

Table of Contents

02 Outlines

05 Coronary Heart Disease Center

09 Cardiac Arrhythmia Center

11 Hypertension Center

13 Pulmonary Vascular Diseases Center

15 Key Laboratory of Clinical Research for Cardiovascular Medications, NHFPC & Phase I Ward

17 Emergency and Intensive Care Center

18 Endocrinology and Cardiovascular Disease Center

20 Dyslipidemia and Cardiovascular Disease Center

22 Heart Failure Care Center

24 Special Care Medical Center

26 Thrombosis and Vascular Medicine Center

29 科研课题



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President's Address

Since 2008, the Department of Cardiovascular Medicine of Fuwai Hospital has released an annual report every year. Reporting outcomes is not only important for keeping our patients informed, but also for facilitating our relentless efforts to provide the highest quality and most efficient care possible.

'Quality and Innovation' is the central philosophy of Fuwai hospital. In 2017, we have worked heartedly for providing more patients with better service and medical solutions. As the national leader in the field of cardiovascular diseases, we have been focusing on the latest technology application and quality improvement to maximize the efficacy of our treatment. Outcomes 2017 includes some highlights of the last productive year, rather than a comprehensive recording of what we have done.

Since its establishment in 1956, Fuwai Hospital has been home to generations of physicians, working tirelessly for the prevention and treatment of heart disease. Through their efforts, Fuwai hospital has become a national leader in treatment, prevention, and research of cardiovascular disease.

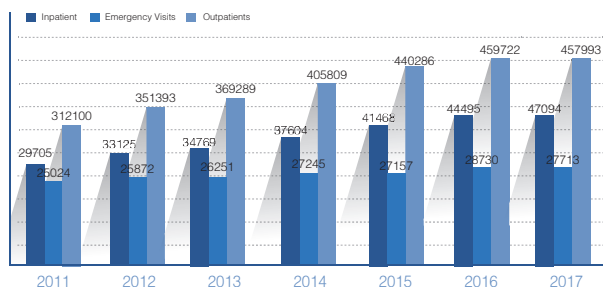
I express my deep appreciation for the hard work and dedication of every one of our colleagues in 2017. I am also grateful for the crucial feedback from our patients, the medical community, and society at large. Thank you for your help and support.

Outlines

The Department of Cardiovascular Medicine includes 9 treatment centers, 1 drug monitoring unit, and 1 key laboratory of Ministry of Health. During 2017, the Department of Cardiovascular Medicine managed 47,094 inpatient admissions and 457,933 outpatient visits. The Department of Cardiovascular Medicine is recognized as the leading department in China for the diagnosis and treatment of coronary artery disease, arrhythmia, heart failure, secondary hypertension, pulmonary hypertension and other complications of heart diseases.

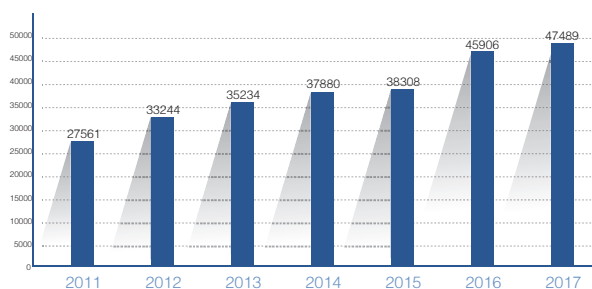
The inpatient mortality rate has been reduced to 0.1%, which meets the international standard. A total of 47,489 interventional therapeutic procedures were performed at the Department of Cardiovascular Medicine during 2017, indicating that our hospital has become one of the world's largest treatment centers.

Numbers of patients managed per year from 2011 to 2017

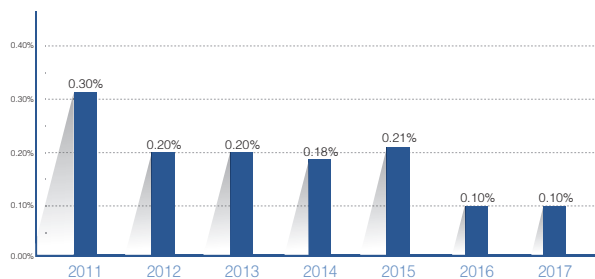




Numbers of interventional therapeutic procedures performed per year from 2011 to 2017



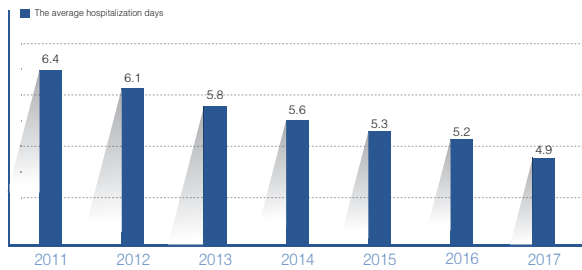
The Inpatient Mortality per year from 2011 to 2017



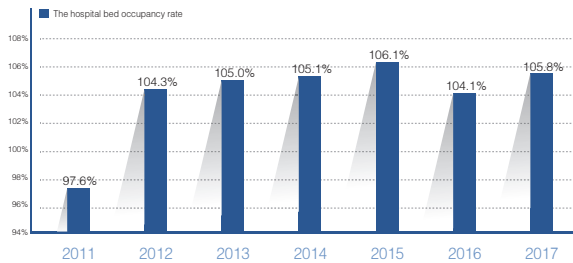
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The average hospitalization days per patient admission for the last 7 years



The hospital bed occupancy rate for the last 7 years



Coronary Heart Disease Center

The Coronary Heart Disease Center was founded in 1978. Some of China's leading cardiologists, including Professors Shou-Qi Tao, Zai-Jia Chen, Yi-Shu Xu, Ji-Lin Chen, and Yue-Jin Yang were former directors of the center. Professor Shu-Bin Qiao is the current director. The center was originally named as the Center for Diagnosis and Treatment of Coronary Heart Disease. It was renamed to its present name in 2003. The center is committed to achieving excellence in clinical care, research, and education. A total of 21 professors (chief physicians) work at the center currently, including 1 academician of engineering. Other staffs include 35 associate chief physicians. During the past year, a total of 37 in-hospital doctoral students, 49 graduate students, and 123 fellows were trained at the center.

