The Medtronic Symplicity™ Global Center of Excellence Program

Medtronic Symplicity™ Center of Excellence Criteria

EXISTING TEAM

Cross-specialty RDN team in place between interventionalist and referrer leaders

DEMONSTRATED EXPERIENCE

Center has performed more than 50 Symplicity RDN cases

COMMITMENT TO COLLABORATION

Willingness to build upon existing RDN program with Medtronic

EXISTING TEAM

(University Hospital of Saarland, Homburg, Germany)

Prof. Dr. med. Michael Böhm

Chief of Cardiology

Prof. Dr. med. Ulrich Laufs

Vice Chairman of the Department of Internal Medicine, Cardiology, Angiology and Intensive Medicine

Dr. med. Felix Mahfoud

Internal Medicine and Cardiology Internist

Dr. med. Christian Ukena

Clinical Electrophysiology Internist

Dr. med. Bodo Cremers

Assistant Medical Director

DEMONSTRATED EXPERIENCE

UniversitätsKlinikum Heidelberg

100+ Procedures Performed

Universitätsklinikum des Saarlandes

450+ Procedures Performed

UK

85+ Procedures Performed

University Medical Center Utrecht

75+ Procedures Performed

Baker IDI HEART & DIABETES INSTITUTE

150+ Procedures Performed

Medtronic Symplicity™ Center of Excellence Benefits

In becoming a Medtronic Symplicity™ Center of Excellence, Medtronic will:

1. Support the site as an international training center for renal denervation.
   - Training sessions will be held at the center with external physicians
   - Physicians at the center can participate in the global proctoring program
   - Center will host visiting physicians from all over the world who are interested in observing live cases

2. Partner in building Symplicity RDN Programs through targeted market development activities.
   - Strategic Support for local, regional, national and International programs

3. The Center will become part of an exclusive global network that will leverage technology to provide borderless educational opportunities.
   - Center will have the opportunity to participate in the Symplicity™ Global Registry

4. Center will be listed on the Medtronic website recognizing them as a Medtronic Symplicity™ Center of Excellence.

5. Provide editorial support and review of publications about renal denervation.

CENTERS OF EXCELLENCE

Baker IDI
HEART & DIABETES INSTITUTE

Universitätsklinikum des Saarlandes

UMC
University Medical Center Utrecht

UK SH

UniversitätsKlinikum Heidelberg

National Heart Centre Singapore
SingHealth

INSTITUT JANTUNG NEGARA
National Heart Institute

SICA-HF

ALMAZOV
Federal Heart, Blood and Endocrinology Centre

University Health Network
Toronto General Hospital Toronto Western Hospital Princess Margaret Hospital

