



FUWAI HOSPITAL, CAMS
NATIONAL CENTER FOR CARDIOVASCULAR
DISEASES, CHINA

CARDIOVASCULAR SURGERY OUTCOMES 2018



国家心血管病中心
中国医学科学院阜外医院
外科年度报告

连续9年位居

“中国医院最佳专科声誉排行榜”

心外科第一！

Ranked #1 in **Cardiovascular Surgery**
on “China Best Hospital Leaderboard”



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序 言

President's Address

Since 2007, the surgical department of Fuwai Hospital has released annual outcomes reports to the public every year. These reports not only enable patients to obtain information on the quality of our team's medical care, but also attract the attention of peers and health workers.

"Quality and Innovation" is the eternal philosophy of our surgical team. In 2018, we made great efforts to build the Medical Information Platform 2.0 version, to improve the quality of medical care with information technology, and to provide patients with safer and more effective treatment.

2018 is a crucial year for the promotion of strategic planning for Fuwai Hospital. The integrated medical pattern was completed. Fuwai Yunnan Cardiovascular Hospital and Fuwai Central China Cardiovascular Hospital have been operating smoothly for one year since their opening. Also in 2018, Shenzhen Sun Yixian Cardiovascular Hospital was renamed as Fuwai Hospital -Shenzhen. As national leader in the field of cardiovascular diseases in China, we kept striving to implement the state-of-the-art technology and pursuing the goal of "protecting health with heart", in order to promote the efficacy and quality of our medical services.

I would express my deep appreciation and gratitude for the hard working and dedication of every single individual employee in Fuwai. I am also grateful for the precious feedback from our patients, the medical community and society at large, we sincerely appreciate your concern and the assistance.



自2007年起，阜外医院外科每年都对大众公布年度业绩报告。年度报告的回顾总结，不仅能使患者获得了我们团队医疗质量的信息，也受到了同行和卫生工作者们的关注，成为医院督促自身提升高效和优质医疗服务的途径。

“品质与创新”是阜外外科团队永恒的目标。在过去一年里，我们全力打造阜外医疗信息化平台2.0版，以信息化为抓手提升医疗品质，为患者提供更安全、有效的治疗。

2018年对于阜外医院而言是推进战略规划布局的关键一年。医疗中心一体化医疗格局构建完毕，云南阜外心血管病医院和阜外华中心血管病医院平稳运营一周年、深圳孙逸仙心血管病医院正式更名中国医学科学院阜外医院深圳医院。作为我国心血管疾病治疗的领导团队，一代代阜外人秉承着对“用心守护健康”这一目标的不懈追求，兢兢业业，甘于奉献，救治了无数心脏病患者，铸就了“敬业、仁爱、求实、攀登”的“阜外”精神，一方面努力提升自身能力，一方面努力承担“国家队”的职责与担当，努力完善我国的心血管病防控体系。

阜外医院将继续遵循践行以“以病人为中心”的理念，优化医疗流程，创新医疗技术，努力为患者提供更好的服务，为打造国际一流的心血管医学中心而努力奋斗！

再次感谢阜外团队的每位成员在过去一年的辛勤付出，感谢所有帮助阜外发展的同行与朋友的支持！

Shengshou Hu, MD, FACC

Academician of Chinese Academy of Engineering

Director of National Center for Cardiovascular Disease

President of Fuwai Hospital, CAMS

Director of State Key Laboratory of Cardiovascular Disease

Director of National Center for Clinical Medicine Research of Cardiovascular Disease

胡盛寿 教授

中国工程院 院士

国家心血管病中心 主任

中国医学科学院阜外医院 院长

心血管疾病国家重点实验室 主任

心血管疾病国家临床医学研究中心 主任

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2018年数读阜外 Service Capacity of Fuwai

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36



病房
Wards

1,276



床位
Beds

26



手术室
Operation Room

17



导管室
Catheter Lab

14,455



2018外科手术量
Surgical Volume
in 2018

49,099



2018介入诊疗量
Intervention
Procedures in 2018

774,484



门诊量
Outpatient Visit

69,708



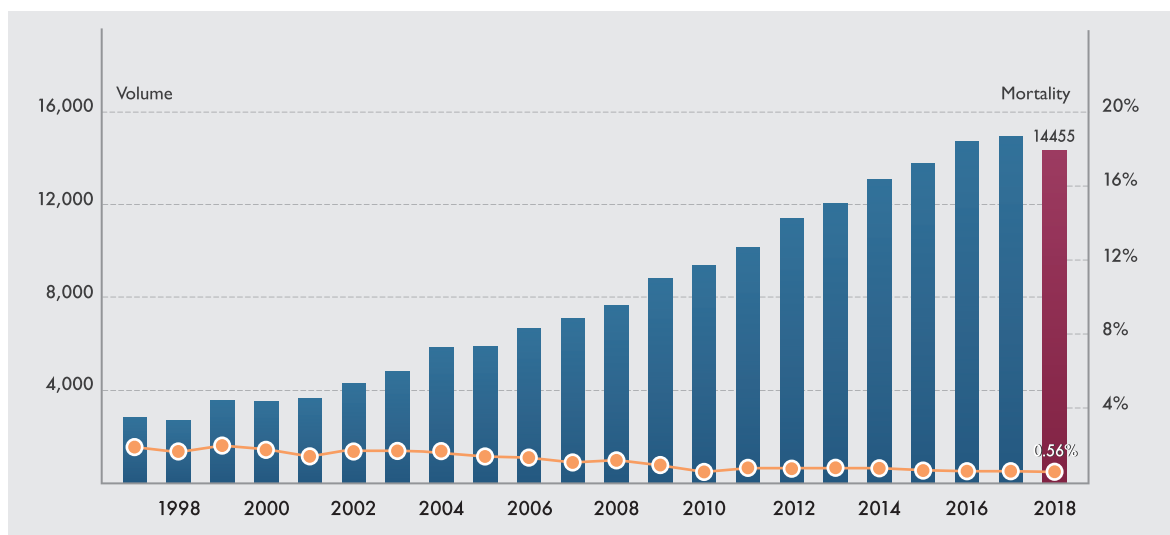
住院人数
Admissions

概述 Overview

心血管外科手术量 SURGICAL VOLUME

In 2018, the surgical volume of Fuwai Hospital reached 14,455. Thirty-day mortality, which has been below 1% for the past ten years, remained stable.

2018年，阜外医院外科手术量达到14455例（不含分院及协作点手术量），居世界各心脏中心前列。30天死亡率连续10年低于1%。



14455

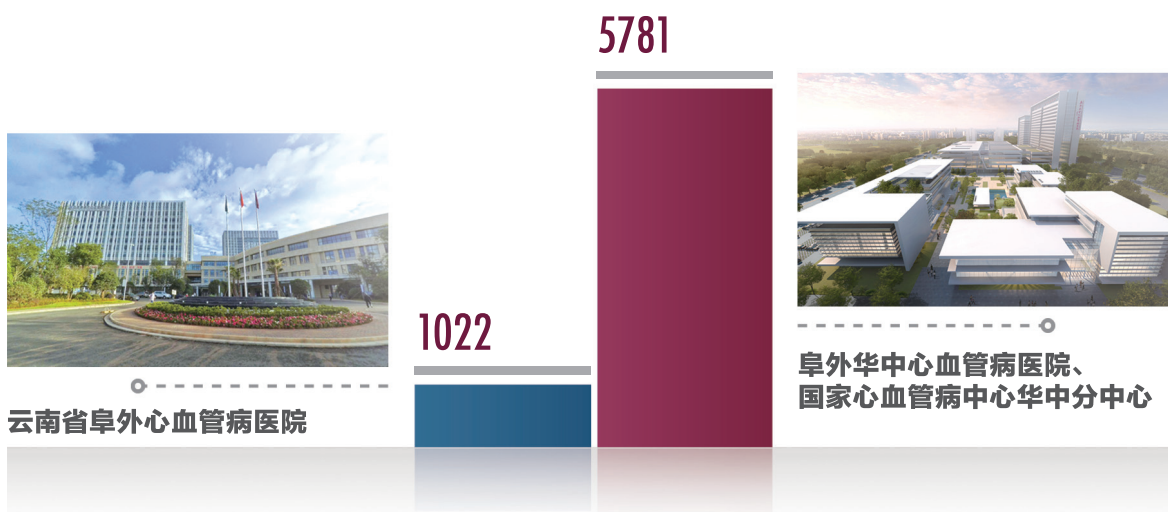
CASE No. OF CARDIOVASCULAR SURGERY 2018

分中心手术量

SURGICAL VOLUME OF SUBCENTERS

In 2018, surgeons at Fuwai Yunnan Cardiovascular Hospital performed 1022 cardiovascular surgeries, while 5781 cases of cardiovascular surgeries were completed at Fuwai Central China Cardiovascular Hospital and Central China Subcenter of the National Center for Cardiovascular Diseases.

2018年，云南省阜外心血管病医院共完成1022例心血管外科手术，阜外华中心血管病医院、国家心血管病中心华中分中心共完成心血管外科手术5781例。



质量控制

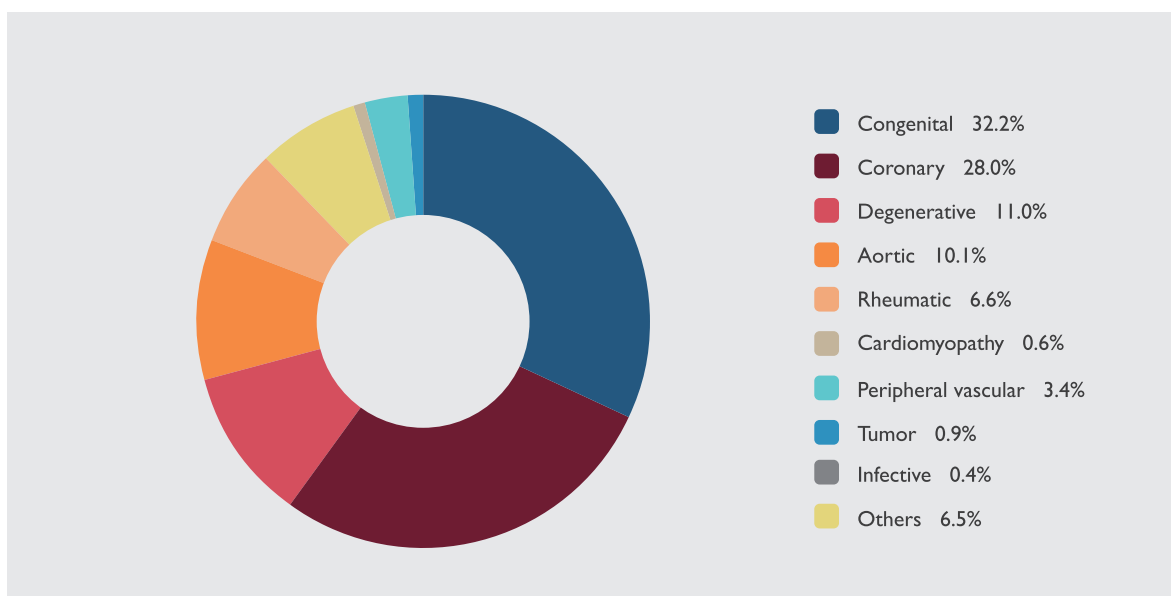
Quality & Safety

病因分布

ETIOLOGIC DISTRIBUTION

Fuwai Hospital treated a large number of patients with a variety of cardiovascular diseases, demonstrating the etiologic distribution of cardiovascular surgery in mainland China. Although congenital heart disease and coronary heart disease has remained the most commonly treated diagnosis at the hospital for years, the number of patients with aortic diseases or degenerative diseases has increased dramatically.

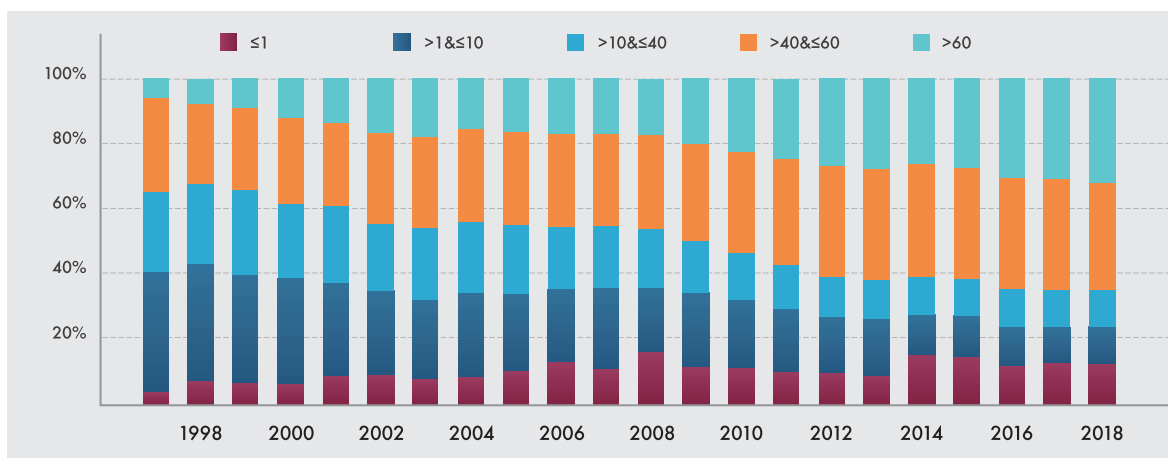
阜外医院心血管外科是全国收治心血管疾病种类最齐全的中心。医院收治患者的病因学分类基本反映出我国大陆地区心血管外科疾病治疗谱。先天性心脏病、冠心病仍为外科手术中主要病种，主动脉疾病和退行性病变所占比重呈上升趋势。



患者年龄分布 AGE DISTRIBUTION

With the improved healthcare conditions and longer life expectancy in China, there has been an increase in the percentage of patients who are either very young or elderly. The Fuwai surgical team has been dedicated to improving surgical techniques and achieving better clinical outcomes for these patients at increased operative risk.

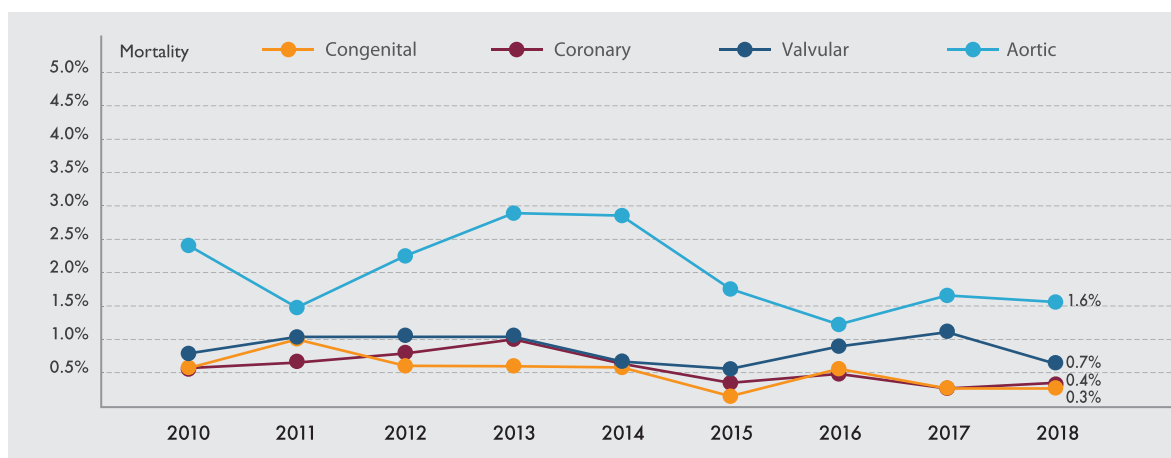
随着我国居民健康水平的不断提高和平均寿命的延长，低龄患者的早期诊治和高龄患者就医条件的改善促使患者年龄分布呈现两极分化的趋势，患者手术风险的增高对手术技术水平提出了更高的要求。



术种分组死亡率 MORTALITY RATE

With an increased focus on surgical quality control and adjustment of individualized surgical strategies for high risk patients, Fuwai Hospital has achieved relatively low 30 days' mortality comparable to those of leading cardiac centers worldwide.

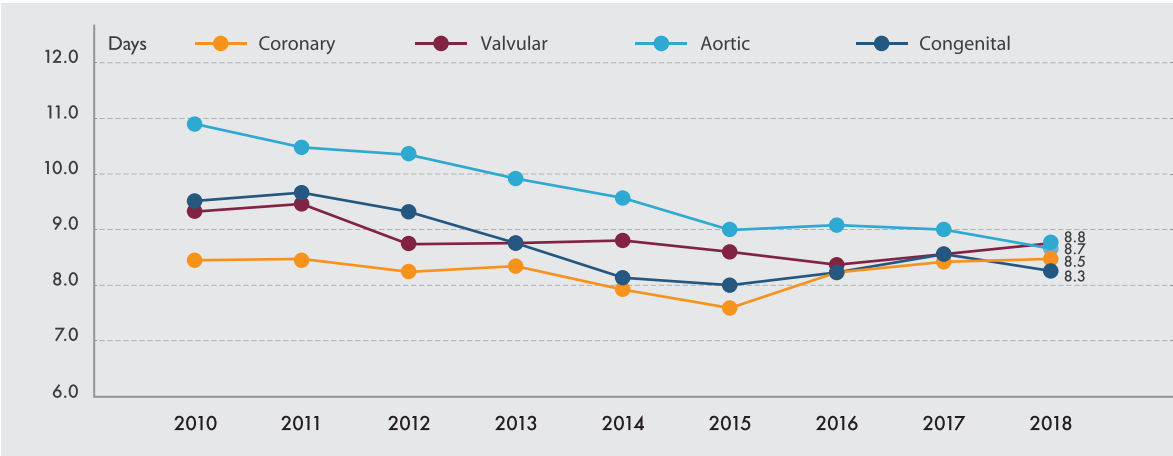
医院加强外科质量控制，努力实现高风险患者的个体化手术策略管理，不同种类心血管手术后30天死亡率均得到有效控制，总体质量达到世界主要心血管病中心水平。



术后住院时长 LENGTH OF POST-OPERATIVE STAY

Adopting advanced techniques can improve the efficiency of clinical practice and help to ensure patient safety and effective use of medical resources. With the focus on surgical advancement and quality, the post-operative hospital length of stay for our patients has gradually decreased in recent years, reaching an average of 8.6 days in 2018.

医院力争提高诊疗效率，有效节约医疗资源。近年来各术种术后住院时长均呈现总体下降趋势，2018年各类心脏手术术后平均住院时长约为8.6天。

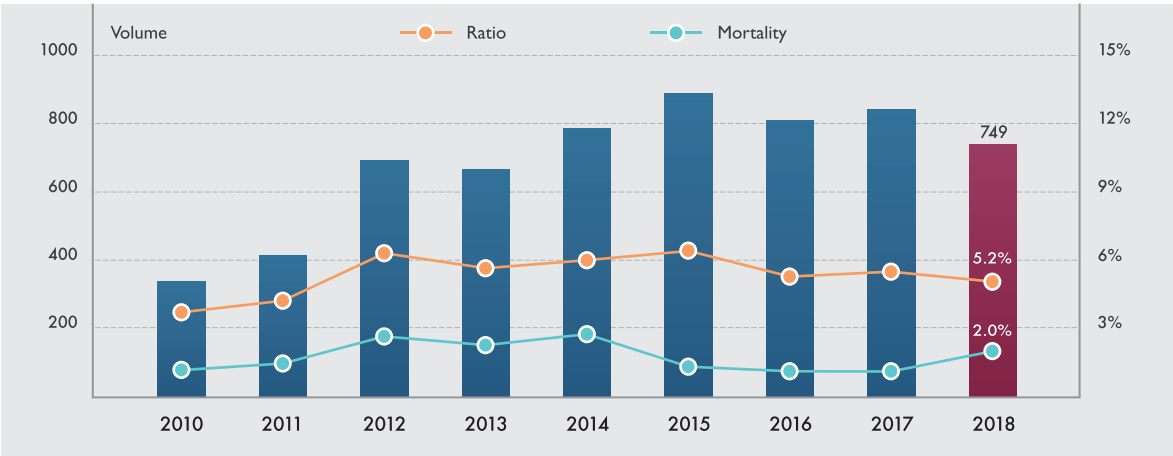


急诊手术

EMERGENCY SURGERY

Over the past nine years, the fast track system for emergency surgery has consistently improved with concomitant increases in surgical volume, and now it’s turning stabilizing. The mortality remains at an international leading level of 1%-2%.

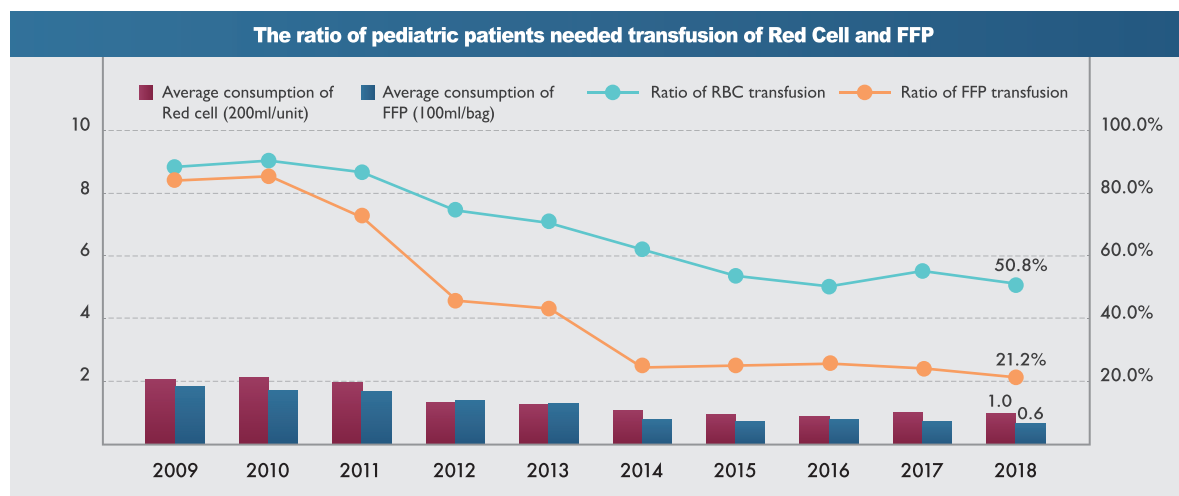
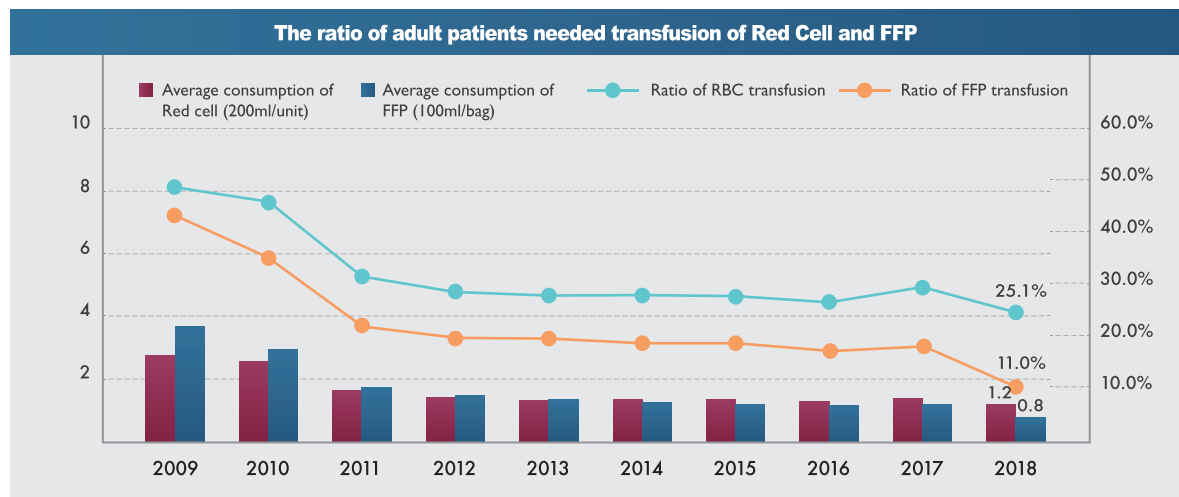
近9年来，医院不断优化急诊手术诊疗流程,急诊手术接诊量总体攀升，目前逐渐趋于稳定。手术死亡率维持在1%–2%。



手术用血比率及用量 BLOOD PRODUCT USAGE

The average consumption of blood product has noticeably decreased over time and stabilized in recent years, reflecting our improvements in healthcare quality and service. In 2018, our hospital further reduced the amount of blood product and improved the utilization rate of medical resources.

