5 liters
- C 5 liters
- D 15 liters

7. What are the most common causes of chronic kidney disease?

- A Diabetes and high blood pressure
- B Kidney stones
- C Pneumonia
- D Depression

8. What are the treatment options for chronic kidney failure?

- A Hemodialysis
- B Peritoneal dialysis
- C Kidney transplantation
- D All of the above

9. How many people worldwide regularly undergo dialysis treatment?

- A 50,000
- B 850,000
- C 2.3 million
- D 10.6 million

10. What risks should be avoided to preserve the kidneys' function?

- A High blood pressure
- B Smoking
- C Obesity
- D All of the above

11. How can you protect your kidneys?

- A Eat a healthy diet and exercise regularly
- B Sleep for no more than 5 hours
- C Drink only a little
- D All of the above

12. How many dialysis patients are there likely to be worldwide in 2020?

- A Fewer than 500,000
- B 1 million
- C 1.9 million
- D More than 3.8 million

1. B
2. C
3. A
4. C
5. D
6. B
7. A
8. D
9. C
10. D
11. A
12. D

WHEN YOUR

KIDNEYS

**FAIL EITHER COMPLETELY
OR ALMOST COMPLETELY, RENAL
REPLACEMENT**

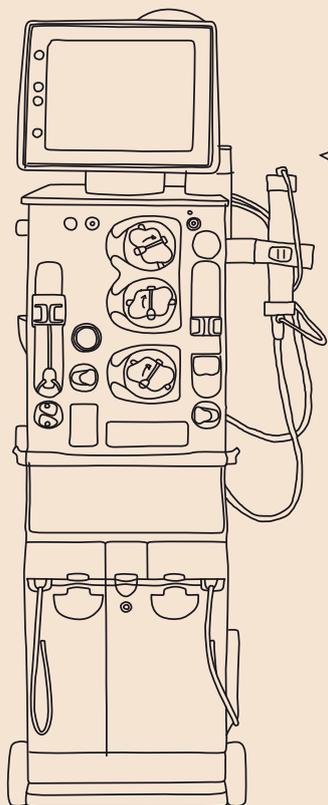
THERAPY

**CAN TAKE OVER
THE VITAL**

FUNCTIONS.

THREE OPTIONS

FOR TREATING CHRONIC KIDNEY FAILURE

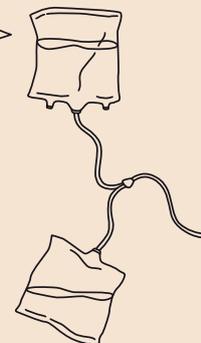


HEMODIALYSIS (HD)

During HD, the patient's blood flows outside the body through disposable bloodlines into a special filter, the dialyzer, also called artificial kidney. In the dialyzer, a special solution absorbs the waste products and excess water filtered out of the blood and transports them out of the body via a separate cycle. The cleaned blood is then returned to the patient. The process is controlled by the hemodialysis machine that pumps blood, adds anticoagulants, regulates the purification process, and controls the mixing of the dialysis solution and its flow rate through the system.

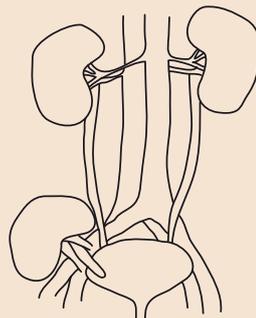
PERITONEAL DIALYSIS (PD)

PD is performed in the patient's body by flushing sterile dialysate through the abdominal cavity. In this case, the peritoneum acts as a dialysis membrane. PD is usually carried out by patients themselves in their home or workplace several times a day or during the night.



TRANSPLANTATION

During a kidney transplantation, a healthy kidney from a donor is transferred to the kidney patient.



DIALYSIS

ASSUMES THE KEY FUNCTIONS

OF THE KIDNEY,

BUT CANNOT COMPLETELY REPLACE

ALL OF THEM

THEREFORE, PATIENTS WITH CHRONIC

KIDNEY DISEASE

MUST

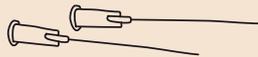
ALSO TAKE

A LOT OF MEDICATION.

EXAMPLE OF THE MEDICATION A DIALYSIS PATIENT REQUIRES EVERY DAY TO REGULATE UNDESIRABLE SIDE EFFECTS:



BLOODCOAGULATION



RENAL ANEMIA



CARDIAC INSUFFICIENCY



CARDIAC ARRHYTHMIA



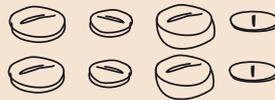
ELEVATED BLOOD FATS



RENAL OSTEOPATHY
*Mineral
metabolims disorders*



RENAL ACIDOSIS
*Disorders of
the acid-base balance*



HYPERTENSION



DIABETES MELLITUS



CARNITINE DEFICIENCY
*Impairment
of the lipometabolism*



VITAMIN DEFICIENCY



PAIN RELIEF



GOUT



INSOMNIA



OVERHYDRATION
*Disorders of the water and
electrolyte balance*



GASTRO-INTESTINAL
DISORDERS



HYPERKALEMIA
*Increased blood concentration
of potassium*

DIALYSIS AT HOME



PAULA LOURENÇO

*Thanks to home hemodialysis, she
can manage even long working days
without any problem.*

MODERN THERAPIES OFFER PATIENTS MANY OPPORTUNITIES TO CARRY ON THEIR DAILY LIFE AS USUAL, DESPITE BEING DIAGNOSED WITH CHRONIC KIDNEY DISEASE. AN ALTERNATIVE TO A CLINIC BASED DIALYSIS TREATMENT IS BEING TREATED IN A FAMILIAR ENVIRONMENT AT HOME. DIFFERENT TYPES OF HOME DIALYSIS ALLOW PATIENTS TO ADAPT THEIR TREATMENT TO THEIR EVERYDAY ROUTINE. HOWEVER, EVERY TYPE OF TREATMENT HAS ITS OWN CHALLENGES.

THREE PORTRAITS OF HOME DIALYSIS PATIENTS IN PORTUGAL SHOW HOW IT IS POSSIBLE TO LEAD AN ACTIVE AND INDEPENDENT LIFE COMBINING WORK, FAMILY AND LEISURE TIME DESPITE BEING DIAGNOSED WITH KIDNEY DISEASE, THANKS TO HOME HEMODIALYSIS AND PERITONEAL DIALYSIS.



PEDRO MONTEIRO
With peritoneal dialysis, he is still fit for sport and work.



LIBERTA BRANDÃO
Thanks to automated peritoneal dialysis, the pensioner still has enough time for her grandchildren.



FREEDOM FOR WORK AND LEISURE

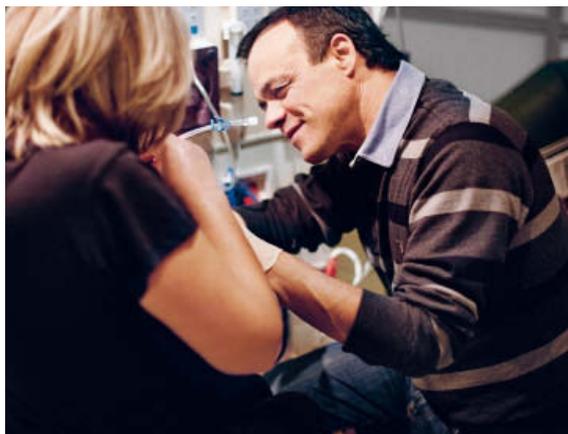
DIALYSIS
AT HOME

32

R
E
P
O
R
T



Paula Lourenço's partner João Glória helps her with home hemodialysis.



Sometimes, when Paula Lourenço strolls along the seaside with her partner, her thoughts drift to the distant shores of Africa. She pictures lions, wildebeests and giraffes running free through the open savannah. Her biggest dream is to go on safari in Kenya. But at the moment that is out of the question, because the 42-year-old has been back on dialysis for the past three years. Under such circumstances, Africa is simply too far away.

Yet Paula Lourenço has managed to create an exceptional degree of freedom for herself. For example, she continues to work full-time as an assistant at the IST School of Engineering in Lisbon despite dialysis. Her job involves placing orders with suppliers and overseeing contracts. It carries a lot of responsibility, and after 18 years her knowledge is hard to replace. That also means that her working days can be long.

But Paula Lourenço is also flexible in her spare time and makes sure that she has time for things she enjoys doing, such as cooking, jigsaw puzzles or swimming. On the weekends, she even drives all the way out to the Alentejo region with her partner, where she owns a farm and tends the garden. And soon she would like to spend time learning the difficult art of Arraiolos rug-making, a tradition brought over by the Moors, which is highly valued in Portugal.