GLOBAL IMPACT

World Map | Canada | Western Europe | Asian Pacific

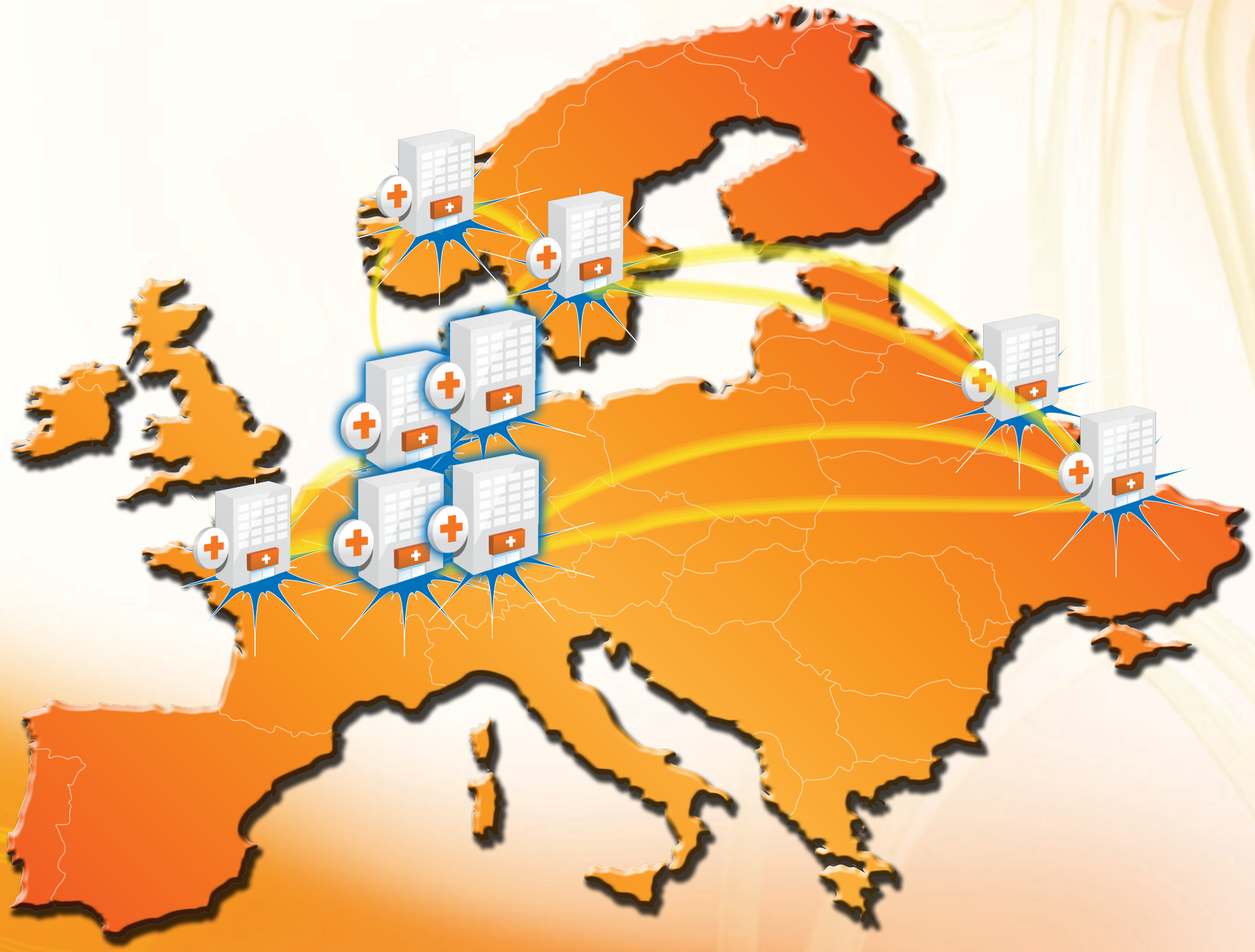
Future

Current

- **University Hospital of Schleswig Holstein - Lubeck, Germany**
- **University Hospital of Saarland - Homburg, Germany**
- **University Medical Center - Utrecht, Netherlands**
- **University Hospital Heidelberg - Heidelberg, Germany**
- **Baker IDI Heart & Diabetes Institute - Melbourne, Australia**

GLOBAL IMPACT

World Map | Canada | **Western Europe** | Asian Pacific



GLOBAL IMPACT

World Map | Canada | Western Europe | **Asian Pacific**

University Hospital of Schleswig Holstein

Lubeck, Germany

The University Medical Center Schleswig-Holstein is one of the largest university hospitals in Europe with more than 70 clinics and institutes. It offers outstanding medical treatment and excellence in research and education, providing top research at the interface of medicine, science and technology and maintain research co-operations with universities all over the world. In addition, modern diagnostic and therapeutic options for patients with severe, chronic and rare diseases are provided.

Universitätsklinikum des Saarlandes

University Hospital of Saarland

Homburg, Germany

The Department of Cardiology has been recognized as a Hypertension Excellence Center by the European Hypertension Society and specializes in the diagnosis and treatment of patients with resistant hypertension. Catheter-based renal denervation has been performed at the hospital from early on first as a participating site in HTN 1 and HTN 2, and now it has treated more than 300 patients with RDN.

University Medical Center
Utrecht

University Medical Center

Utrecht, Netherlands

Utrecht University is a research university comprising of seven faculties, which collectively span the entire academic spectrum in teaching and research. Founded in 1636, the University is now a modern, leading institute enjoying a growing international reputation. In the Shanghai Ranking, Utrecht University ranks 1st in the Netherlands, 12th in Europe and 48th worldwide. Ever since its foundation, the University has been located in Utrecht's historical, medieval town center. The inner city campus comprises of two faculties. The other faculties are situated at the Uithof Campus, east of the town center. A third campus, just outside the town center, is home to University College Utrecht, Utrecht University's international undergraduate school. There are more than 30,000 students at Utrecht University.

The first catheter-based renal denervation in The Netherlands was performed at the UMC Utrecht. Presently, the departments of nephrology, cardiology, radiology and vascular medicine are working together closely in state-of-the-art patient care and research in the field.

UniversitätsKlinikum Heidelberg

University Hospital Heidelberg

Heidelberg, Germany

The University of Heidelberg Department of Internal Medicine III is the largest cardiology department in a university setting in Germany, caring for more than 12,000 inpatients and 64,000 outpatients. It is embedded in the internal medicine department and the heart center at the institution. The department is equipped with the latest technologies including 256-slice CT scanners, 1,5T Herz-MRI, 4 cath labs and 1 for pacemaker and valve implantations.

Renal denervation has been offered at the center since October 2010, and more than 50 patients have already been treated.

Baker IDI Heart & Diabetes Institute

Melbourne, Australia

Baker IDI Heart and Diabetes Institute is a world renowned medical research facility. Our work extends from the laboratory to hospital research and wide-scale national and international community studies with a focus on diagnosis, prevention and treatment of diabetes and cardiovascular disease.

In 2008 the Baker Heart Research Institute merged with the International Diabetes Institute (which had operated in Melbourne for over 25 years) to form Baker IDI Heart and Diabetes Institute. The Baker IDI is currently celebrating 85 years of research excellence.

National Heart Centre Singapore
SingHealth

National Heart Centre Singapore

Singapore

The National Heart Centre Singapore (NHC) is dedicated to providing excellence in healthcare as the national and regional referral centre for cardiovascular disease. This will be achieved through our clinical services, teaching, research and training.

FUTURE SITE

Hypertension

JOURNAL OF THE AMERICAN HEART ASSOCIATION

Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

THE LANCET

www.thelancet.com

Renal Denervation as a Therapeutic Approach for Hypertension

Novel Implications for an Old Concept

Markus P. Schlaich, Paul A. Sobotka, Henry Krum, Robert Whitbourn, Anthony Walton, Murray D. Esler

Hypertension, heart failure, and chronic kidney disease represent a significant and growing global health issue. Current therapeutic strategies for these conditions are mainly based on lifestyle interventions and pharmacological approaches, but the rates of control of blood pressure and the therapeutic efforts to prevent progression of heart failure, chronic kidney disease, and their sequelae remain unsatisfactory, and additional options are required.

The contribution of renal sympathetic nerve activity to the development and progression of these disease states has been convincingly demonstrated in both preclinical and human experiments. Preclinical experiments in models of hypertension, myocardial infarction, heart failure, chronic kidney disease, and diabetic nephropathy have successfully used renal denervation as both an experimental tool and a therapeutic strategy.[1–6] In the absence of appropriate drugs to pharmacologically reduce blood pressure in severely hypertensive patients, therapeutic splanchnicectomy and even radical surgical sympathectomy were used since the 1930s. In patients with end stage renal disease (ESRD) and uncontrollable hypertension, an even more radical approach, such as bilateral nephrectomy, is sometimes considered. Surgical renal denervation has been shown to be an effective means of reducing sympathetic outflow to the kidneys, increasing urine output (natriuresis and diuresis), and reducing renin release, without adversely affecting other functions of the kidney, such as glomerular filtration rate and renal blood flow. The human transplant experience has clearly demonstrated that the denervated kidney reliably supports electrolyte and volume homeostasis in free-living humans. On the basis of these findings and in view of the demand for alternative treatment options, targeting the renal sympathetic nerves as a major player in the pathophysiology of hypertension, kidney disease, and heart failure is a very attractive therapeutic approach.