医院严格把控用血指征，血制品使用比例、人均红细胞及血浆用量呈持续下降趋势。2018年，我院进一步降低血制品用量，提高医疗资源的利用率。

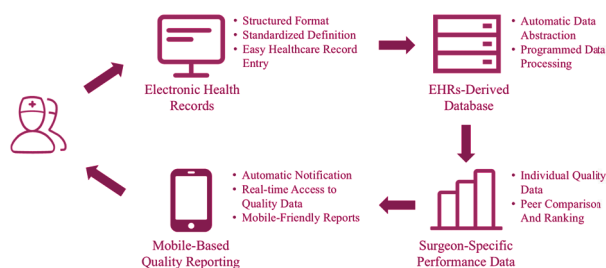


信息化途径定期发布医疗质量报告

ROUTINE PUBLISHING OF OUTCOMES REPORTS BY INFORMATION CENTER

Surgical quality improvement is an important task in Fuwai Hospital. In 2015, the quality improvement task force developed a surgeon performance monitoring system based on the structured electronic healthcare records (EHRs) and a mobile-based quality feedback platform, and provided multidimensional performance measurement and reporting. This system enabled real-time collection of surgical quality data, and measured the process, outcomes, and efficacy of surgeries. Each surgeon regularly received reports on their specific quality data and peer-comparison results, which were delivered through mobile based applications. With the implementation of this measure, the surgical team can improve the quality of medical care provided at our hospital

外科医疗质量控制是阜外医院管理的重要内容。自2015年，我院质控工作组基于结构化电子病历系统与移动信息平台，开发了信息化医疗质量监测系统，实现了医生手术质量的多维度评价与实时报告反馈。该系统实现了诊疗数据的实时上报，并对医生诊疗过程合理性、患者结局以及医疗资源耗费等多个维度进行全面评价。该系统利用微信公众平台、阜外员工APP等方式，向每一位外科医师定期推送针对性评价结果报告，展示医生个人医疗质量数据，并提供同行对比结果。此举措实施以来，有效促进了外科手术团队巩固优势、改善不足，更推动了我院整体医疗质量水平的持续提高。

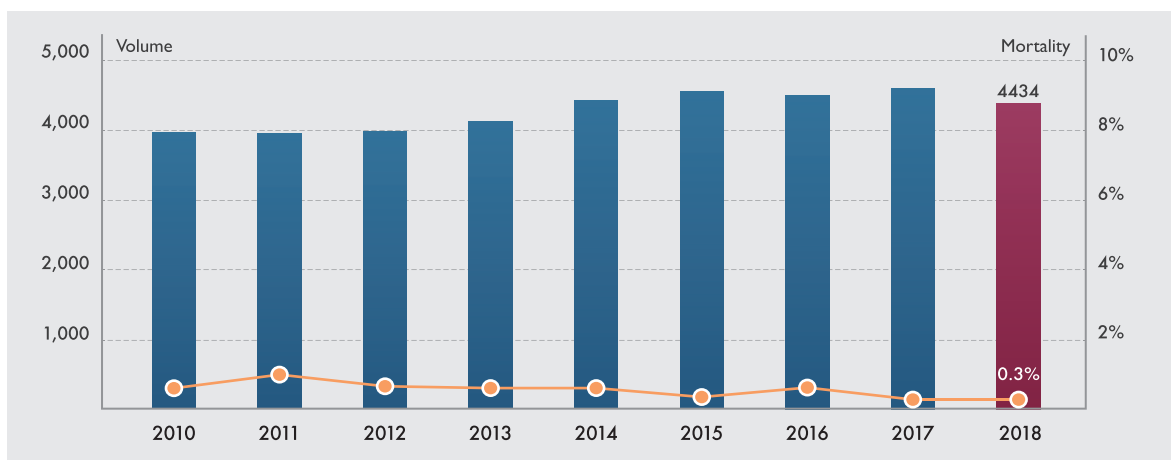


先天性心脏病 Congenital Heart Disease

先天性心脏病手术 CONGENITAL HEART SURGERY

Congenital heart defect remains the most common anomaly of the neonates. There are 150,000 to 180,000 newborns diagnosed with congenital heart defects every year in the nation. In 2018, the number of congenital heart surgeries reached 4434, with an extremely low mortality of 0.3%.

先天性心脏病是中国大陆新生儿最常见的先天性缺陷，全国每年约出生15–18万先天性心脏病患儿。在2018年，阜外医院先天性心脏病手术例数达到4434台，而死亡率仅为0.3%。



4434

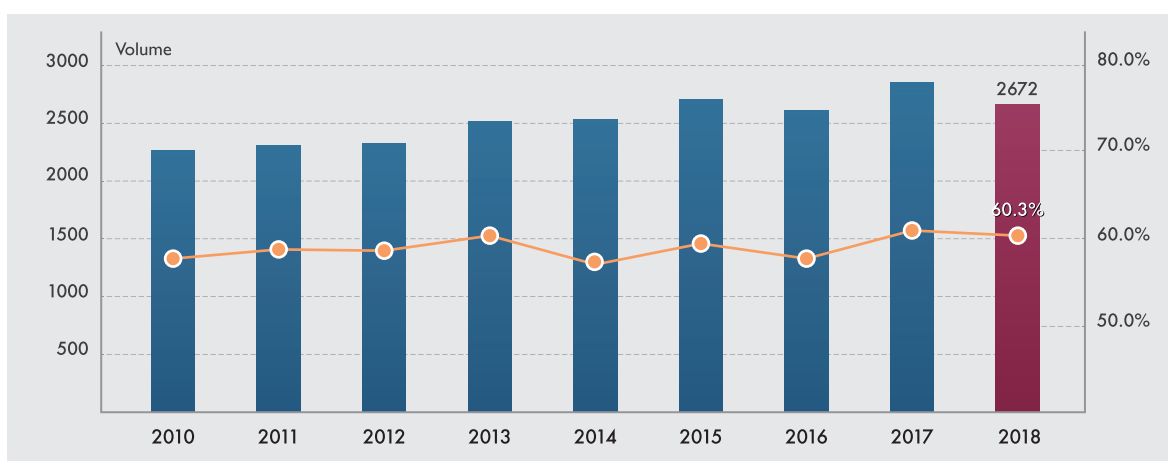
CASE No. OF CONGENITAL HEART SURGERY 2018

危重复杂先心病手术数量

SURGICAL VOLUME OF CRITICAL AND COMPLEX CONGENITAL HEART DISEASE

With the improvement of surgical technique and perioperative management, the complexity of congenital cardiac surgeries is continuously increasing. In 2018, more than 60% cases in Fuwai hospital were critical or complex congenital heart defects.

随着外科技术和围术期处理理念进步，阜外医院危重或复杂先心病手术所占比例逐年增加，在2018年危重或复杂先心病手术所占比例超过60%。

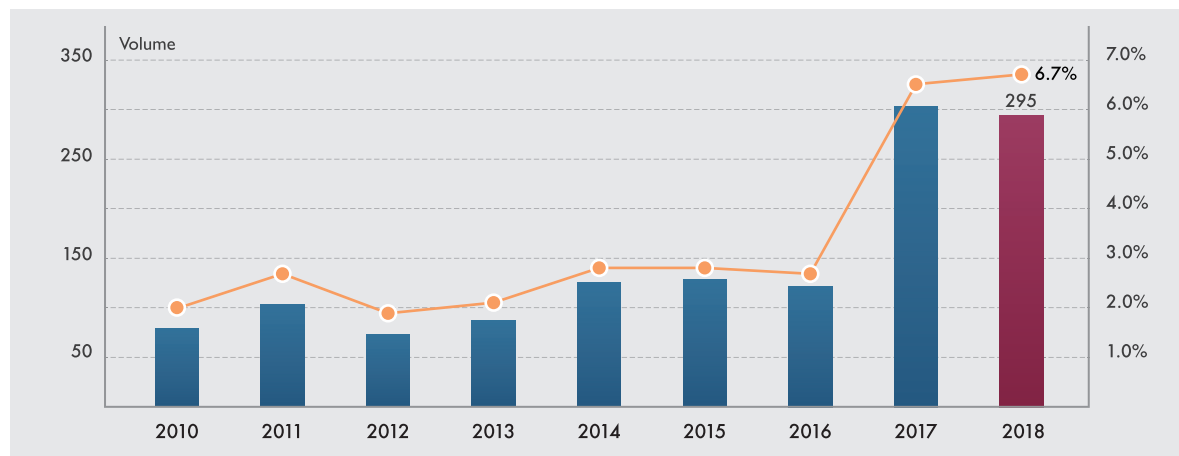


二次或多次手术比例

SURGICAL VOLUME OF REDO-CARDIAC SURGERY

As more patients who experienced congenital heart surgeries grown up, much more redo-cardiac surgeries were required. In 2018, the percentage of redo-cardiac surgery was 6.7%.

随着越来越多经历过先心病手术的患儿长期存活，近年二次手术的比例显著增加。阜外医院在2018年6.7%的手术是二次或者多次心脏手术。

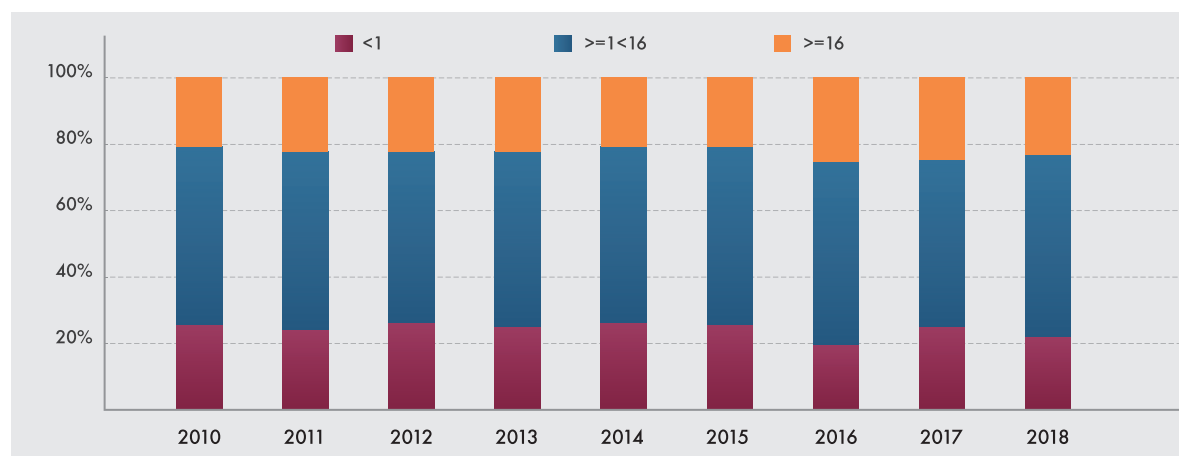


手术患者年龄分布

AGE DISTRIBUTION

As the number of patients with congenital heart anomaly surviving to adulthood increases, adult congenital heart surgery has become a new trend in congenital heart therapy. The rate of adult congenital heart surgery at Fuwai hospital has been over 20 percent for years.

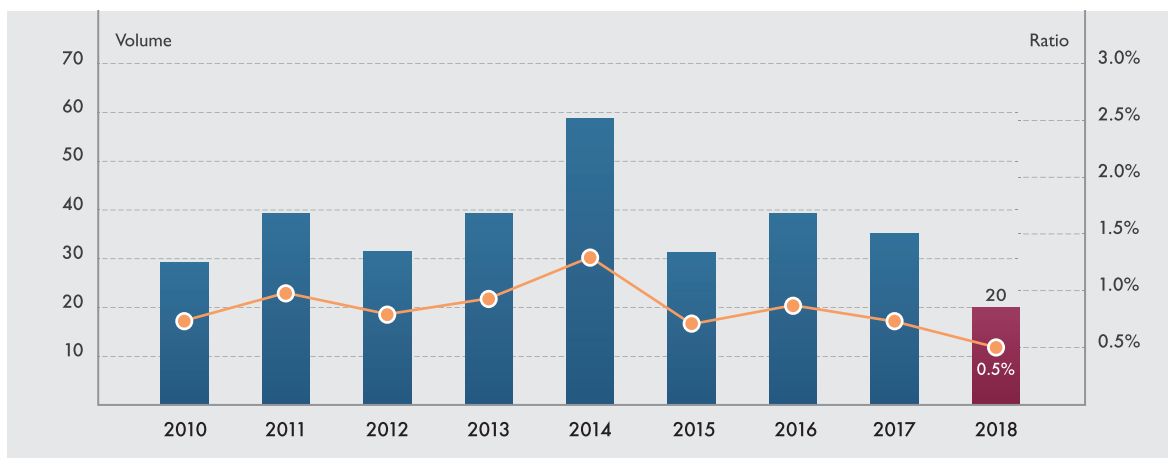
随着手术后的先天性心脏病患者数量逐年累积，众多成人患者需接受再次手术。阜外医院成人先天性心脏病手术所占比例近年一直维持在超过20%的水平，反应了全球先心病外科治疗的新趋势。



新生儿手术量 患儿手术数量 SURGICAL VOLUME OF NEONATES ($\leq 28D$)

Corrective surgery for neonates with complex congenital heart disease presents a major challenge. The surgical volume was stable in recent years while the mortality has been reduced annually.

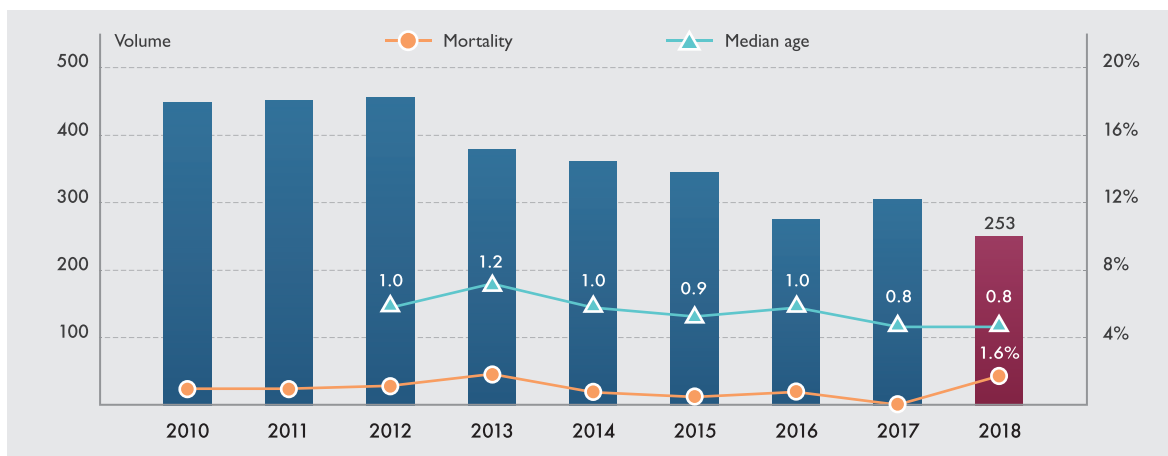
新生儿复杂先天性心脏病矫治术无疑是极富挑战性的工作，阜外医院外科团队在这方面数量保持稳定的情况下，死亡率逐年降低。



法洛四联症手术 SURGERY OF TETRALOGY OF FALLOT

Tetralogy of Fallot is the most common cyanotic congenital heart disease. The Department of Cardiac Surgery at Fuwai Hospital has broad experience with treating this condition and has produced excellent outcomes. In 2018, the median age of anatomical repair was below 1 year, and in hospital mortality was lower than 2%.

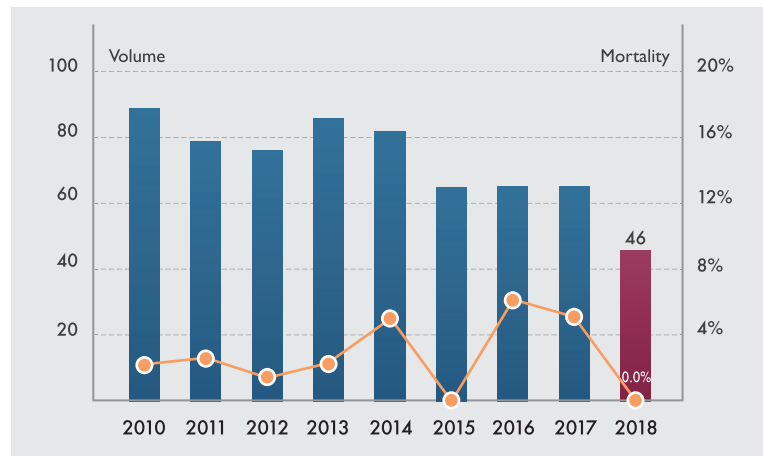
法洛四联症是紫绀类先天性心脏病发病率最高的疾病。阜外医院外科在根治法洛四联症方面积累了丰富的经验，并取得了居国际先进水平的治疗结果。2018年接受根治术患者年龄中位数已小于1岁，住院死亡率低于2%。



动脉调转手术 ARTERIAL SWITCH OPERATIONS

Arterial switch operation for transposition of the great arteries/double outlet right ventricle is considered as one of the most successful landmark congenital heart surgeries. The Fuwai team has achieved great success with this procedure and is recognized as one of the best centers performing arterial switch in the world.

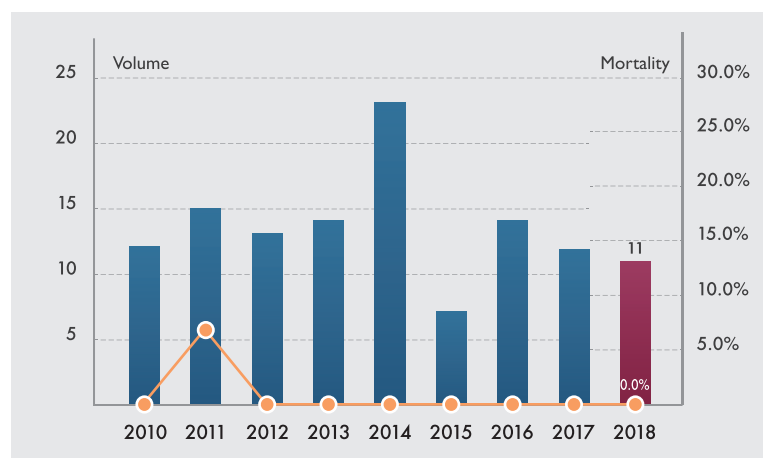
动脉调转手术治疗完全性大动脉转位、右室双出口等畸形是先心病外科诊治中心成熟的重要标志。阜外医院在这方面成绩斐然，目前手术效果已居全球领先水平。



双根部调转手术 DOUBLE ROOT TRANSLOCATION

The double root translocation (DRT) procedure was invented by surgeons at Fuwai Hospital for anatomical correction of complex complete transposition of great arteries (TGA; combined with left ventricular outflow tract obstruction [LVOTO]) and double outlet of right ventricle (DORV; TGA type combined with right ventricular outflow tract obstruction). More than 160 patients have undergone DRT procedure until 2018; Thirty-day and long term follow up results were significantly better than traditional Rastelli procedure.

阜外外科团队原创双根部调转手术，解剖矫治合并左室流出道狭窄的大动脉转位以及大动脉转位类右室双出口（合并右室流出道狭窄）。截止至2018年，已经完成160余例手术，术后30天和远期随访结果明显优于Rastelli手术。

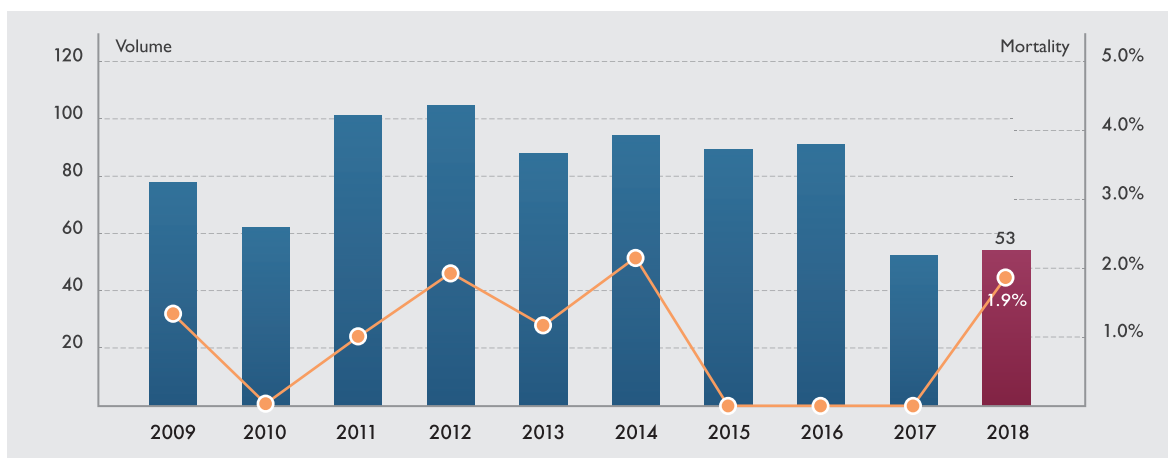


	DRT	Rastelli	Rev.
Case No.	155	67	22
Follow up (month)	72	70	72
In hospital mortality	7(4.5%)	7(10.4%)	3(13.6%)
Follow up mortality	13(8.4%)	9(13.4%)	3(13.6%)
Reoperation rate	13(8.4%)	17(25.4%)	3(13.6%)
Reintervention rate	3(1.9%)	2(3.0%)	3(13.6%)

双向Glenn手术 BIDIRECTIONAL GLENN SHUNT

The Glenn shunt has been regularly used in Fuwai Hospital for certain types of congenital heart disease. However, the indication for single ventricular palliation has changed over time, leading to more anatomical repairs. Hence, the number of Glenn shunts decreased in 2017 and 2018.

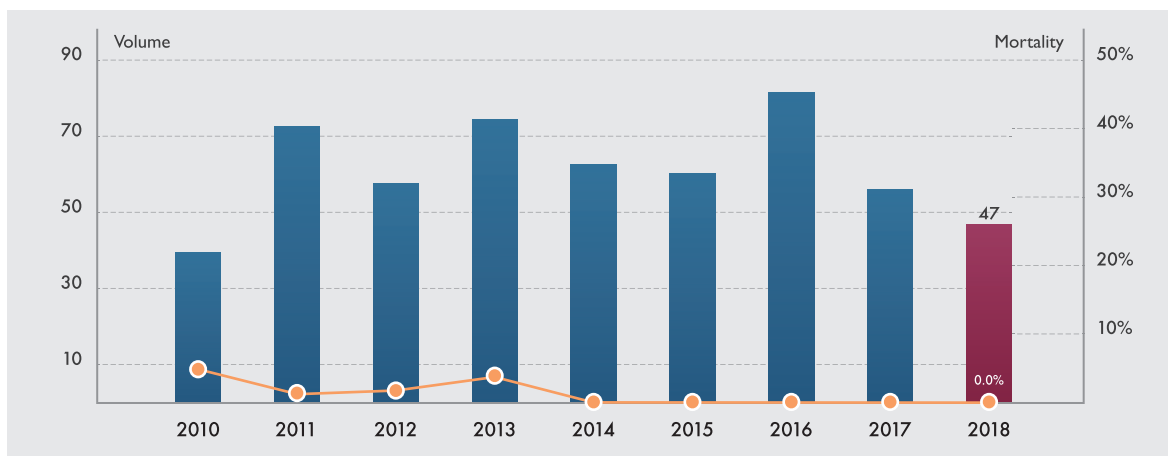
作为复杂先心病姑息手术治疗的重要术式，Glenn手术在阜外一直常规开展，但阜外医院近年来一直致力于严格把控姑息手术适应症，尽力对患儿进行解剖根治，避免Glenn及全腔手术，因而2017及2018年阜外医院Glenn手术例数较前下降。



Fontan类手术 FONTAN OPERATION

As the most popular procedure for single ventricular palliation, the Fontan operation has been regularly used for several decades. In 2018, the volume of the Fontan procedure decreased while more patients received anatomical repairs.

作为通用的单心室类姑息手术，Fontan手术已经在阜外医院常规开展多年。2018年Fontan类手术结果满意，同时数量较前下降，更多的患儿得到了解剖矫治。

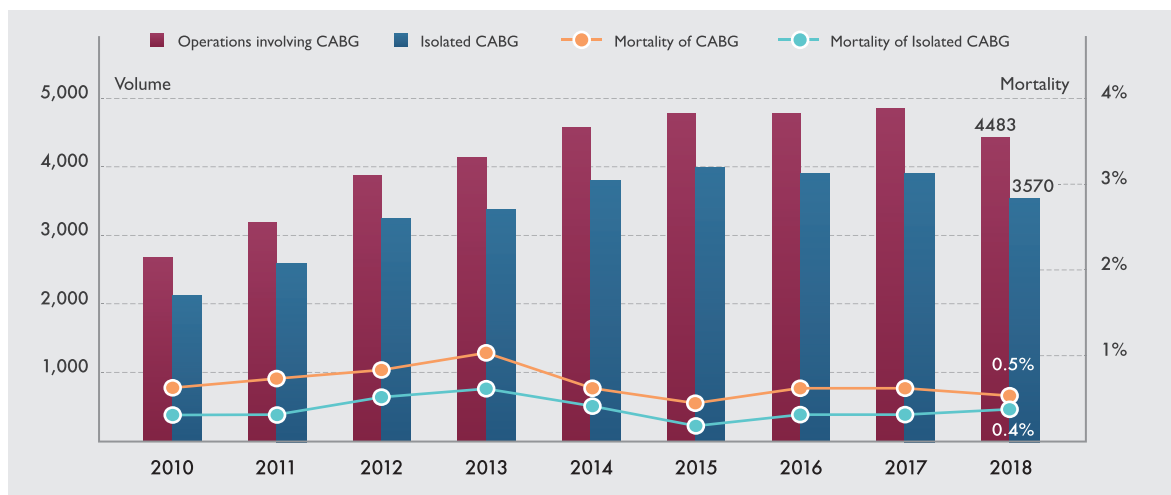


冠状动脉 粥样硬化性心脏病 Coronary Disease

冠状动脉旁路移植术 CABG

In mainland China, Fuwai Hospital is the pioneer of the CABG operation. In 1974, Fuwai surgeons performed the first CABG in the mainland. Beating heart bypass surgery (Off-pump CABG) through sternotomy was also first performed in China at Fuwai Hospital in 1996. The first case of hybrid CABG in China was successfully completed in 1999 at our hospital as well. In 2018, 4,483 patients received CABG at Fuwai Hospital, with 3,570 receiving isolated CABG. Thirty-day mortality has remained stable over the past 14 years at a level of less than 1%.

