



FUWAI HOSPITAL, CAMS
NATIONAL CENTER FOR CARDIOVASCULAR
DISEASES, CHINA

CARDIOVASCULAR SURGERY OUTCOMES 2019



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10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”

BEIJING, P. R. CHINA

FUWAI HOSPITAL, CAMS
NATIONAL CENTER FOR CARDIOVASCULAR
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CARDIOVASCULAR SURGERY **OUTCOMES 2019**

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

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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" has always been the eternal philosophy and pursuit of our surgical team. In 2019, we made great efforts to build the "Smart Hospital" 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 through innovative ideas, methods and technical skills.

2019 is a crucial year for Fuwai Hospital to implement the development plan for the new era. The network system, which is dedicated to enhancing the national overall capacity of diagnosis and treatment for cardiovascular disease, centered by Beijing Fuwai hospital and linked by three regional medical centers: Yunnan Fuwai Hospital, Huazhong Fuwai Hospital and Shenzhen Fuwai Hospital, has achieved initial outcomes. 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.

Fuwai Hospital will continue to strive for excellence in providing better humanized service with high quality for our patients.

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.

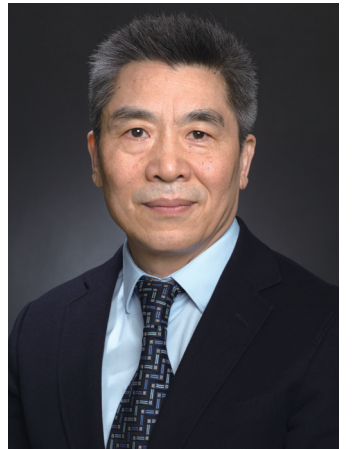
自2007年起，阜外医院外科每年都对大众公布年度业绩报告。年度报告的回顾总结，不仅能使患者获得了我们团队医疗质量的信息，也受到了同行和卫生工作者们的关注，成为医院督促自身提升高效和优质医疗服务的途径。

“品质与创新”一直是阜外外科团队为患者提供医疗服务永恒的主题和追求。在过去一年里，我们通过持续推进“智慧医院”2.0版信息化平台建设，以信息化为抓手提升医疗品质的监管与改进，以与时俱进的理念、方法和技术手段的创新为患者提供更安全、有效的治疗。

2019年是阜外医院践行新时代发展理念的关键一年。以北京阜外医院为中心，以云南阜外医院、华中阜外医院及深圳阜外医院三家区域医疗中心为枢纽辐射点，构建致力于提升全国心血管外科整体服务能力的网络体系建设取得初步成效。作为我国心血管病治疗的领导团队，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。