Role of Renal Sympathetic Nerves in Cardiovascular and Kidney Disease

The renal sympathetic nervous system has been identified as a major contributor to the complex pathophysiology of hypertension, states of volume overload (such as heart failure), and progressive renal disease, both experimentally and in humans.[1–6] Studies using radiotracer dilution methodology to measure overflow of norepinephrine (NE) from the kidneys to plasma revealed increased renal NE spillover rates in patients with essential hypertension,[7,8] particularly so in young hypertensive subjects, which, in concert with increased NE spillover from the heart, is consistent with the hemodynamic profile typically seen in early hypertension, characterized by increased heart rate, cardiac output, and renovascular resistance.[9] It is now widely accepted that essential hypertension is commonly neurogenic, both initiated and sustained by sympathetic nervous system overactivity.

Activation of cardiorenal sympathetic nerve activity is even more pronounced in heart failure, as demonstrated by an exaggerated increase of NE overflow from the heart and the kidneys to plasma in this patient group.[10] Not surprisingly, IV infusion of the centrally acting α_2-adrenoceptor agonist clonidine, at modest doses, significantly attenuates cardiac and renal sympathetic tone in heart failure patients.[11] In addition to the beneficial effects of antiadrenergic therapy in the heart, the renal sympatholytic effects may counteract the salt and water retention that is a hallmark of the condition. In line with this notion is the recent demonstration of a strong negative predictive value of renal sympathetic activation on all-cause mortality and heart transplantation in patients with congestive heart failure, which is independent of overall sympathetic activity, glomerular filtration rate, and left ventricular ejection fraction.[12] These findings clearly suggest that treatment regimens that further reduce renal sympathetic stimulation have the potential to improve survival in patients with heart failure.

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From the Neurovascular Hypertension and Kidney Disease Laboratory/Human Neurotransmitters Laboratory (M.P.S., M.D.E.), Baker IDI Heart and Diabetes Institute and Alfred Hospital, Melbourne, Victoria, Australia; Department of Cardiology (P.A.S.), Hennepin County Medical Center, Minneapolis, Minn; Ardian, Inc (P.A.S.), Palo Alto, Calif; Monash Centre of Cardiovascular Research and Education in Therapeutics (H.K.), Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Victoria, Australia; Department of Cardiology (R.W.), St. Vincent's Hospital, Melbourne, Victoria, Australia; Heart Centre (A.W.), Alfred Hospital, Melbourne, Victoria, Australia.

This trial has been registered at www.clinicaltrials.gov (identifiers NCT00483808 and NCT00551304).

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(*Hypertension*. 2009;54:000-000.)