The center consists of 7 wards, 1 coronary care unit (CCU), 1 intensive care unit (ICU), with a total of 264 inpatient beds. The number of percutaneous coronary intervention (PCI) procedures has increased by 0.3% in 2017, reaching 17,851, and 884 cases were primary PCIs. Transradial PCI (TRI) has accounted for 16,077 (90.1%) of all PCI procedures. More than 3/4 of TRIs were performed in high-risk patients with complex lesions, including 14,667 (88.2%) patients with multi-vessel disease, 486 (0.3%) patients with left main disease, and 2,149 (12.0%) patients with chronic total occlusion. Percutaneous transluminal septal myocardial ablation with alcohol for hypertrophic obstructive cardiomyopathy was performed in 25 patients. Quality of PCI has been improved continually, as evidenced by significantly decreased mortality rate for elective PCI (0.02%, 4/16,967) and low mortality rate for primary PCI (1.02%, 9/884). Both the quantity and quality of PCI procedures performed via transradial approach were higher than any other centers worldwide.

For many years, the center has conducted live broadcasts of complicated coronary PCI on the international conferences as China Heart Conference (CHC), China Interventional Therapeutics (CIT), Euro-PCR in Europe, Transcatheter Cardiovascular Therapeutics (TCT) in United States and Transcatheter Cardiovascular Therapeutics Asia Pacific (TCTAP) in Korea. By these academic activities, the

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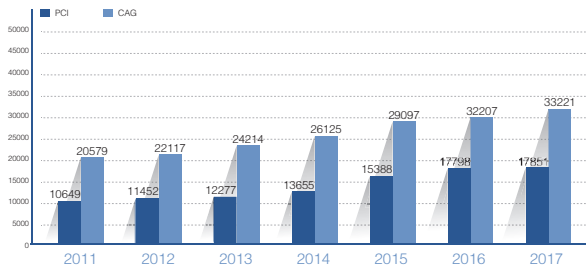


center has gained global recognition and become the largest PCI and TRI center worldwide. In 2017, the center has also paid attention to PCI of complex higher-risk and indicated patients (CHIP). Professor Shu-Bin Qiao, as the chairman, established the first CHIP club in China, which focuses on mechanical devices assisted intervention and high-risk or complex clinical situations, such as left main bifurcation, chronic total occlusion, severe calcification, diffuse or small vessel disease, and graft vessel disease. A series of training program both on- and off-line have helped to improve the treatment and clinical care of CHIP patients in China.

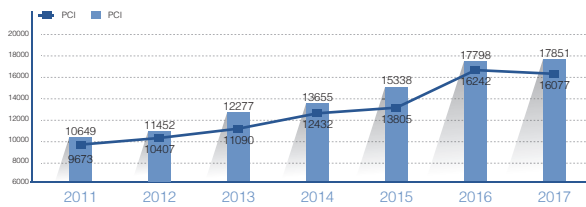
In 2017, several novel PCI techniques and devices were utilized in our center, such as excimer laser coronary atherectomy (ELCA) treating in-stent CTO lesion, CrossBoss/Stingray antegrade dissection reentry technique, robot assisted PCI, Impella assisted PCI, and transcatheter aortic valve replacement (TAVR). Sixty-two TAVRs were performed last year and number of total cases has been above 200. Clinical trials on domestic biodegradable scaffolds and quantitative flow ratio (QFR) have made great progress with results presented in both international conferences and journals. In 2017, the center received longitudinal funding from 8 different research grants, with a total of 6.355 million RMB. Eight new lateral research projects are in progress, with total 5.312 million RMB supported. The center has published 60 research articles during 2017.



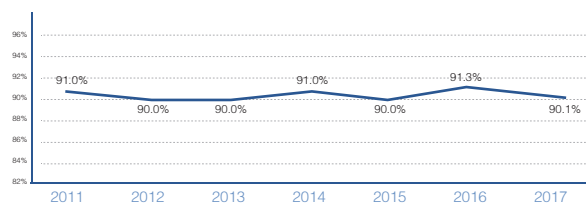
Numbers of coronary angiography (CAG) and percutaneous coronary intervention (PCI) procedures performed per year from 2011 to 2017



Numbers of PCI and PCI by transradial intervention (TRI) procedures performed per year from 2011 to 2017

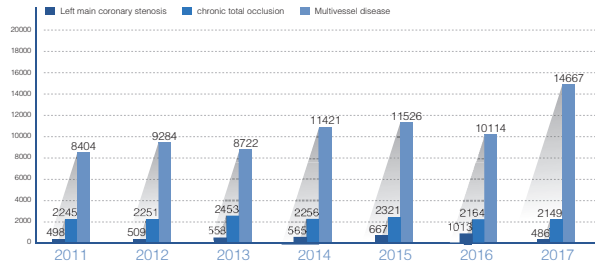


The proportion of TRI/Total PCI procedures performed per year from 2011 to 2017

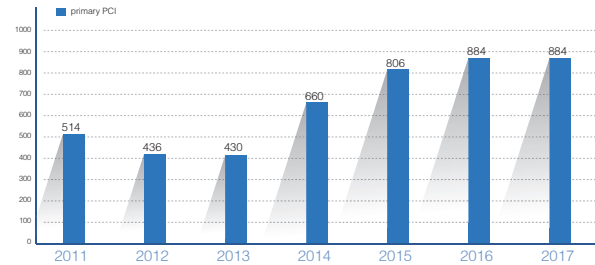




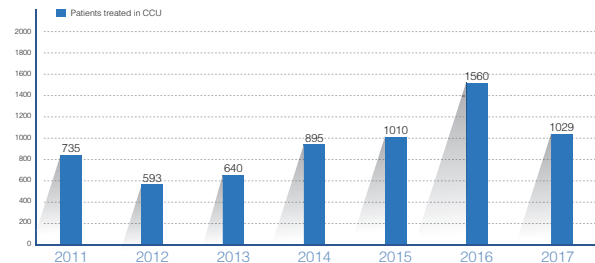
Numbers of patients with complex coronary artery disease who underwent PCI procedures per year from 2011 to 2017