Paula Lourenço can only do these things because she has opted for home hemodialysis. She does not have to go to a clinic during the day at fixed times three times a week, but can incorporate the dialysis treatment more flexibly into her daily life. "Instead of watching television in the living room in the evenings, I just do it in my dialysis room,"



she says. Since her four-month training program on home hemodialysis, Paula Lourenço has already completed around 500 home dialysis sessions. Her partner assists her in this. "Without him, I wouldn't be able to do dialysis treatment at home," she concedes. Fortunately, they have enough space to set up a dedicated sterile room that is large enough for the dialysis machine.

"You have to be very responsible and sensible to do this type of treatment," admits Paula Lourenço. But the solution is ideally suited to her private and professional life. It's easy for her to muster the necessary discipline for her diet, weight and fluid control because she has done it all her life. She was diagnosed with kidney disease when she was just seven years old. From the age of twelve, she underwent various forms of dialysis until receiving a donor kidney when she was 18. She was able to live with it for 21 years. Now she is back on the transplant list. If you ask Paula Lourenço what she dreams of, she doesn't have to think twice: "A safari in Africa would be great."

**"YOU HAVE TO BE
VERY RESPONSIBLE AND
SENSIBLE TO DO THIS
KIND OF TREATMENT."**

PAULA LOURENÇO



THE TREATMENT TAKES UP 90 MINUTES OF HIS DAY

34

It was a shock, even though Pedro Monteiro had known for a long time that the day would eventually come: In February 2011, his kidney function deteriorated to the extent that he could no longer live without dialysis treatment. For the active 42-year-old, this was a frightening concept. Would he be able to carry on with his previous life? Going out with friends, traveling, sport?

Meanwhile, the engineer's trade union employee from Porto leads a life that does not differ significantly from before undergoing dialysis. He still goes to work every day, and regularly works out at the gym or jogs along the banks of the Douro river in his spare time.

Pedro Monteiro is a peritoneal dialysis patient. With this form of dialysis, the peritoneum is used to rid the blood of toxins and remove water from the body. The peritoneum is a natural filter membrane. When a dialysis solution remains in the abdominal cavity for several hours, it collects urea, creatine, and other metabolic products that would otherwise be excreted by the kidney. Pedro Monteiro still has a slight residual renal function. "Fortunately," he says, "otherwise peritoneal dialysis would not be a treatment option for me."

Three times a day, Pedro Monteiro has to drain the old fluid and introduce new dialysis fluid via a catheter in his abdomen. He begins the first of these 30-minute treatments before breakfast. Then he gets his son, who is now six years old, ready for school. "In total, dialysis only takes up 90 minutes of my day," reports Pedro Monteiro. That can

be incorporated into his daily routine without any problem. "And I can still lead an independent life, which is very important to me," he adds.

The biggest danger with peritoneal dialysis is the risk of infection. Although new bag systems and improved solutions have significantly reduced the number of complications, the catheter remains a potential gateway for bacteria. "Therefore, patients first have to learn how to carry out the treatment correctly and carefully," says Susana Rios who supports dialysis patients for Fresenius Medical Care in Porto. Pedro Monteiro was also trained by her. "But for an independent person like him, that wasn't a problem," she praises him.

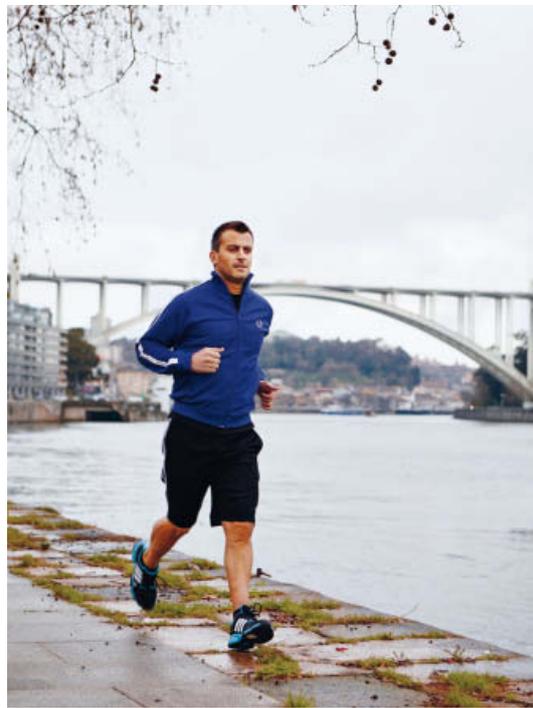
One of the few real disadvantages of peritoneal dialysis for Pedro Monteiro is that he can no longer play in the pool with his son. He is not allowed to go swimming any more because of the catheter. On the other hand, he is much more mobile than he would be with other treatment options. At the end of 2013, he wants to fly to Rio de Janeiro with his wife and son to celebrate his wife's 40th birthday. Thanks to peritoneal dialysis, that wish can come true.



Three times a day, Pedro Monteiro has to connect the bags for the dialysis solution to his abdominal catheter.



The engineer's trade union employee lives with his son and his wife in Porto.



**"I CHOSE PERITONEAL
DIALYSIS BECAUSE I WANT TO BE
FREE AND INDEPENDENT."**

PEDRO MONTEIRO

Home dialysis patient Pedro Monteiro together with his nurse Susana Rios (left) and Susana Gomes, Communication Department from Fresenius Medical Care Portugal.



DIALYSIS TREATMENT WHILE YOU SLEEP

DIALYSIS
AT HOME

36

R
E
P
O
R
T



**"I CAN CONTINUE
TO SUPPORT MY FAMILY
AND COOK FOR
MY GRANDCHILDREN."**

LIBERTA BRANDÃO



*The cyclor for automated peritoneal dialysis is monitored
by Liberta Brandão's husband Henrique.*





Liberta Brandão is happiest when surrounded by her family.

Long before Liberta Brandão needed renal replacement therapy, she already associated the word dialysis with dread and a particular burden. Her sister had been a dialysis patient for a long time, before receiving a kidney transplant. "After treatment in the clinic, she felt unwell and was always frustrated at the time," recalls the 74-year-old. When Liberta Brandão found out six years ago that she, too, was in need of such treatment, she was devastated. When presented with her options, she chose peritoneal dialysis – partly to avoid having to go to a clinic for treatment.



"I am always busy, always doing something," Liberta Brandão describes herself. She mostly enjoys looking after her family. At the weekend, she often has both her sons with their wives and children over to visit. Then she cooks for everyone and indulges her three grandchildren in particular. "The only thing I want out of life is to stay healthy enough so that I can keep looking after my family," she says, because without having them around her, she would feel lonely.

But Liberta Brandão is not quite so alone, because she has the support of her husband, to whom she has been

married for 47 years. Even though he himself is ill and has been through chemotherapy, he helps her as best he can. Above all, he is her right-hand man for dialysis.

After being treated for a year with manual peritoneal dialysis, Liberta Brandão changed to automated peritoneal dialysis. With this form of treatment, a special machine called a cyclor changes the dialysis solution. It means that patients no longer need to deal with different bags. In addition to lowering the risk of infection, automated peritoneal dialysis has an extremely practical advantage: Patients can undergo treatment during the night while they sleep.

Although Liberta Brandão has to dialyze twice during the day in addition to this nighttime session, it is still a distinct advantage compared to manual peritoneal dialysis, which she had to carry out every four hours. "I was only able to choose this type of dialysis because my husband is always by my side," she concedes. He has found out all about the technology, learned how to operate the cyclor, and now monitors it.

For Liberta Brandão, the longer breaks between treatments are important. They give her the freedom she needs to do her household chores and pursue her hobbies. "Today, I can do everything I used to do before, just a little slower," she says, summing up her life with dialysis.

The taste of
Mexico, India,
Italy ...

**TASTY
DISHES**

*Good
food for a
higher
quality of
life*

**Full
of
flavor**



*Anybody
can
cook!*

Food & Dialysis

Aaron McCargo, Jr. is bringing his trademark, the "Flavor of Bold", into dialysis patients' kitchens. The winner of the TV casting show "The Next Food Network Star" in 2008 has his own TV show called "Big Daddy's House". He has been developing recipes for and cooking with dialysis patients ever since he joined Fresenius Medical Care's Healthy Lifestyles initiative in North America in January, 2011. Aaron started his career early on working in hospital kitchens, where he learned that "eating is an essential part of patients' lifestyles and helps them in their fight for their lives". He also knows a major problem faced by people on dialysis: Because they have to follow a strict diet, many lose their appetite. Aaron's mission is to create dialysis-friendly recipes that are so easy, affordable and mouthwatering that patients and their families just have to try them.