Hypertension is available at http://hyper.ahajournals.org

DOI: 10.1161/HYPERTENSIONAHA.109.138610

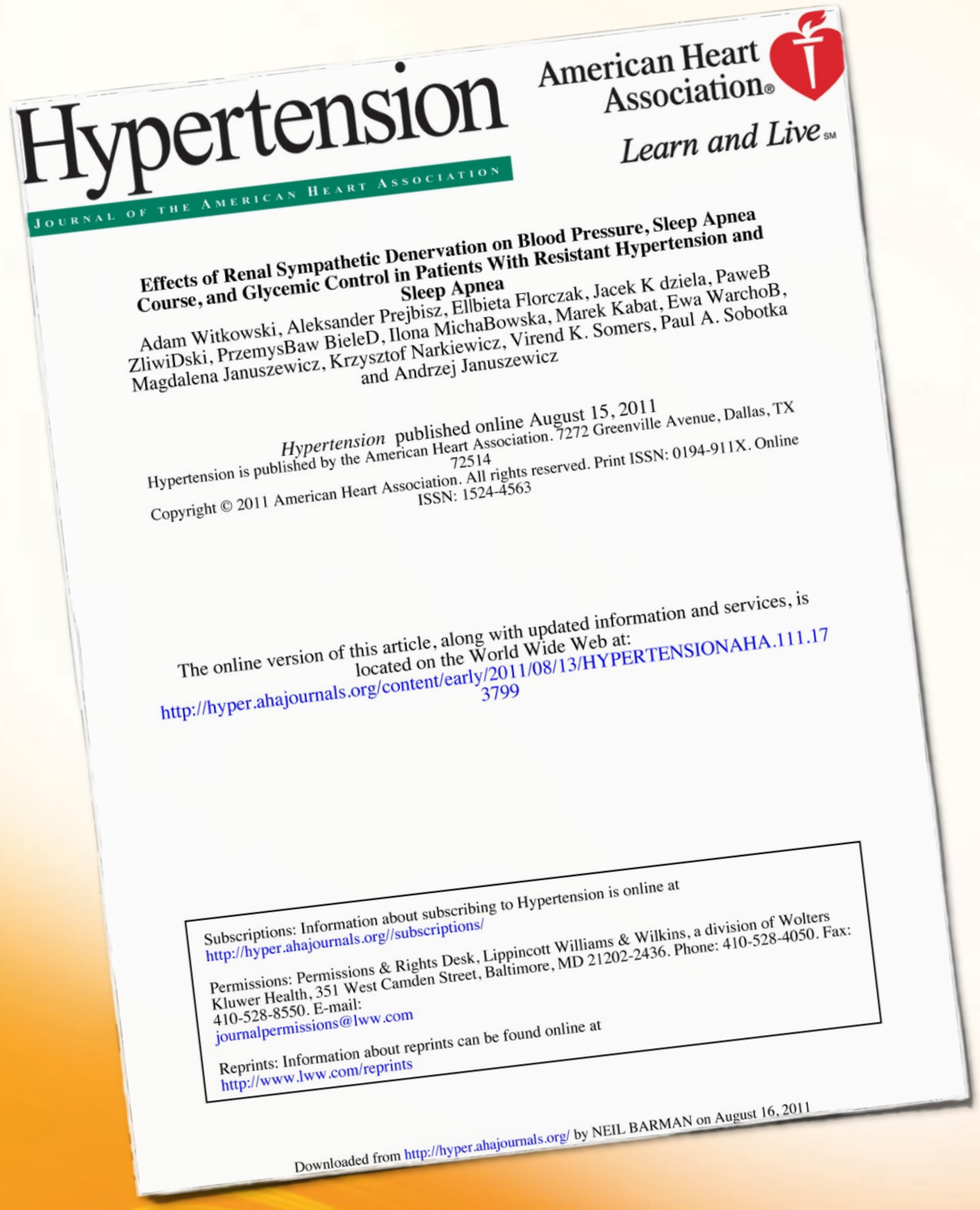
Hypertension

JOURNAL OF THE AMERICAN HEART ASSOCIATION

Summary

Following bilateral renal nerve ablation, renal norepinephrine spillover was markedly reduced from both kidneys, with a 48% reduction from the left kidney and a 75% reduction from the right kidney. In addition, renin activity was halved, renal plasma flow increased, and a progressive and sustained reduction in systemic blood pressure was observed, from 161/107 mm Hg at baseline to 127/81 mm Hg at 12 months. Furthermore, whole-body norepinephrine spillover was reduced by 42%. At 1-year follow-up, sympathetic-nerve firing rates showed evidence of normalization, left ventricular mass was reduced, and the patient was able to discontinue 2 anti-hypertensive drugs. These findings suggest that renal-nerve ablation may be an effective treatment for hypertension.

Schlaich MP, Sobotka PA, Krum H, et al. Renal sympathetic-nerve ablation for uncontrolled hypertension [To the editor]. *N Engl J Med*. 2009;361(9):932-934.



Hypertension

Journal of the American Heart Association

Abstract

In conclusion, catheter-based renal sympathetic denervation lowered BP in patients with refractory hypertension and obstructive sleep apnea, which was accompanied by improvement of sleep apnea severity. Interestingly, there are also accompanying improvements in glucose tolerance. Renal sympathetic denervation may conceivably be a potentially useful option for patients with comorbid refractory hypertension, glucose intolerance, and obstructive sleep apnea, although further studies are needed to confirm these proof-of-concept data.

Witkowski A, Prejbisz A, Florczak E, et al. Effects of renal sympathetic denervation on blood pressure, sleep apnea course, and glycemic control in patients with resistant hypertension and sleep apnea. *Hypertension*. 2011;58(4):559-565.


Hypertension
Journal of the American Heart Association
American Heart Association®
Learn and Live℠

Catheter-Based Renal Sympathetic Denervation for Resistant Hypertension: Durability of Blood Pressure Reduction Out to 24 Months

Symplicity HTN-1 Investigators

Hypertension 2011;57;911-917; originally published online Mar 14, 2011;
DOI: 10.1161/HYPERTENSIONAHA.110.163014
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 Print ISSN: 0194-911X. Online ISSN: 1524-4563

Hypertension
Journal of the American Heart Association

Abstract

Renal sympathetic hyperactivity is seminal in the maintenance and progression of hypertension. Catheter-based renal sympathetic denervation has been shown to significantly reduce blood pressure (BP) in patients with hypertension. Durability of effect beyond 1 year using this novel technique has never been reported. A cohort of 45 patients with resistant hypertension (systolic BP ≥160 mm Hg on ≥3 antihypertension drugs, including a diuretic) has been originally published. In conclusion, in patients with resistant hypertension, catheter-based renal sympathetic denervation results in a substantial reduction in BP sustained out to ≥2 years of follow-up, without significant adverse events.