Numbers of patients who underwent primary PCI procedures per year from 2011 to 2017



Numbers of patients admitted to the coronary care unit per year from 2011 to 2017



Cardiac Arrhythmia Center

The Clinical Electrophysiological Laboratory of Fuwai Hospital was founded in 1981, and was the only one domestic professional institution that engaged in research and treatment of cardiac arrhythmias at that time. Professor Chen Xin and Professor Wang Fangzheng, as the center directors in succession, led the clinical electrophysiological laboratory ever since it was established. Professor Zhang Shu is the current director of the Cardiac Arrhythmia Center. The Laboratory changed its name to Cardiac Arrhythmia Center since 2003. Currently, the center has 12 Professors (Chief Physician) including 3 professors who are recipients of special government allowance, 10 deputy chief physicians, 21 doctoral students, 18 graduate students. The center takes advantages of talented professionals that dedicate to collaborative operation and high technology adoption, and manage the variety of difficult arrhythmia cases with the "all-weather capability." Therapeutic range covers all types of arrhythmias. The curative efficacy and follow-up standards have reached to the international advanced levels.

Cardiac Arrhythmia Center now has 4 wards with over 120 beds. Since 2001, the center has conducted more than 40000 cases of arrhythmia catheter ablations and implanted over 19,000 pacemaker/ICD units. In 2017, the center performed 2111 pacemakers-ICD-CRTs implantation including 329 ICD+CRT; 5050 catheter ablation therapies were performed with 2206 atrial fibrillation cases and 1026 cases of ventricular arrhythmias. From the point view of quantity and quality, the center has long been recognized as the No.1 arrhythmia management institute in the Asian-Pacific region, and it has stood among one of the largest arrhythmia interventional treatment centers in the world, as shown in Figures below. The center always actively develops and adopts new technologies for treatment of arrhythmias. In 2017, the center had successfully implanted the first subcutaneous ICD(S-ICD). Professor Zhang Shu as the Secretary-General has successfully presided over the 2017 World Congress of Arrhythmia in Beijing.

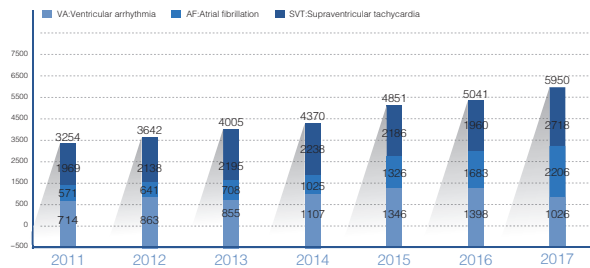
Moreover, the Center has successfully led key scientific programs of the national 10th five-year and 11th five-year projects, which focused on the incidence of atrial fibrillation and sudden cardiac death in China, and the findings derived from these two 5-year projects were published internationally. At present, working

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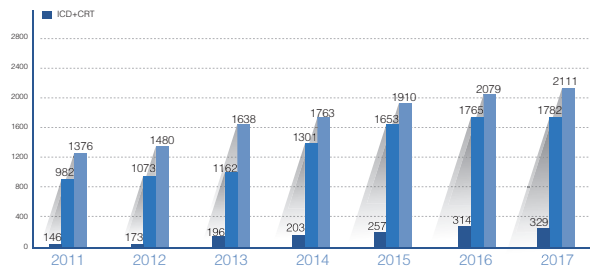


together with other divisions, the center is taking the lead in three cornerstone programs of the national 12th five-year project. In 2017, the center obtained 9 scientific research grants sponsored by the government, a total of 17.56 million RMB funding. In 2017, the center had published a total of 49 papers.

Numbers of radiofrequency catheter ablation procedures performed according to type of arrhythmia per year from 2011 to 2017



Numbers of devices implanted per year from 2011 to 2017



Hypertension Center

The Hypertension Center was established in 2003, and was previously named the Institute of Hypertension. Professors Lisheng Liu, Deyu Zheng, Guozhang Liu, Rutai Hui were former directors of the Center. Professor Jun Cai is the current director. The staffs working at the center now include 2 emeritus professors, 4 full professors, 5 associate professors. There were 6 in-hospital MD students, 8 Master students.

The center specializes in the research and treatment of hypertension, and includes a ward with 38 inpatient beds. This has become one of the largest centers in the Asia-Pacific region specializing in the management of hypertension and peripheral vascular disease. The staff members have extensive experience in the standard management of secondary hypertension, resistant hypertension, and peripheral vascular disease. The center has a prestigious leading role in the field of hypertension treatment, providing interventional diagnosis and treatment of peripheral vascular disease.

Ambulatory blood pressure monitoring (ABPM), limb blood pressure, arterial hardness, endothelial function testing and sleep apnea monitoring have been performed for numerous patients in the center. As well as pressure titration of CPAP for patients with moderate to severe sleep apnea. Depending on the laboratory findings and nuclear medicine results of plasma renin, aldosterone, urine aldosterone, plasma catecholamine, urine metanephrines and normetanephrines, as well as serum cortisol, urine free cortisol and 1-mg overnight dexamethasone suppression test(DST), together with I - 131 iodine benzyl guanidine (MIBG)adrenal medulla imaging, many cases of primary aldosteronism, pheochromocytoma and Cushing's syndrome have been diagnosed during the last year .