Chef McCargo's "Not Too Spicy for Your Mama" Chipotle Wings

INGREDIENTS FOR 4 SERVINGS

1 pound fresh jumbo chicken wings cut in pieces,
1½ tablespoons diced chipotle peppers in adobo sauce,
¼ cup honey,
¼ cup unsalted butter (slightly melted),
1 teaspoon black pepper,
1 tablespoon chopped chives

39



METHOD

Pre-heat oven to 400°F. Place pre-cut wings on a greased non-stick sheet tray. Bake for 18–20 minutes, turning half-way through the cooking time, or until crisp on the outside and reaching an internal temperature of 160°F. In a large bowl, mix remaining ingredients and stir until well mixed. Toss wings in sauce until evenly coated, then remove from bowl and serve.



Chef McCargo's "New You" Jumbo Shrimp Scampi

40

INGREDIENTS FOR 4 SERVINGS

1 pound (16/20) peeled shrimp,
2 tablespoons chopped fresh garlic,
1 teaspoon crushed red pepper flakes,
½ teaspoon black pepper,
¼ cup fresh-squeezed lemon juice,
2 tablespoons white wine (or 2 tbsp low-sodium chicken stock),
2 tablespoons unsalted cold butter (cubed small),
1 tablespoon chopped parsley,
¼ cup flour,
¼ cup canola oil



NUTRIENTS PER SERVING

24 grams protein
259 mg potassium
249 mg phosphorus
172 mg sodium
328 calories

METHOD

Heat half of the canola oil in large nonstick sauté pan on medium high heat. In a large bowl, mix flour, black pepper, and red pepper flakes. Toss shrimp in flour mixture and coat evenly. Sauté shrimp for approximately 3 – 5 minutes on each side in batches (use leftover oil as needed). Remove from pan and place on a plate or sheet tray to rest. Add to the same pan the garlic, wine, and lemon juice; stir and cook until hot. Turn off heat, stir in cold butter in small amounts until incorporated. Add shrimp back to pan with any drippings along with parsley and toss or stir until coated.

Chef McCargo's Jalapeño Turkey Burger *"Jalapeño and Lime meets Smoked Mozzarella"*

FOOD
&
DIALYSIS

41

R
E
C
I
P
E
S

INGREDIENTS FOR 6 SERVINGS

1½ pound ground turkey,
1 jalapeño or 2 tablespoons finely diced jalapeño,
Juice of 2 limes and zest of 1,
1 tablespoon black pepper,
1 tablespoon reduced-sodium Worcestershire sauce,
4 tablespoons extra virgin olive oil,
¾ cup shredded smoked mozzarella cheese,
6 hamburger buns



NUTRIENTS PER SERVING

28 grams protein
382 mg potassium
286 mg phosphorus
344 mg sodium
421 calories

METHOD

Pre-heat oven. In a medium size bowl, mix the first 5 ingredients plus 2 tbsp. of olive oil. Make equal size burger patties and lightly brush with remainder 2 tbsp. of oil. Cook for 5–7 minutes, flipping once, or waiting until an internal temperature of 165°F is reached. Top each with an equal amount of cheese and melt in a toaster oven or in oven on broil. Serve on a toasted bun.



Dos and Don'ts

Good nutrition is a challenge for many of us. Eating well on dialysis is even more difficult. There is no general recommended diet for kidney patients, ingredients and meal planning have to meet individual needs. However, most patients also have to take care with the following:

PROTEIN

The body needs protein for various vital processes such as building muscles, repairing tissues and producing hormones and enzymes. As protein gets lost during dialysis, patients need more protein than people with healthy kidneys. They should therefore choose foods that are rich in high-quality protein such as beef, pork, poultry, lamb, eggs, fish, soy, and dairy products.

**EAT
ENOUGH
PROTEIN**

PHOSPHORUS AND CALCIUM

Phosphorus and calcium are vital for healthy bones, but are often unbalanced in dialysis patients. Therefore patients take phosphate binders whenever necessary to strengthen their bones and consume foods or drinks that are rich in phosphorus, such as roast beef, plain yogurt, cola drinks, nuts, and cheddar cheese, only in moderation.

Limit
phosphorus
and
potassium

**FRUITS AND
VEGETABLES
CAN BE
DANGEROUS**

POTASSIUM

To function perfectly, the nerves and muscles need potassium, a mineral found in many fruits and vegetables. But while there are no limits to the amount of potassium a healthy person can consume, dialysis patients have to make sure they don't eat too much as it can have an adverse effect on their hearts. Patients should therefore omit or limit foods that are rich in potassium such as tomatoes, bananas, white beans, potatoes and avocados.

SODIUM

Sodium is a mineral that plays a key role in controlling blood pressure and water balance within the body. Healthy kidneys rid the body of excess sodium, but in dialysis patients, sodium and fluid can build up, resulting in high blood pressure, cardiac arrests or strokes. To avoid complications, dialysis patients should be aware of hidden salt, e. g. in camembert cheese, ready-made sauces, canned soup, smoked salmon, salami, and frozen pizza.

**No
added
salt**

FLUID INTAKE

Since dialysis cannot remove fluids from the body as effectively as healthy kidneys do, most patients have to limit their fluid intake. Fortunately, there are some tricks that can help: avoiding food that is too salty or too sweet, for example, sucking on a grape or ice cube whenever thirsty, rinsing your mouth with cold water, or chewing sugar-free chewing gum.

**Less
liquid**

**No
tomatoes,
no
beans**



A PASSION FOR FOOD

Aaron's eyes light up at the sight of a chunk of chicken turning golden brown. The sizzling of the panada is music to his ears, and he loves to inhale the scent of fresh herbs. "I often wake up in the middle of the night with some recipe in my head, so I get up and write down all the ingredients," he explains. Cooking and enjoying good food mean the world to him. "Many dialysis patients tell me they used to feel the same," Aaron says. But because they are obliged to avoid some ingredients and to limit others, to use little or no salt and to reduce their fluid intake, they are discouraged from cooking and enjoying meals.

FORBIDDEN FRUITS

Aaron consulted Fresenius Medical Care's dietitians and found out which foods patients can eat, and which are a no-go. "I was shocked when I found out that people on dialysis can't eat bananas, broccoli, oranges, tomatoes, nuts or beans," the celebrity chef admits. "Things that are generally considered healthy." Unlike healthy kidneys, dialysis does not filter patients' blood around the clock. Nutrients like phosphorus, which together with calcium keeps the bones strong, and potassium, which enables nerves to communicate with muscles, can accumulate within patients' bodies, resulting in complications such as strokes or heart attacks. To make things even more confusing, foods that are high in phosphorus are often also high in protein. And dialysis patients need about a third more protein than people with healthy kidneys, as they lose some of this vital nutrient during treatment. One of the worst foods for dialysis patients is star fruit (carambola): It contains neurotoxins that are harmless for healthy people, but life-threatening if your kidneys have failed.

CREATIVE COOKING

When he creates his dialysis-friendly recipes, Aaron McCargo, Jr. leaves out these dangerous ingredients, replacing salt with fresh herbs, lemon zest or pepper, for example. People on dialysis should not ingest more sodium per day than contained in one teaspoon of salt, whereas healthy people usually consume the equivalent of 2.5 teaspoons or more. And while the recommended fluid intake for people with functioning kidneys is about two liters a day, many dialysis patients are advised not to drink more than a quarter the amount. This is because excess fluid is not removed during dialysis and fluid retention can lead to edemas, high blood pressure and other complications. Knowing this, Aaron's dishes include as little fluid as possible. Whenever a patient tells Aaron what he misses most, the chef feels challenged to create an alternative, "with a distinctive flavor, but following the rules". Since treatment eats up enough of patients' time, Aaron makes sure that his meals don't take long to prepare – some can be pre-made and frozen. Aaron is happy whenever "a patient gets back in the kitchen because of one of my recipes and when it puts a smile on their faces. This makes me want to work even harder." No wonder he dreams of dialysis-friendly meals at night.