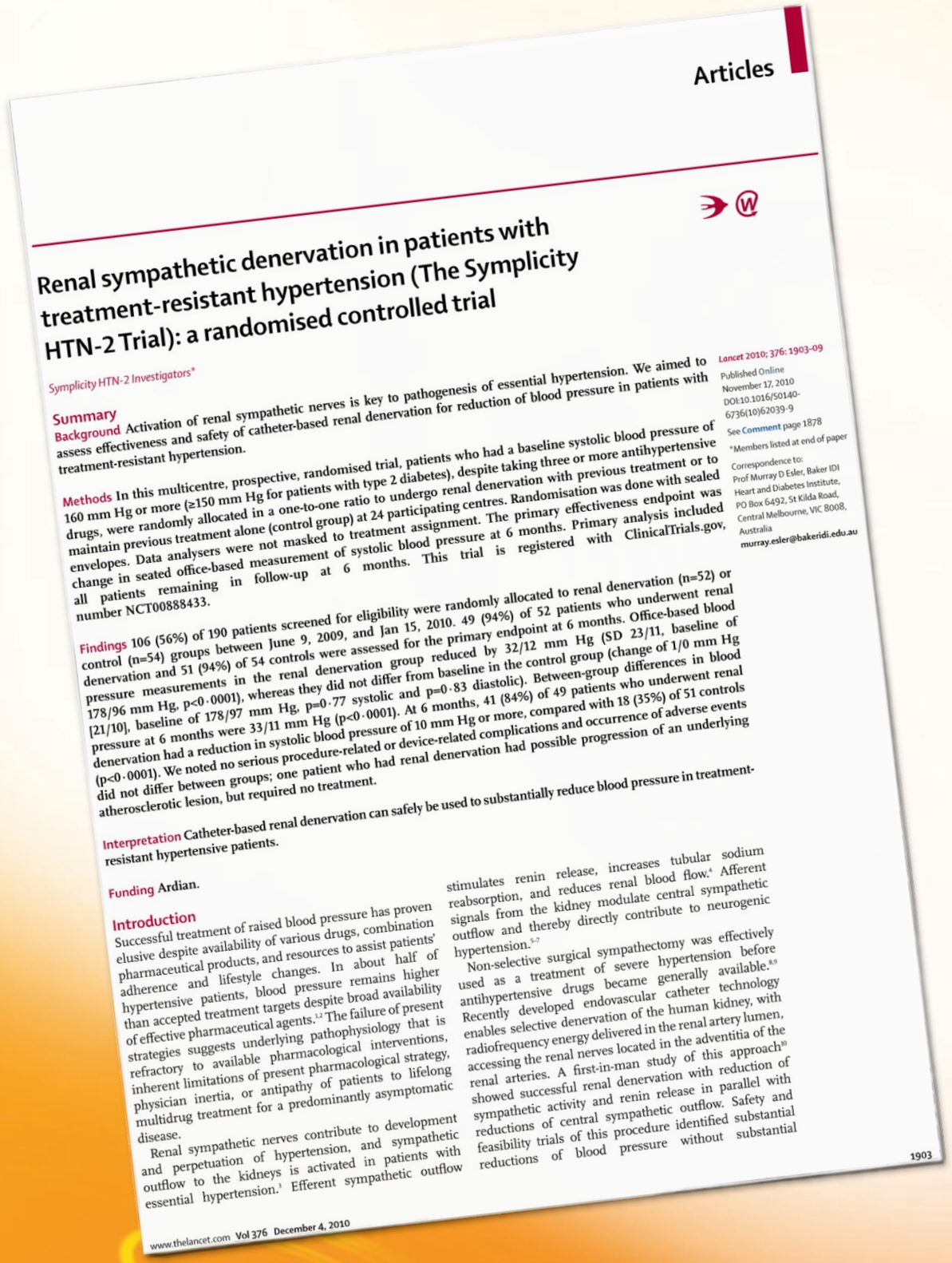
Symplicity HTN-1 Investigators; Krum H, Barman N, Schlaich M, et al. Catheter-based renal sympathetic denervation for resistant hypertension: durability of blood pressure reduction out to 24 months. *Hypertension*. 2011;57(5) 911-917.

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

Abstract

Renal denervation improves glucose metabolism and insulin sensitivity in addition to a significantly reducing blood pressure. However, this improvement appeared to be unrelated to changes in drug treatment. This novel procedure may therefore provide protection in patients with resistant hypertension and metabolic disorders at high cardiovascular risk.

Mahfoud F, Schlaich M, Kindermann I, et al. Effect of renal sympathetic denervation on glucose metabolism in patients with resistant hypertension: a pilot study. *Circulation*. 2011;123(18):1940-1946.



Articles

Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 Trial): a randomised controlled trial

Symplicity HTN-2 Investigators*

Summary

Background Activation of renal sympathetic nerves is key to pathogenesis of essential hypertension. We aimed to assess effectiveness and safety of catheter-based renal denervation for reduction of blood pressure in patients with treatment-resistant hypertension.

Methods In this multicentre, prospective, randomised trial, patients who had a baseline systolic blood pressure of 160 mm Hg or more (≥150 mm Hg for patients with type 2 diabetes), despite taking three or more antihypertensive drugs, were randomly allocated in a one-to-one ratio to undergo renal denervation with previous treatment or to maintain previous treatment alone (control group) at 24 participating centres. Randomisation was done with sealed envelopes. Data analysers were not masked to treatment assignment. The primary effectiveness endpoint was change in seated office-based measurement of systolic blood pressure at 6 months. Primary analysis included all patients remaining in follow-up at 6 months. This trial is registered with ClinicalTrials.gov, number NCT00888433.

Findings 106 (56%) of 190 patients screened for eligibility were randomly allocated to renal denervation (n=52) or control (n=54) groups between June 9, 2009, and Jan 15, 2010. 49 (94%) of 52 patients who underwent renal denervation and 51 (94%) of 54 controls were assessed for the primary endpoint at 6 months. Office-based blood pressure measurements in the renal denervation group reduced by 32/12 mm Hg (SD 23/11, baseline of 178/96 mm Hg, p<0·0001), whereas they did not differ from baseline in the control group (change of 1/0 mm Hg [21/10], baseline of 178/97 mm Hg, p=0·77 systolic and p=0·83 diastolic). Between-group differences in blood pressure at 6 months were 33/11 mm Hg (p<0·0001). At 6 months, 41 (84%) of 49 patients who underwent renal denervation had a reduction in systolic blood pressure of 10 mm Hg or more, compared with 18 (35%) of 51 controls (p<0·0001). We noted no serious procedure-related or device-related complications and occurrence of adverse events did not differ between groups; one patient who had renal denervation had possible progression of an underlying atherosclerotic lesion, but required no treatment.

Interpretation Catheter-based renal denervation can safely be used to substantially reduce blood pressure in treatment-resistant hypertensive patients.

Funding Ardian.

Lancet 2010; 376: 1903–09
Published Online November 17, 2010 DOI:10.1016/S0140-6736(10)62039-9

See Comment page 1878

*Members listed at end of paper

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murray.esler@bakeridi.edu.au

Introduction

Successful treatment of raised blood pressure has proven elusive despite availability of various drugs, combination pharmaceutical products, and resources to assist patients' adherence and lifestyle changes. In about half of hypertensive patients, blood pressure remains higher than accepted treatment targets despite broad availability of effective pharmaceutical agents.[1,2] The failure of present strategies suggests underlying pathophysiology that is refractory to available pharmacological interventions, inherent limitations of present pharmacological strategy, physician inertia, or antipathy of patients to lifelong multidrug treatment for a predominantly asymptomatic disease.