1974年阜外医院心血管外科实施了中国大陆首例冠状动脉旁路移植术。1996年在国内最早开展胸骨正中切口非体外循环下冠状动脉旁路移植术。1999年完成中国大陆首例杂交冠状动脉旁路移植术。2018年全院完成冠状动脉旁路移植术4483例，其中单纯冠状动脉旁路移植术3570例。单纯冠状动脉旁路移植术后30天死亡率连续14年低于1%。



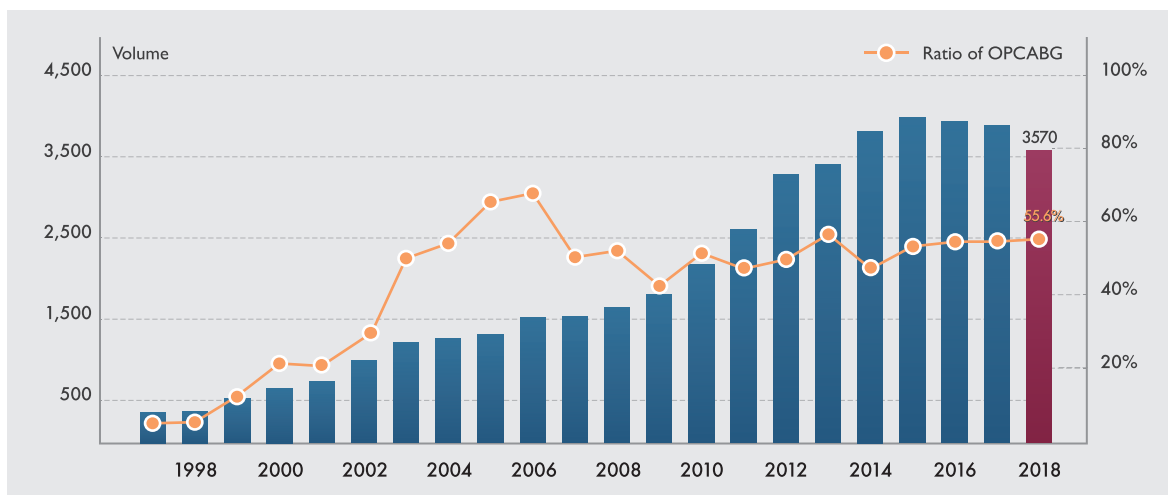
4483

CASE No. OF CABG 2018

非体外循环冠状动脉旁路移植术 OFF-PUMP CABG

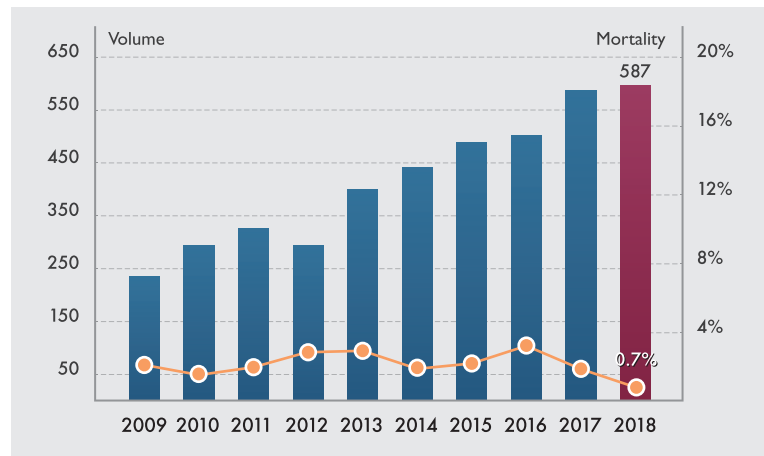
Recent clinical trials have challenged the safety and efficacy of off-pump CABG, prompting our review of the application of this technique. The proportion of off-pump CABG decreased in the past decade at our institute, and individualized use of this technique has been occurring since 2006.

近年来，国际临床指南对非体外循环冠状动脉旁路移植术临床效果的评价趋于审慎。阜外医院心血管外科从患者获益的角度出发，适时调整技术策略应用，严格把控非体外循环冠状动脉旁路移植术手术指征，近10年来总体比例下降，目前已趋于稳定。



冠状动脉旁路移植术合并瓣膜类手术 CABG COMBINED WITH VALVULAR SURGERY

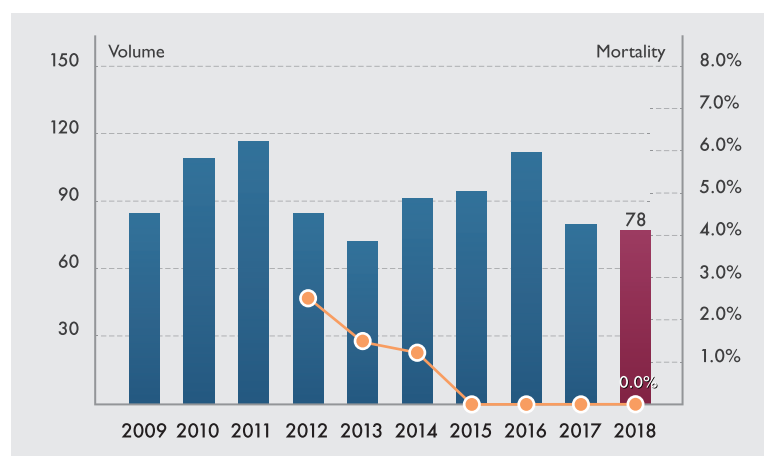
In Fuwai Hospital, coronary CT or angiogram is routinely performed for patients over 50 years old to increase the perioperative safety of cardiovascular surgery. Performing coronary surgery simultaneously with valvular surgery increases complexity. In recent years, perioperative mortality for this combined surgery has stabilized at a relatively low level and volume has increased dramatically. In 2018, the perioperative mortality rate of this type of surgery has been reduced to 0.7%.



阜外医院对于50岁以上患者，术前均常规行冠状动脉CT或造影，明确是否合并冠脉疾病，最大程度提高患者行心血管手术的安全性。同期施行冠状动脉搭桥和心脏瓣膜手术，手术难度及复杂性显著增加。阜外医院在该类手术量逐年增加的情况下，始终将围术期死亡率控制在较低水准。2018年，该类手术围术期死亡率已降低至0.7%。

室壁瘤手术 SURGERY FOR VENTRICULAR ANEURYSM

Surgical approaches could significantly improve the long-term outcomes for patients with ventricular aneurysm. However, the complexity and risk of such surgeries are higher than those of surgeries for other cardiac conditions, requiring higher standards for the surgeons and the heart team. In the most recent four years, such surgeries have been successfully performed with zero surgical mortality.

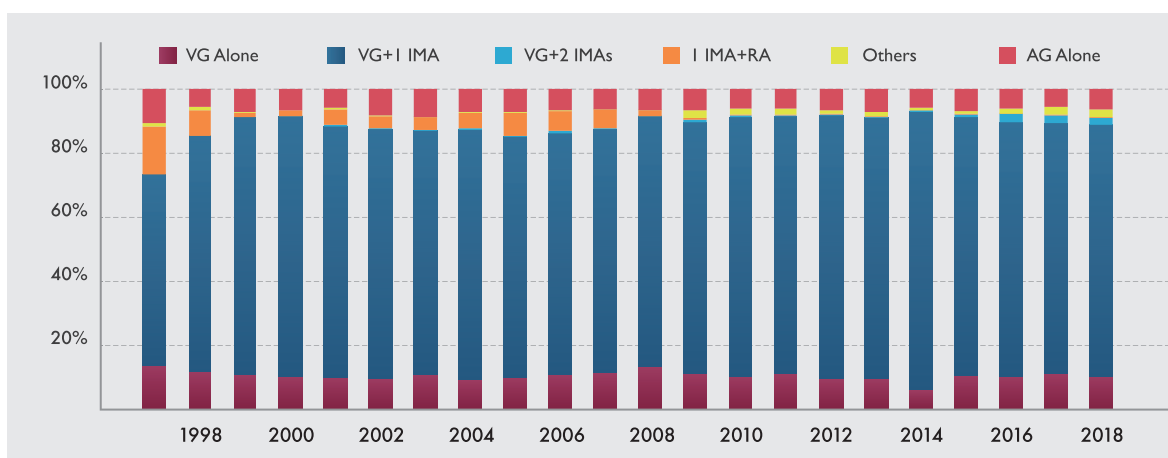


外科手术可显著改善室壁瘤患者远期预后，但该手术难度及风险均较高，对术者及其心脏团队水平提出了更高的要求。阜外医院团队已连续四年室壁瘤手术未有围术期死亡。

旁路材料选择 CONDUITS IN CABG

Left internal thoracic artery plus great saphenous vein graft is the standard in current clinical practice. The surgical team of Fuwai Hospital intended to provide individualized optimal revascularization strategies for patients. Newer approaches, such as bilateral internal thoracic artery, total arterial graft, “no touch” technique for great saphenous vein harvest, are also routinely performed at our institution.

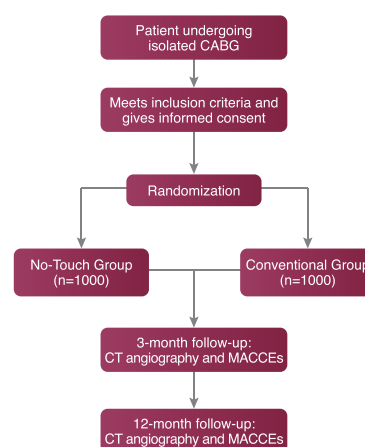
当前，左胸廓内动脉+大隐静脉仍是外科搭桥手术的主流选择。近年来，阜外医院外科团队致力于通过优化治疗策略，提高搭桥患者远期预后。在常规开展“no touch”获取大隐静脉等技术的同时，双侧胸廓内动脉的应用、全动脉化技术应用比例也有显著提高，为不同患者提供个性化的再血管化治疗策略。



No-Touch技术获取静脉移植血管 NO-TOUCH STUDY FOR VEIN GRAFT HARVEST

The No-Touch study is a multi-center randomized clinical trial aiming to evaluate the short- and long-term efficacy of the No-Touch saphenous vein harvesting technique after CABG, compared with that of the conventional approach. Led by Professor Shengshou Hu at Fuwai Hospital, a professional team of CABG surgeons, vein-harvesting residents, full-time study coordinators, and case registration network staff has been established. The study was officially launched in May, 2017. So far, over 2000 patients have been enrolled, with post-operative follow-up being carried forward as anticipated.

No-Touch（不接触）技术获取静脉移植血管效果评价研究是一项由阜外医院牵头的多中心前瞻性随机对照临床研究，旨在探索No-Touch技术获取静脉移植血管在国内冠状动脉旁路移植术患者中的安全性及近、远期效果，制定符合中国实际情况的技术应用规范和指南。2017年在首席研究者胡盛寿院士领导下，组建了包括冠状动脉旁路移植手术的术者、静脉获取者、专职研究助理以及病例登记网络系统技术人员在内的研究团队，目前已完成2000例患者的入组，随访工作正稳步推进中。



瓣膜性心脏病

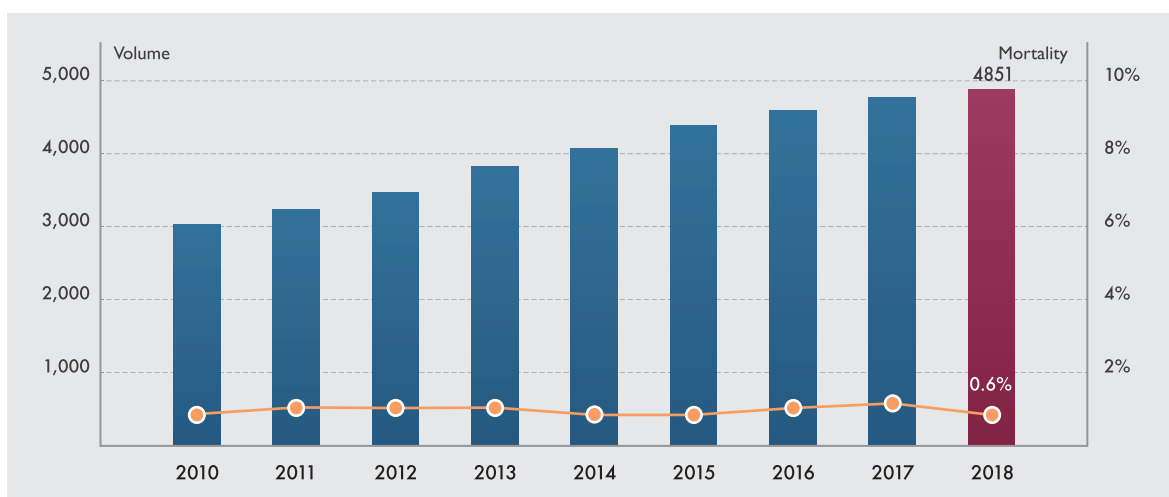
Valve Disease

心脏瓣膜手术量及死亡率

VALVULAR SURGERY

Fuwai Hospital performs the largest number of valvular procedures in China. In 2018, 4,851 patients received valvular operation at our institution with a thirty-day mortality of 0.6%.

阜外医院是中国最大的瓣膜外科中心，2018年完成心脏瓣膜手术4851例，在手术量持续增长的同时，死亡率始终保持在较低水平，2018年术后30天死亡率为0.6%。



4851

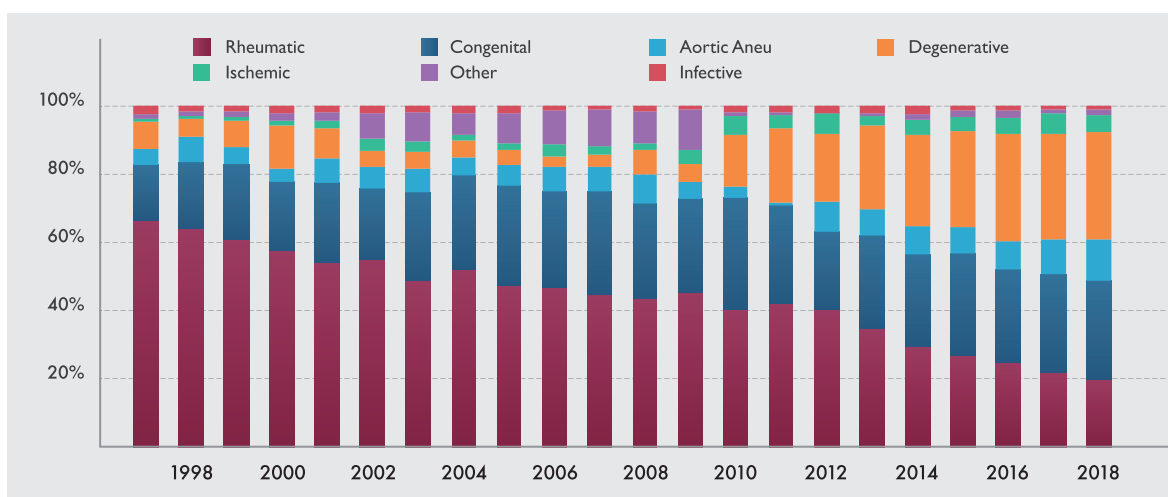
CASE No. OF VALVULAR SURGERY 2018

心脏瓣膜手术病因构成

ETIOLOGIC DISTRIBUTION OF VALVULAR DISEASE

Rheumatic disease was the major cause of valve disease in China, though the number of cases has been declining. In recent years, degenerative valvular disease has increased dramatically. Analysis of the Fuwai surgical database demonstrated that the percentage of valvular disease patients with degenerative valvular disease exceeded the percentage with rheumatic valvular disease in 2018.

阜外医院收治患者的病因分类基本反映出我国瓣膜病外科的疾病变化谱。一直以来，风湿性病变是我国瓣膜类疾病的主要病因，同时退行性病变比例呈现逐年上升趋势。阜外医院单中心数据显示，当前退行性病变比例已超过风湿性病变，成为目前瓣膜类疾病的主要病因。

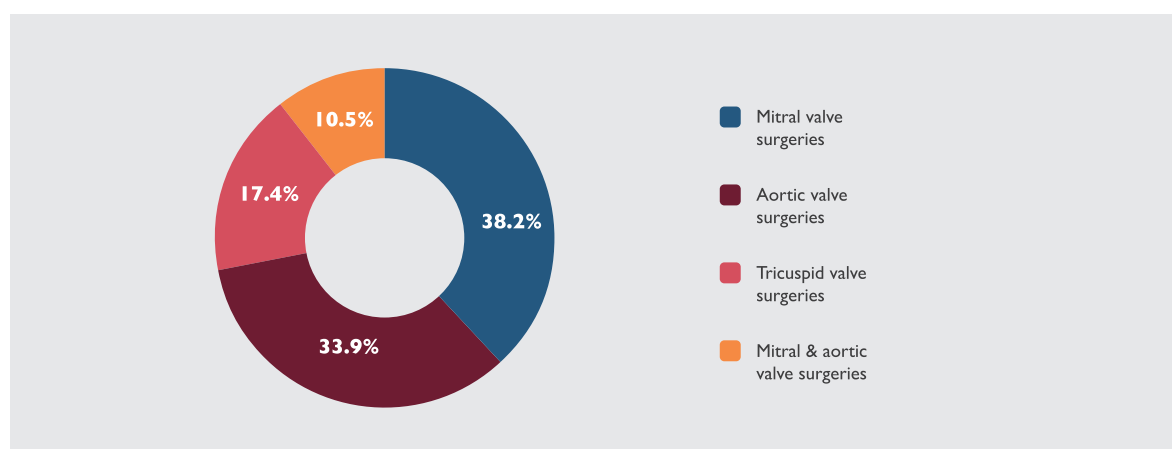


手术种类构成

COMPOSITION OF VALVULAR SURGERIES

Mitral valve replacement represented the major proportion of all valvar surgeries in 2018. However, the rate of aortic and mitral valve replacement continued to decline while the volume of tricuspid valvuloplasty increased. Isolated pulmonary valve surgeries were not considered in this chart.

近年来，二尖瓣置换术始终在心脏瓣膜手术中占据首位。同时，主动脉瓣联合二尖瓣置换术的比例呈下降趋势，而三尖瓣成形术的比例有所增加。单纯肺动脉瓣手术未纳入统计。

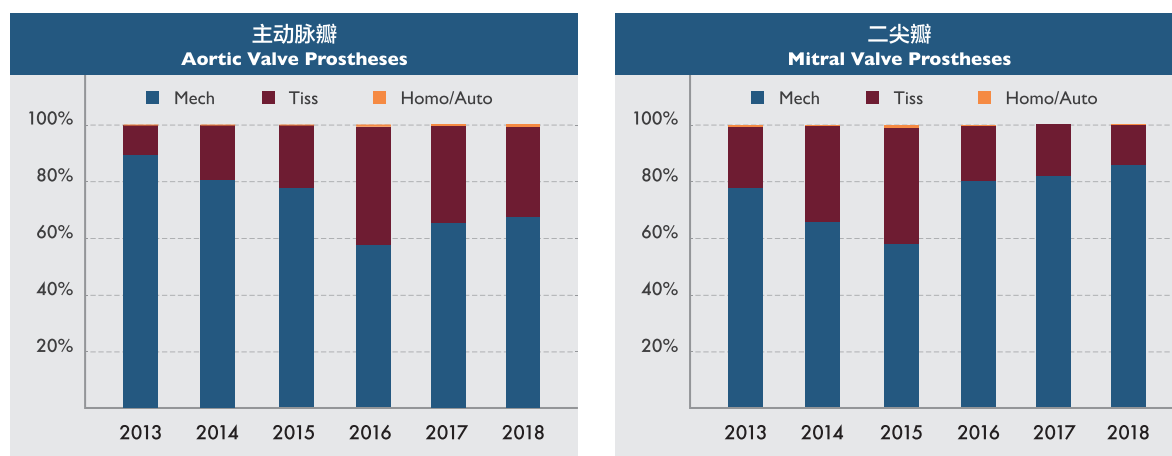


人工瓣膜种类

COMPOSITION OF VALVE PROSTHESES

Mechanical valve accounted for the major type of artificial valve. However, in recent years, the proportion of bioprosthetic aortic valve increased significantly.

人工机械瓣膜始终占据主导地位。主动脉瓣手术中生物瓣膜的使用比例增长迅速。

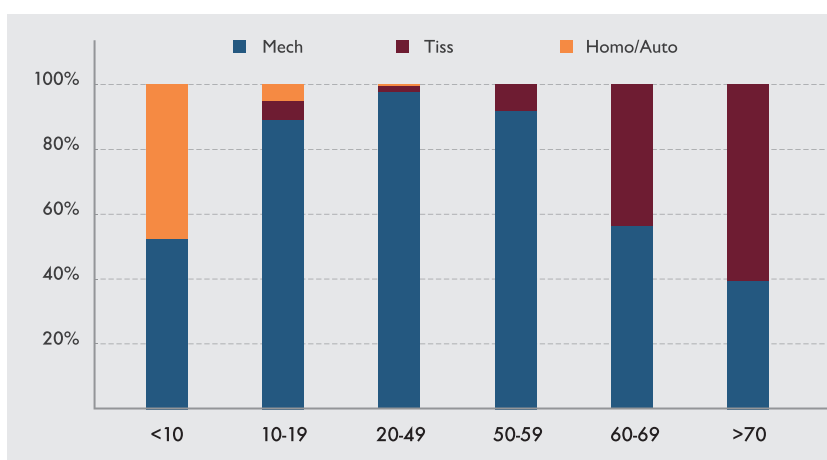


不同年龄患者所用人工瓣膜种类

DISTRIBUTION OF VALVE PROSTHESES BY AGE

Despite of the overall predominance of mechanical valves, elderly patients tended to receive bioprosthetic valves.

接受心脏瓣膜手术的成年患者，年龄越大使用生物瓣膜的比例越高。

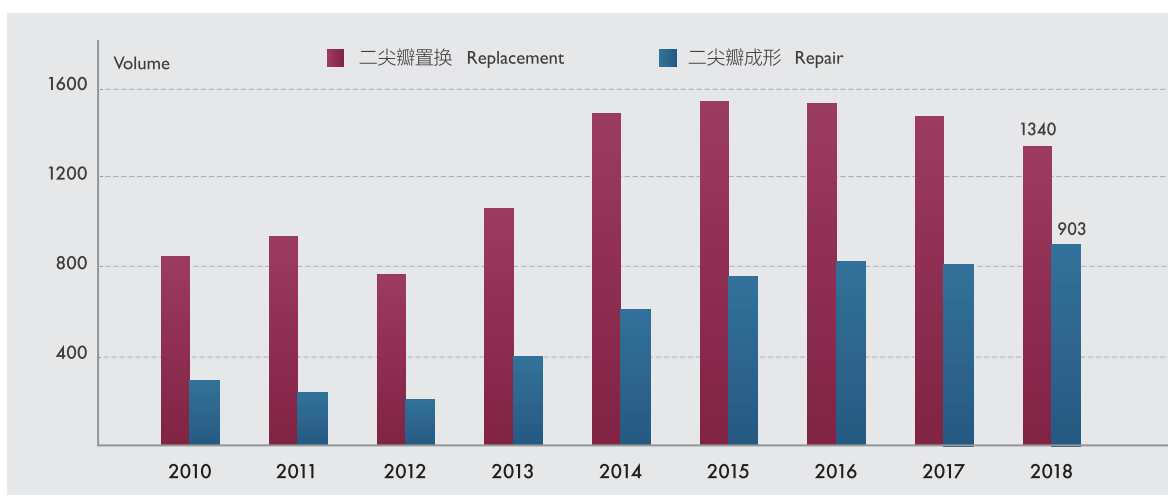


二尖瓣瓣膜成形术

MITRAL VALVE REPAIR

For the Fuwai surgical team, the mitral valve repair technique has become the main treatment for patients with mitral valve insufficiency. There were 903 such repairs performed in 2018.