Find dialysis-friendly
ingredients and meals,
information on nutrients, recipes,
and advice on life with dialysis
on our Fresenius Medical Care
website at

www.ultracare-dialysis.com

500,000TH
DIALYSIS
MACHINE

44

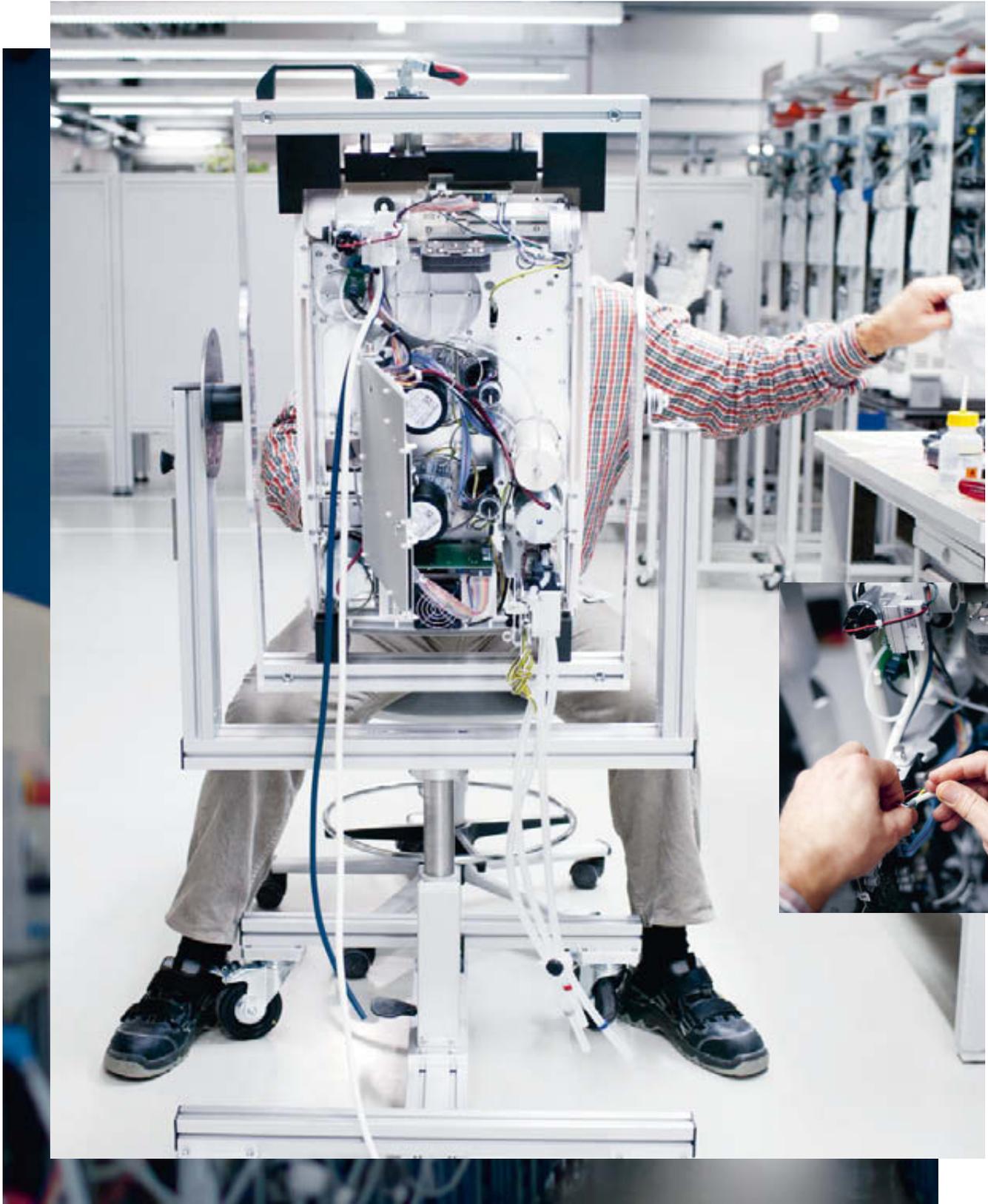
R
E
P
O
R
T

500,000th

DIALYSIS MACHINE

IN 2012, THE 500,000TH DIALYSIS MACHINE ROLLED OFF THE PRODUCTION LINE AT FRESENIUS MEDICAL CARE'S FACTORY IN SCHWEINFURT. WHAT WAS ONCE A VISION IS NOW A SUCCESSFUL SERIES-PRODUCED MODEL. TODAY, MORE THAN HALF OF ALL DIALYSIS MACHINES USED WORLDWIDE ARE MADE BY FRESENIUS MEDICAL CARE. THE COMPANY IS CONSTANTLY WORKING ON IMPROVING THE QUALITY OF DIALYSIS WHILE MAKING TREATMENT MORE AFFORDABLE FOR THE GROWING NUMBER OF PATIENTS WORLDWIDE.

Complex inner workings: A dialysis machine has up to 1.4 million different configuration possibilities depending on how the machine is equipped. The technology can already be adapted to the customers' requirements before distribution.



The history of the modern dialysis machine started in the 1970s with a question: How to turn a highly specialized treatment, available to only a few people at the time, into a series-produced lifesaver? The question became a vision. And the vision became a success story that today has 8,000 parts. That's how many components are inside a modern Fresenius Medical Care dialysis machine.

The very first model became the world's leading and best-selling dialysis machine of its time. Since then, the Company has expanded its lead with its follow-up models: In recent years, Fresenius Medical Care has sold around five times more dialysis machines worldwide than its nearest competitor. In November 2012, the 500,000th dialysis machine rolled off the production line.

From the very beginning, the prime objective in developing dialysis machines was to make therapy safe, gentle and affordable for as many patients as possible. When Fresenius Medical Care started serial production of the first devices in 1979, the treatment was available to fewer than 10,000 patients worldwide. New dialysis machines have made dialysis even more effective and can be manufactured in larger quantities. More than two million people in the world now undergo dialysis treatment; approximately one in two are treated with a product developed and produced by Fresenius Medical Care.

KEY FUNCTIONS OF THE DIALYSIS MACHINE

The dialysis machine pumps the blood from the patient's body through a bloodline system to the dialyzer, also called the artificial kidney. In the course of a treatment session lasting some four to five hours, up to 120 liters of blood are pumped through the tubes – that's several times a patient's total blood volume. In the dialyzer, a dialysis fluid absorbs the toxins and excess water filtered out of the blood and removes them via a separate cycle. At the same time, the machine dispenses and administers drugs to prevent blood coagulation and collects data during treatment, from blood pressure to the temperature of the dialysate. It can modify the treatment process automatically and adapt it individually to the patient's needs as required. The machine's safety features have also been continuously enhanced and automated: The machine now recognizes changes in the patient's bodily functions during dialysis. The same applies to technical problems: If a tube leaks or if the hydraulics no longer function smoothly in a particular area, the fault is immediately displayed on the monitor and treatment is automatically interrupted.

Thanks to their touchscreen monitor and digital data management, modern dialysis machines are easy to operate. State-of-the-art software controls the fine-tuning of all components, including a total of 180 hydraulic parts. Fresenius Medical Care dialysis machines are now used in more than 120 countries and are pre-programmed in up to 30 operating languages.

FULLY AUTOMATED TO THE LEADING MANUFACTURER OF DIALYSIS MACHINES

Fresenius Medical Care's production sites have also progressed steadily. Whereas the Schweinfurt factory produced precisely 36 machines in 1979, it now makes several tens of thousands. This is thanks to a large number of fully automated production steps, for example in the manufacture of highly sensitive solenoid valves, a key component of the hydraulic circuit. Fresenius Medical Care now not only produces dialysis machines in Schweinfurt, but also specifically for the North American market at its sister factory in Walnut Creek, California.

DIALYSIS MACHINES OF THE FUTURE: COMPACT AND MOBILE

The overriding objective is still to make sure that one day, every person who needs dialysis treatment will get it. There are already signs that treatment is becoming more compact and mobile. Fresenius Medical Care is working on completely new solutions. The PAK – short for "Portable Artificial Kidney" – could be available soon. This machine, the size of a shopping basket, will redefine the possibilities of dialysis: Patients can transport it in their own car whenever they need to, and it only requires six liters of tap water for a hemodialysis session. Conventional, permanently installed machines need up to 200 liters of specially prepared water per treatment.

What started off as a vision is now a series-produced success, an incentive for Fresenius Medical Care to keep on improving the quality of dialysis therapy and continuously enhancing it in every way. And the next milestone is already in sight: Whereas it took us just over three decades to build the first 500,000 dialysis machines, the latest forecasts suggest that the 1,000,000th machine will be delivered as soon as 2020.