阜外医院将继续为心血管病患者提供更方便、更优质、更有温度的医疗服务。

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！



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心血管疾病国家临床医学研究中心 主任

2019年数读阜外
SERVICE CAPACITY OF FUWAI



中国最大的
心血管疾病诊疗中心

THE BIGGEST
CARDIOVASCULAR CENTER
IN CHINA

35



病房
Wards

1,275



床位
Beds

26



手术室
Operation Room

17



导管室
Catheter Lab

14,808



2019外科手术量
Surgical Volume
in 2019

52,720



2019介入诊疗量
Intervention
Procedures in 2019

801,379



门诊量
Outpatient Visit

74,519



住院人数
Admissions

概述 Overview

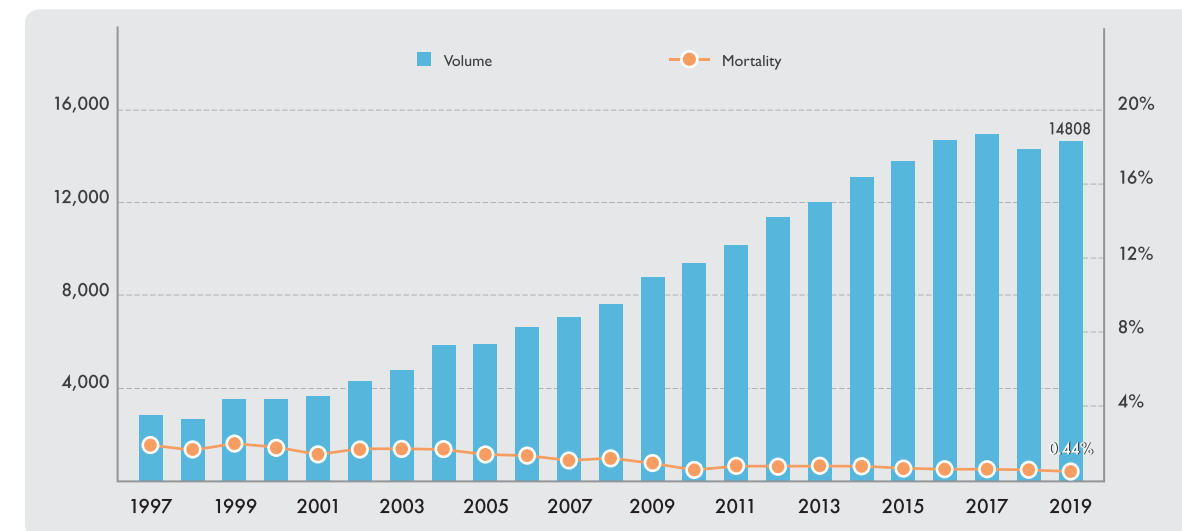
14808

CASE No. OF CARDIOVASCULAR SURGERY 2019

心血管外科手术量 SURGICAL VOLUME

In 2019, the surgical volume of Fuwai Hospital reached 14,808. Thirty-day mortality, which has been below 1% for the past eleven years, remained stable.

2019年，阜外医院外科手术量达到14808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11年低于1%。



分中心手术量 SURGICAL VOLUME OF SUBCENTERS

In 2019, surgeons at Fuwai Yunnan Cardiovascular Hospital performed 1636 cardiovascular surgeries, while 4705 cases of cardiovascular surgeries were completed at Fuwai Central China Cardiovascular Hospital and Central China Subcenter of the National Center for Cardiovascular Diseases, 1407 cases were performed at Fuwai Hospital Chinese Academy of Medical Sciences, Shenzhen.

2019年，云南省阜外心血管病医院共完成1636例心血管外科手术，国家心血管病中心华中分中心、阜外华中心血管病医院共完成心血管外科手术4705例，中国医学科学院阜外医院深圳医院完成各类心血管外科手术1407例。

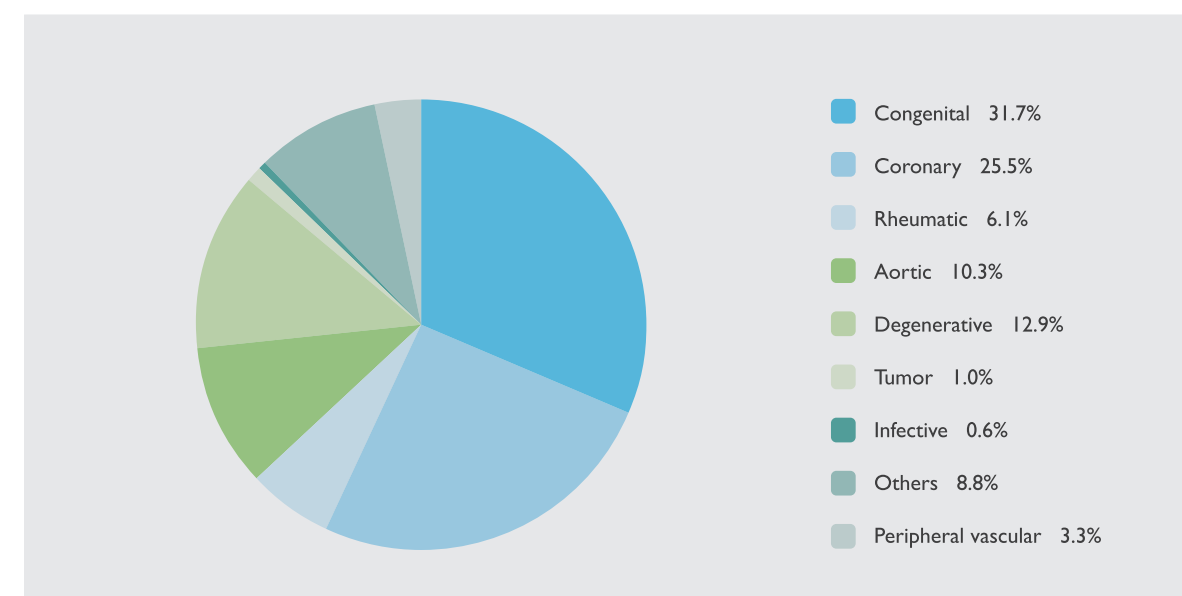


质量控制 Quality & Safety

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, coronary heart disease have remained the most common diagnosis at the hospital for years, the number of patients with aortic diseases or peripheral vascular diseases have increased dramatically.