Renal sympathetic nerves contribute to development and perpetuation of hypertension, and sympathetic outflow to the kidneys is activated in patients with essential hypertension.[3] Efferent sympathetic outflow stimulates renin release, increases tubular sodium reabsorption, and reduces renal blood flow.[4] Afferent signals from the kidney modulate central sympathetic outflow and thereby directly contribute to neurogenic hypertension.[5–7]

Non-selective surgical sympathectomy was effectively used as a treatment of severe hypertension before antihypertensive drugs became generally available.[8,9] Recently developed endovascular catheter technology enables selective denervation of the human kidney, with radiofrequency energy delivered in the renal artery lumen, accessing the renal nerves located in the adventitia of the renal arteries. A first-in-man study of this approach[10] showed successful renal denervation with reduction of sympathetic activity and renin release in parallel with reductions of central sympathetic outflow. Safety and feasibility trials of this procedure identified substantial reductions of blood pressure without substantial

THE LANCET
www.thelancet.com

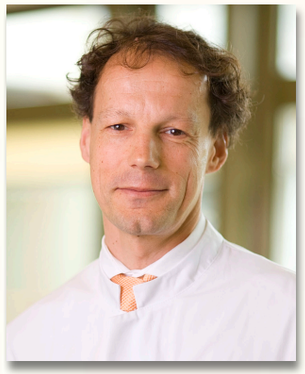
Abstract

Activation of renal sympathetic nerves is key to pathogenesis of essential hypertension. We aimed to assess effectiveness and safety of catheter-based renal denervation for reduction of blood pressure in patients with treatment-resistant hypertension. At 6 months, 41 (84%) of 49 patients who underwent renal denervation had a reduction in systolic blood pressure of 10 mm Hg or more, compared with 18 (35%) of 51 controls (p<0.0001). We noted no serious procedure-related or device-related complications and occurrence of adverse events did not differ between groups; one patient who had renal denervation had possible progression of an underlying atherosclerotic lesion, but required no treatment. Catheter-based renal denervation can safely be used to substantially reduce blood pressure in treatment-resistant hypertensive patients.

Symplicity HTN-2 Investigators; Esler MD, Krum H, Sobotka PA, et al. Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 Trial): a randomized controlled trial. *Lancet*. 2010;376(9756):1903-1909.

GLOBAL KOL COMMUNITY


Professor Peter J. Blankestijn


PD Dr Erwing Blessing


Professor Dr med Michael Bohm


Dr med Bodo Cremers


Professor Pieter Doevendans


Professor Murray Esler


Professor Dr med Ulrich Laufs


Dr med Felix Mahfound


Professor Willem Mali


PD Dr Kai Mortensen


Professor Markus Schlaich


Professor Dr Heribert Schunkert


Dr med Christian Ukena


Dr Britta Vogel


Dr Evert-Jan Vonken


Dr Michiel Voskuil


Professor Joachim Weil


Professor Dr Martin Zeier

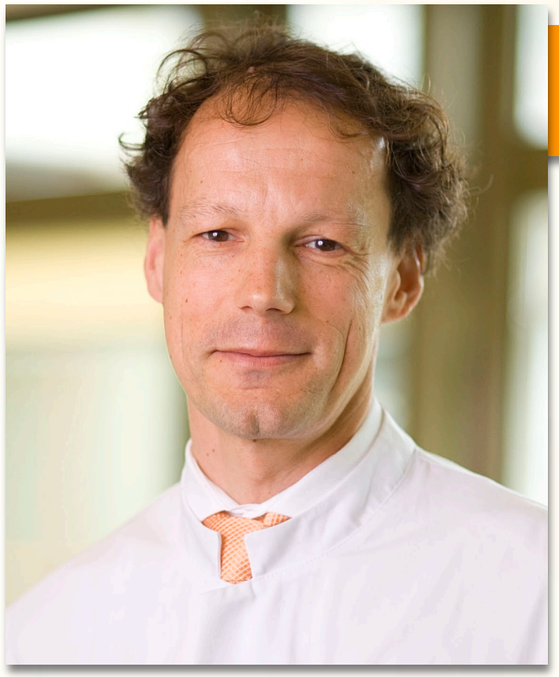
Professor Peter J. Blankestijn

Professor Peter Blankestijn has been a staff member and Associate Professor in the Department of Nephrology and Hypertension at the University Medical Center Utrecht since 1991. In 1992, he was registered as a Clinical Hypertension Specialist (European Society of Hypertension).

His research activities mainly include studies in humans with regards to the following subjects:
- hypertension, with special interest for hypertension in chronic kidney disease patients and for the sympathetic nervous system
- treatment and prevention of complications of chronic kidney disease patients
- hemodialysis techniques
- treatment and prevention of complications of hemodialysis treatment

Professor Blankestijn has served as principal investigator of several multicenter studies, including CONTRAST and MASTERPLAN.

He is a member of many professional medical societies, and serves in a leadership position for many of these including as Co-chair of the Working Group on Dialysis Therapy of the European Renal Association (ERA) / European Dialysis and Transplant Association (EDTA). Professor Blankestijn authored more than140 articles in peer reviewed journals.



PD Dr Erwin Blessing

Dr Blessing is an interventional cardiologist, angiologist and a consultant at the University Hospital of Heidelberg where he started his career in 1997. He spent 3 years at the University of Seattle researching inflammation and atherosclerosis. He was rewarded for his scientific work with the “Merit Young Investigator Travel Award 2000, Council Atherosclerosis, Thrombosis and Vascular Biology, 73rd Scientific Session of the American Heart Association, New Orleans, USA”.

Vascular biology is still the core area of his scientific interest. Dr Blessing has been head of the angiology department since January 2008, focusing on interventionalangiology. He also works as a cardiologist mainly in the field of interventional cardiology and secondary prevention. Dr Blessing’s interest in prevention engaged him in the field of hypertension; he has been doing renal denervation since September 2010. He lectures at the University Heidelberg on vascular diseases, has 60 articles published in peer-reviewed journals and has written 5 book chapters.