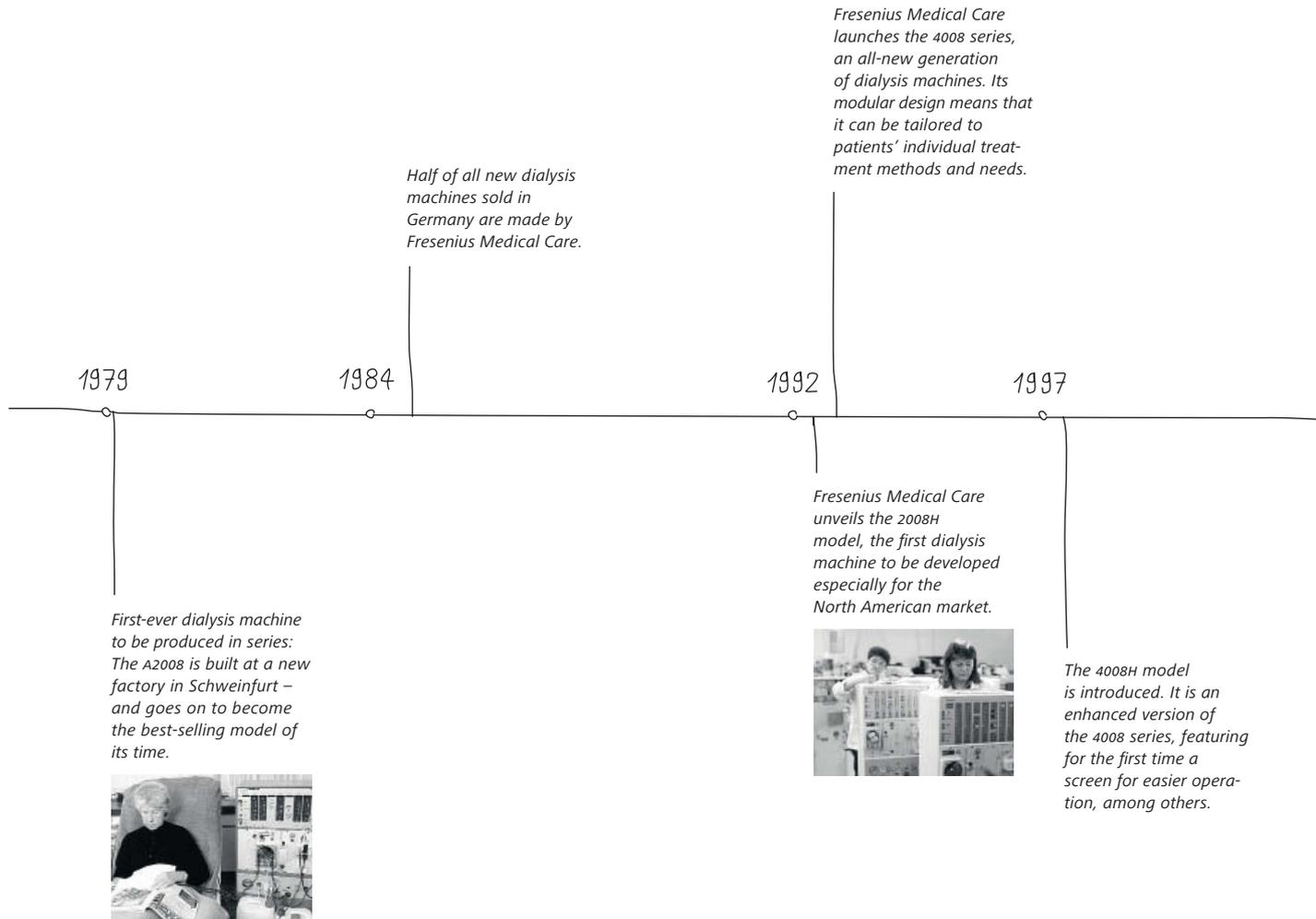
OUR DIALYSIS MACHINES TODAY

- 46,093 dialysis machines produced in 2012
- 8,000 individual parts per dialysis machine
- 1,400,000 possible machine configurations depending on how the machine is equipped
- 180 hydraulic components per dialysis machine
- 200,000,000 treatments per year with Fresenius Medical Care dialysis machines
- 1,000,000,000 dialyzers produced by Fresenius Medical Care to date
- 13,175 employees in production worldwide

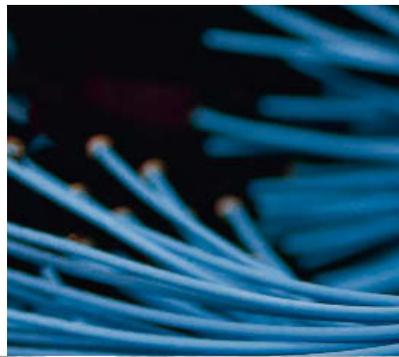
500,000TH
DIALYSIS
MACHINE

47

R
E
P
O
R
T



What started off as the vision to offer lifesaving help for patients with chronic kidney disease became a series-produced success: In 2012 Fresenius Medical Care produced its 500,000th dialysis machine.





Demanding task: A modern dialysis machine from Fresenius Medical Care consists of 8,000 components. In spite of a large number of fully automated production steps, up to 50 employees are involved in the production of one dialysis machine.

OUR VISION FOR DIALYSIS TOMORROW

500,000TH
DIALYSIS
MACHINE

50

R
E
P
O
R
T

- *Launch of a portable dialysis machine*
- *Reduction in water used during dialysis treatment from max. 200 liters to six liters*
- *Production of the 1,000,000th dialysis machine in 2020*
- *Further reduction of side effects and long-term complications for dialysis patients*

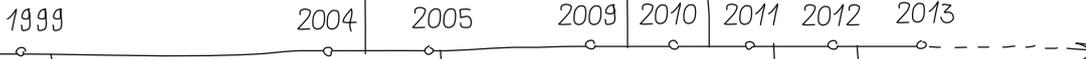
The 4008s classic dialysis machine is unveiled, allowing Fresenius Medical Care to continue the success of the 4008 series right up to the present day.

Half of the 45,000 dialysis machines produced worldwide each year are made by Fresenius Medical Care.

Fresenius Medical Care presents the 2008T, a dialysis machine geared to the North American market.



Launch of the PAK, the "Portable Artificial Kidney": Approval is obtained for the first portable and mobile dialysis machine to be produced in series.



Fresenius Medical Care celebrates a milestone: The 100,000th dialysis machine rolls off the assembly line.

The 5008 model is launched, providing the option of ONLINE hemodiafiltration as a standard feature.



The 500,000th dialysis machine rolls off the production line in Schweinfurt.

The compact 2008K@home device sets new standards in home hemodialysis.



More than half of all dialysis machines used worldwide are made by Fresenius Medical Care. Our machines which we produce in Schweinfurt, Germany, as well as in Walnut Creek, California are used in more than 120 countries.



Growing Together



THE QUALIFICATIONS AND PERFORMANCE OF OUR EMPLOYEES ARE KEY FACTORS FOR FRESENIUS MEDICAL CARE'S SUCCESS. TO IDENTIFY MANAGERS WITH OUTSTANDING CAPABILITIES WITHIN THE COMPANY AND ENHANCE THEIR PROFESSIONAL AND PERSONAL SKILLS, WE LAUNCHED THE GLOBAL EXECUTIVE CHALLENGE IN 2012. BY FOSTERING TALENT WITH TARGETED MEASURES, WE AIM TO SECURE OUR FUTURE AS THE MARKET LEADER.



Borries von Mueller

"WE NEED LEADERS WHO ACT AS ROLE MODELS FOR THEIR EMPLOYEES, WHO EMBRACE AND SHARE OUR UNDERSTANDING OF COLLABORATIVE, INNOVATIVE AND SUCCESSFUL GROWTH."

MAKING THE RIGHT DECISION AT THE RIGHT TIME

Finding the right location for a new production facility is a difficult task for any company, including Fresenius Medical Care. Countless factors must be taken into account before a decision can be made. This costs above all time. Is it possible to develop a procedure to automate and thus accelerate the decision-making process? This was one of the tasks put to the participants at the first Global Executive Challenge. Talented executives from all levels of the Global Manufacturing Operations division were selected for the 2012 pilot project. One group of participants developed a method of this kind in conjunction with internal and external instructors. They presented the results to a committee comprising top managers and members of the Management Board at Fresenius Medical Care. Following the success of the pilot project, the Global Executive Challenge will be held annually in future.

The Global Executive Challenge was developed by Jim Freedman, Vice President Leadership Development at Fresenius Medical Care, and Borries von Mueller, Global Head of Human Resources. "We need leaders who act as role models for employees and who embrace and share our understanding of collaborative, innovative and successful growth," says von Mueller. Fresenius Medical Care owes its success to people with just these skills. Sometimes, staying at the top is harder than getting there in the first place. That is why in an international and globalized working environment where the pace has accelerated due to the rapid consolidation of virtual networks, the Company will continue to rely on employees who remain focused and can make the right decisions at the right time, highly flexible people who can be assigned to other locations and other functions on very short notice.



Jim Freedman

"THE PROGRAM IS CALLED 'GLOBAL EXECUTIVE CHALLENGE' BECAUSE IT CHALLENGES PARTICIPANTS TO PUT THE KNOWLEDGE THEY GAIN FROM IT INTO PRACTICE IN THEIR DAY-TO-DAY WORK, THUS STRENGTHENING THEIR SKILLS AS MANAGERS."