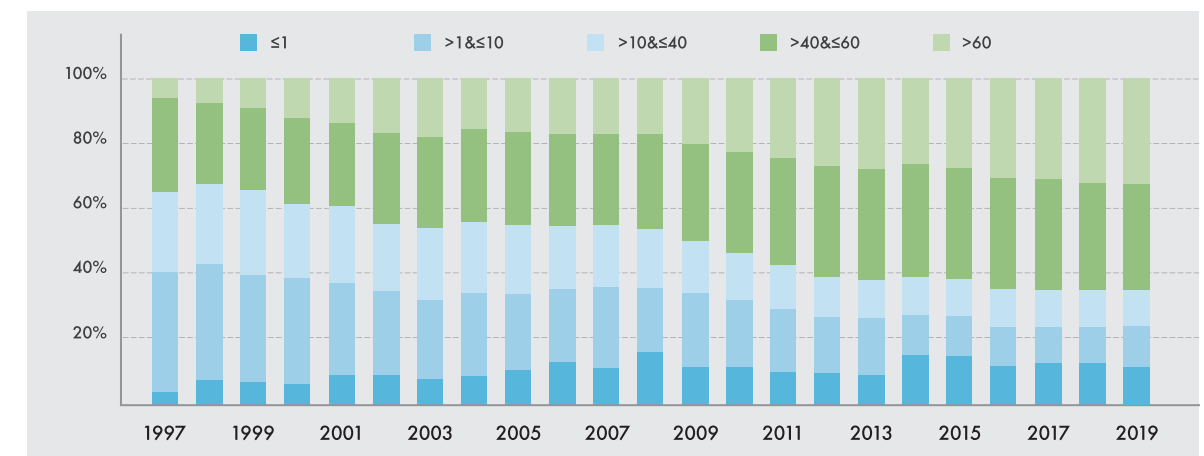
阜外医院心血管外科是全国收治心血管疾病种类最齐全的中心。医院收治患者的病因学分类基本反映出我国大陆地区心血管外科疾病治疗谱。先天性心脏病、冠心病仍为外科手术中主要病种，主动脉疾病和退行性病变所占比重呈上升趋势。



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.

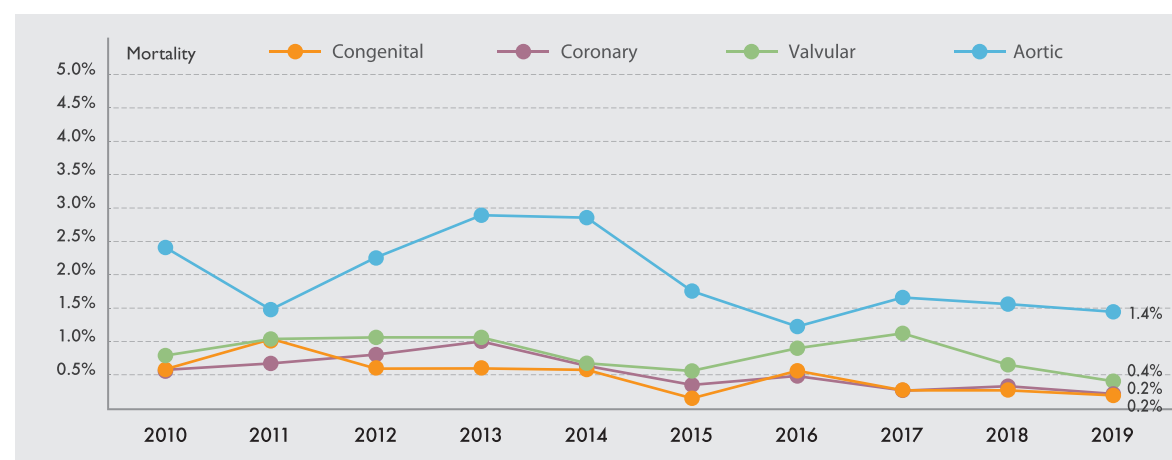
随着我国居民健康水平的不断提高和平均寿命的延长，低龄患者的早期诊治和高龄患者就医条件的改善促使患者年龄分布呈现两极分化的趋势，患者手术风险的增高对手术技术水平提出了更高的要求。



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. For example, Thirty-day mortality of isolated CABG was 0.2% in 2019.