Professor Dr med Michael Böhm

Michael Böhm performed his medical training at the medical school of Hannover in Germany. Residency in Internal Medicine and fellowships in Cardiology at the Ludwig Maximilians-University in Munich, Germany at the Klinikum Großhadern; Heisenberg Graduate of the Deutsche Forschungsgemeinschaft; Assistant and Associate Professor of Internal Medicine and Cardiology at the Universität zu Köln in Germany. Since 2000, he has been the Director of the Klinik für Innere Medizin III and Chief of Cardiology at the University of Saarland in Homburg/Saar, Germany. Professor Böhm's special interests include pathophysiology and therapy of heart failure. In particular, he is involved in studies on signal transduction in the failing heart and in vascular biology. Professor Böhm has been the principal investigator in several international multicenter studies including the SHIFT-trial. He has written more than 350 original papers, book chapters and review articles. He has obtained several awards from scientific societies. Professor Böhm is a reviewer for most recognized scientific journals in the cardiovascular field and the chief editor Clinical Research in Cardiology. He is president of the German Society of Cardiology.

Dr med Bodo Cremers

Dr Bodo Cremers is a graduate in medicine from the University of Cologne, Germany. He is currently the Assistant Medical Director at the Klinik für Innere Medizin III, Department of Internal Medicine and Cardiology, University of Saarland, Homburg, Germany. In addition to being involved in cardiology research at his institution, Dr Cremers is also an active member of multiple societies including the “Working Group on Myocardial Function”, ESC; “Arbeitsgruppe Interventionelle Kardiologie (AGIK)”, DGK; and the “European Association of Percutaneous Cardiovascular Interventions (EAPCI)”, ESC.

Professor Pieter A Doevendans

Prof Dr Pieter Doevendans is Professor of Cardiology at the Division Heart and Lungs in the UMC Utrecht. He studied medicine in Leiden and then trained as a cardiologist in Maastricht. Next he moved to the UMC Utrecht. Since May 2004, he has been full professor in Translational Cardiology, and in 2005 he became chairman of the Department of Cardiology at the UMC Utrecht. He serves an additional role as chairman of the working group of Cellular Biology of the Heart, part of the European Society of Cardiology. His research interests include stem cell therapies for treating cardiovascular disease and understanding sudden cardiac death.

Professor Murray Esler

Professor Esler is a cardiologist and medical scientist, based at the Baker IDI Heart and Diabetes Institute and the Alfred Hospital, Melbourne, Australia. His research interests are:

- The human sympathetic nervous system
- Stress, and its effects on the heart and blood pressure
- Causes and treatment of high blood pressure and heart failure
- Neurotransmitters of the human brain

Professor Esler is the author of more than 350 papers on these topics. His principal research contribution has been the development of isotope dilution methodology to study the human sympathetic nervous system in internal organs not accessible to microneurography (“regional noradrenaline spillover” technique), and the application of this tool in the investigation of the sympathetic neural physiology of circulatory control, aging, exercise and mental stress responses, and the neural pathophysiology of cardiac failure and essential hypertension. His demonstration of a high level of chronic activation of the cardiac sympathetic outflow in patients with heart failure provided the theoretical backdrop for the evaluation of beta-adrenergic blockers in this condition. More recently, his demonstration of activation of the renal sympathetic outflow in essential hypertension was the stimulus for the development of a new treatment for difficult to control patients, radio-frequency ablation of the renal sympathetic nerves with purpose-designed renal artery catheter. He was chief investigator of the randomized controlled trial describing the successes achieved with this new treatment published in the Lancet (17 November 2010).

Prof Dr med Ulrich Laufs

Professor Ulrich Laufs is Professor for Clinical and Experimental Medicine and Vice Chairman of the Department of Internal Medicine, Cardiology, Angiology and Intensive Medicine at the University of Saarland, Homburg, Germany. He completed his training at the University of Hamburg, and did his residency at the University of Köln. After spending 2 years in the Cardiovascular Division of Brigham and Women's Hospital, Boston, he undertook his fellowships at the University of Köln and the University of Saarland. Professor Laufs has received numerous honors including the Elite Reviewer Award from the European Heart Journal, and he has published in multiple peer-reviewed journals.

Dr med Felix Mahfoud

Dr Felix Mahfoud is an internist at the Klinik für Innere Medizin III, Department of Internal Medicine and Cardiology, University of Saarland, Homburg, Germany. Hestudied human medicine at the Johann-Wolfgang-Goethe University, Frankfurt/Main, Germany and the University of Toronto, Canada. A recipient of multiple national awards, Dr Mahfoud has also authored multiple publications in peer-reviewed journals. He is a member of several organizations including the “German Chapter of the Young Cardiologists”, ESC and the “Working Group on Interventional Hypertension Treatment”, German Hypertension League.

Professor Willem Mali

Willem Mali received his MD from Utrecht University in 1975. He became a resident in radiology at the University Hospital Utrecht and was registered as radiologist in 1980. In 1979 he performed a fellowship in radiology at the University of California in Los Angeles. In 1984 he obtained his PhD in medicine for research on a vascular interventional procedure. From 1987 to 1992, he was medical manager of the Department of Radiology at the University Hospital Utrecht. In 1989 he became professor of radiology at this hospital.

Since 1993, Willem Mali has been responsible for the clinical research of the radiology department. He has initiated and participated in many of the large-scale trials that validated newly developed minimally invasive treatment techniques. This involved iliac artery stenting (DIST trial), renal artery stenting (STAR trial), carotid artery stenting (ICSS trial), vertebroplasty (VERTOS trial), and many other interventional procedures. He directs the research at the department of radiology, involving 8 postdocs and 12 PhD students and a small trial o ce.

Willem Mali is (co)author of 360 articles in peer-reviewed international journals and has supervised 68 PhD theses.

He has been a member of several committees of the Gezondheidsraad, of the Foundation “Het Nederlands Tijdschrift voor Geneeskunde”, of the SCK committee of the Dutch Cancer Society and of the scientific board of the Netherlands Heart Foundation.