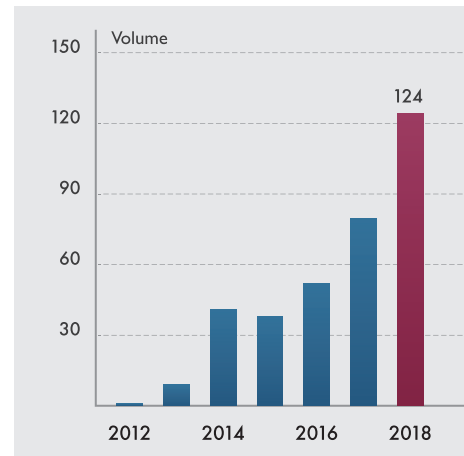
在阜外医院，二尖瓣瓣膜成形术已成为治疗二尖瓣瓣膜关闭不全的主要术式，2018年共完成903例二尖瓣成形术。



经导管主动脉瓣置入术

TRANSCATHETER AORTIC VALVE IMPLANTATION

In September 2012, the first transcatheter aortic valve implantation (TAVI) procedure with a domestic valve was successfully performed. Fuwai Hospital has been committed to promoting the first clinical trial for TAVI in China. In July 2014, the Fuwai surgical team pioneered the use of the domestically-produced J-Valve™ to perform transapical aortic valve implantation. Because of the unique design of J-Valve™, our team was the first in the world to successfully apply the TAVI technique on a patient with aortic insufficiency alone. In 2018, 124 patients with high risk of severe aortic valve disease successfully received this minimally invasive procedure.



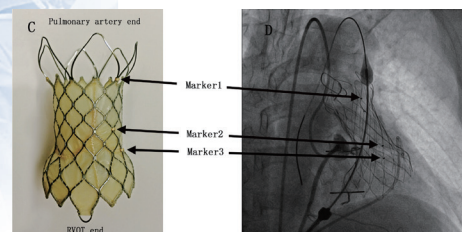
2012年9月，中国第一例国产经导管主动脉瓣在中国医学科学院阜外医院置入成功。阜外医院也首先开展了我国第一个TAVI临床试验。2014年7月，阜外外科团队运用我国自主研发的J-Valve™瓣膜，在国内率先开展了经心尖入路的TAVI手术，不同于国际上TAVI技术仅用于主动脉瓣狭窄患者，阜外外科团队还在国际上首次为单纯主动脉瓣关闭不全患者成功实施了介入瓣膜的植入。2018年共完成该类手术124例。

经皮肺动脉瓣支架植入术

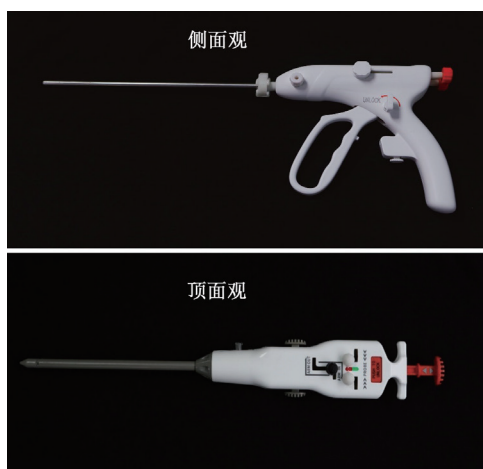
PERCUTANEOUS PULMONARY VALVE IMPLANTATION

The innovative self-expandable pulmonary valve stent (Venus-P valve) was developed in China according to the anatomical characteristics of severe pulmonary regurgitation and right ventricular out flow tract enlargement after TOF transannular patch. Fuwai Hospital has completed the largest group (32 cases) clinical research of Venus-P valve and achieved favorable results. Our team was invited to give academic reports at international conferences such as CSI and AATS to introduce China's experience.

国产新型自膨式肺动脉瓣支架（Venus-P瓣膜）是根据国人法洛四联症跨环补片术后肺动脉瓣大量返流合并右室流出道扩大的解剖特点而研制的。阜外医院完成该新型支架最大组（32例）临床应用研究，并取得了良好的效果。团队受邀在CSI和AATS等国际会议做学术报告，介绍中国经验。



MITRALSTITCH™二尖瓣修复系统 MITRALSTITCH™ MITRAL VALVE REPAIR SYSTEM



The surgical team of Fuwai hospital has developed a new type of mitral valve repair system (Mitralstitch™), which can implant artificial chordae and perform “edge-to-edge” repair under the guidance of ultrasonography. This system can achieve two methods of valvuloplasty and be applied in complex lesions effectively. The outcomes have been reported at international conferences such as TCT, CSI and ICI.



阜外医院外科团队研制了一种新型经心尖二尖瓣修复系统（Mitralstitch™），该系统可以完全在超声引导下植入人工腱索和进行“缘对缘”修复，实现了一械多能，能有效应用于复杂病变。Mitralstitch™系统应用结果已受邀在TCT、CSI、ICI等国际会议做学术报告，引起广泛关注。



主动脉外科

Aortic Surgery

The Vascular Surgery Center of Fuwai Hospital has focused more on aortic diseases than peripheral diseases during the past half a century. The first aorta operation was performed at the hospital in 1958. The Vascular Surgery Center of Fuwai has subsequently become one of the largest aortic surgery centers worldwide.

A new vascular team was established at the hospital in November 2015. This team uses open, endovascular, and hybrid procedures to treat patients with a range of vascular diseases, including aortic, peripheral artery, and venous diseases. The Vascular Surgery Center of Fuwai Hospital currently has 3 clinical wards and a total of 140 beds. In 2018, the Fuwai vascular team performed 1,474 aortic procedures, 1,910 peripheral vascular procedures, and 802 cardiac surgeries.

1958年，阜外医院血管外科中心在国内率先开展主动脉外科手术。历经几代人的奋斗，已积累了丰富的临床经验，并为中国的主动脉外科领域培养了一批又一批的领军人才和技术骨干。近年来，阜外医院建立了“主动脉急诊绿色通道”，为病患实现实时就医、保证高质量医疗服务提供了切实有效的制度保障。

2015年11月，阜外医院顺势而为，组扩建全新的血管外科中心，已全面开展颅外几乎所有血管疾病的腔内、外科及杂交手术。目前，拥有三个整建制病房的阜外医院血管外科不仅成为了国内最大规模的血管外科中心，而且在心脏、主动脉及外周血管领域，已基本实现“无诊治盲区”、“无技术短板”，并朝着建设国际顶级血管外科中心的目标稳步迈进。

2018年，阜外医院血管外科中心完成各类主动脉手术1474台，各类外周血管手术1910台，在手术数量和质量上都达到了国际先进水平。此外，血管中心专家还实施了802例常规心脏外科手术。

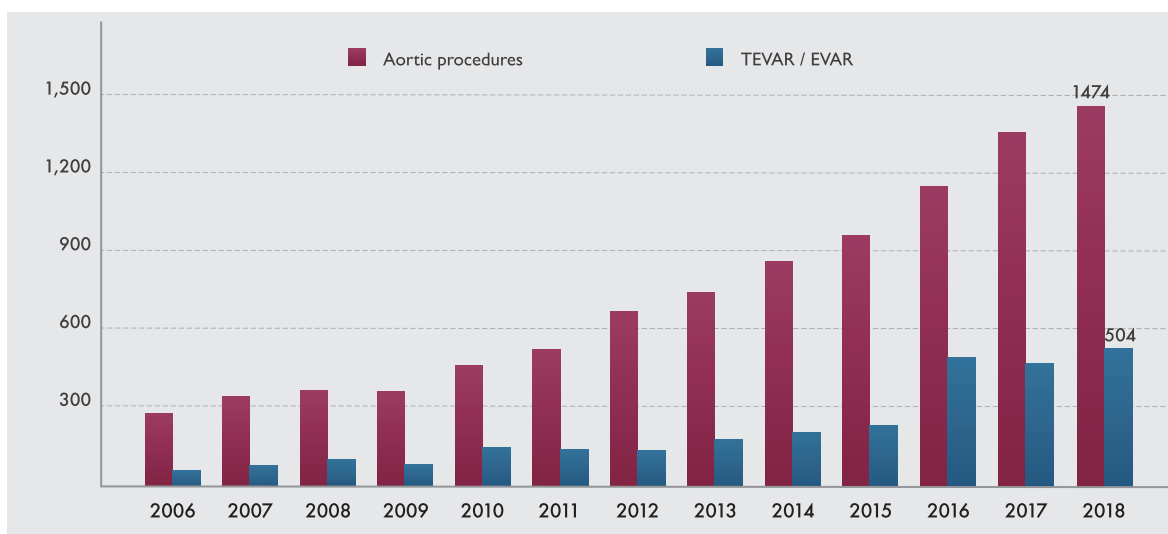
1474

CASE No. OF AORTIC PROCEDURE 2018

主动脉疾病手术量 VOLUME OF AORTIC SURGERIES

The Vascular Surgery Center of Fuwai Hospital is considered the first choice for patients with aortic aneurysms and dissections throughout China. In 2018, there were 1,474 aortic procedures performed at the center; this represents an increase of 8.6% from the previous year. Among these procedures, 861 were open aortic surgeries, 504 were endovascular aortic repairs and 109 were one-stop hybrid procedures. Our data do not include the aortic operations performed at the Pediatric Cardiac Surgical Center.

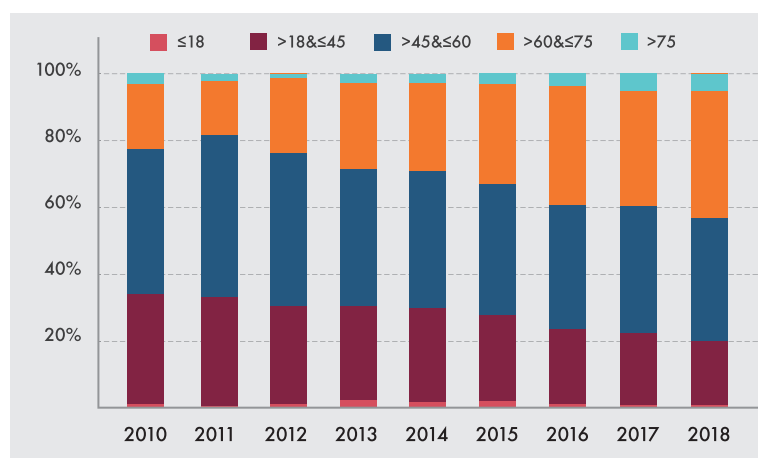
2018年完成主动脉病变的手术治疗1474例，较2017年增长8.6%，其中主动脉开放手术861例，腔内覆膜支架修复术504例，各型主动脉杂交手术109例。本数据不包括小儿外科中心专家完成的小儿主动脉手术。



主动脉手术患者的年龄分布 AGE DISTRIBUTION

In recent years, the proportion of patients over 60 years of age who underwent open, endovascular, or hybrid aortic procedures at Fuwai Hospital increased significantly.

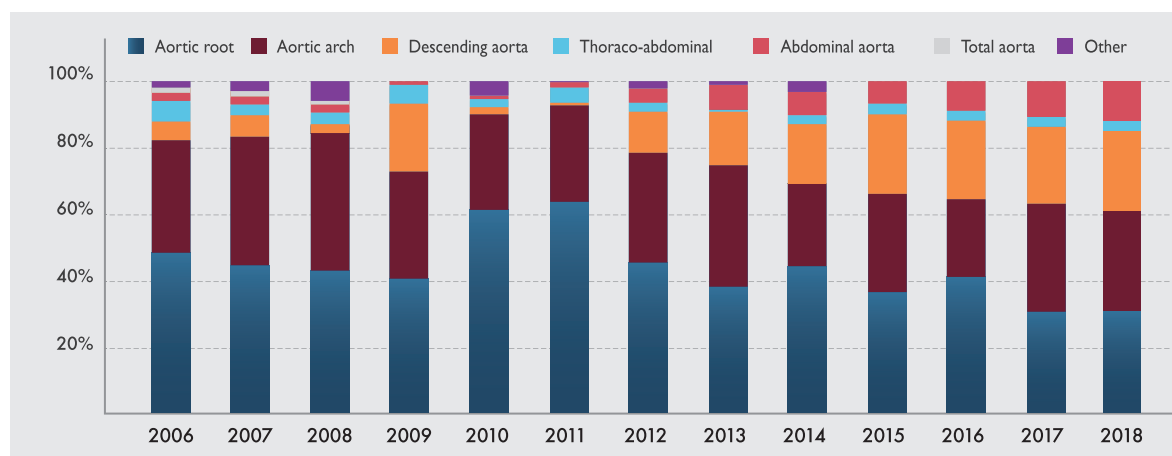
近年来接受主动脉外科、腔内和杂交手术的患者中，60岁以上患者比例明显增加。



主动脉手术治疗部位构成图 COMPOSITION OF AORTIC SURGERIES

These figures show the composition of aortic procedures at Fuwai Hospital over the past several years. In 2018, Fuwai Hospital operated 450 procedures on the aortic root and ascending aorta (30.6%), 443 procedures on aortic arch (30.1%), 356 procedures on descending aorta (24.2%), and 178 procedures on abdominal aorta (12.1%).

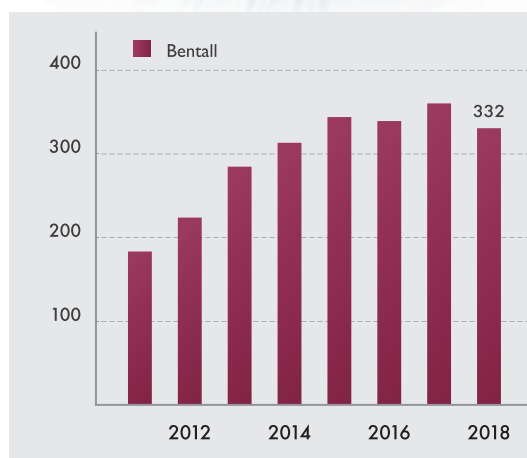
这张图显示了阜外医院血管外科历年以及2018年主动脉手术部位的构成情况。2018年，阜外医院完成主动脉根部和升主动脉手术450例（30.6%），主动脉弓部手术443例（30.1%），降主动脉手术356例（24.2%），胸腹主动脉手术44例（3.0%），腹主动脉手术178例（12.1%）。



主动脉根部手术 AORTIC ROOT SURGERIES

In 2018, surgeons at the Vascular Surgery Center performed 537 aortic root operations, including 332 Bentall's procedures, 158 Wheat's procedures, 46 David's procedures, and 1 Cabrol procedure.

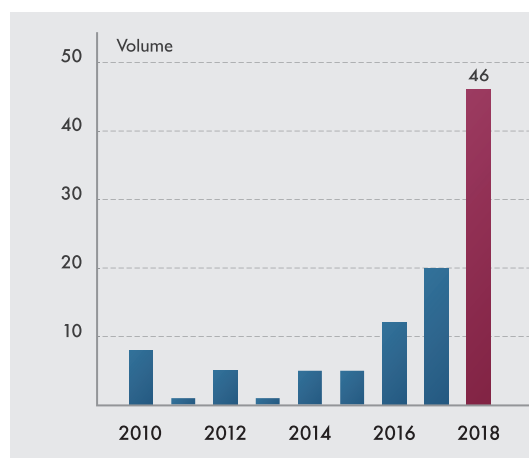
2018年，阜外医院血管外科中心完成主动脉根部手术共计537例，其中Bentall's手术332例，Wheat's手术158例，David's手术46例，Cabrol手术1例，同时实施了其他心血管手术的患者也计算在内（如Bentall's+全主动脉弓替换术）。



保留主动脉瓣的主动脉根部替换术 VALVE SPARING AORTIC ROOT REPLACEMENT (DAVID PROCEDURE)

This procedure preserves the patient's own healthy aortic valve, avoiding lifelong anticoagulation and the potential risks associated with prosthetic valves. In 2018, surgeons at the Vascular Surgery Center performed 46 David Procedures.

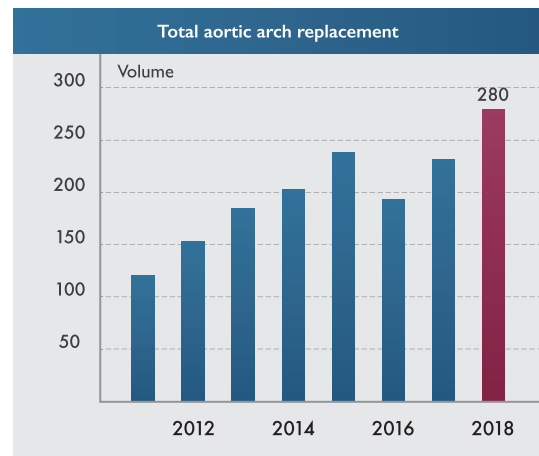
保留主动脉瓣的主动脉根部替换术保留了患者自身健康的主动脉瓣膜，避免了终身抗凝和与人工瓣膜相关的潜在风险。2018年，阜外医院血管外科中心完成该系列手术46例。



主动脉弓开放手术 OPEN AORTIC ARCH OPERATIONS

In 2018, surgeons at the Vascular Surgery Center performed 401 open aortic arch operations, including 280 total aortic arch replacement, 24 subtotal aortic arch replacement, and 97 partial aortic arch replacement procedures. The data do not include hybrid arch replacement operations.

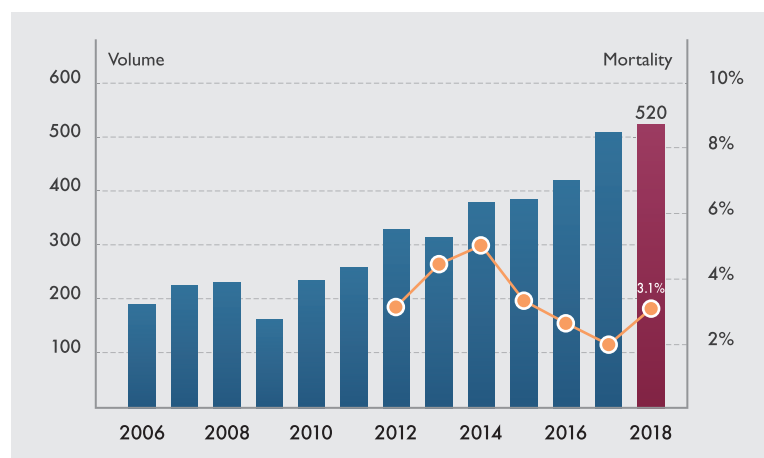
The proportion of open aortic arch replacement procedures has decreased since 2016. The primary reason for this change is the increase in the number of patients with arch pathologies managed by total endovascular procedures such as triple or double chimney technique, fenestration technique, and hybrid procedures.



2018年，阜外医院血管外科中心完成主动脉弓部外科手术401例（同时进行了主动脉根部或升主动脉手术的患者也计算在内），其中深低温停循环下的全主动脉弓替换手术280例（不包括杂交手术），次全弓替换手术24例，部分弓替换手术97例。近两年，主动脉弓外科手术在主动脉手术总量中所占权重较2015年前下降，这与更大比例的主动脉弓部病变患者接受了全腔内修复手术和杂交手术有关，其中包括“双烟囱”技术、“三烟囱”技术、“预开窗”技术、“原位开窗”技术等腔内微创技术在锚定区不足的患者群中的运用。

主动脉夹层 AORTIC DISSECTION

In mainland China, there is a relatively high incidence of aortic dissection in young and middle-aged men with hypertension; the average age is lower than that of the USA and European countries. Lifesaving emergency surgery to repair the dissected aorta is frequently performed by the Fuwai vascular team. In 2018, we performed a total of 520 open, endovascular, and hybrid aortic procedures with a 30-day postoperative mortality of 3.1%.

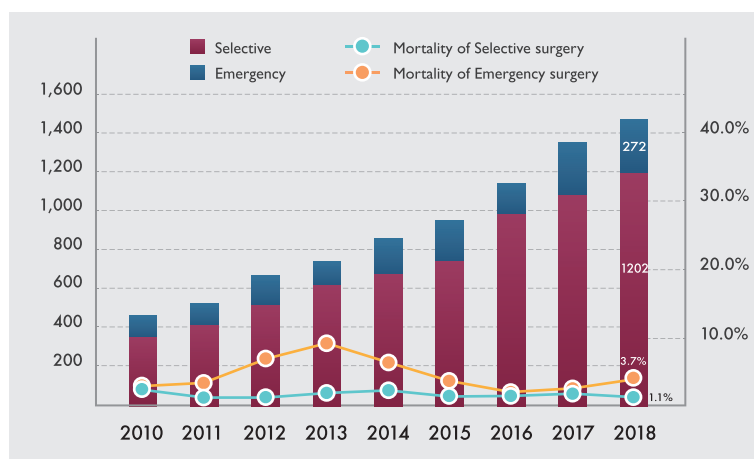


中国高血压病人群约有2.6亿，但由于控制率偏低等原因，主动脉夹层发病率偏高，而且患者的平均年龄低于欧美发达国家。阜外医院血管外科团队每年为许多这样的患者实施紧急手术治疗，以挽救他们的生命。2018年，完成主动脉夹层手术520例，术后30天死亡率降至3.1%，达世界顶级水平。

主动脉急诊和择期手术的比例和术后30天死亡率 SELECTIVE AND EMERGENCY AORTIC SURGERY

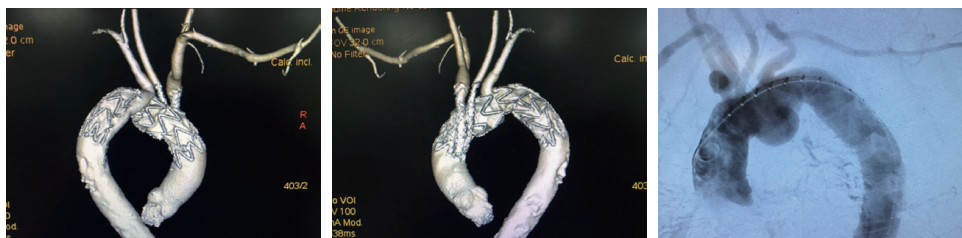
Aortic emergencies, including acute aortic syndrome and aortic rupture, are usually life-threatening, sudden onset catastrophes of the aorta that present immense surgical technique challenges and have high associated risk. The Aortic Emergency Green Channel policy of Fuwai Hospital has been in place for several years and has helped ensure that the majority of emergent aortic patients are treated in an efficient manner. In 2018, surgeons at the Vascular Surgery Center performed 1202 scheduled surgeries and 272 emergent aortic surgeries, with thirty-day mortality of 1.1% and 3.7%, respectively (deaths prior to hospital admission and during surgical preoperation in the emergency room were excluded from calculations).

以急性主动脉综合征、主动脉瘤破裂为代表的主动脉急症往往需要紧急手术，技术难度大，手术风险高。阜外医院集全院优势力量，从制度层面入手，建立了“胸痛中心”和“主动脉急诊绿色通道”，在主动脉急诊患者的救治效率和救治成功率方面，均已成为中国医院救治主动脉疾病的典范。2018年，阜外医院血管外科中心为1202例主动脉疾病患者实施了择期手术，为272例患者实施了急诊手术（病情平稳的B型夹层不计在内），术后30天死亡率分别低至1.1%和3.7%（院前死亡和急诊准备期间的术前死亡未统计在内）。

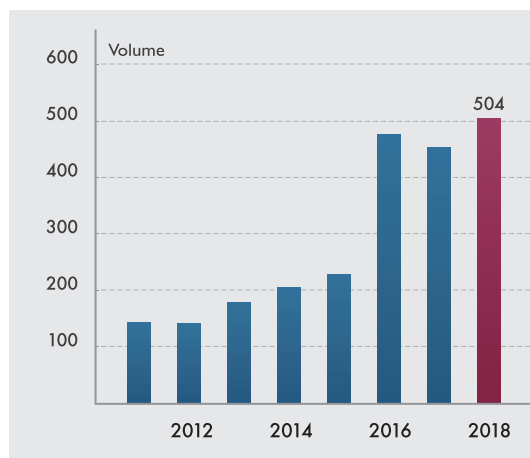


主动脉微创腔内修复术 ENDOVASCULAR AORTIC REPAIR

In 2018, surgeons at the Vascular Surgery Center performed 504 endovascular operations, including 320 TEVAR, 170 EVAR, 8 TEVAR+EVAR simultaneously, and 6 balloon-expandable stent implantations for coarctation of the aorta. Among these cases, 119 patients without enough landing zones for endografts were treated successfully by usage of the chimney, double/triple chimney, snorkel, and fenestration techniques.