Most diagnoses and treatments worldwide of Takayasu arteritis were achieved in our center, since the use of 18 f - deoxidization glucose positron emission imaging (18 f - FDG PET), which providing early diagnosis and monitoring of disease activity, greatly improving the diagnosis and treatment of Takayasu arteritis .





From 2014, the center has explored the application of molecular diagnosis technology in young refractory hypertension patients, made the diagnosis and treatment standards and processes of secondary hypertension, refractory hypertension to reach the international advanced level.

The number of cases managed is currently increasing by 30% per year. A total of more than 2500 therapeutic renal artery interventions were performed so far, with a complication rate of 0.8% and mortality rate of 0.13%, which is lower than that reported by other centers internationally. Long-term treatment outcomes are also good compared with other centers internationally. During the past year, 493 high risk cases of supra-arch artery (carotid artery, vertebral artery and subclavian artery) and 212 cases of renal artery interventional therapy were performed, both ranking first in China. The Hypertension Center has treated 71 patients with primary aldosteronism using percutaneous selective adrenal artery embolization.

The Center organized and participated in 3 projects supported by National Natural Science Foundation of China. The Center won many National Science and Technology Progress Awards, and currently conducting the national 12th five-year project of "Resistant Hypertension". Eighteen papers indexed by the Science Citation Index (SCI) were published in 2017.



Pulmonary Vascular Disease Center

Research Laboratory for Cor Pulmonale and Pulmonary-Cardiac Circulation of Fuwai Hospital are founded in 1972, and then renamed as Pulmonary Vascular Diseases Center in 2003. The former directors of the center are Prof. Cai Rusheng, Prof. Chen baiping and Prof. Xiansheng Cheng successively. Now, the director is Prof. Jianguo He. The PVD center now has four professors (Chief Physician), three associate professors (associate chief physician), eight PhD candidates, two master student, three specialized training doctor, and seven visiting doctors in Pulmonary Vascular Diseases in 2017.

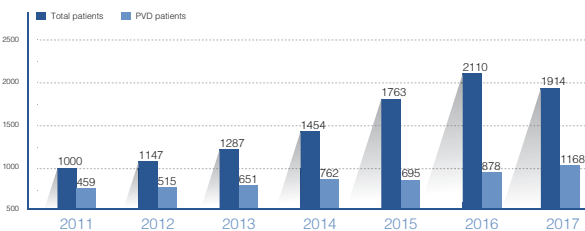
The PVD center has one ward and forty beds. It is dedicated in a wide spectrum of cardiovascular diseases, and is extremely famous in China for pulmonary vascular diseases including pulmonary embolism, pulmonary hypertension (PH), and right heart diseases. The number of discharged patients of PVD center was 1914 (including 1168 patients with pulmonary vascular diseases) and the number of patients who underwent right heart catheterization examination and pulmonary vascular intervention was 410 in 2017. Great achievements in the diagnostic accuracy, healing rate, rate of successful rescue, bed utilization ratio and the control of medical costs of single disease are made. And cardiopulmonary exercise testing has been carried out on patients with pulmonary vascular disease creatively.

New advance and new achievement were made by the staff of the center in 2017, such as undertook a total of 17 government sponsored programs including two Key Projects in the National Key Technology R&D Program during the 13th Five-Year Plan Period, among which the center led one (Figure 1) and participated in another. Also, the center undertook a total of 3 new projects of National Natural Science Foundation of China and some other projects, and 4 international multi-center clinical trials. In 2017, the center has published 11 papers.

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Total number of discharged patients of PVD center and the number of patients with PVD.



The 2017 summing-up meeting of the 13th Five-Year Plan project--- research on diagnosis and treatment of complications and comorbidities of chronic obstructive pulmonary disease



Key Laboratory of Clinical Research for Cardiovascular Medications, NHFPC & Phase I Ward

Key Laboratory of Clinical Research for Cardiovascular Medicines (used to be Clinical Pharmacology Laboratory/Center) was founded in 1983, under the advocacy of famous cardiovascular specialist ShouQi Tao. Professor Ping Tao and Professor Yishi Li have successively become the directors of the Lab. The current director is Professor Lixin Jiang. In December 2001, as the Chinese first specialized in medical clinical research, Key Lab was approved by Ministry of Health. The first-class research team, first-class research facilities, and first-class management have been built in our Lab, through the clinical research on different categories of cardiovascular disease related medicines. For the medical and health affairs of our country, it has been a state of the art of research platform for innovation. With opening to the society, it provides public welfare research and services for medical clinical research.

In the past few decades, the ability of clinical evaluation of medicines have been continuously improved in Key Lab. It has already had the early phase clinical research ability for cardiovascular innovative candidates, including FIH(First in Human), phase II and III safety / effectiveness clinical evaluation; At the same time, we have the ability of comprehensive evaluation of large-scale multi-center clinical trials with clinical outcome events as the end point. It will provide full process and high quality clinical evaluation technology support for China's self-developed cardiovascular innovative medicines. Since 2000, nearly 300 clinical trials for new drugs have been completed in Phase I-IV, involving more than 100 new drug products, covering almost all varieties of cardiovascular medicines in the world. Our Lab plays as the guiding role of clinical evaluation for cardiovascular drugs.

According to the requirement of ISO17025/15189 certification, key laboratories established a medical testing platform for clinical trial with excellent personnel, scientific management, good equipment, accurate and reliable test results. It has four affiliated laboratories: Lab of Drug Metabolism, Lab of Clinical Detection, Pharmacogenomics & Proteomics Lab and Lab of Therapeutic Drug Monitoring (TDM). In 2008, Key laboratory was first approved by the ISO 17025 Laboratory (CNAS) accreditation / metrology certification. And on-site review was passed in 2017. The ISO 17025 laboratory accreditation / metrology certification continuously





issued by the China National Accreditation Service for Conformity Assessment (certificate number: CNAS L3456). It indicates that our Lab and foreign laboratories are at the same level of management, and the testing results have been internationally recognized.