ESTABLISHING A COMMON MANAGEMENT CULTURE

The most productive way for a company to find managers with these qualities is to promote suitable candidates from within the organization. The Global Executive Challenge does just that. Each year, 15 to 20 selected candidates will be invited to take part in the program. Participants come together for one week at three workshops in three different locations. Accompanied by external and internal instructors, they develop solutions to real problems in the group and then present them. Each group is supported by a mentor from the Company's management. Participants in the pilot project were particularly impressed by the constructive idea behind the program, as Gerhard Breith, Plant Manager in Changshu (China), confirms: "The atmosphere was incredibly intensive, fueled by ambition as well as mutual respect. I was amazed above all by how open-minded the participants and instructors were to different approaches and the creative solutions that came out of it."

Other companies often take programs developed by external providers for training executives and then adapt them to their own requirements. Fresenius Medical Care prefers to do things a different way and developed the Global Executive Challenge entirely in-house. "Some buy an off-the-peg suit and then adjust it until it fits, but we tailor the suit ourselves, exactly the way we want it," explains Freedman. "Our aim with the Global Executive Challenge is to establish something like an overarching leadership culture at Fresenius Medical Care."



Providing impetus from outside by external instructors

Heike Strobel

**“OUR WORKSHOPS
MADE THE WORLD A LITTLE
SMALLER. I CAN NOW RELY
ON AN EXTENDED INTER-
NATIONAL NETWORK IN MY
DAY-TO-DAY WORK.”**



Gerhard Breith

**“MASTERING THE
GREAT CHALLENGING TASKS OF
THE PROGRAM TOGETHER
WITH COLLEAGUES FROM ALL
OVER THE WORLD – THAT
REALLY BOOSTS THE MOTI-
VATION.”**

*Establishing a platform for
the international teamwork*



Troy McGhee

**“DECISION-MAKING IS
ABOUT MOVING THE COMPANY
FORWARD, AND OFTEN
MEANS CHANGES THAT CAN
BE QUITE INCONVENIENT
INITIALLY.”**

The idea of this common culture is to strengthen collaboration between managers, regardless of their country of origin or functional area, and overcome obstacles. Freedman compares it to an orchestra: Here, too, people with different skills pool their specialist knowledge to obtain the best possible result in step with other specialists. And each individual knows automatically what he or she has to do.

To keep up the motivation during the seminars, external instructors provide the necessary impetus from outside. They are selected just as carefully as the participants. "We're not looking for theorists, but for people who can show us possible approaches in a practical context. This allows us to see what we are doing right and what we can still achieve," says Freedman.

REINFORCING THE GLOBAL NETWORK

The overriding aim of the Global Executive Challenge is for participants to learn from each other and further strengthen Fresenius Medical Care's global network across regional and functional borders. The time spent working together intensively in the workshops helps to build deep mutual trust and gain a better understanding of what other executives and the Company are capable of. The program developers deliberately set difficult challenges for the participants. The groups comprise managers from all areas of the Company who have to deal with problems outside their own field, a situation that can occur in practice, too. "For example, a Chinese manager might have to take on responsibility in a different business area in the U.S. from one day to the next," explains von Mueller.

A RESOUNDING SUCCESS FOR PARTICIPANTS AND ORGANIZERS ALIKE

The program is not called "challenge" for nothing. The participants are deliberately taken to their limits in terms of what they can achieve. But that is also what makes it so appealing to them, emphasizes Heike Strobel, Director Controlling Global Manufacturing Operations and a participant in the pilot project: "The opportunity of working together away from the daily routine and developing solutions for problems other divisions have to face, really broadened my horizon. Presenting our proposals to the Management Board turned the program into a particular challenge, from which I'm sure we all benefited." For Troy McGhee, Vice President Manufacturing North America, the seminar was an important confirmation of what in his view should distinguish a manager at Fresenius Medical Care: "Each of us needs a clear understanding of where we stand within the Company and where we want to go. The workshop verified this for me."

The initiators' expectations were also exceeded. "The results presented by the groups were of the same high quality as those of the best consultancy firms, and are already being implemented within the Company," says von Mueller. "This shows us that our leaders want to contribute their experience, master new challenges and work with others from different business areas. There just wasn't a platform for this before." Now there is. And that is not all: The method developed in the Global Executive Challenge pilot project to automate and accelerate the search for new production sites has now been implemented at Fresenius Medical Care.

Reinforcing the global company network and the common management culture

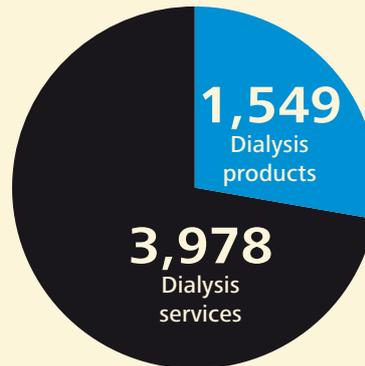
Successful pilot project – Taking participants to their limits

Creating particular challenges for executives

FACTS AND FIGURES

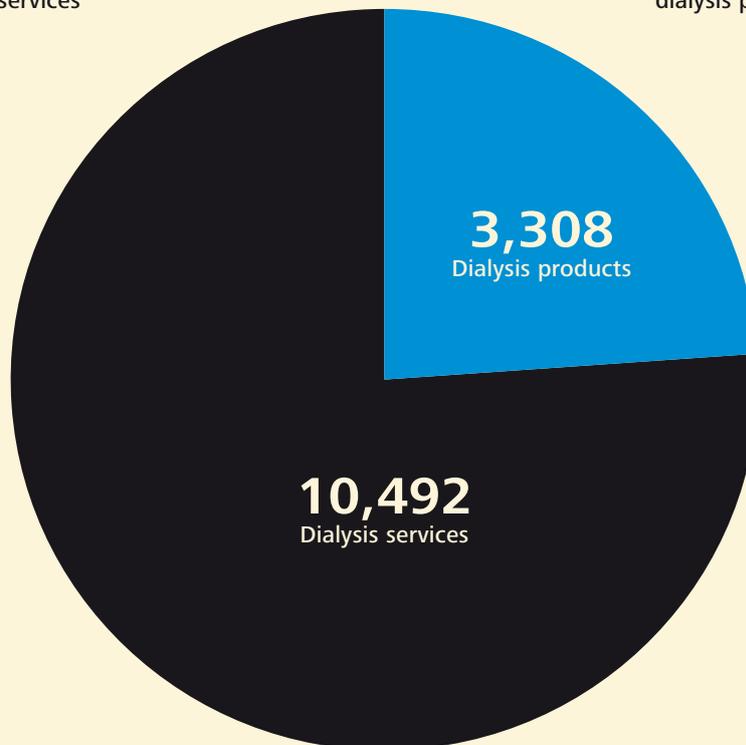
REVENUE BY SEGMENT (in \$M)

2003



+164%
Increase of revenue with
dialysis services

2012



+114%
Increase of revenue with
dialysis products

OPERATIONS

(in \$M)

2003

2012

5,528

+150%

13,800

57

Net revenue

974

+190%

2,822

Earnings Before Interest, Taxes,
Depreciation and Amortization
(EBITDA)

757

+193%

2,219

Earnings Before Interest
and Taxes (EBIT)

546

+254%

1,932

Earnings Before Taxes
(EBT)

331

+259%

1,187

Net income attributable to shareholders of
Fresenius Medical Care AG & Co. KGaA

754

+170%

2,039

Operating cash flow

478

+187%

1,373

Free cash flow

13,800

Revenue in \$M

>40

Production sites

NORTH AMERICA

Dialysis products: 9%
Dialysis services: 91%

Waltham, U.S. 01

86,153

Employees

LATIN AMERICA

Dialysis products: 31%
Dialysis services: 69%

3,160

Clinics

MAJOR LOCATIONS AMERICA

- 01 Waltham, U.S., Regional headquarters North America
- 02 Ogden, U.S., Dialyzers
- 03 Walnut Creek, U.S., Dialysis machines
- 04 Toledo, U.S., Hemodialysis concentrates
- 05 Livingston, U.S., Hemodialysis concentrates
- 06 Montreal, CA, Hemodialysis concentrates
- 07 Irving, U.S., Hemodialysis concentrates
- 08 Reynosa, MX, Tubing systems
- 09 Guadalajara, MX, Dialysis solutions
- 10 Santafé de Bogotá, CO, Dialysis solutions
- 11 Jaguariúna, BR, Dialysis solutions
- 12 Pilar, AR, Hemodialysis concentrates & dialysis solutions