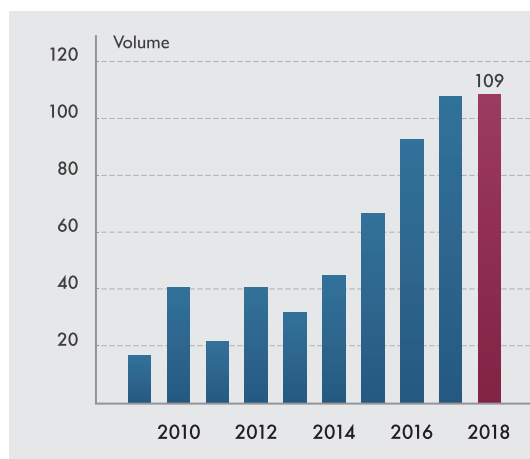


2018年，阜外医院血管外科中心完成主动脉覆膜支架腔内修复术504例，其中胸动脉覆膜支架腔内修复术320例，腹主动脉覆膜支架腔内修复术170例，同期进行胸主动脉和腹主动脉腔内修复手术8例，主动脉缩窄介入支架（球扩式）植入术6例。其中，采取烟囱技术、潜望镜技术、开窗技术等辅助技术为119名锚定区不足的主动脉病变患者实施了腔内修复（大部分患者为主动脉弓部病变）。



主动脉杂交手术 HYBRID AORTIC SURGERIES

Since Fuwai Hospital established its first one-stop hybrid operation room in 2006, an additional five advanced hybrid operating rooms have been added. The number of hybrid operations performed at Fuwai Hospital continues to increase annually. In 2018, surgeons at the Vascular Surgery Center performed 109 hybrid operations for arch pathologies. Additionally, hundreds of patients with multiple cardiovascular diseases were treated in the one-stop style in the hybrid operating rooms using procedures such as CABG+EVAR and ASD repair+TEVAR.



阜外医院自2006年建立亚洲第一家杂交手术室以来，目前拥有世界最先进的杂交手术室5间，开展了大量“一站式”杂交手术。2018年，阜外医院血管外科中心完成各型主动脉杂交手术109例。此外，阜外医院血管外科专家充分利用国际顶尖的杂交手术室平台优势，为同一患者“一站式”处理多种心血管疾病，如房缺修补术联合胸主动脉支架术、冠脉旁路移植术联合腹主动脉覆膜支架腔内修复术等，此类广义的杂交手术未计入本年报杂交手术总量。

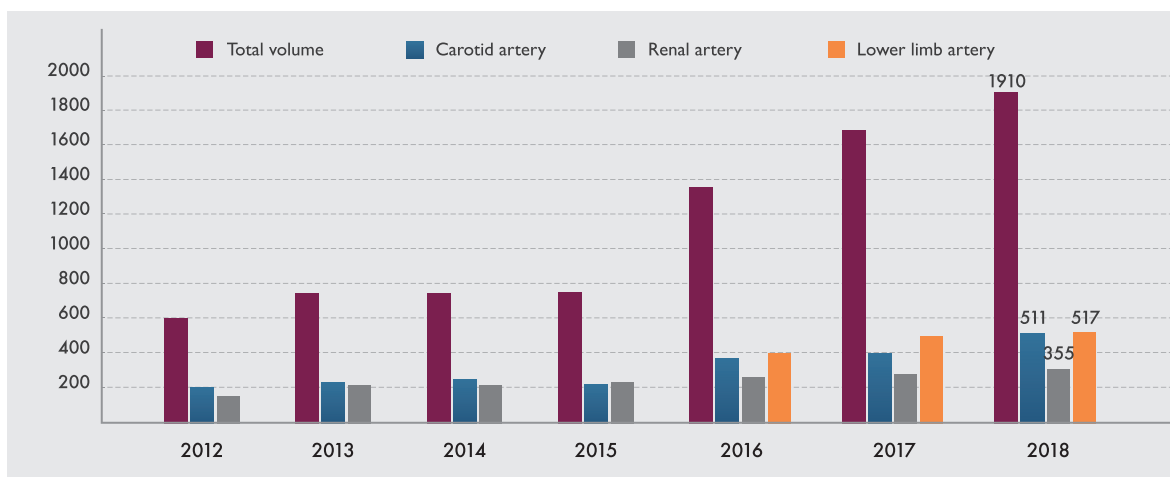
周围血管疾病 Peripheral Vascular Diseases

1910

CASE No. OF PERIPHERAL VASCULAR PROCEDURE 2018

OUTCOMES 2018

A dedicated peripheral vascular ward was established at Fuwai Hospital in November 2015. Ward staff include Team A vascular surgeons and Team B interventional cardiologists. In 2018, the two teams performed 1,910 interventional and open procedures for patients with peripheral vascular diseases such as carotid, vertebral, lower limb and renal artery stenosis, including 1206 cases of these procedures performed by interventional cardiologists and 704 opening and interventional procedures performed by vascular surgeons. The procedures performed by Team B were not included in the annual surgical volume of Fuwai Hospital.



2015年底，阜外医院新设外周血管疾病治疗团队，由血管外科中心一病区、二病区的血管外科医师和内科介入医师组成，主要以外周动脉疾病的介入和外科治疗作为主攻方向。2018年共实施颈动脉、肾动脉、内脏动脉、下肢血管、锁骨下动脉介入和外科手术1910例，其中，血管外科医师实施各类外周血管开放及介入手术704例，内科介入医师实施外周血管介入手术1206例。内科介入医师实施的外周血管介入手术量将在阜外医院内科年报中体现，而不计入阜外医院外科年报的手术总量。

微创心脏外科

Minimally Invasive Cardiac Surgery

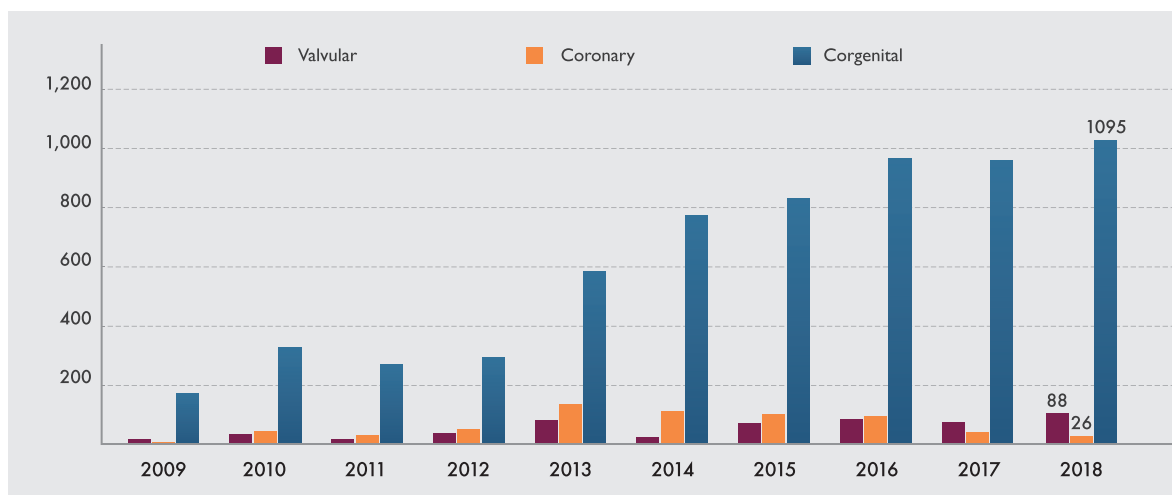


小切口心脏手术

MINIMALLY INVASIVE SURGERIES

The Fuwai surgical team is devoted to reducing surgical trauma for patients by using minimally invasive surgical techniques. The volume of these techniques, which include limited sternotomy, right subaxillary minithoractomy, and the parasternal approach, has steadily increased in recent years.

小切口心脏手术是减少患者手术创伤的微创手术技术手段，包括部分胸骨切口、右侧腋下小切口、胸骨旁切口及胸腔镜手术等，手术量持续、稳定增长。

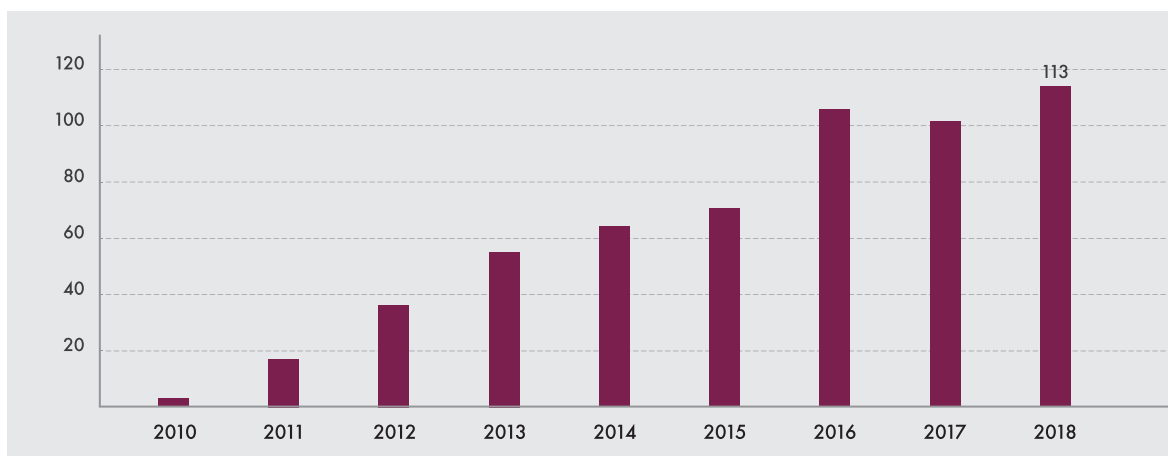


胸腔镜辅助心脏手术

VIDEO-ASSISTED THORACOSCOPIC CARDIAC SURGERIES

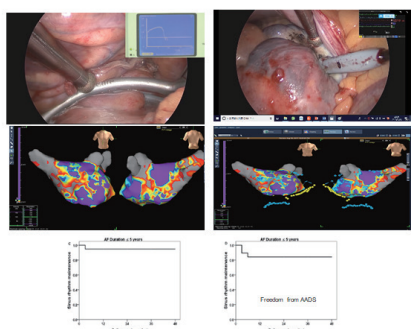
Video thoracoscope-assisted cardiac surgeries are routinely performed at Fuwai Hospital for congenital heart disease, mitral valve repair or replacement, and minimally invasive coronary artery bypass surgeries. Favorable outcomes were achieved for persistent atrial fibrillation by using hybrid thoracoscopic and catheter ablation.

阜外医院常规开展胸腔镜辅助的系列心脏手术，其领域涵盖常见的先天性心脏病矫治、二尖瓣成形、置换及微创搭桥等。尤其是针对持续性房颤，开展了全胸腔镜下心外膜消融+心内膜联合消融的复合治疗技术。



心律失常的外科治疗

SURGICAL TREATMENT FOR HEART ARRHYTHMIA



A total of 256 combined MAZE IV procedures were performed at Fuwai hospital in 2018, and 227 patients with lone atrial fibrillation underwent video thoracoscopy-assisted or one-stop hybrid ablation (percutaneous and video thoracoscopy-assisted). Modified bi-atrial ablation lesion, a novel strategy first introduced by Fuwai hospital, was performed for patients suffering long-standing persistent atrial fibrillation, and 75% of them maintained sinus rhythm at six months after the surgery. The case video “Hybrid Ablation of Modified Mini-Maze: A New Technique for Long-standing Persistent Atrial Fibrillation Treatment” was invited to be presented at the Learning Center at the

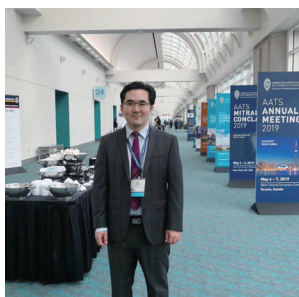
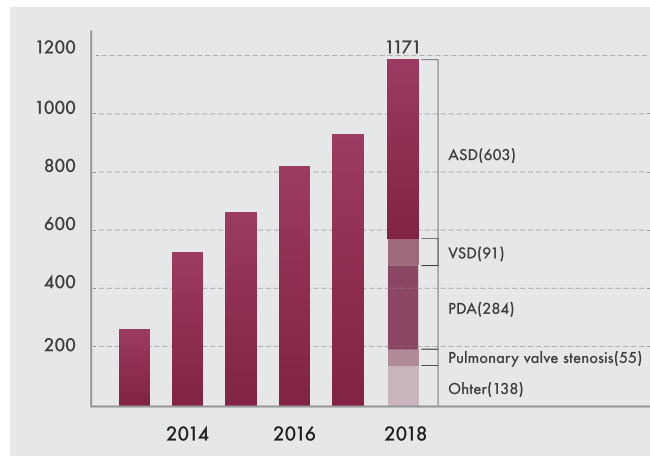
AATS 98th Annual Meeting (2018, San Diego). As to patients with long-standing persistent non-valvular atrial fibrillation (atrial fibrillation history less than 5 years), one-stop hybrid ablation resulted in a 94.7% sinus rhythm maintenance at 2 years’ follow-up. Surgical treatment for ventricular arrhythmia has also been a routine practice at Fuwai hospital, including hybrid procedure (surgical and interventional) for valvular disease with ventricular tachycardia, and video thoracoscopy-assisted thoracic sympathetic trunk exclusion for long QT syndrome and catecholaminergic polymorphic ventricular tachycardia (CPVT).

房性心律失常方面，该年度心脏手术同期迷宫IV治疗房颤256例，胸腔镜辅助或“一站式”复合消融技术治疗孤立性房颤的总例数达到227例。其中，在国内率先采用心外膜改良双房消融线路治疗长程持续性房颤，术后6月窦性心律维持率75%。“一站式”复合消融技术治疗长程持续性房颤的手术视频获邀在第98届美国胸外科协会年会进行演示播放，其最新随访结果显示，对于房颤持续时间小于5年的患者，术后2年窦性心律维持率94.7%。室性心律失常方面，开展了外科和介入联合治疗瓣膜病合并室速，胸腔镜辅助下胸交感干神经节切除治疗长QT间期综合征和儿茶酚胺敏感性室性心动过速。

无放射线经皮介入技术

PERCUTANEOUS AND NO-FLUOROSCOPY PROCEDURE

The surgical team of Fuwai Hospital pioneered percutaneous interventional therapy for structural heart disease using ultrasound instead of radiation (Percutaneous And No-fluoroscopy procedure). This procedure has great advantages of protecting patients and doctors, and reduces hardware requirements. Also, this procedure is cost-saving, suitable for promotion, and widely recognized currently. The surgical team of Fuwai Hospital has been invited to perform this procedure in more than 10 countries and regions including Canada, Russia, Turkey, Hong Kong and Kenya. More than 300 trainees from Europe, America, Asia and Africa have been trained in Fuwai hospital. Now this procedure has been promoted to more than 20 countries and regions.



阜外医院外科团队在国际上原创了一种无放射线经皮介入技术，用经胸超声替代放射线进行经皮介入治疗结构性心脏病，具有保护患者、保护医生、节约费用、硬件要求低、适合推广的巨大优势，得到国内外同行广泛认可。阜外医院外科团队多次受邀到加拿大、俄罗斯、土耳其、香港、肯尼亚等十余个国家和地区现场演示手术；培训了来自欧美、亚洲、非洲的国内外学员300余人，其创新技术被推广到二十多个国家和地区。



肥厚梗阻心肌病

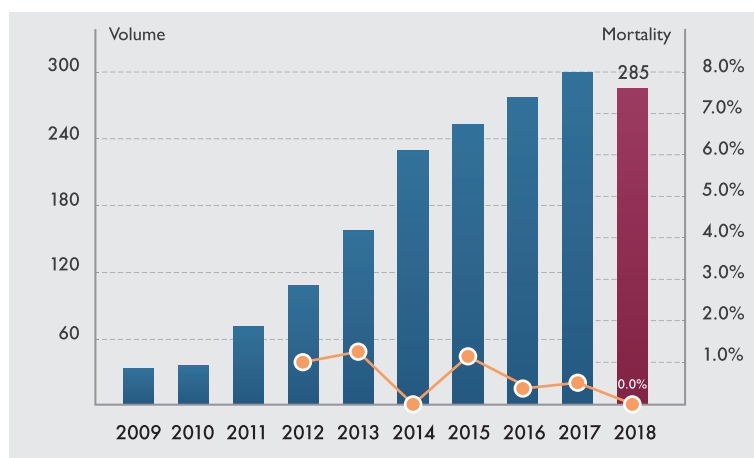
Hypertrophic Obstructive Cardiomyopathy

改良Morrow手术

MODIFIED MORROW PROCEDURE

The volume of the modified Morrow procedure at Fuwai Hospital is increasing. A total of 285 procedures have been successfully performed with zero surgical mortality within thirty-day postoperatively in 2018.

近年来，阜外医院实施该手术的手术量持续增长并取得良好治疗效果。2018年累计完成285例，术后30天内未有死亡病例。

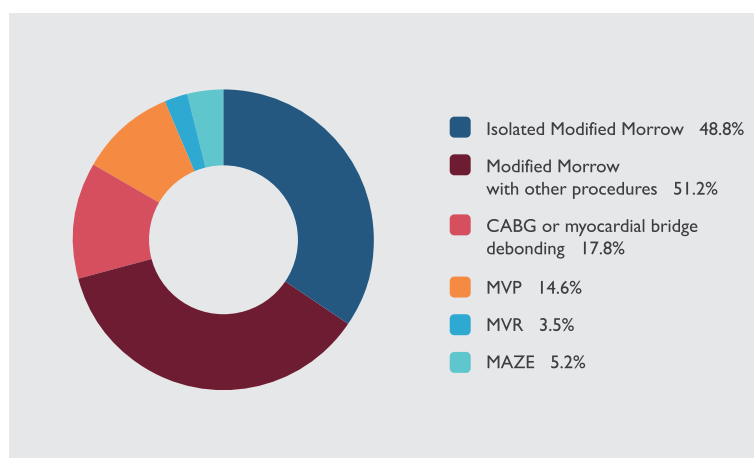


术种分布

DISTRIBUTION OF OPERATION

The modified Morrow technique is often combined with other cardiac procedures (e.g., CABG or myocardial bridge debonding). Such combined procedures accounted for over 40% of the total morrow procedures.

Morrow联合其他手术的术式在所有肥厚梗阻心肌病手术中占比超过40%，其中最主要的类型为Morrow合并CABG或肌桥松解。



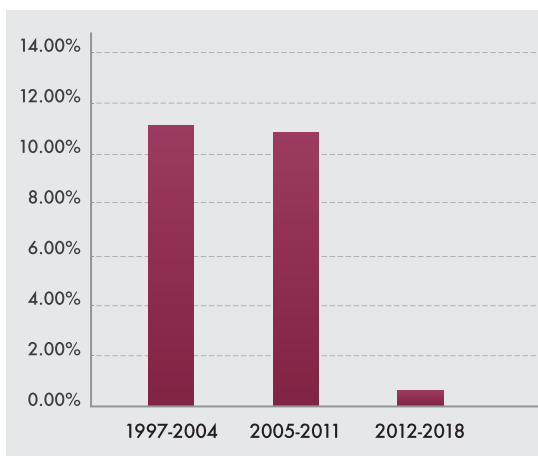
肺动脉内膜剥脱术

Pulmonary Endarterectomy Surgery

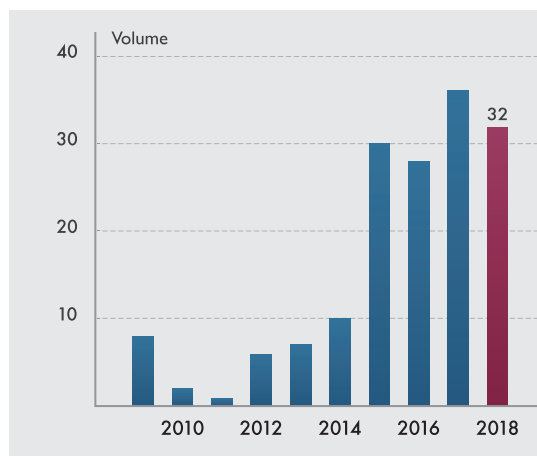
From 1997 to 2018, a total of 213 cases of pulmonary endarterectomy had been accomplished at Fuwai Hospital. The latest 100 patients had a peri-operative mortality rate under 1% (1/136). Meanwhile, our center firstly carried out pulmonary endarterectomy + sequential pulmonary balloon angiography hybrid therapy strategy in mainland China. Up to now, 17 cases of hybrid therapy for patients with CTEPH were completed in our center.

阜外医院自1997年至2018年共开展肺动脉内膜剥脱术213例（全国第一），近100例患者围术期死亡率1%，近5年围术期结果跻身全球第一梯队行列，并在国内率先开展肺动脉内膜剥脱术+序贯式肺动脉球囊扩张杂交治疗慢性血栓栓塞性肺动脉高压，至今17例患者接受分期杂交治疗，为开展此类治疗方案的全球最大中心之一。

分时间段死亡率
MORTALITY IN DIFFERENT PERIODS



阜外医院PEA手术例数
SURGICAL VOLUME OF PEA

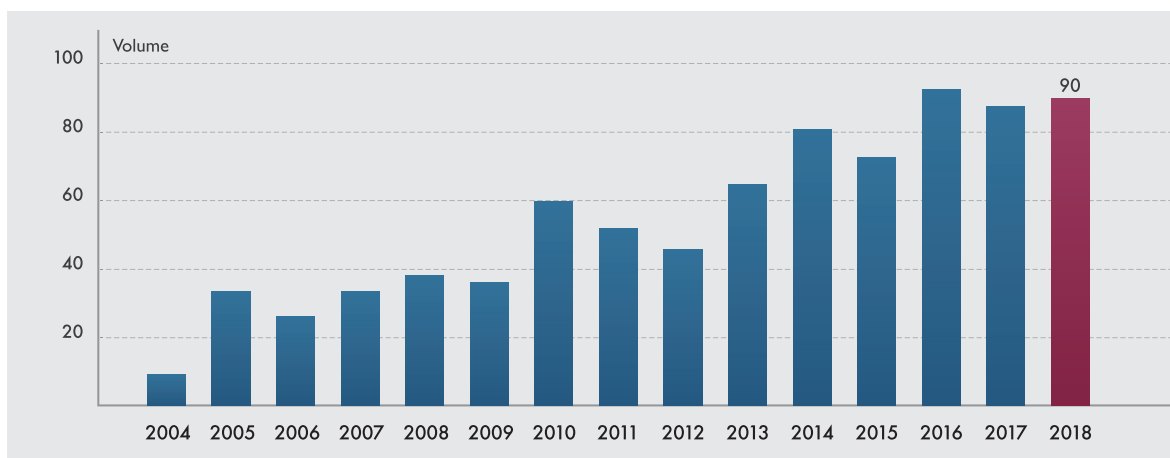


心衰及移植

Heart Failure and Transplantation

心脏移植手术量

HEART TRANSPLANTATION



Since June 2004, 823 patients have undergone heart transplantation at Fuwai Hospital; 90 of these transplantations were in 2017.

自2004年6月至今，阜外医院外科团队在院内完成心脏移植823例，其中2018年完90例。

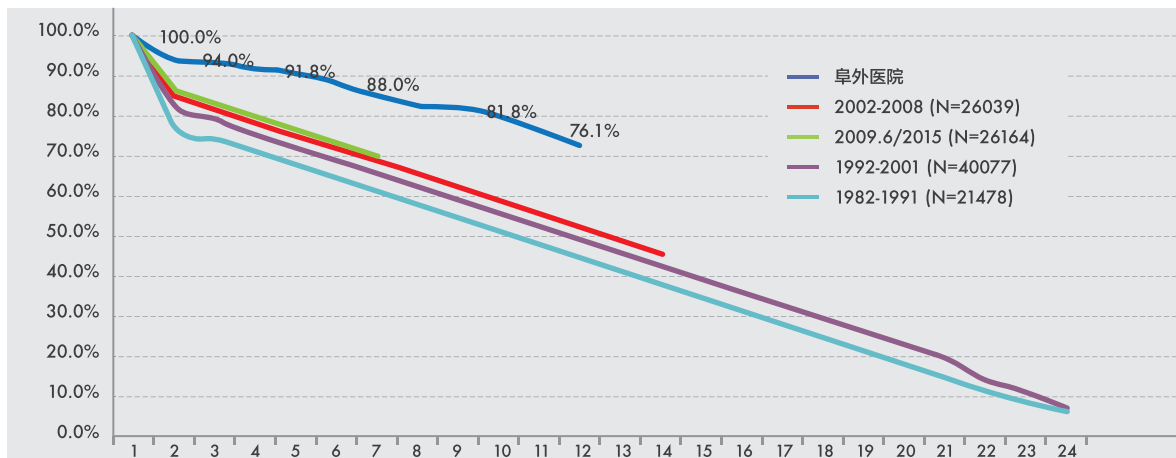


心脏移植生存率图

KAPLAN-MEIER SURVIVAL CURVE FOR HTX PATIENTS IN ISHLT AND FUWAI HOSPITAL

The one-year survival rate after heart transplantation was 94.0% at Fuwai Hospital. Five-year survival was 88.0%, and ten-year survival was 76.1%; these rates are higher than those of ISHLT.