Under the unified deployment of hospitals, the renovation and reconstruction of key laboratories and Phase I wards completed this year. The ward beds increased from the original 24 to 28, and were officially put into usage on December 1st. Key Lab also passed the assessment of the Science and Education Division of the National Health and Family Planning Commission and the result was "good."

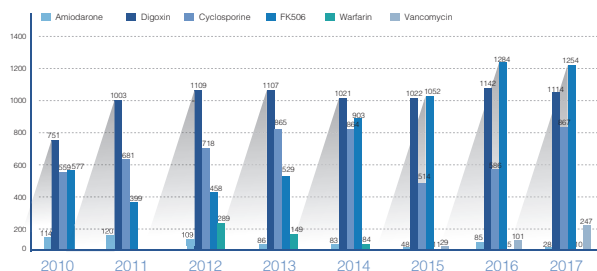
In 2017, Key Lab is responsible for reporting adverse response and monitoring therapeutic drugs for Hospital : 96 cases of adverse drug responses were reported. 52 cases of adverse medical device were reported. The total 3510 cases are for year of 2017, including 1114 digoxin cases, 867 ciclosporin cases, 28 amiodarone cases, 1254 FK506 cases, and 247 vancomycin cases. Genotyping was carried out for clinical samples 10 subjects in this year, for providing guidance on individualized clinical application of Warfarin.

In 2017, Key Lab was granted with one state-sponsored research project. As an open research platform, Key Lab also responsible for: one topic of capital characteristics, one project from Chinese Pharmacological Society, and 2 drug clinical trials. Commissioned by the CFDA, Key lab is the lead in the revision of Chinese' GCP regulations. And we have started to solicit online comments. In 2017, the center had published 11 papers.

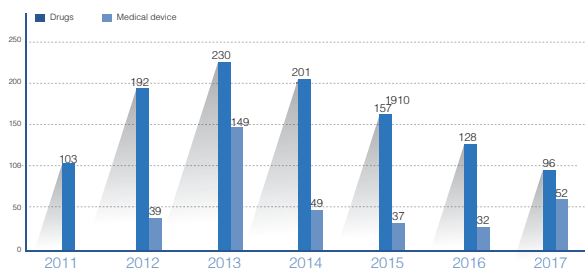




Numbers of patients undergoing therapeutic drug monitoring per year from 2010 to 2017



Numbers of adverse drug reactions reported per year from 2010 to 2017



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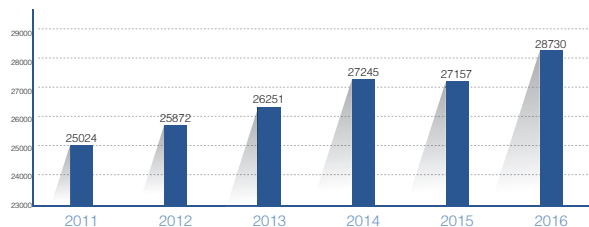
Emergency and Intensive Care Center

The Emergency and Intensive Care Center of Fuwai Hospital consists of the Emergency Room, ICU and an Emergency Ward. It is one of the largest centers specialized in the clinical management and research of acute severe cardiovascular disease. There are many experienced clinical experts and a variety of advanced equipment. A total of 27,713 patients were treated in the Emergency Room in 2017 with more than 99% survival rate in severe and critical patients. The Emergency Room are experienced in treating Acute Coronary Syndrome, Aortic Dissection, Hypertension emergency, Acute Heart Failure. The ICU and Ward No. 19 are experienced in treating end-stage ischemic heart disease, cardiomyopathy, valvular heart disease, aortic dissection, and acute coronary syndrome. In 2017 more than 3000 inpatients have been admitted.

The Chest Pain Center which base on emergency department are serviced for patients with a set of symptoms that include chest pain and chest tightness for improving the process of diagnosis and increase the accuracy and effectiveness of treatment.

This center is also very active in clinical and basic research. There are several projects founded by national grants, clinical trials at III-IV phase for cardiovascular medicines and international multicenter trials, including AVERROES , Inter-CHF、RE-LY-ABLE、HOPE- 3, GLORIAL,ELIXA,COMPASS, Medical and health innovation project ,etc. In 2017, the center had published 8 papers.

Numbers of patients treated in the emergency room per year from 2011 to 2017



Endocrinology and Cardiovascular Disease Center

Endocrine and Cardiovascular Disease Center was established in 2011, professor Guangwei Li is the current director. The staffs working at the center include 2 chief physician, 4 vice physician, 2 in hospital doctoral students, 1 graduate students.

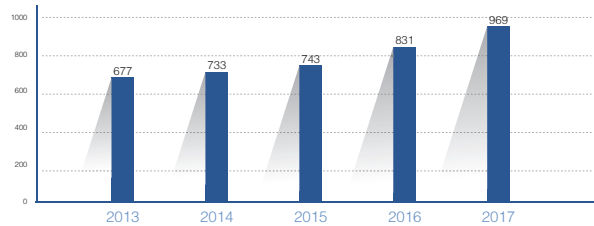
The center has 1 ward, 25 beds. Outpatient amount in 2017 was 10622, increasing by 12.3% compared with 2016; the discharged amount has reached 969, which was increased by 19.3% compared with 2016, the amount of consultation within the hospital reached 3415, increased by 21.5% compared with 2016. The insulin pump intensive treatment in newly diagnosed type 2 diabetes, which was characteristic treatment of the center, was kept conducting since the center was established. Almost 470 cases finished the special treatment until the end of 2017 in total, remaining 50% remission rate consecutively. The center's program - "The standardized systemic management of hyperglycemia in the whole hospital", was kept conducting, all the wards in the whole hospital was covered with monitoring instrument and in 2017 had come into service in 2 wards, which helped achieving better glycemic control, reducing perioperative complication and shortening hospitalization days as consequence. The center of "Chinese Diabetes Society Diabetes Care and Education Authentication Base" was kept conducting, more nurses were trained to be specialized in diabetes education, who provided special diabetes care and education, such as lifestyle intervention and medication advice to diabetic patients, patients satisfaction was increased greatly. In 2017, the nursing consultation clinic was initiated, 114 patients have attended the clinic, which played a key role in better self-management, better glycemic control, delaying diabetic complication and improving life quality.