EUROPE

- 13 Bad Homburg, GER, Company headquarters and regional headquarters for Europe, Middle East, Africa and Latin America
- 14 Schweinfurt, GER, Dialysis machines
- 15 St. Wendel, GER, Dialyzers & bags for peritoneal dialysis
- 16 L'Arbresle, FR, Dialyzers & hemodialysis concentrates
- 17 Cremona, IT, Tubing systems
- 18 Borisov, BY, Dialyzers & tubing systems
- 19 Krems, AT, Adsorbers
- 20 Vršac, SRB, Dialyzers, dialysis solutions & tubing systems
- 21 Antalya, TR, Tubing systems

ASIA-PACIFIC

- 22 Hongkong, CN, Regional headquarters Asia-Pacific
- 23 Inukai, JP, Fiber bundles
- 24 Buzen, JP, Dialyzers & dialysis solutions
- 25 Changshu, CN, Tubing systems
- 26 Ipoh, MY, Water treatment systems
- 27 Smithfield, AU, Hemodialysis concentrates
- 28 Scoresby, AU, Dialysis chairs

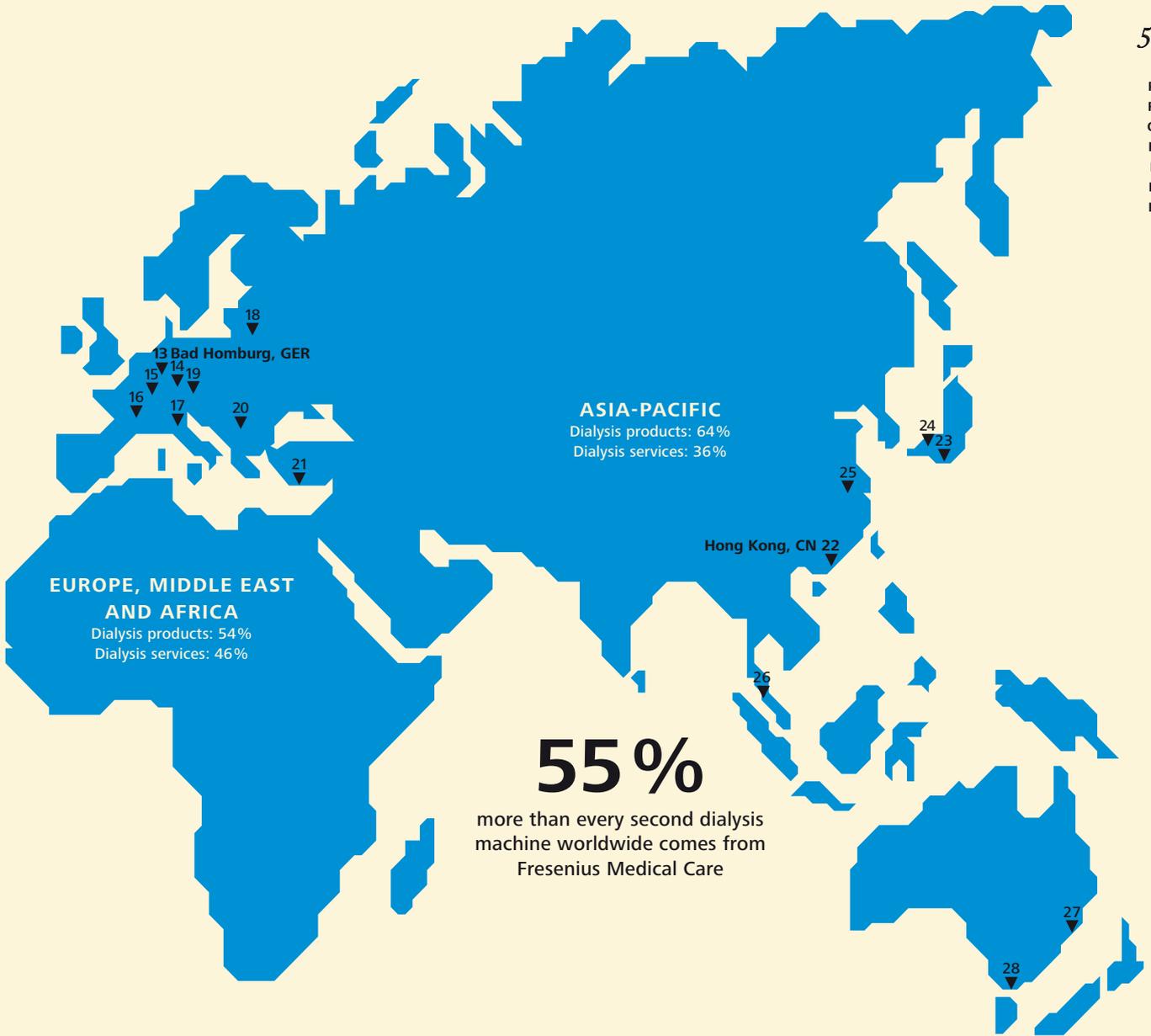
257,916

Patients

FACTS
AND
FIGURES

59

P
R
O
F
I
L
E



38,588,184

Dialysis treatments

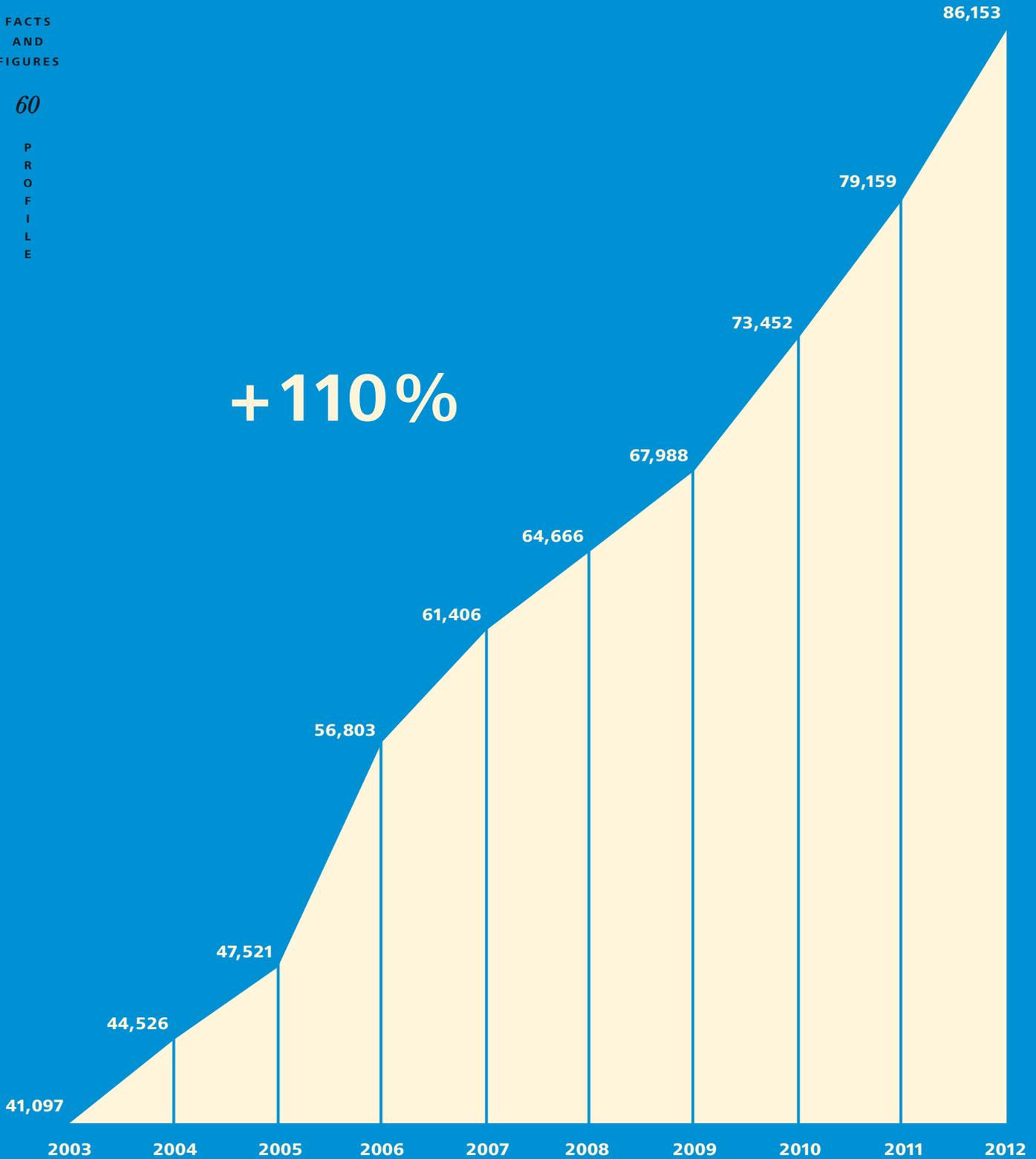
EMPLOYEES

FACTS
AND
FIGURES

60

P
R
O
F
I
L
E

+110%



DIALYSIS SERVICES

2003

2012

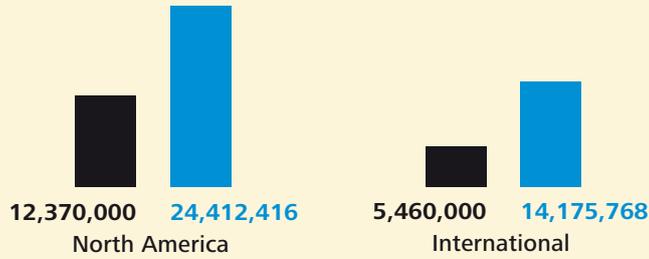
TREATMENTS

17,830,000

+116%

38,588,184

61

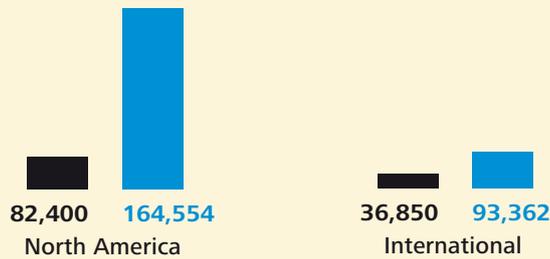


PATIENTS

119,250

+116%

257,916

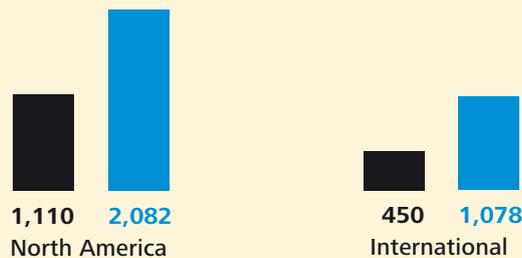


CLINICS

1,560

+103%

3,160



REVIEW 2012

62

FRESENIUS MEDICAL CARE PROVIDES EMERGENCY AID

ITALY In May, a severe earthquake strikes the Italian province of Emilia Romagna. As the facilities of Fresenius Medical Care are not disrupted, we are able to help affected companies. With the support of our well-established crisis management team, we deliver more than 200 dialysis machines to Italy at short notice and install them, thus enabling immediate and sustained treatment for dialysis patients in the region.

FRESENIUS MEDICAL CARE RESPONDS TO HURRICANE SANDY

U.S. In October, Hurricane Sandy wreaks havoc on the east coast of the United States, posing a major challenge for patients and employees of Fresenius Medical Care North America. Around 230 clinics are affected. Fresenius Medical Care once again demonstrates how well it responds in crisis situations. We ensure that our own patients receive care, as well as treating dialysis patients in other clinics. We supply generators, gasoline, diesel, drinking water, medicine, and hot meals to facilities, patients, and employees in need.



CAMPAIGN TO RAISE AWARENESS OF RENAL FUNCTION

AUSTRALIA International World Kidney Day is held on March 8, 2012. Fresenius Medical Care Australia marks this occasion with its own "World Kidney Day" in Sydney. In addition, from May 27 to June 2, Fresenius Medical Care Australia runs a national campaign at various locations around the continent to highlight the importance of the kidney as a vital organ. The theme of World Kidney Day in 2012 is "Donate – kidneys for life – receive", emphasizing patients' quality of life after a successful kidney transplant and the life-saving aspect of organ donations. The aim of World Kidney Day is to raise awareness of the functions healthy kidneys perform, what factors put renal function at risk and what everyone can do to keep their kidneys healthy and prevent kidney disease. Fresenius Medical Care sets up information stands in well-frequented public places, drawing people's attention to the message of the international World Kidney Day with presentations on renal function and treatment options for kidney disease. Postcards and promotional gifts also drive home the theme. In the course of the campaign, 500 people take the opportunity to have their blood pressure checked by dialysis nurses; high blood pressure is one of the risk factors for kidney disease.

500,000TH DIALYSIS MACHINE PRODUCED

GERMANY In November, the 500,000th dialysis machine from the multi-award-winning 5008 series rolls off the production line at the Schweinfurt plant. Fresenius Medical Care began developing its own dialysis machines back in the mid-1970s, and series production started in 1979. The very first model, the A2008, went on to become the world's best-selling dialysis machine of its time, a leading position that the Company has maintained to this day with its follow-up models. Fresenius Medical Care donates the dialysis machine to the German Kidney Foundation in recognition of its outstanding work. Further information can be found *starting on page 44*.