阜外医院移植后患者1年生存率为94.0%，3年生存率91.8%，5年生存率88.0%，10年生存率达76.1%；明显高于国际心肺移植协会（ISHLT）统计的同期生存率。

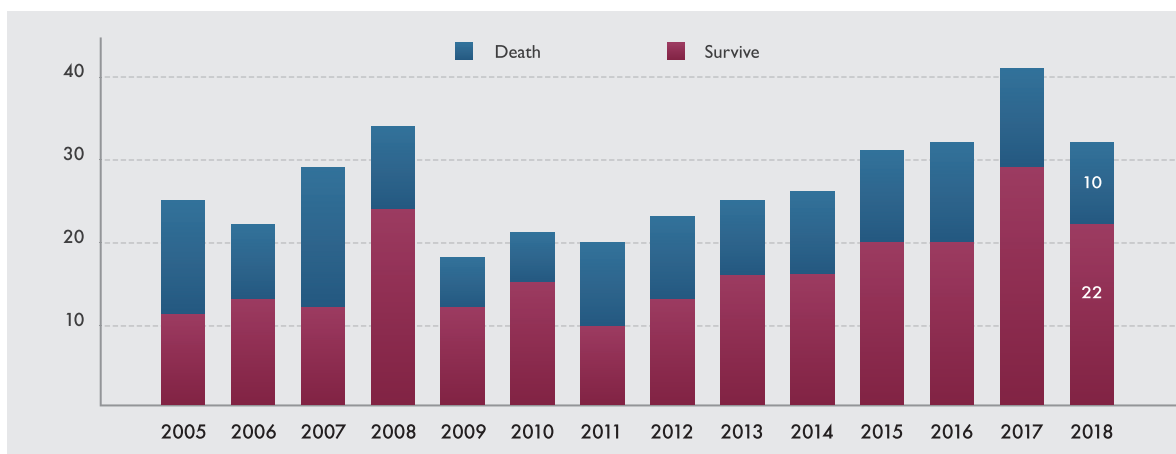


ECMO的应用

APPLICATION OF ECMO

ECMO is regularly used at Fuwai Hospital for patients with acute cardiogenic shock, and ECMO+IABP is routinely used for short-term ventricular assistance. Both applications have achieved excellent outcomes.

在阜外医院，ECMO广泛应用于救治急性心源性休克患者，ECMO+IABP已成为短期心室辅助常规，并取得良好效果。



心室辅助装置外科技术治疗急危重心脏衰竭

VENTRICULAR ASSISTIVE DEVICE FOR ACUTE CRITICAL HEART FAILURE

The treatment of acute critical heart failure has been a concerned focus of clinical practice in the field of cardiovascular disease due to its extremely high mortality. The ventricular assist device was first applied in China by the artificial heart team leading by Academician Shengshou Hu. From 2017 to 2018, 16 patients with heart failure had been treated with ventricular assist device by this team and long-term follow-up showed a significantly improving survival rate.

由于极高死亡率，急危重心脏衰竭的治疗一直是心血管疾病领域的临床焦点。阜外医院胡盛寿院士人工心脏团队自2017-2018年在中国首次应用心室辅助装置外科技术治疗此类患者16例，显著提高生存率。

第一阶段：应用第三代磁悬浮心室辅助装置救治危重心衰患者4例。

The first stage: The third generation of ventricular assist device, which is magnetic levitated, was used to treat 4 patients with critical heart failure.

All these 4 patients suffered from acute heart failure, refractory to inotropes/vasopressors. After 10-14 days of ECMO or IABP supports, there were still life-threatening hemodynamic instability. Significant improvements in cardiac function and hemodynamic condition were observed in all patients after device implantation. One patient underwent cardiac transplantation 192 days after device implantation, one patient had cardiac function recovery with device removal, one patient achieved long-term survival with device support, and one patient died of infection 30 days after surgery.

该4例患者均为心脏衰竭急性发作，血管活性药物治疗无效，接受ECMO或IABP支持10-14天，出现血流动力学不稳定，生命危在旦夕。术后所有患者心功能和血流动力学指标均明显改善，1例患者术后192天行心脏移植术，1例患者心功能恢复撤除装置，1例患者带装置长期生存，1例患者术后30天死于感染。

	Gender	Etiology	Preoperative condition	Outcome	Time of support (days)
1	Male	DCM and cardiogenic shock	ECMO+IABP	Destination Therapy	>700
2	Male	DCM and acute heart failure	IABP	Heart transplantation	193
3	Male	DCM and acute heart failure	ECMO+IABP	VAD Removal	166
4	Female	Myocarditis, cardiogenic shock and renal failure	Mechanical ventilation+ ECMO+IABP	Died of sepsis	34

第二阶段：以“临床试验”方式，开展有搏动血流心室辅助装置外科技术治疗危重心脏衰竭患者。

The second stage: Through "clinical trial", the pulsatile blood flow ventricular assist device was used to treat patients with sever heart failure.

The EVAHEART I is an implantable ventricular assist system consisting of a centrifugal pump and a controller that produces pulsatile blood flow. Its operating parameters include: speed 800-3000 rev / min, flow 2-20L / min, power consumption 2-20 watts. The team implanted EVAHEART I in 12 patients with acute or chronic critical heart failure. Early and mid-term follow-up data showed that the device significantly improved the survival rate and quality of life.

EVAHEART I是由可产生搏动血流的离心泵和控制器组成的植入式心室辅助系统。其运行参数包括：转速800–3000转/分，流量2–20L/min，功耗2–20瓦。团队共为12例危重和急慢性心力衰竭患者植入EVAHEART I，早期和中远期随访数据表明，该装置显著提高了心力衰竭患者的生存，同时改善生活质量。

	Gender	Etiology	INTERMACS	Outcome	Time of support (days)
1	Male	DCM and acute heart failure	2	Destination Therapy	451
2	Male	DCM and hepatic insufficiency	2	Heart transplantation	156
3	Male	DCM and pulmonary hypertension	3	Destination Therapy	437
4	Male	DCM and acute heart failure	1	Destination Therapy	374
5	Male	DCM and pulmonary hypertension	2	Destination Therapy	367
6	Male	Critical valvular heart disease	3	Destination Therapy	357
7	Male	DCM and hepatic insufficiency	3	Destination Therapy	345
8	Male	ICM and cardiogenic shock	1	Destination Therapy	337
9	Male	DCM and acute heart failure	2	Destination Therapy	330
10	Male	DCM and pulmonary hypertension	3	Destination Therapy	213
11	Male	DCM and Renal Insufficiency	2	Destination Therapy	185
12	Male	ICM and ventricular aneurysm	2	Destination Therapy	94



图1. 植入式磁悬浮心室辅助装置治疗危重心脏衰竭患者

Figure 1. Implantable magnetic levitated ventricular assist device treating patients with acute heart failure

Summary: The main indication of ventricular assist device surgical techniques in the treatment of heart failure in Fuwai Hospital include: (1) Bridge to heart transplantation, including patients with obesity, rare blood type, poor nutritional status, and no suitable donor; (2) Bridge to recovery of cardiac function, including patients with fulminant myocarditis, ischemic cardiomyopathy and early stage of dilated cardiomyopathy; (3) Destination therapy, including patients with advanced age, combining renal insufficiency, chemotherapy-induced cardiomyopathy and other patients not suitable for heart transplantation.

总结: 阜外医院心室辅助外科技术治疗心脏衰竭患者的主要应用目的包括（1）心脏移植前过渡支持，包括体重过大、血型稀有、营养状态差和急性心衰发作无合适供体的患者；（2）心脏功能恢复，包括爆发性心肌炎、部分缺血心肌病和早期扩心病患者；（3）替代治疗，包括高龄、心衰合并肾功能不全、化疗药物心肌病等不适合心脏移植的患者。



图2. EVAHEART I 心室辅助装置治疗危重心脏衰竭患者

Figure 2. EVAHEART I ventricular assist device treating patients with critical heart failure

技术协作

Domestic Collaboration Network

无锡明慈心血管病医院
Wuxi Mingci Cardiovascular Hospital

3rd Sino-German Medical Seminar

第三届中国德医疗交流研讨会



In 2018, Fuwai Hospital provided assistance and training to more than 30 training center units. A total of 6,093 cardiovascular surgeries were completed by these units, including 1,156 cases completed under the guidance of Fuwai Hospital.

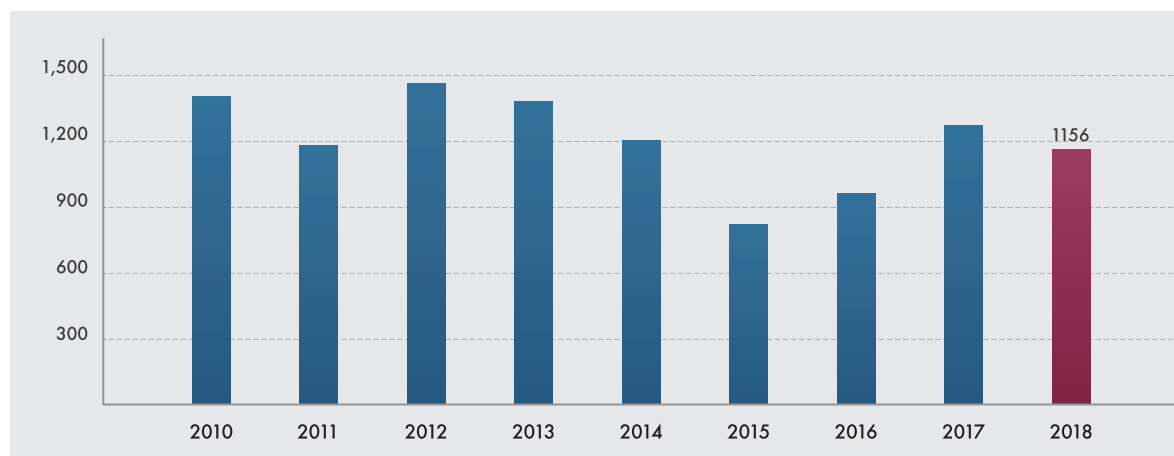
In 2018, Fuwai Yunnan Cardiovascular Hospital completed 1022 cases of cardiovascular surgeries, Central China Subcenter of the National Center for Cardiovascular Diseases and Fuwai Central China Cardiovascular Hospital completed 5781 cases of cardiovascular surgeries.

2018年，阜外医院对30余家培训中心单位给予相应的帮扶和培训工作。全年完成各类心血管外科手术6093例，其中阜外医院指导完成1156例。

2018年，云南省阜外心血管病医院完成各类心血管外科手术1022例，国家心血管病中心华中分中心、阜外华中中心心血管病医院完成各类心血管外科手术5781例。

技术协作手术量

CARDIOVASCULAR SURGERIES PERFORMED BY FUWAI SURGICAL TEAM IN TECHNIQUE COLLABORATION PROGRAM





血管技术培训网络覆盖图

Legend:

- 已覆盖地区 (Covered areas)
- 未覆盖地区 (Uncovered areas)



云南省阜外心血管病医院

Fuwai Yunnan Cardiovascular Hospital



Fuwai Yunnan Cardiovascular Hospital (FYCH) was founded as a triple A standard, first-class hospital specializing in cardiovascular diseases. With 4-year construction, the hospital officially kicked off operation and provided medical services to the public on September 19, 2017.

By 2018, 10 Ward Areas have opened, including Adult Cardiac Surgery, Pediatric Cardiac Surgery, Vascular Surgery, Heart Arrhythmia, Coronary Heart Disease, Hypertension, Comprehensive Internal Medicine (Pulmonary Vascular Disease & Coronary Heart Disease). A total of 340 beds are available. The number of outpatient and ER visits, hospitalization, and discharged patient was 32,034, 6,941 and 6,861 respectively. A total of 4,359 procedures were performed, including 3,337 interventional procedures and 1,022 surgeries.

In 2018, we launched free screening and long-term management program for children with Congenital Heart Disease (CHD) in the whole province. So far, we have screened 1,012,282 children in 3,035 schools, and provided surgery and medical care for 1,028 children with CHD.

FYCH is actively integrated into the national the Belt and Road Initiative, and combines with our clinical techniques and brand advantages to raise the international influence of Fuwai Brand, so as to promote academic connection and health diplomacy with countries like Myanmar, Cambodia, Laos, and Nepal.

云南省阜外心血管病医院是按三级甲等心血管病专科医院标准建设的高水平医院。经过近4年的筹建，2017年9月19日，医院正式对外收治门诊、住院病人。

截止2018年，医院已开放成人心脏外科、小儿心脏外科、血管外科、心律失常、冠心病、高血压、内科综合（肺血管）病区等10个病区，共340余张床位。门急诊挂号32034人，入院6941人，出院6861人，共完成4359台手术，其中内科介入手术3376台，外科手术1022台。

2018年，医院启动全省儿童先心病免费筛查和慢性病登记项目工作，目前共完成3035所学校的先心病免费筛查，检查儿童1012282名，查出疑似患儿27703例，救治患儿1028名。

同时，医院积极服务和融入国家“一带一路”倡议，结合自身临床技术和品牌优势、主动谋划，提升阜外品牌的国际影响力，切实促进与周边国家（缅甸、柬埔寨、老挝、尼泊尔等）的学术交流，积极服务国家医疗外交。



阜外华中心血管病医院 国家心血管病中心华中分中心

Fuwai Central China Cardiovascular Hospital Central China Subcenter of the National Center for Cardiovascular Diseases

Fuwai Central China Cardiovascular Hospital, Central China Subcenter of the National Center for Cardiovascular Diseases, a tertiary hospital located in the central China, Henan Province, has come into practice since December 16th, 2017. Fuwai Central China Cardiovascular Hospital was collaboratively built by Fuwai Hospital, National Center for Cardiovascular Disease and the People's Government of Henan Province, with tremendous support and instructions from the National Health Commission.

As a regional hospital, Fuwai Central China Cardiovascular Hospital has 1000 beds, distributed in 34 open wards for 15 clinical specialties. There are 1,301 employees. In 2018, we had a total of 219,500 outpatient visits and 29,100 hospitalizations. 5,781 cardiac surgeries and 15,159 intervention procedures were successfully completed. Under the leadership of Dr. Shengshou Hu, 91 senior specialists from Fuwai hospital have made 281 visits to Fuwai Central China Cardiovascular Hospital, dedicating to outpatient caring, ward rounding, procedure performing, consultation and lecturing, and the local patients can truly enjoy a first-class medical service without long distance arduous travel.

阜外华中心血管病医院、国家心血管病中心华中分中心是在国家卫健委关心支持和重视推动下，由中国医学科学院阜外医院、国家心血管病中心与河南省人民政府合作共建，依托河南省人民医院，按照现代医院管理制度要求建设的三级甲等公立医院，是国家心血管病中心在全国布局的唯一分中心国家心血管病中心华中分中心所在地。2017年12月16日，阜外华中心血管病医院正式投用。

阜外华中心血管病医院编制床位1000张，开放病区34个，设有15个临床专科。现有职工1301人。2018年，心血管专业门急诊量达21.95万人次，出院病人达2.91万人次，手术量达5781例，介入手术量15159。在胡盛寿院士的带领下，阜外医院先后有91名专家来豫开展门诊、查房、手术、会诊及讲学281人次，患者足不出省就可真正享受到国家级专家的诊疗服务。



中国医学科学院阜外医院深圳医院

Shenzhen Hospital of Fuwai Hospital



cardiovascular disease medical and research center, based in Shenzhen, serving Guangdong, Hong Kong, Macao and the gulf region, radiating to southeast Asia".

2018年10月26日中国医学科学院阜外医院与深圳市人民政府正式签署战略合作框架协议，托管运营深圳市孙逸仙心血管医院，更名为中国医学科学院阜外医院深圳医院。阜外医院深圳医院施行“一院两区一体化”管理，全面纳入阜外医院医疗、教学、科研、预防和管理体系，罗湖院区主要作为“国家心血管病临床医学研究中心·深圳”科研基地，南山院区主要作为心血管疾病诊疗和科研、教学基地。

2018年12月11日起，阜外医院陆续派出专家团队进驻深圳，由心血管专家组成的团队“集体传帮带”，在深圳成功开展了多项国内领先、顶尖的技术。阜外医院深圳医院对标国内外最高、最好、最优，沿袭阜外医院的品质与理念，推动临床和科研“变道超车”。通过几年努力，将建设成为“立足深圳，服务粤港澳大湾区，辐射东南亚，国际先进、国内一流的高水平心血管疾病诊疗中心和临床医学研究中心”。

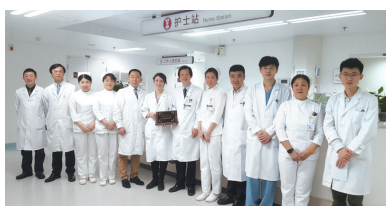


On October 26, 2018, Fuwai Hospital and Shenzhen Municipal People's Government formally signed a strategic cooperation framework agreement to host and operate Shenzhen Sun Yixian Cardiovascular Hospital, renamed as Fuwai Hospital-Shenzhen. Fuwai Hospital-Shenzhen implements “two districts and one integrated hospital” management, which is fully adopted the medical, training, scientific research, prevention and management systems of Fuwai Hospital. Luohu Hospital is mainly used as the scientific research base of “National Clinical Medical Research Center for Cardiovascular Diseases-Shenzhen” and Nanshan Hospital is mainly used as medical, teaching and research center for cardiovascular disease.

Since December 11, 2018, teams of experts from Fuwai Hospital has been deployed in Fuwai hospital-Shenzhen, bringing several advanced and leading techniques to Shenzhen. Established according to the highest standard at home and abroad, Fuwai hospital-Shenzhen follows the quality and philosophy of Fuwai Hospital and advocates “change lanes and overtake” on clinical and research work. Through several years of efforts, it will be built into a “high-level world class

积极融入“一带一路”战略

Integration of “the Belt and Road” Strategy



The National Center for Cardiovascular Diseases, Fuwai Hospital was actively engaged in furthering the influence of the hospital through the national “the Belt and Road” initiative.

In 2018, in addition to continuing to carry out operation demonstration and physician exchange training programs in countries like Argentina and Brazil, the expert team of Fuwai Hospital completed 13 cases of consultation and operation demonstration in countries along the line of “the Belt and Road”, covering 5 countries, and held 8 cardiovascular advanced training classes for doctors in these countries, which trained a total of 40 advanced doctors.



The center signed cooperation contracts with nine international medical centers along the line of “the Belt and Road”, including Indonesia, Philippines, Burma, Laos, Cambodia, Thailand, Nepal, Pakistan, and Kazakhstan. Additionally, the center supported the integration of Fuwai Yunnan Cardiovascular Hospital into the national strategy of “the Belt and Road.” With the unique advantage of “two independent administration systems in one hospital,” Fuwai has improved its medical service and capacity in south and southeastern Asia. Various forms of academic exchanges, including international fellow training via master’s degree programs in cardiovascular clinical research, donating mobile medical vehicles, carrying out short-term free clinics, holding congenital heart disease screening programs, have been successfully conducted in over 30 countries along the line. The goal of these efforts is to optimize medical education and play a leading role in the training of distinguished cardiovascular specialists.





国家心血管病中心，中国医学科学院阜外医院积极融入国家“一带一路”战略，打造阜外品牌在国际上的影响力。

2018年，阜外医院专家团队除继续在阿根廷、巴西等国家开展手术演示及医师交流培训外，在“一带一路”沿线国家完成会诊及手术演示13例，范围覆盖格鲁吉亚、印尼、希腊、俄罗斯、乌兹别克斯坦等5个国家，举办8期“一带一路”沿线国家医师长短期交流培训，培训高级进修医师共计40人。

国家心血管病中心已与印尼、菲律宾、缅甸、老挝、柬埔寨、泰国、尼泊尔、巴基斯坦、哈萨克斯坦等9个“一带一路”沿线国家的医学中心签署合作协议。积极推进云阜融入国家“一带一路”战略，利用“一院两制”优势，发挥向南亚、东南亚的健康辐射功能，开设“一带一路”沿线硕士国际班，完成涵盖一带一路超过30个国家的心血管疾病临床医学研究硕士国际班的创建、招收和教学工作，捐助流动医疗车，开展短期义诊、先心筛查等活动。通过不断完善的学科体系建设，为培养顶尖心血管临床医学研究师资力量和人才发挥引领作用。





交流 Communication



中国心脏大会（CHC）2018 暨国际冠心病大会（ICC）2018 暨第三届中国血管大会（CVC）

CHINA HEART CONGRESS (CHC) 2018 IN CONJUNCTION WITH INTERNATIONAL CORONARY CONGRESS (ICC) 2018 AND THE 3RD CHINA VASCULAR CONGRESS (CVC)

On August 2-5, 2018, China Heart Congress (CHC) 2018 in conjunction with International Coronary Congress (ICC) 2018 and the 3rd China Vascular Congress (CVC) was held at the China National Convention Center in Beijing. The conference was organized by Chinese Medical Association (CMA) and National Center for Cardiovascular Diseases, China (NCCD) and Beijing Kaiqi Cardiovascular Foundation. The theme of conference was "New Era · New Journey - Innovation, Translation, and Cooperation".

Over the years, with the strong support and active participation of many partners and medical colleagues, the China Heart Congress has developed into the most influential cardiovascular academic event in Asia-Pacific region. This year, a total of 11,156 experts and colleagues in the field of cardiovascular disease participated in the conference. The conference was composed of plenary session, the International Coronary Conference (ICC) 2018, the cardiovascular hot spots summits, and more than 60 sub-forums and satellite conferences; there were detailed discussions in field of basic research, epidemiology and laboratory test, imaging and testing, cardiovascular surgery, and nursing. This year's conference also focused on cardiovascular big data, structural heart disease, vascular disease, innovative technology, primary training and other topics. The state of the art of precision medicine in cardiovascular disease worldwide was further demonstrated with the help of advanced informational and visual multimedia teaching system from Fuwai Hospital. Experts and scholars from China and all around the world shared their latest academic research results. They also discussed hot issues in practice, exchanged information on clinical practice, education, research, prevention and industry, and coping with national, regional and global challenges in cardiovascular disease together.

2018年8月2-5日，中国心脏大会（CHC）2018暨国际冠心病大会（ICC）2018暨第三届中国血管大会（CVC）在北京国家会议中心成功召开。本届大会由中华医学会、国家心血管病中心、北京楷祺心血管公益基金会三方联合主办。大会主题为“新时代·心征程 - 创新·转化·合作”。

多年来，在众多伙伴和医界同仁的大力支持和积极参与下，中国心脏大会已经发展成为我国乃至亚太地区心血管界最具影响力的学术盛会。今年大会共有11156名心血管疾病相关领域同道参与其中。本届大会内容丰富，包括心脏大会全体大会和血管全体大会、国际冠心病大会（ICC）2018、心血管疾病热点峰会、60余个分论坛以及卫星会；对心血管疾病基础研究、流行病学和人群预防、心血管疾病影像和检验、心血管内外科治疗、护理等方面均安排了详尽的讨论。今年大会还重点关注心血管大数据、结构性心脏病、血管疾病、创新技术、基层培训等专题，并借助阜外医院国际领先的信息化、可视化的多媒体教学系统进一步展示当前国内外心血管疾病精准医学研究的前沿与成果。来自我国和世界各地的专家学者在中国心脏大会上分享了最新学术研究成果，讨论实践中的热点问题，交流心血管病医、教、研、防及产业的各种信息，共同应对心血管疾病的国家、地区及全球性挑战。



国际冠脉大会2018 INTERNATIONAL CORONARY CONGRESS 2018

The 2018 International Coronary Congress (ICC 2018) was held on Aug 2-5, 2018, at the National Convention Center in Beijing. The International Coronary Congress, in the interests of being truly international, multidisciplinary and representative of the full heart team caring for coronary patients, has opted to partner with several professional medical societies and institutions. This is the first time that ICC taking place in China, featured by an international faculty, with 36 foreign coronary surgeons from 13 countries who delivered as many as 16 sessions, containing 87 lectures. Simultaneously, special training sessions of surgical skill training was given by leading cardiac specialist during the congress. The meeting achieved remarkable success in developing comprehensive programs to promote best practices in surgical coronary revascularization that included the most innovative techniques and technologies from the leading minds in the field worldwide.

During ICC2018, Dr. John Puskas and Dr. David Taggart, co-founders and chairman of ICC, presented Dr. Shengshou Hu the 2018 Lifetime Achievement Award. Dr. Hu was praised as a visionary leader of cardiovascular surgery in China, who was the first in the world to complete video thoracoscopy assisted CABG combined with PCI for treatment of multi-vessel disease, and practiced the biggest amount of 'One-stop Hybrid Coronary Revascularization'. He also performed the first off-pump CABG, first Video Thoracoscopy Assisted CABG in China, and led to build the Chinese Cardiac Surgery Registry System. Dr. Hu also conducted multiple RCTs regarding quality improvement of CABG, including Dual AntiPlatelet Therapy after CABG (2010), on CABG with Cell Transplantation (2011), and CABG with Omentum and Auricle Wrapping (2015). Dr. Shengshou Hu is the first domestic recipient of ICC Lifetime Achievement Award (Bruce Lytle and Brian Buxton from USA in 2015; Naresh Trehan from INDIA in 2016; George E. Green from USA in 2017).