In 2017, the center hosted 11 studies in total, the total research fund reached 4.5 million Yuan. 5 oral presentations in international scientific meeting, 2 oral presentations in domestic scientific meeting, 6 posters exchange in domestic scientific meeting. The center of national pharmacological test center was kept doing clinical trials, in 2017 one 3-phase clinical trial was undergoing, one 3-phase clinical trial had already approved by the ethics committee of Fuwai hospital.

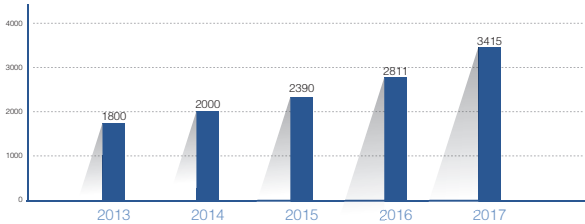




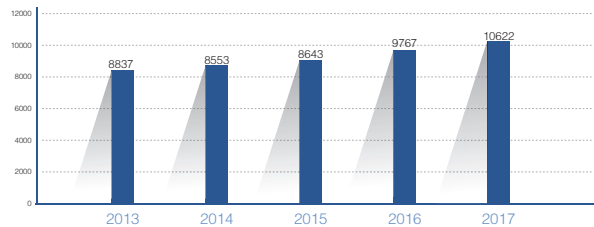
The number of discharged patients from 2011 to 2017



The number of outpatients from 2011 to 2017



The number of consultations from 2011 to 2017



Dyslipidemia and Cardiovascular Disease Center

Center for Dyslipidemia and Cardiovascular Disease (CDCD) was established in October, 2010 and the current Chief of the center is Professor Jian-Jun Li, MD, PhD, FESC, FACC. CDCD focus on the clinical practice, education, scientific research with respect to lipid disorder and cardiovascular disease, especially atherosclerotic cardiovascular disease (ASCVD). The principle staff of the center consists of three professors and three associate professors. Of them, two are doctoral tutor, three are master tutors. There are seven doctoral students and eight master students in our team during 2017.

A 51B ward is currently affiliated to CDCD, which locates at North Building of FuWai Hospital, and there are nominal 21 beds (actually running 35 beds) prepared mainly for patients with lipid disorder or accompanied by ASCVD. Basic research unit of the center is covered by State Key Laboratory of Cardiovascular Disease at ShiJingShan district, Beijing. The principle research field of CDCD is comprised of the prevention and treatment of coronary artery disease, especially focusing on the translational medicine with regard to the association of primary or secondary dyslipidemia and inflammation with ASCVD. CDCD is the earliest center in China which is established specially for dyslipidemia and cardiovascular disease.

Achievements on clinical practice of CDCD during 2017 have also been remarkable similar with passing years. A total of 2342 patients (mainly dyslipidemia and/or ASCVD) were admitted to the center. Of them, 1626 patients were successfully performed with percutaneous coronary intervention (PCI) or coronary angiography (CAG). More importantly, during 2017, there were no medical accidents, deaths, medical complaints, and key medical errors, which showed an excellent clinical practice. CDCD team is the first in China to carry out plasma exchange therapy for familial hypercholesterolemia (FH) (since 2015). During 2017, further indications of plasma exchange are investigated by CDCD. By the end of 2017, a total of 57 patients with FH were successfully treated by plasma exchange with excellent effect and good safety. This work made a strong influence in the clinical practice of FH and



During 2017, successful "Lipidology Forum" during China Heart Congress'2017 was wonderfully accomplished and the 4th Fuwai Lipidology Forum "2017 Fuwai clinical lipid management & basic translation forum" was performed successfully. These high level academic activities built the important academic status of CDCD in the lipid field of China. At the same time, the CDCD team insists on inspired medical rounds and clinical discussion, as well as medical literature reading (2 times for a week). Every young physician in CDCD team actively participated in writing scientific papers. Every one of them gave academic lectures regularly. In addition, there is a scientific research discussion meeting every week for team members. CDCD team encourages every physician to investigate clinical practical problems, especially to establish scientific ideas and methods. CDCD is becoming an experienced center for training young lipid specialists and lipid scientists.

Not surprisingly, 2017 is also the harvest year for CDCD concerning scientific achievements. A total of 31 peer-reviewed SCI indexed papers had been published with the total impact factor is 79 scores (6 of them, IF higher than 5). CDCD continues to participate in several international large multicenter clinical trials in the lipid field and carries out series clinical and basic researches of their own. In view of the excellent scientific work, CDCD was awarded with the prize of "Advanced Research Group " in 2017 by Fuwai Hospital.





Heart Failure Care Center

Heart Failure Care Unit (HFCU), the predecessor of Heart Failure Center, was initially founded in 2002 and renamed Heart Failure Center in 2012. It is one of the characteristic departments in Fuwai Hospital and the first professional medical center established in China focus on prevention, diagnosis, treatment and research for heart failure (HF). Over the past 15 years, the center has done a lot of works on medical practice, scientific research and teaching for HF and made remarkable achievements in China.