AWARD RECEIVED FOR OUTSTANDING ACHIEVEMENT IN SOCIAL WORK

U.S. Fresenius Medical Care North America receives the Spirit of Excellence Award from “Modern Healthcare” (independent u.s. business magazine in the healthcare industry) in 2012 for work performed by social workers from Fresenius Medical Care responsible for Western u.s. The award recognizes outstanding achievements by companies and individuals that exceed expectations in caring for patients. The social workers have developed and implemented a new intervention model for patients who have difficulties meeting medical requirements themselves, in particular regarding the frequency and duration of treatment. They help these patients to avoid health risks and thus to minimize additional stays in hospital and the associated increase in healthcare costs. From September 2011 until March 2012, this successful intervention model is successfully rolled out to more than 400 clinics with 732 patients. As a result, 76% of patients improve their behavior. In October, we introduce the initiative in more than 2,000 clinics in North America.

RESEARCH FUNDING PROGRAM LAUNCHED

U.S. In 2012, Fresenius Medical Care donates \$10M to help set up the Ben.J.Lipps Research Fellowship Program, a sponsorship scheme for research and development in the field of nephrology. The program is named for Dr. Ben J.Lipps, CEO of Fresenius Medical Care until December 31, 2012. Ben Lipps’ achievements are a prime example of how scientific findings can be creatively put into practice for the benefit of patients. (Each year, ten new fellowships are awarded and ten from the previous year are continued.)

FIRST SPECIALIST CONFERENCE IS A MAJOR SUCCESS

GERMANY The first Fresenius Medical Care “Nephro Summit” is held in Berlin from March 30 to April 1. Participants come to find out about the latest developments in renal therapy. Experts give presentations and engage in lively discussions with some 330 visitors from more than 20 countries. The nephrologists are delighted – the event is a great success. This shows how important it is for specialists to meet customers directly. It also proves that Fresenius Medical Care Renal Pharma is on the right course with this event.



DOWN UNDER AS A TRAVEL DESTINATION FOR DIALYSIS PATIENTS

AUSTRALIA With more and more patients wanting to travel the world, the South Asia-Pacific region is becoming increasingly important. Fresenius Medical Care has a strong network of clinics in Australia, New Zealand, Singapore and Malaysia that provide dialysis in holiday resorts. To give patients the opportunity to discover Australia as a travel destination, the local Holiday Dialysis team runs a global campaign in 2012 with a prize draw for a one-week trip for two to Sydney, including return flights and with all dialysis requirements provided for.



INNOVATION PRIZE RECEIVED

AUSTRIA In November, Fresenius Medical Care in Krems is named the state winner of the “Jobs Through Innovation” competition. The award is a joint government and business initiative. At the Krems location, we develop and produce innovative blood-cleaning therapies. The award recognizes our products and people development.

THANK YOU

**WE WOULD LIKE
TO THANK
OUR PATIENTS, PART-
NERS AND SHARE-
HOLDERS FOR THEIR
CONFIDENCE IN
OUR COMPANY AND
OUR EMPLOYEES FOR
THEIR DEDICATION
AND COMMITMENT IN
THE PAST YEAR.**

*Your Fresenius Medical Care
Investor-Relations-Team*

IMPRINT

PUBLISHED BY

Fresenius Medical Care AG & Co. KGaA

EDITORIAL OFFICE

Investor Relations

EDITORIAL DEADLINE

March 13, 2013

CONCEPT AND DESIGN

hw.design gmbh

PHOTOGRAPHY

Ellen Callaway

page 38–43

Matthias Haslauer

page 30–37 and cover

Christian Lietzmann

page 63

Matthias Ziegler

page 2–21, 44–51 and cover



PEFC™
PEFC/04-31-0805



The production of and the paper used for the Fresenius Medical Care Annual Report 2012 are certified in accordance with the criteria of the Programme for the Endorsement of Forest Certification (PEFC). Furthermore, the Annual Report 2012 has been produced in a carbon-neutral manner. The CO₂ emissions caused by its production were compensated for by certified climate protection projects.

FRESENIUS MEDICAL CARE

Else-Kröner-Str. 1
61352 Bad Homburg v.d.H., Germany
www.fmc-ag.com