Willem Mali is a honorary Fellow of CIRSE (the Cardiovascular International Radiological Society of Europe).

PD Dr Kai Mortensen

PD Dr. Kai Mortensen is a Senior Physician at the University of Lübeck, Department of Cardiology in Lübeck, Germany. Dr. Mortensen attended medical school at Christian- Albrechts University Kiel, Germany and Basel, Switzerland. After completing his internships at the Department of Heart Surgery, Kiel (CAU), Germany and Internal Medicine, University Hospital Hamburg (UKE), he went on to perform his fellowship in internal medical/cardiology at the University Heart Center in Hamburg, Germany. Mortensen is board certified in emergency medicine, internal medicine and cardiology.

Professor Markus Schlaich

Associate Professor Markus Schlaich is a nephrologist with a specific interest in hypertension, its causes and consequences. Dr Schlaich has a strong clinical research background in hypertension, nephrology and cardiovascular disease, and is an author on more than 130 peer-reviewed articles and book chapters. He has a specific interest in treatment modalities targeting the sympathetic nervous system and has contributed to the development of renal denervation as a novel therapeutic approach to hypertension. He currently heads the “Neurovascular Hypertension & Kidney Disease Laboratory” at the Baker Heart Research Institute and acts as Director of the Alfred & Baker Hypertension Network. He also holds an NHMRC Senior Research Fellowship and an academic appointment with the Department of Medicine of Monash University and serves on the Executive Committee of the High Blood Pressure Research Council of Australia.

Professor Dr Heribert Schunkert

Professor Dr. med. Heribert Schunkert is Clinic Director at the University Hospital Schleswig Holstein, Campus Lübeck. His early scientific career was spent at the RWTH Aachen and in Boston at Harvard Medical School at both the Brigham and Women's Hospital and at Beth Israel Hospital. He returned to Germany where he completed his fellowships in cardiology and interventional cardiology at the University of Regensburg, after which he was an attending physician in cardiology and then head of the department. Professor Schunkert's major research interests include molecular biology and genetics of cardiovascular diseases; regulation of myocardial growth processes; and epidemiological aspects of hypertension and coronary heart diseases. He has served on the editorial boards for various scientific journals; he is also a member of many professional societies. Professor Schunkert has been the recipient of several awards in the field.

Dr med Christian Ukena

Dr Christian Ukena is an internist with a focus on clinical electrophysiology at the Department of Cardiology, University of Saarland, Homburg, Germany. In 2009, Dr Ukena was a recipient of the Young Investigator Award from the German Society of Hypertensiology (DHL). His research interests include hypertension, heart failure, myocarditis, and electrophysiology.

Dr Britta Vogel

Dr Vogel started her career in the cardiology department of the University Hospital of Heidelberg in 2006. Her clinical focus is on interventional cardiology, as well as interventional angiology. She has been performing renal denervation since November 2010, and is also in charge of the recruitment of patients with resistant arterial hypertension, suitable for the RDN procedure. Besides her clinical interests, Dr Vogel also heads several studies exploring the role of microRNAs in various cardiovascular diseases. Above that, she is interested in the research of the molecular mechanisms leading to heart failure in zebrafish.

Dr Evert-Jan Vonken

Evert-Jan Vonken, MD, PhD studied medicine at the University of Utrecht, and completed his PhD research at the UMC Utrecht. He performed his residency at UMC Utrecht followed by his fellowship at Johns Hopkins University, USA from 2006-2007. Vonken has been a staff member in the interventional radiology department at UMC Utrecht since 2008. His areas of interest include neurovascular interventions, especially intra-arterial thrombolysis and peripheral vascular interventions, in particular, “below the knee” revascularization in patients with critical ischemia. Vonken’s scientific research includes involvement in the PADI trial (antiplasty with drug eluding stent of infrapopliteal stenosis in critical limb ischmia) and involvement in research on the intra-arterial RFA of the renal artery for the treatment of hypertension.

Dr Michiel Voskuil

Michiel Voskuil studied medicine in Amsterdam. He did his PhD training under the supervision of Prof Dr JJ Piek at the Department of Cardiology, Academic Medical Center (AMC) in Amsterdam. His thesis was entitled: “Experimental and clinical studies on collateral and epicardial flow in obstructive arterial disease” (dissertation in 2003). His fellowship in interventional cardiology was also performed at the AMC. Since 2010 he has worked as an interventional cardiologist at the University Medical Center in Utrecht. His focus besides percutaneous coronary interventions (including rotablation, intracoronary physiological paramaters, radial access) is on percutaneous treatment of hypertension (‘renal denervation’) and percutaneous treatment of congenital heart disease (ASD/PFO/PDA closure, coarctation stenting, Melody valve implantation).

Professor Joachim Weil

Professor Joachim Weil is Vice-Director Internal Medicine, Cardiology, Angiology and Intensive Care Medicine, in the Department of Internal Medicine II at the University Hospital Lübeck, Germany. Weil attended medical school at the University Medical School in Freiberg, Germany, and continued with his graduate studies in molecular biology (cell and molecular) at the University Medical School in Hamburg, Germany. After his internship in internal medicine at St Georg's Hospital in Hamburg, he completed his residency in internal medicine at the University Hospital Regensburg. Professor Weil is a member of multiple professional societies, and has published extensively in peer-reviewed journals.

Professor Dr Martin Zeier

Associated Professor Martin Zeier, MD, FASN is a renal physician and since 2004 has been head of the Division of Nephrology at Heidelberg University Hospital. He started his career in the Division of Nephrology in 1985, and is a specialist for kidney diseases, cardiovascular diseases and the treatment of hypertension. His main interest is in kidney transplantation, including transplantation of high-risk immunized patients, AB0 incompatible transplantations and immunosuppressive treatments. Since 1985 he has been giving lectures on kidney disease at the University of Heidelberg. Professor Zeier has strong scientific interests and is the author of more than 220 scientific publications in peer-reviewed journals as well as an author of several book chapters.