The current director of the Center is Jian Zhang and vice director is Yu-hui Zhang. The Center has a skilled medical and scientific research team for HF including 5 chief physicians, 3 associate chief physicians, 4 attending physicians and 1 deputy director nurse at present. Moreover, one postdoctoral and more than 10 doctor students have been trained and studied in the Center. So far, there are 28 beds in HFCU associated with Heart Failure Center.

With regard to clinical works, around 700 patients with HF has been admitted to HFCU in 2017. The main etiology of HF was cardiomyopathy, especially dilated cardiomyopathy, which also included coronary artery disease, infective endocarditis, pericardial diseases and valvular heart disease. By means of ultrasound-guided endocardial myocardial biopsy combined with various cardiac imaging and gene detection, the ability of identifying the cause of HF and the diagnosis and differential diagnosis of cardiomyopathies with different types has markedly improved. Routine Swan-Ganz balloon floating catheter is used to evaluate and monitor the hemodynamics of patients with HF to guide clinical management. On the basis of guideline-directed medical therapy, some non-medical device treatments such as bedside hemofiltration or ultrafiltration, extracorporeal membrane pulmonary oxygenation (ECMO), percutaneous left ventricular assist device (i.e., Impella) were actively carried out in some patients with refractory HF and several patients in critical condition were successfully rescued in the Center.

In terms of scientific researches, the data platform for China Heart Failure Registry (China-HF) has been further developed and the results involving the largest number of patients (13, 687) hospitalized with HF in China so far has been published in 2017 by the Center, which has provided a scientific basis for national prevention



and treatment of HF. Furthermore, the Center has undertaken the National Key Research & Development Program of the 13th Five-year Plan Period, study on the prevention and control of major chronic non-communicable diseases, research on long-term management and evaluation of chronic HF and establishment of quality control system, and the registry study on the application of ultrafiltration in the management of patients with acute decompensated HF and water and sodium retention has also initiated in 2017. As an important new drug research platform in China, the Center has undertaken many clinical evaluation studies on new drugs for HF at home and abroad and won a good reputation in the world.

As for social activities, the Center has hosted the China International Heart Failure Congress (CIHFC) 2017 & 2nd Annual Scientific Meeting of Chinese Heart Failure Association (CHFA), Chinese Medical Doctor Association (CMDA), and undertaken the Heart Failure Forum in China Heart Congress (CHC) 2017. Moreover, relying on the International Academy of Heart Failure (IAHF) and the Heart Failure Web, the Center has carried out a wide range of professional education programs for physicians in HF nationwide in 2017, which has helped to increase the level of standardized diagnosis and treatment of HF for physicians and made great contributions to improve the overall situation of prevention and treatment of HF in China. In addition, in 2017, the Center has established the first professional journal of HF in China, the Chinese Journal of Heart Failure and Cardiomyopathy, published the Chinese Expert Consensus on the Clinical Standardized Application of Intravenous Beta-adrenergic Receptor Blocker, and the 2017 Guideline (China) for the Management of Hypertrophic Cardiomyopathy, which has helped to guide the diagnosis and treatment of HF and related diseases.

Above all, the Heart Failure Center will continue to work hard with rigorous working attitude and advanced medical technology to provide comprehensive and high-quality medical services to the majority of patients with HF in our country. While further promoting the clinical application of new drugs and new technologies, the Center will also pay attention to early prevention and treatment of HF, holistic management and comprehensive rehabilitation of patients with HF, and strive to make new greater contributions to the development of HF in our country.



Special Care Medical Center

Special Care Medical Center was founded in 2004, which consists of 2 internal medicine wards, 1 surgical ward, outpatient service, cardiac specialist examination office and intractable disease consultation center. The director of the center is Professor Dang Aimin, and vice-directors are Professor Huang Xiaohong and Professor Wang Liqing. The center currently internal medicine has 4 professors (chief physicians), 6 deputy chief physicians, and 3 senior attending physicians.

The clinical characteristics of the center contain comprehensive treatment and management of cardiovascular diseases (CVD) for elderly, early screening for CVD, intractable disease consultations, VIP health care and international medical services. 2527 patients were admitted in 2017, and the annual interventions were 2025 person-times, in which most cases were associated with complex lesions and chronic total occlusion. 1. Comprehensive treatment and management of cardiovascular diseases include: (1) Coronary heart disease: The center carried out evaluation and revascularization of elderly patients (>75 years of age), reduced cardiac function (LVEF<35%) cases, chronic total occlusion of coronary, severe coronary artery calcification, left main trunk and bifurcation lesions, which accounted for about 70% of the total cases. (2) Hypertension: Overall assessment of target organ damages and individualized optimal management were carried out whereas gradual development of ambulatory blood pressure monitoring, arterial stiffness and vascular endothelial function tests, sleep respiratory monitoring were also conducted in the center. (3) Arrhythmia: The evaluation of thromboembolism and bleeding risk in elderly patients with atrial fibrillation, and the installation of artificial pacemakers in patients with high-risk arrhythmias. (4) Heart failure: according to the characteristics of senile end-stage heart failure combined with multiple organ dysfunctions, comprehensive management and long-term follow-up were achieved for these patients. 2. The joint medical team composed of academicians and well-known cardiologists regularly participated in the union rounds for patients with intractable disease. 3. More than 60,270 senior specialist clinic services were provided in 2017. An intractable disease consultation system were established and 197 consultations had been provided. The center has been responsible for health care for VIP and 73 international patients in 2017. 4. The center helped to conduct the special care examinations and early screening for

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CVD of 1600 person-times in 2017.

We successfully hosted Cardiovascular Aging and Geriatric Cardiovascular Diseases Forum in 2017 CHC. In addition, the center has also held the Advanced Training Course for elderly patients with cardiovascular disease for several consecutive years, it has become an extraordinary forum in this field of China.