国际冠脉大会2018 (ICC 2018) 于8月2日-5日在北京国家会议中心召开, 国际冠脉大会是冠脉外科领域最高水准的国际顶级盛会, 今年系首次在中国举办。来自全球各地的杰出冠心病外科专家和学者通过交流最新研究证据、研讨创新技术, 促进冠脉血运重建治疗方式的优化。同时, 本次大会也联合外科医师与内科医师, 讨论了冠心病血运重建治疗策略、质量控制、心脏团队与医师培训相关领域的新成果、新进展与新趋势, 以期为患者提供最好的临床诊疗与预后。ICC2018由5个亚洲心血管外科专业学会联合举办, 涵盖世界13个国家的心血管外科, 由36位国际顶级专家出席, 共有16个会议主题、87场主题演讲。大会期间同时设置了10场由国际专家亲授的外科技术培训以及人文精神论坛。国际冠脉大会对于提升我国冠心病整体诊治水平有巨大的推动作用。

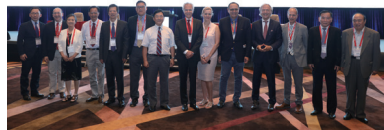
大会期间, 由ICC的共同创办者、主席——美国西奈山伊坎医学院的John D. Puskas教授和英国牛津大学John Radcliffe医院的David Taggart教授, 共同授予了胡盛寿院长终身成就奖, 授奖辞中肯定了他作为一位有远见的领导者, 为中国乃至国际冠脉外科的贡献, 包括: 全球首例胸腔镜辅助下CABG联合PCI治疗冠状动脉多支病变; 完成全球最大量的“一站式”杂交手术; 建成我国首个多中心心血管外科数据库系统; 在国内首先开展了正中切口非体外循环下冠状动脉搭桥手术、胸腔镜辅助下冠状动脉搭桥手术; 并主导了多项冠脉外科临床医学研究: 搭桥术后双联抗血小板、搭桥联合干细胞移植、搭桥联合大网膜包裹等。这是首次由中国学者获此殊荣 (历届国际冠脉大会终身成就奖获得者分别为: 2015年美国Bruce Lytle教授及Brian Buxton教授; 2016年印度Naresh Trehan教授; 2017年美国George E. Green教授), 体现了国际冠脉外科界对我国心血管医治水平的肯定与赞赏。

中国血管大会终身成就奖获得者

汪忠镐 中国科学院院士



CVC 2018 第三届中国血管大会



血管疾病诊疗技术国际培训、交流合作备忘录
SIGNING CEREMONY OF MEMORANDUM OF UNDERSTANDING
INTERNATIONAL MEDICAL SERVICE AND TRAINING OF VASCULAR



第三届中国血管大会

THE 3RD CHINA VASCULAR CONGRESS

On August 3, 2018, the 3rd China Vascular Congress (CVC 2018) was successfully held at the China National Convention Center in Beijing. This academic event, focusing on the state of the art of surgical, endovascular, and hybrid treatment for aortic, peripheral arterial, and venous diseases, was attended by more than 20 foreign experts from more than 10 countries and more than 1,300 domestic cardiovascular surgeons. CVC 2018, for the first time, established the "Honorary Academy Award", which was awarded to Zhonghao Wang, academican of the Chinese Academy of Sciences, expert of vascular surgery. One of the features of CVC 2018, "Medical Skill & Healing Art Symposium," included an exploration of the cross-border integration of medicine and art led by Yansong Bai, member of CPPCC, national famous host. In accordance with the national strategy of "the Belt and Road," the Chinese National Society of Vascular Surgery signed the Memorandum of Understanding with Large medical institutions in Poland, Dominica, etc.

2018年8月3日，第三届中国血管大会（China Vascular Congress, CVC）在北京国家会议中心隆重开幕，来自全国各地1300多位心血管外科专家和来自10余个国家20余位外国专家参加了此次学术盛会，共同探讨了外科、腔内、杂交治疗主动脉、外周动脉和静脉疾病的最新进展。今年CVC2018特别设立“中国血管大会终身成就奖”，本届奖项授予中国科学院院士、血管外科奠基人汪忠镐院士。作为本次大会特色之一，“医术·艺术”人文讲坛邀请全国政协委员、著名主持人白岩松先生发表专题演讲，探讨医术与艺术的跨界交融。同时，在国家大力提倡“一带一路”战略的时代背景下，秉承“和平合作、开放包容、互学互鉴、互利共赢”的丝绸之路精神，中国国家心血管病专家委员会血管外科专业委员会与波兰、多米尼加等国大型医疗机构在CVC2018开幕式上签署了学术合作备忘录。





第三届阜外国际复杂先心病高峰论坛暨大动脉调转手术技术高级培训班 THE 3RD FUWAI INTERNATIONAL CONFERENCE OF COMPLEX CONGENITAL HEART DISEASES & ADVANCED HANDS-ON SURGICAL TRAINING COURSE OF SWITCH PROCEDURE

On December 1-2, 2018, the 3rd Fuwai International Conference of Complex Congenital Heart Diseases, which was considered as the best congenital cardiac disease forum in China, was perfectly held in Beijing. Top pediatric cardiac surgeons from USA, France, Italy, Japan, South Korea, Prof. Hu Shengshou, Prof. Li Shoujun and other domestic experts shared their cutting-edge technologies and reported the results of late-breaking trials in the field of complex congenital heart diseases. The conference was focused on the treatment challenge and surgical repair of left heart anomalies, the decision making and bi-ventricle repair technique in cono-truncal anomalies, and the surgical treatment of congenital valvular disease. Top expert and surgeons around the world had deep discussions and shared their valuable experiences during this meeting. In addition, several surgical videos from these masters were presented, which made the audience enjoyed and benefited a lot.

In order to improve the quality of surgical treatment for TGA in China, a high-level training course on Switch operation was successfully held at Fuwai hospital on December 3-4, 2018. It was the first time in China to apply 3D printing technology to the teaching on operation of complex congenital heart disease. The training course adopted the world's most advanced 3D heart model, which was closest model to the actual human heart with complex malformation, and covered three different types of major coronary artery malformations of TGA. The course was guided by top international experts to comprehensively improve the surgical skills of the trainees.

2018年12月1日至2018年12月2日第三届阜外国际复杂先心病高峰论坛在中国医学科学院阜外医院成功举行。来自世界杰出中心的顶级先心病外科专家和胡盛寿院士、李守军教授等国内专家逐一展示了复杂先心病外科治疗进展。本次论坛针对小儿先心病领域相关左心系统病变的挑战和外科矫治，小儿瓣膜病的精细化外科治疗以及圆锥动脉干畸形的治疗决策和双心室矫治技术等三大专题进行报告和深入探讨。会议期间国内外专家讨论热烈，分享了复杂先心病先进的治疗经验，同时会议期间还播放了国际心脏外科大师手术视频，使参会人员大呼过瘾、获益良多。

为提高我国大动脉转位外科治疗水平，为此类患儿争取最佳手术时机，阜外医院于2018年12月3日-4日成功举办大动脉调转技术操作高级培训班。这是国内首次将3D打印技术应用于复杂先心病的手术操作学习。本次培训班采用国际最先进的、最接近真实手术操作状态的3D心脏模型，涵盖三种不同冠状动脉畸形大动脉转位矫治术的模拟操作教学，并由国际顶级专家现场指导，从而全面提高与会者的大动脉转位术的手术技术。





第十一届复杂先心病研讨班： 右心系统复杂畸形治疗策略的改良和创新

THE 11TH COMPLEX CONGENITAL HEART DISEASE SEMINAR: IMPROVEMENT AND INNOVATION OF TREATMENT STRATEGY FOR COMPLEX RIGHT HEART DISEASES

The 11th Complex Congenital Heart Disease Forum: Improvement and innovation of treatment strategy for complex right heart diseases was successfully held in Fuwai Hospital from March 29th to 31st, 2018. More than 300 surgeons, anesthesiologist and intensivist from all over the country attended this seminar. As usual, several live demonstrations of surgery for challenging cases were presented during this meeting.

The theme of this seminar were the improvement and innovation of treatment strategy for complex right heart anomalies. Right heart anomalies account for a large proportion of complex congenital heart disease, and the ability of surgical treatment reflects the level of treatment for congenital heart disease in a cardiac center. How to choose the best treatment strategy and surgical plan with the greatest benefit and the lowest risk for patients have always been the concern for every pediatric cardiac surgeon. Experts and doctors at the meeting gave a shared their work experience in detail and discussed the clinical cases enthusiastically. Therefore, the participants fully understand the key points of preoperative diagnosis, surgical indications, surgical options, specific operative techniques, anesthesia and extracorporeal circulation management, perioperative comprehensive management, and the improvement and innovation of treatment strategies for complex right heart anomalies.

2018年3月29日-31日，“第十一届复杂先心病研讨班暨右心系统复杂畸形治疗策略的改良和创新”在北京阜外医院成功举办。来自全国各地的300多名医生参加了会议。沿袭以往学习班的特色，会议还安排了典型病例手术演示。

本次研讨会的主题是复杂右心系统疾病治疗策略的改良与创新。右心系统病变在复杂先天性心脏病中占有很大的比重，其手术治疗的水平体现着一个医疗中心先心病方面的治疗水准。如何正确选择治疗策略，设计对于患者受益最大、风险最低的手术方案，一直是每一个小儿心外科医生非常关注的问题。会议上专家学者详细介绍了他们的工作经验，热烈的讨论了临床病例。参会者全面了解复杂右心系统疾病的术前诊断，手术适应症、术式选择、手术操作要点，麻醉体外循环管理及围术期综合处理，并对治疗策略的改良与创新有着进一步的认识。



第十届阜外主动脉病变治疗研讨会 THE 10TH FUWAI SEMINAR ON AORTIC SURGERY

In the end of 2018, the 10th Fuwai Seminar on Aortic Surgery was successfully held in Fuwai Hospital. This conference was focused on "Surgical treatment of aortic arch disease" and its topics covered surgical, endovascular and hybrid treatment of aortic disease. We had the honor to invite the aortic surgery team of Cleveland medical center to communicate with us, including: Professor Lars Svensson, director of the heart center; Professor Eric Roselli, director of adult cardiac surgery and aortic surgery; and Professor Michael Tong, director of the heart transplantation and mechanical assistance center.

In addition, anesthesiology, extracorporeal circulation, perioperative management and related basic research of aortic diseases had also been involved in this conference. Moreover, more than 40 domestic and foreign experts communicated and discussed the frontiers and hot issues in surgical and endovascular treatment of aortic diseases.

2018年底，“第十届阜外主动脉病变治疗研讨会”在阜外医院圆满召开。本届会议以“主动脉弓部病变”为主线，讨论了主动脉弓部病变的外科、腔内、杂交治疗以及其他相关话题。本次研讨会特邀美国克利夫兰医学中心心脏中心主任Lars Svensson教授、成人心脏外科和主动脉外科主任Eric Roselli教授以及心脏移植和机械辅助中心主任Michael Tong教授与会交流。

此外，本届研讨会还涉及麻醉、体外循环、围手术期管理以及主动脉疾病相关基础研究的最新进展。国内外专家40余人就主动脉疾病外科及血管内治疗的前沿和热点问题进行交流和讨论。





第七届中国心脏重症大会 THE 7TH CHINA HEART CRITICAL CARE CONGRESS

On June 23-24, 2018, the 7th China Heart Critical Care Congress was successfully held at the National Convention Center, Beijing. With the theme of "Heart Critical Care – Education and Improvement", the conference is by far the most influential academic event in the field of cardiac critical care. 288 experts and scholars from home and abroad attended the conference. The content of the conference was fascinating, attracting nearly 5,000 peers from all over the country to discuss the development of the cardiac critically care, technical difficulties, and the current opportunities and challenges. Professor Zhang Haitao, the chairman of the conference, delivered a speech at the opening ceremony with the topic of "current status, opportunities and challenges of cardiac critical care".

The conference invited CCTV's famous sports commentator Yu Jia as the "China Heart Health Ambassador", specially set up the theme of "Medical Humanities - Contemporary Doctors' Responsibilities and Social Expectations", and invited academicians Zhang Yun, medical expert, Prof. Cheng Xiansheng, the founder of China cardiopulmonary vascular disease, famous sports commentator Yu Jia, and Professor Zhu Hengpeng, the deputy director of the Institute of Economics of the Chinese Academy of Social Sciences, discussed their opinion from the view of doctors, patients and society, and shared their personal experiences and unique thoughts on medicine and humanities.

The conference set up 14 academic sub-forums, and organized various academic activities such as academic speeches, case discussions, and typical case presentations, etc. In addition, the conference announced the list of "China Extinguished Doctors - cardiac critical care in 2017", and 34 experts and doctors in the field of cardiac critical care were awarded.

2018年6月23-24日，第七届中国心脏重症大会在北京国家会议中心成功举办。本次大会以“心脏重症-普及与提高”为主题，是心脏重症领域内影响力最大的学术盛会。来自国内外288位专家学者出席本届大会，大会内容精彩纷呈，吸引了全国近5000名心脏重症同道与会学习，探讨了心脏重症学科的发展、技术难点，以及面临的机遇与挑战。大会主席阜外医院张海涛教授在开幕式致辞并发表了“心脏重症的现状、机遇与挑战”的精彩报告。

大会特别聘请中央电视台著名体育评论员于嘉担任“中国心脏健康形象大使”，特设“医学人文-当代医生的责任与社会的期望”主题沙龙，邀请医疗领域专家张运院士、中国心肺血管疾病奠基人程显声教授、著名体育评论员于嘉、中国社会科学院经济研究所副所长朱恒鹏教授四位嘉宾，分别从医生、患者、社会三个角度展开探讨交流，结合自己亲身经历分享了对医学与人文的独到见解。

本届大会设置了14个学术分论坛，开展了学术演讲、疑难病例讨论、典型病例展示等形式多样的学术活动。大会同期揭晓“华医纵横榜-2017年度心脏重症”上榜名单，34名心脏重症领域专家、医生获奖。





2018阜外国际心血管麻醉论坛暨全国心血管麻醉及围术期处理研讨会 2018 FUWAI INTERNATIONAL CARDIOVASCULAR ANESTHESIA FORUM & CHINA CARDIOVASCULAR ANESTHESIA & PERIOPERATIVE MANAGEMENT SYMPOSIUM.

With the continuous development of cardiovascular surgery and interventional therapy, cardiovascular anesthesia is also facing new opportunities and challenges. New concepts, theories and technologies are constantly emerging, which puts forward higher requirements for cardiovascular anesthesiologists.

“China Cardiovascular Anesthesia & Perioperative Management Symposium” has been held annually since 1995, and attracts many colleagues from all over the country who are committed to cardiovascular anesthesia and perioperative management. We not only discussed aortic disease, pediatric heart disease, coronary heart disease, valve disease, organ and blood protection, perioperative monitoring, anesthesia management, clinical research and other aspects, but also had an in-depth discussion on anesthesia for special types of heart disease surgery and interventional treatment of heart disease. We sincerely invited colleagues from all over the country who are engaged in cardiovascular anesthesia, surgery, cardiopulmonary bypass and perioperative management to attend this grand meeting.

Differently from previous symposiums, we held Fuwai International Cardiovascular Anesthesia Forum simultaneously this year. We invited anesthesiologists from the Cleveland Clinic, which ranks first in the field of cardiac surgery in the United States, and the German Heart Center Berlin, which is one of the largest and most famous cardiovascular hospital in Germany, to discuss hot issues in related fields in the forum. We also invited the anesthesiologists and surgeons from Birmingham Children's Hospital UK, Royal Brompton Hospital UK and the Nationwide Children's Hospital USA to share their advanced concepts in some specific areas of CHD. And the Executive Director of the Evidence-based Integration Medical Association of Canada was also invited to discuss the statistical issues in clinical research.

“全国心血管麻醉及围术期处理研讨会”自1995年以来每年举办一次，每次都吸引了众多来自全国各地致力于心血管麻醉和围术期管理的同道前来参会。2018年11月17日-18日，“全国心血管麻醉及围术期处理研讨会”成功召开，会议不仅在大血管、小儿心脏病、成人冠心病、心脏瓣膜病、器官和血液保护、围术期监测、麻醉管理、临床科研等方面开展讨论，更在特殊类型心脏病、心脏病介入治疗的麻醉等方面进行深入的探讨。诚邀到全国各地从事或热爱心血管麻醉、外科、体外循环和围术期工作的同道参加本届盛会。

与往届不同的是，今年我们同期举办了阜外国际心血管麻醉论坛，论坛邀请了来自美国的克利夫兰医学中心和德国柏林心脏中心的麻醉学专家与大家共同探讨相关领域的热点问题。同时会议也邀请了来自美国哥伦布泛美儿童医院、英国伯明翰儿童医院以及英国皇家布朗普顿医院的麻醉学及外科学专家分享在小儿先心病特定领域的先进理念。会议同时还邀请了来自加拿大循证整合医学学会的执行董事与大家分享临床研究中的统计学问题。





2018年阜外外科团队在国际专业学术会议上的发言 PRESENTATIONS AT INTERNATIONAL MEETINGS 2018

2018 The 15th Shanghai-Tokyo Angio-Research Symposium

Tokyo, Japan. December 8-9

Dr. Chenyang Shen

Kissing Self-Expanding Covered Stents Reconstruction of TASC II C and D Aortoiliac Occlusive Disease

2018 The 15th Shanghai-Tokyo Angio-Research Symposium

Tokyo, Japan. December 8-9

Dr. Jie Fang

A Retrospective Study of Femoropopliteal Artery Revascularization with Orchid DCB

Leipzig Interventional Course (LINC) 2018

Leipzig, Germany. January 30-February 2

Dr. Chenyang Shen

A Retrospective Study of Orchid DCB – data from real world single center

VEITH Symposium 2018

NewYork, USA. November 11-17

Dr. Chenyang Shen

Kissing Self-Expanding Covered Stents Reconstruction of TASC II C and D Aortoiliac Occlusive Disease

VEITH Symposium 2018

NewYork, USA. November 11-17

Dr. Chang Shu

Options for Treatment of Aortic Arch Pathology: When Open, Hybrid, Fenestrated or Branched TEVAR (F/B TEVAR) or Chimney TEVAR (Ch/TEVAR)

Leipzig Interventional Course (LINC) 2018

Leipzig, Germany. January 30-February 2

Dr. Chang Shu

1. Total endovascular techniques utilization in aortic dissection radical treatment
2. Aortic arch pathology options: open, hybrid, fenestration, chimney, or branched stent graft?
3. Endovascular treatment for abdominal aortic dissection

Veith Symposium 2018

NewYork, USA. November 11-17

Dr. Chang Shu

Options for Treatment of Aortic Arch Pathology: When Open, Hybrid, Fenestrated or Branched TEVAR (F/B TEVAR) or Chimney TEVAR (Ch/TEVAR)

Charing Cross (CX) Symposium

London, UK. April 24-27

Dr. Chang Shu

Thoracic Endovascular Aortic Repair Fenestration Technique & Chimney Technique

Complex Cardiovascular Catheter Therapeutics (C3) 2018

Orlando, USA. June 17-20

Dr. Chang Shu

Live Case Transmission: Fenestration Assisted TEVAR

International Congress of Endovascular Surgery (CICE) 2018

Sao Paulo, Brazil. April 18-21

Dr. Chang Shu

1. Aortic arch pathology options: open, hybrid, fenestration, chimney or branched stent-graft?



2. Current endovascular methods to treat aortic dissection
3. EVAR and percutaneous bifurcated stent-graft implantation

8th International Congress Aortic Surgery – Peripheral and Venous “HOW TO DO IT”

Milano, Italy. December 13-15

Dr. Chang Shu

Thoracic endovascular aortic repair fenestration & chimney technique: 4000 cases treated

Asia Pacific Medtech Forum 2018

Singapore. October 8-10

Dr. Chenxi Ouyang

Track 5 Healthcare Systems in Transition and Market Access

European Society for Vascular Surgery (ESVS) 32nd Annual Meeting

Valencia, Spain. September 24-28

Dr. Kun Fang

Comparison of in situ fenestration and physician-modified fenestration for left subclavian artery revascularization during thoracic endovascular aortic repair

European Society for Vascular Surgery (ESVS) 32nd Annual Meeting

Valencia, Spain. September 24-28

Dr. Chuan Tian

Clinical and imaging outcomes after hybrid surgery for aortic arch pathology

AATS 98th Annual Meeting

San Diego, USA. April 28-May 1

Dr. Cuntao Yu

Hybrid aortic repair without deep hypothermic circulatory arrest yields superior to total arch replacement with frozen elephant trunk in DeBakey type I dissection

AATS 98th Annual Meeting

San Diego, USA. April 28-May 1

Dr. Zhe Zheng

Video Presentation: Hybrid ablation of modified mini-maze: a new technique for long-standing persistent atrial fibrillation treatment

2nd Annual Meeting of the Korean Arrhythmia Surgery Network

Seoul, South Korea. July 7

Dr. Zhe Zheng

1. Hybrid ablation for long stand AF -Fuwai Experience
2. Current status of arrhythmia surgery in China or at Fuwai Hospital

ESC Congress 2018

Munich, Germany. Sep 24-29

Dr. Jianyu Qu

Preoperatively continued aspirin in elective isolated coronary-artery bypass grafting: a single institutional propensity score matched study

26th Annual Meeting of the Asian Society for Cardiovascular and Thoracic Surgery

Moscow, Russia. May 24-27

Dr. Sheng Liu

1. The potential value of Qanadli computed tomography index for pulmonary endarterectomy: a semi-quantitative analysis of the relationship between the pulmonary artery occlusion severity and pulmonary hemodynamics
2. Long-term result after pulmonary endarterectomy: a single center's 20 years experiences in Fuwai Hospital in China and its pathological result.

EACTS 32nd Annual Meeting

Milan, Italy. October 18-20

Dr. Shoujun Li

Congenital Aortic Uni-neocuspidization with Glutaraldehyde treated Autologous Pericardium.

ESC Congress 2018

Munich, Germany. Sep 24-29

Dr. Kai Ma

Impact of conduction disturbance after anatomical repair for congenital corrected transposition of the great arteries

EACTS 32nd Annual Meeting

Milan, Italy. October 18-20

Dr. Lei Qi

Outcomes of Superior Vena Cava to Right Atrial Connection and Intra-cardiac Repair after Bidirectional Glenn Shunt

STS 54th Annual Meeting

Florida, USA. Jan 27-31

Dr. Fengpu He

Mid-term Outcomes of Common Atrioventricular Valve Repair in Patients with Single Ventricular Physiology

2018 Annual Meeting of World Society for Pediatric and Congenital Heart Disease

Orlando, USA. July 22-26

Dr. Hao Zhang

Establishment of Congenital Heart Surgery Database in China

82nd Annual Scientific Meeting of Japanese Circulation Society

Osaka, Japan. March 23-25

Dr. Hao Zhang

Times to Promote the Quality of Control Cardiovascular Surgery in China

32nd EACTS Annual Meeting

Milan, Italy. October 18-20

Dr. Yuanyuan Tong

Perioperative Outcomes of Using Different Temperature Management Strategies on Pediatric Patients Undergoing Aortic Arch Surgery: A Single-Center, 8-Year Study

2018 Society for the Advancement of Blood Management (SABM) Annual Meeting

New York, USA. September 13-15

Dr. Hongwen Ji

Perspective of PBM in China and Fuwai Hospital's Experiences

2018 SCA 40th Annual Meeting & Workshops

Phoenix, USA. April 28-May 2

Dr. Hushan Ao

The Current Situation of Chinese Cardiothoracic Anesthesia

Euro-ELSO 2018 Congress

Prague, Czech Republic. May 23-26

Dr. Yongnan Li

Effect of an IABP with VA-ECMO on mortality of cardiogenic shock patients: a systematic review and meta-analysis



教育与培训

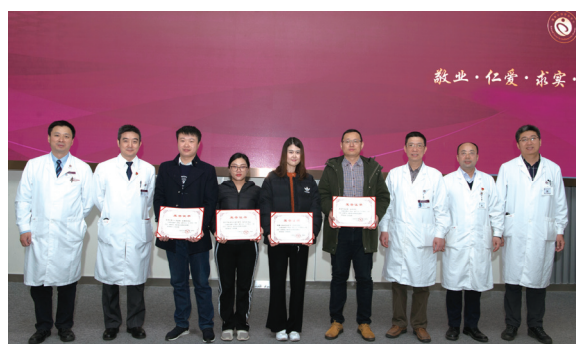
Education and Training



Fuwai Hospital has always advocated the concept of “broad leading talents” in education and training program. For being continued to cultivate qualified cardiovascular professionals for the country, Fuwai Hospital was recognized as the “cradle” of expert training in the field of cardiovascular disease in China. Fuwai Hospital has established a comprehensive education training system for doctors and researchers at each level. The system includes standardized resident training program focused on the basic skills, postgraduate education to foster scientific research abilities, and fellowship training program with an emphasis on advanced clinical skills. This education system has trained a large number of cardiovascular professionals and technical personnel who currently work at medical institutions across the nation.

In 2018, 41 new postgraduate students were recruited, and 23 students graduated and received their PhD from the surgical departments of Fuwai Hospital. At the same time, an addition of 204 doctors from domestic medical centers, including 58 surgeons, completed their continuing education training programs in our surgical departments..

阜外医院一直提倡“大人才观”的教育培训理念，为国家培养合格的心血管专业人才，是国家心血管防治领域的人才培养摇篮。以培养年轻医生基本技能的住院医师规范化培训，到以培养科研能力为主的研究生教育，再到以专注临床技能培训的进修医生教育，阜外医院构建了一套完整立体的，可适应我国各层次血管专业人才需要的教育培养体系，为国家输送了大量的心血管专业技术人才。2018年，阜外医院外科系统新入学研究生41名，23名研究生顺利毕业，目前在校研究生123名。同时国内共204名医师顺利完成了在阜外医院外科系统的进修课程，其中中心外科医师58名。





2018年阜外外科团队举办的专业学习班 TRAINING PROGRAM AND WORKSHOP 2018

第八届阜外下肢动脉硬化闭塞症腔内治疗学习班

The 8th Training Courses of Fuwai Hospital for Intervention of ASO Disease
7月6日

主动脉腔内技术学习班

Training Courses for Endovascular Aortic Repair (EVAR)
第一期：5月28-30日
第二期：6月25-27日

国家心血管病专家委员会血管外科专业委员会国际研修班

International Seminar for Vascular Surgery, on Behalf of Experts Committee of National Center for Cardiovascular Disease
10月8-26日，11月1日

主动脉夹层多中心注册登记研究项目研讨会

Seminar for Multicenter Registry of Aortic Dissection
6月28-29日

急性心力衰竭综合救治技术普及和提高培训班

Popularization and Improvement Training Courses for Comprehensive Management of Acute and Chronic Heart Failure
8月4-6日

心脏瓣膜病外科治疗培训班

Training Courses for Surgical Treatment of Heart Valve Diseases
第一期：6月21-23日
第二期：11月28-12月2日

冠状动脉旁路移植术临床学习班

Training Courses for Coronary-Artery Bypass Grafting
6月7-10日

房颤临床学习班

Training Courses for Surgical Treatment of Atrial Fibrillation
8月2-4日





心血管外科微创技术高级培训班

Advanced Training Program for Minimally Invasive Cardiovascular surgery

第一期： 5月20日

第二期： 9月14日

心脏生物瓣膜移植培训班

Training Courses for Cardiac Bioprosthetic Valve Replacement

7月4-7日

心外科搭桥进阶技术研讨会

Advanced Seminar for Coronary-Artery Bypass Grafting

9月7-9日

肥厚型梗阻性心肌病外科治疗培训班

Training Courses for Surgical Treatment of Hypertrophic Obstructive Cardiomyopathy

8月2-4日

ECMO模拟培训班

ECMO simulation Training Courses

第一期： 4月12-14日

第二期： 7月7-8日

第三期： 10月18-19日

第四期： 11月10日

第五期： 11月24-25日

第五届中国医学科学院阜外医院心血管外科手术室专业护士学习班

The 5th Training Courses for Cardiovascular Theatre Nurses

8月3-5日

中国医学科学院阜外医院心血管外科手术室教学研讨班暨精密器械规范化管理培训班

Seminar for Cardiac Operating Room Teaching in Conjunction with Training Courses for Standardized Management of Surgical Precision Instruments

5月19日



科研 Research

During 2018, the Fuwai surgical team published 63 SCI articles and continued to improve its communication of new knowledge in the field of cardiovascular surgery research.

2018年阜外医院外科系统共发表SCI论文63篇，继续在心血管外科临床与科研领域进行着新知识的传播与交流。

英文期刊 SCI ARTICLES

(第一作者或通讯作者来自外科系统)

1. Xing J, Ying Y, Mao C, Liu Y, Wang T, Zhao Q, Zhang X, Yan F and Zhang H. Hypoxia induces senescence of bone marrow mesenchymal stem cells via altered gut microbiota. *Nat Commun.* 2018;9:2020.
2. Li Y, Yan S and Gao S. Peripheral Venoarterial Extracorporeal Membrane Oxygenation: Needs More Focus on Left Ventricle Unloading. *Crit Care Med.* 2018;46:e719-e720.
3. Ma K, Wang G and Li S. Considerations in pursuing the optimal timing for pulmonary valve replacement in repaired tetralogy of Fallot. *Heart.* 2018;104:959-960.
4. Yan S, Ji B and Lou S. Straight deep hypothermic circulatory arrest: Cling to old fashion or not? *J Thorac Cardiovasc Surg.* 2018;156:710-711.
5. Liu M, Li Y, Liu Y, Yan S, Liu G, Zhang Q and Ji B. Cold-inducible RNA-binding protein as a novel target to alleviate blood-brain barrier damage induced by cardiopulmonary bypass. *The Journal of thoracic cardiovascular surgery.* 2018.
6. Deng L, Xu J, Tang Y, Sun H, Liu S and Song Y. Long-Term Outcomes of Tricuspid Valve Surgery in Patients With Congenitally Corrected Transposition of the Great Arteries. *J Am Heart Assoc.* 2018;7:e008127.
7. Lai S, Hua X, Gao R, Zeng L, Song J, Liu J and Zhang J. Combinational Biomarkers for Atrial Fibrillation Derived from Atrial Appendage and Plasma Metabolomics Analysis. *Sci Rep.* 2018;8:16930.
8. Li B, Chen S, Sun H, Xu J, Song Y, Wang W and Wang S. Mitral valve annuloplasty versus replacement for severe ischemic mitral regurgitation. *Sci Rep.* 2018;8:1537.
9. Deng L, Huang X, Yang C, Lyu B, Duan F, Tang D and Song Y. Numerical simulation study on systolic anterior motion of the mitral valve in hypertrophic obstructive cardiomyopathy. *Int J Cardiol.* 2018;266:167-173.
10. Ou-Yang WB, Li SJ, Xie YQ, Hu SS, Wang SZ, Zhang FW, Guo GL, Liu Y, Pang KJ and Pan XB. Hybrid Balloon Valvuloplasty for the Treatment of Severe Congenital Aortic Valve Stenosis in Infants. *Ann Thorac Surg.* 2018;105:175-180.
11. Qiu J, Zhang L, Luo X, Gao W, Liu S, Jiang W, Wu J and Yu C. Higher Mortality in Patients Undergoing Nighttime Surgical Procedures for Acute Type A Aortic Dissection. *Ann Thorac Surg.* 2018;106:1164-1170.
12. Wang S, Meng X, Luo Z and Pan X. Transapical Beating-Heart Mitral Valve Repair Using a Novel Artificial Chordae Implantation System. *Ann Thorac Surg.* 2018;106:e265-e267.
13. Yuan X, Li B, Sun H, Yang Y, Meng H, Xu L, Song Y and Xu J. Surgical Outcome in Adolescents and Adults With Anomalous Left Coronary Artery From Pulmonary Artery. *Ann Thorac Surg.* 2018;106:1860-1867.
14. Guo H-W, Sun X-G, Shi Y and Shu C. Surgical repair of huge ascending aortic and arch aneurysms with aortic dissection combined with pulmonary artery dissection and aortopulmonary artery fistula. *Eur J Cardiothorac Surg.* 2018;55:374-376.
15. Li Y, Yan S, Gao S, Liu M, Lou S, Liu G, Ji B and Gao B. Effect of an intra-aortic balloon pump with venoarterial extracorporeal membrane oxygenation on mortality of patients with cardiogenic shock: a systematic review and meta-analysis. *Eur J Cardiothorac Surg.* 2018;55:395-404.
16. Sun X, Guo H, Liu Y and Li Y. The aortic balloon occlusion technique in total arch replacement with frozen elephant trunk. *Eur J Cardiothorac Surg.* 2018.
17. Tang B, Song Y, Cui H, Ji K, Yu Q, Zhu C, Zhao S and Wang S. Prognosis of adult obstructive hypertrophic cardiomyopathy patients with different morphological types after surgical myectomy. *Eur J Cardiothorac Surg.* 2018;54:310-317.
18. Zhao D, Yang K, Li S, Yan J, Hua Z, Fang N, Su W, Lv X and Yu B. Outcomes of different rehabilitative procedures in patients with pulmonary atresia, ventricular septal defect and major aortopulmonary collateral arteries. *Eur J Cardiothorac Surg.* 2018.

19. Yang H, Ma Y, Luo M, Zhao K, Zhang Y, Zhu G, Sun X, Luo F, Wang L, Shu C and Zhou Z. Identification of gross deletions in FBN1 gene by MLPA. *Hum Genomics*. 2018;12:46.
20. Qi YF, Shu C, Xiao ZX, Luo MY, Fang K, Guo YY, Zhang WB and Yue J. Post-Transcriptional Control of Tropoelastin in Aortic Smooth Muscle Cells Affects Aortic Dissection Onset. *Mol Cells*. 2018;41:198-206.
21. Lu Z, Wang X, Yang J, Li S and Yan J. Vasopressin in vasodilatory shock for both left and right heart anomalous pediatric patients after cardiac surgery. *Shock*. 2018;50:173-177.
22. Zhang L, Qiu J, Yang X, Wang and Yu C. Circadian variations in the onset of aortic dissection in northern China. *Chronobiol Int*. 2018;35:1481-1489.
23. Yan C, Wang C, Pan X, Li S, Song H, Liu Q, Xu N and Wang J. Three-dimensional printing assisted transcatheter closure of atrial septal defect with deficient posterior-inferior rim. *Catheter Cardiovasc Interv*. 2018;92:1309-1314.
24. Wang M, Chen K, Chen X, Chen L, Song J and Hu S. Endomyocardial biopsy in differential diagnosis between arrhythmogenic right ventricular cardiomyopathy and dilated cardiomyopathy: an in vitro simulated study. *Cardiovascular Pathology*. 2018;34:15-21.
25. Chen K, Song J, Wang Z, Rao M, Chen L and Hu S. Absence of a primary role for TTN missense variants in arrhythmogenic cardiomyopathy: From a clinical and pathological perspective. *Clin Cardiol*. 2018;41:615-622.
26. Wang T, Wang X, Liu J, Zou L, Wang J, Zhao M and Cui Y. Substitution of artificial colloids for fresh frozen plasma in pediatric cardiopulmonary bypass surgery. *Paediatr Anaesth*. 2018;28:914-923.
27. Zhou M, Gao M, Luo Y, Gui R and Ji H. Long non-coding RNA metallothionein 1 pseudogene 3 promotes p2y12 expression by sponging miR-126 to activate platelet in diabetic animal model. *Platelets*. 2018:1-8.
28. Tong Y, Liu J, Zou L, Feng Z, Zhou C, Lv R and Jin Y. Perioperative Outcomes of Using Different Temperature Management Strategies on Pediatric Patients Undergoing Aortic Arch Surgery: A Single-Center, 8-Year Study. *Front Pediatr*. 2018;6.
29. Wang C, Gong J, Shi S, Wang J, Gao Y, Wang S, Peng YG, Song J and Wang Y. Levosimendan for Pediatric Anomalous Left Coronary Artery From the Pulmonary Artery Undergoing Repair: A Single-Center Experience. *Front Pediatr*. 2018;6:225.
30. Liu M, Zeng Q, Li Y, Liu G and Ji B. Neurologic recovery after deep hypothermic circulatory arrest in rats: A description of a long term survival model without blood priming. *Artif Organs*. 2018.
31. Lyu L, Yao J, Gao G, Long C, Hei F, Ji B, Liu J, Yu K, Hu Q and Hu J. Incidence, Risk Factors, and Outcomes of Hyperbilirubinemia in Adult Cardiac Patients Supported by Veno-Arterial ECMO. *Artif Organs*. 2018;42:148-154.
32. Chen L, Hua X, Song J and Wang L. Which aortic clamp strategy is better to reduce postoperative stroke and death: Single center report and a meta-analysis. *Medicine (Baltimore)*. 2018;97.
33. Guo H, Sun X, Yu C and Shu C. A case report of frozen elephant trunk combined with endovascular treatment for acute aortic dissection of Kommerell's diverticulum involving right aortic arch and descending aorta. *Medicine (Baltimore)*. 2018;97:e0166.
34. Qiu J, Cai W, Shu C, Li M, Xiong Q, Li Q and Li X. Application of thoracic endovascular aortic repair (TEVAR) in treating dwarfism with Stanford B aortic dissection: A case report. *Medicine (Baltimore)*. 2018;97:e0542.
35. Tian M, Wang X, Gao H, Wang L and Hu S. Left main coronary artery atresia with concomitant mitral regurgitation in an adult: A case report. *Medicine (Baltimore)*. 2018;97:e12367.
36. Sun H, Wang S and Song M. Long noncoding RNA SENCN alleviates the inhibitory effects of rapamycin on human umbilical vein endothelial cells. *Mol Med Rep*. 2018;18:1405-1414.
37. Sun Q-r, Zhang X and Fang K. Phenotype of Vascular Smooth Muscle Cells (VSMCs) Is Regulated by miR-29b by Targeting Sirtuin 1. *Medical Science Monitor*. 2018;24:6599-6607.
38. Wang S, Ouyang W, Liu Y, Zhang F, Guo G, Zhao G and Pan X. Transcatheter perimembranous ventricular septal defect closure under transthoracic echocardiographic guidance without fluoroscopy. *Journal of thoracic disease*. 2018;10:5222.
39. Deng L, Zhu J, Xu J, Guo S, Liu S and Song Y. Clinical presentation and surgical treatment of primary pulmonary artery sarcoma. *Interactive cardiovascular thoracic surgery*. 2017;26:243-247.
40. Li Y, Deng L and Song Y. Surgical treatment of huge left ventricular outflow tract pseudoaneurysm. *Interactive cardiovascular thoracic surgery*. 2018;27:613-614.
41. Liu X, Zhang W, Wang L, Wang S, Yu Y, Chen S and Ao HJl. Male patients with diabetes undergoing coronary artery bypass grafting have increased major adverse cerebral and cardiovascular events. *Interactive cardiovascular thoracic surgery*. 2018.
42. Pan T, Li D, Li S, Yan J and Wang X. Early initiation of peritoneal dialysis improves postoperative recovery in children with right ventricular outflow tract obstructive lesions at high risk of fluid overload: a propensity score-matched analysis. *Interactive cardiovascular thoracic surgery*. 2018;27:250-256.
43. Wu JL, Zhang L, Qiu JT and Yu CT. Morphological

- features of the thoracic aorta and supra-aortic branches in patients with acute Type A aortic dissection in China. *Interactive cardiovascular thoracic surgery*. 2018;27:555-560.
44. Lu W, Ouyang W, Wang S, Liu Y, Zhang F, Wang W and Pan X. A novel totally biodegradable device for effective atrial septal defect closure: A 2-year study in sheep. *J Interv Cardiol*. 2018;31:841-848.
 45. Fan HG, Marcacci C, Dulguerov F and Dreyfus GD. Degenerative Mitral Valve Repair: From Etiology, Pathology, Surgical Strategy to Durability. *Chin Med J (Engl)*. 2018;131:2486-2488.
 46. Li B, Sun HS, Pan SW and Xu JP. Outcomes of Ebstein's Anomaly Patients Treated with Tricuspid Valvuloplasty or Tricuspid Valve Replacement: Experience of a Single Center. *Chin Med J (Engl)*. 2018;131:1067-1074.
 47. Liu CY, Du JZ, Rao CF, Zhang H, Liu HN, Zhao Y, Yang LM, Li X, Li J, Wang J, Wang HS, Liu ZG, Cheng ZY and Zheng Z. Quality Measurement and Improvement Study of Surgical Coronary Revascularization: Medication Adherence (MISSION-2). *Chin Med J (Engl)*. 2018;131:1480-1489.
 48. Zhang Y, Yang Y, Sun HS and Tang Y. Surgical Treatment of Left Ventricular Pseudoaneurysm. *Chin Med J (Engl)*. 2018;131:1496-1497.
 49. Zhang Z, Zhao X and Wang Y-F. Dexmedetomidine for Transesophageal Echocardiography-Guided Percutaneous Closure of an Atrial Septal Defect in an Infant without Endotracheal Intubation. *Chin Med J (Engl)*. 2018;131:2137.
 50. Zhang C, Luo Q, Li Y, Wu X, Hao Z, Li S, Xia Z, Yan F and Sun L. Predictors of Short-term Outcomes Following Repair of Anomalous Origin of the Left Coronary Artery From the Pulmonary Artery in Chinese Children: A Case-Control Study. *J Cardiothorac Vasc Anesth*. 2018;32:2644-2651.
 51. Zhou H, Wang G, Yang L, Shi S, Li J, Wang M, Zhang C, Li H, Qian X, Sun X, Chang Q and Yu C. Acute Kidney Injury After Total Arch Replacement Combined With Frozen Elephant Trunk Implantation: Incidence, Risk Factors, and Outcome. *J Cardiothorac Vasc Anesth*. 2018;32:2210-2217.
 52. Chen Q, Li S, Hua Z, Zhang H, Yang K, Gao H, Ma K, Zhang S and Qi L. Anatomical Repair Conversion After Bidirectional Cavopulmonary Shunt for Complex Cardiac Anomalies: Palliation is Not a One-Way Path. *Pediatr Cardiol*. 2018;39:604-609.
 53. Zhang Y, Duan Y, Yan J, Wang Q, Li S and Xu H. Impact of Nesiritide Infusion on Early Postoperative Recovery After Total Cavopulmonary Connection Surgery. *Pediatr Cardiol*. 2018;39:1598-1603.
 54. Ju Z, Ma J, Wang C, Yu J, Qiao Y and Hei F. Effects of pumpless extracorporeal lung assist on hemodynamics, gas exchange and inflammatory cascade response during experimental lung injury. *Exp Ther Med*. 2018;15:1950-1958.
 55. Li X, Cai W, Zhang P, Fang K, Zhu J and Shu C. Comparison of Stanford B Aortic Dissection Patients Who Received Thoracic Endovascular Aortic Repair Combined with or without Sleep Apnea Syndrome. *Annals of vascular surgery*. 2018;52:79-84.
 56. Yuan L, Shu C, Zhou X, Li J, Wang L, Li X, Xiong X and Li L. Radiation suppresses neointimal hyperplasia through affecting proliferation and apoptosis of vascular smooth muscle cells. *The journal of vascular access*. 2018;19:153-161.
 57. Liu Y, Guo G-L, Zhang F-W, Wen B, Ou-Yang W-B, Xie Y-q and Pan X-B. A Novel Wire Is Effective for Echo-Guiding Percutaneous Atrial Septal Defect Closure: A Preclinical Study. *Journal of healthcare engineering*. 2018.
 58. Wang E-S, Fan X-S, Xiang L, Li S-J and Zhang H. Surgical outcome after complete repair of tetralogy of Fallot with absent pulmonary valve: comparison between bovine jugular vein-valved conduit and monocusp-valve patch. *World Journal of Pediatrics*. 2018;14:510-519.
 59. Liu Y, Guo GL, Wen B, Wang S, Ou-Yang WB, Xie Y and Pan XB. Feasibility and effectiveness of percutaneous balloon mitral valvuloplasty under echocardiographic guidance only. *Echocardiography*. 2018;35:1507-1511.
 60. Wang L, Qian X, Wang M, Tang X and Ao H. Which factor is the most effective one in metabolic Syndrome on the outcomes after coronary artery bypass graft surgery? A cohort study of 5 Years. *J Cardiothorac Surg*. 2018;13:1.
 61. Xu F, Song Y, Feng W, Li X and Du J. Increased Short-Term and Mid-Term Major Complications Were Observed in Elderly Patients with Renal Dysfunction after Surgical Ventricular Restoration. *The heart surgery forum*. 2018;21:E194-E200.
 62. Yuan X, Zhang H, Zheng Z, Rao C, Zhao Y, Wang Y, Krumholz HM and Hu S. Trends in mortality and major complications for patients undergoing coronary artery bypass grafting among Urban Teaching Hospitals in China: 2004 to 2013. *European Heart Journal-Quality of Care Clinical Outcomes*. 2017;3:312-318.
 63. Xiang L, Su Z, Liu Y, Zhang X, Li S, Hu S and Zhang H. Effect of family socioeconomic status on the prognosis of complex congenital heart disease in children: an observational cohort study from China. *Lancet Child Adolesc Health*. 2018;2:430-439.

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发展历程 History

In 1956, the predecessor of Fuwai Hospital, the Chest Hospital of the Chinese People's Liberation Army (PLA), was founded in the Heishanhu area of Beijing.

1956年，医院的前身中国人民解放军胸科医院于黑山扈成立。



In 1962, Fuwai Hospital was designated as an Institute for Cardiovascular Diseases, identifying it as a hospital specializing in cardiovascular diseases that integrates both patient care and medical research.

1962年，医院兼称心脏血管系统疾病研究所，形成院所一体化的心血管病专科医院。

In 2004, the Cardiovascular Disease Prevention, Treatment and Research Center affiliated to the Ministry of Health was established, marking the official recognition of our hospital as a national institution specializing in cardiovascular disease and integrating medical care, scientific research, medical education, and disease prevention.

2004年，卫生部心血管病防治研究中心成立，标志着我院成为集医疗、科研、教学、预防为一体的国家级心血管病专科医院。



1956

1962

2004

1958

1994

In 1958, responsibility for the Chest Hospital of Chinese PLA was transferred to the local government. The hospital was subsequently relocated to Fuchengmenwai Street, became affiliated with the Chinese Academy of Medical Sciences, and was renamed Fuchengmenwai Hospital Affiliated to the Chinese Academy of Medical Sciences, or Fuwai Hospital for short.

1958年，中国人民解放军胸科医院移交地方，迁至阜成门外，归属中国医学科学院，定名为“中国医学科学院阜成门外医院”，简称“阜外医院”。



In 1994, Fuwai Hospital Affiliated to the Chinese Academy of Medical Sciences was renamed Fuwai Cardiovascular Hospital, Chinese Academy of Medical Sciences.

1994年，中国医学科学院阜外医院更名为中国医学科学院阜外心血管病医院。





In 2011, the State Key Laboratory of Cardiovascular Diseases joined Fuwai Hospital.

2011年，心血管疾病国家重点实验室落户阜外医院。



In 2014, Fuwai Cardiovascular Hospital, Chinese Academy of Medical Sciences was renamed Fuwai Hospital, Chinese Academy of Medical Sciences, National Center for Cardiovascular Disease. The hospital began operating under the dual integrated operation model, which is based on the "two independent legal persons, one administration system."

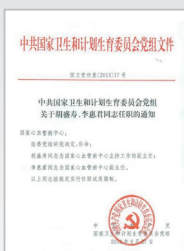
2014年，中国医学科学院阜外心血管病医院更名为中国医学科学院阜外医院。国家心血管病中心，中国医学科学院阜外医院正式进入“两个独立法人，一套行政机构”两位一体的运行模式。

2011

2014

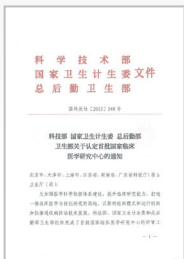
2013

2015



In 2013, the Xishan scientific research base was fully launched.

2013年，阜外医院西山科研基地全面启用。



In 2013, the National Clinical Research Center for Cardiovascular Diseases joined Fuwai Hospital.

2013年，国家心血管疾病临床医学研究中心落户阜外医院。



In 2015, the new medical building opened, integrating the clinic, emergency, and surgical systems to efficiently serve an even greater number of patients. The center has become the world's largest cardiovascular center as well as a national cardiovascular center for treatment, prevention, and medical research and education.

2015年，正式启用了集门诊、急诊、住院、手术等为一体的综合大楼，目前已成为世界上最大的心血管疾病诊治中心和集医疗、科研、预防和人才培养于一体的国家级医学研究与教育中心。

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In 2018, 58 doctors from domestic centers completed training programs in our surgical departments. We express our sincere appreciation for their hard work and dedication as well as the support of our colleagues and friends.

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陈 澄	云南省阜外心血管病医院和云阜国际心血管病医院	于四海	朝阳市中心医院
李郭三	云南省阜外心血管病医院和云阜国际心血管病医院	祁 亮	兰州大学第一医院
穆纯杰	云南省阜外心血管病医院	路 超	保定第七医院
路发文	云南省阜外心血管病医院	陈小聪	东莞市人民医院
刘琼梅	云南省阜外心血管病医院和云阜国际心血管病医院	尹衍林	徐州市矿山医院
陈宇雨	云南省阜外心血管病医院	郝 斌	淄博市中心医院
金 雄	云南省阜外心血管病医院和云阜国际心血管病医院	黄景彬	广西壮族自治区人民医院
周 勇	云南省阜外心血管病医院	郭亚雄	晋城市人民医院
张 超	云南省阜外心血管病医院	孙 鹏	山东省高密市人民医院
蔡云金	云南省阜外心血管病医院和云阜国际心血管病医院	王茂华	山东省立医院
白 赟	云南省阜外心血管病医院	张学军	天津市武清区人民医院
赵 勇	云南省阜外心血管病医院	吴海卫	南京军区南京总医院
唐志骐	云南省阜外心血管病医院	魏 伟	天津武清区人民医院
郝雨知时	云南省阜外心血管病医院	夏 杰	温州医科大学附属第二医院
曾程萍	云南省阜外心血管病医院	孙 博	哈尔滨医科大学附属第一医院
张 臻	阜阳市人民医院	傅元豪	北京大学第三医院
张振忠	运城市中心医院	吴原波	温州医科大学附属第一医院
何胜平	南方医科大学南方医院	樊孝华	湖南郴州市第一人民医院
李学军	贵州医科大学附属医院	陈 灿	湖北随州市中心医院

(以上排名不分先后)