In 2017, the center successfully applied for 6 academic programs and was involved in several large-scale clinical studies domestically and abroad. 5 SCI papers and several key journal articles were published.



Thrombosis and Vascular Medicine Center

Thrombosis and Vascular Medicine Center (TVMC) of Chinese Academy of Medical Sciences FuWai Hospital is founded in 2013. TVMC is a multi-divisional department involving clinical care, basic research and epidemiological study. The first and current chair, Professor Zhi-Cheng Jing, is also the chair of Beijing Thrombosis and Haemostasis Society and the winner of both National Natural Science Fund for Distinguished Young Scholars and Yangtze River Scholars Distinguished Professorship from Chinese government. Current faculties include 1 professor, 1 chief physician, 5 associate chief physicians, 2 associate research fellows and 1 associate chief technician. Our ultimate aim is patient benefit, which drives our medical innovation. TVMC is dedicated to build a world-class medical center for thrombosis and haemostasis disease, Eisenmenger's syndrome, pulmonary vascular disease, myocarditis and myocardiopathy.

TVMC offers specialist outpatient clinics for pulmonary embolism, pulmonary artery hypertension and anticoagulation, as well as specialist inpatient care. TVMC provides patient care in specialized area, including pulmonary embolism and deep vein thrombosis, intracardiac and arterial (coronary artery included) thrombosis, all classes of pulmonary hypertension (pediatric pulmonary hypertension and chronic thromboembolic pulmonary hypertension [CTPEH] included), hemoptysis, hemorrhagic disease and right heart disease, myocarditis and myocardiopathy. Routine clinical treatments include thrombolysis for pulmonary embolism, right heart catheterization, acute pulmonary vasodilator test, percutaneous coronary intervention, inferior vena cava angiography and filter placement, pulmonary artery angiography, balloon pulmonary angioplasty (BPA), endomyocardial biopsy, percutaneous atrial septostomy. Molecular diagnosis service for thrombophilia in Chinese population was started from 2013. Genetic diagnosis service for inherited pulmonary hypertension and pulmonary vascular disease was started from 2015. Within TVMC, most of the state of the art therapies are available. TVMC plays an active role in the international and national multi-center clinical trials. In 2017, TVMC has launched a world first prospective multi-center clinical trial of pulmonary embolism thrombolytic therapy with recombinant human pro-urokinase (rhPro-uk). In 2016, TVMC started refined BPA treatment for chronic pulmonary





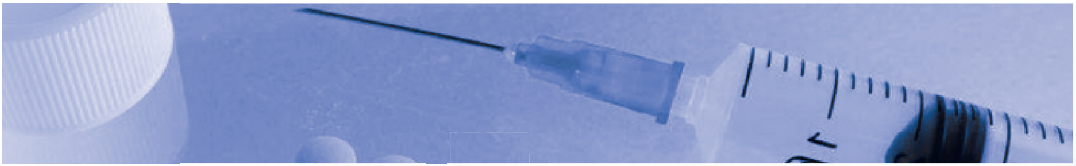
obstructive vasculopathy, including CTEPH, pulmonary vasculitis and fibrosing mediastinitis etc. In 2017, this procedure was further improved by cooperation with surgical team, leading to the Chinese first series of hybrid or bridging operations of BPA and pulmonary endarterectomy for severe and complex cases. TVMC performs the most BPA procedures in the country, with more than 80 patients benefited from the improvement of symptoms and prognosis since 2016. The perioperative complications and mortality rate were comparable with the world-class level. As a nationwide leader of BPA, TVMC is active in popularizing this procedure throughout China. We have already helped carry out BPA treatment in more than 20 hospitals and facilitated 3 publications on BPA in China.

TVMC offers anticoagulation outpatient clinics every afternoon from Monday to Friday, setting up the long-term follow-up and management system for patients with thrombosis, taking novel oral anticoagulants and warfarin. Our management focuses on reducing the recurrence of thrombosis.

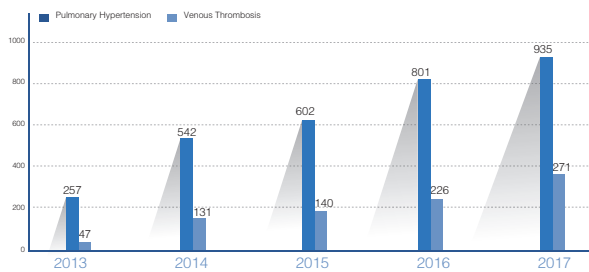
In 2017, the Chinese Academy of Medical Sciences Key Laboratory of Pulmonary Vascular Medicine was officially approved to be set up and embedded in TVMC. Current projects are supported by the Major Program of the National Natural Science Foundation (NNSF) for Orphan Diseases, Distinguished Young Scholars Fund of NNSF, Key Program of NNSF, Major Program of International Cooperation of NNSF and several other projects. The laboratory is dedicated to build the world-class cohort, bio-bank and immortalized lymphoblast cell lines for rare pulmonary vascular and thrombosis disease. Current research focuses on thrombosis and pulmonary vascular disease, involving multi-omics approaches (whole genome sequencing, proteomics, metabolomics), patient-specific induced pluripotent stem cells, gene editing and cell transplantation, aiming to explore new therapy for patients. We have provided genetic counseling for more than 1000 pulmonary hypertension patients, supporting hereditary disease patients with more information on management options and family planning.

The Long March National Vascular Medicine Conference held by TVMC offers excellent communication opportunities for specialists in this area. The 9th annual conference was held in 2017 and is now a high-impact conference in pulmonary vascular medicine in the country, with nationally recognized contribution to specialist training, building pulmonary vascular science and enhancing international communication.





Pulmonary Vascular Disease in Inpatient Ward



Major Pulmonary Vascular Interventional Procedures