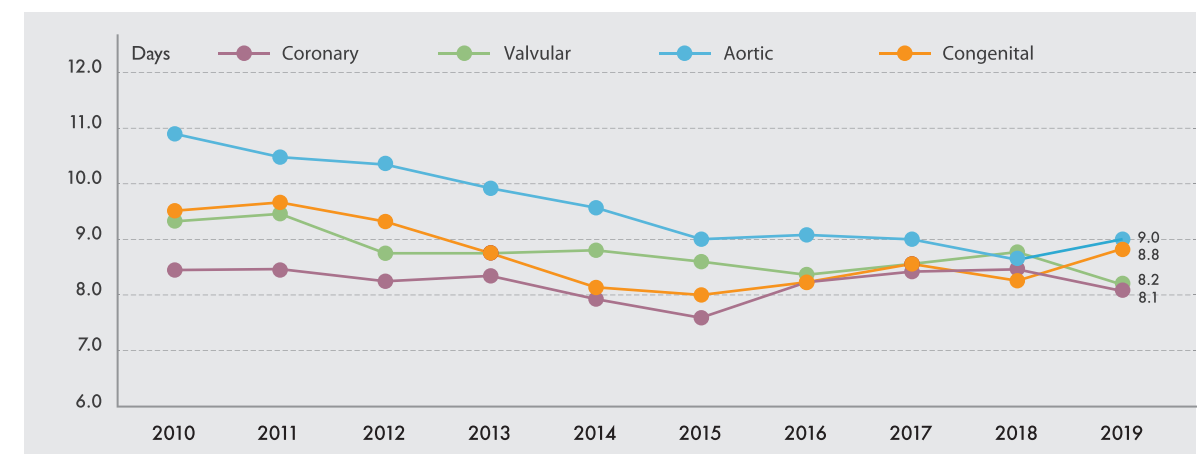
医院持续强化心血管外科手术质量的监控与改善，努力实现高风险患者的个体化手术策略管理，不同种类心血管手术术后30天死亡率一直保持在较低水平，总体医疗质量达到世界主要心血管病中心水平。如，2019年单纯冠状动脉旁路移植术后30天死亡率为0.2%。



术后住院时间 LENGTH OF POST-OPERATIVE STAY

Fuwai hospital has been dedicated to improving medical quality, decreasing surgical complications and saving medical resources. With the focus on surgical advancement and quality, the length of post-operative stay for our patients has gradually decreased in recent years. The post-operative hospital length of stay for CABG reached an average of 8.1 days in 2019.

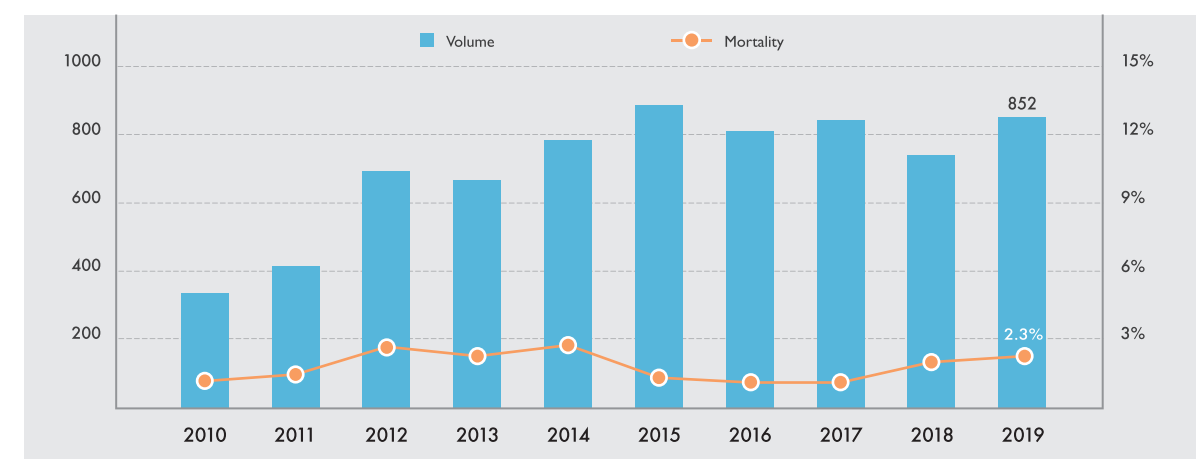
医院不断提高医疗质量，降低手术并发症，有效节约医疗资源。近年来各术种术后住院时长均呈现总体下降趋势，2019年冠状动脉旁路移植术手术术后平均住院时长约为8.1天。



急诊手术 EMERGENCY SURGERY

Over the past ten years, the fast track system for emergency surgery has consistently improved with concomitant increases in surgical volume, while the thirty-day mortality of emergency surgery remains persistently below 3.0%.

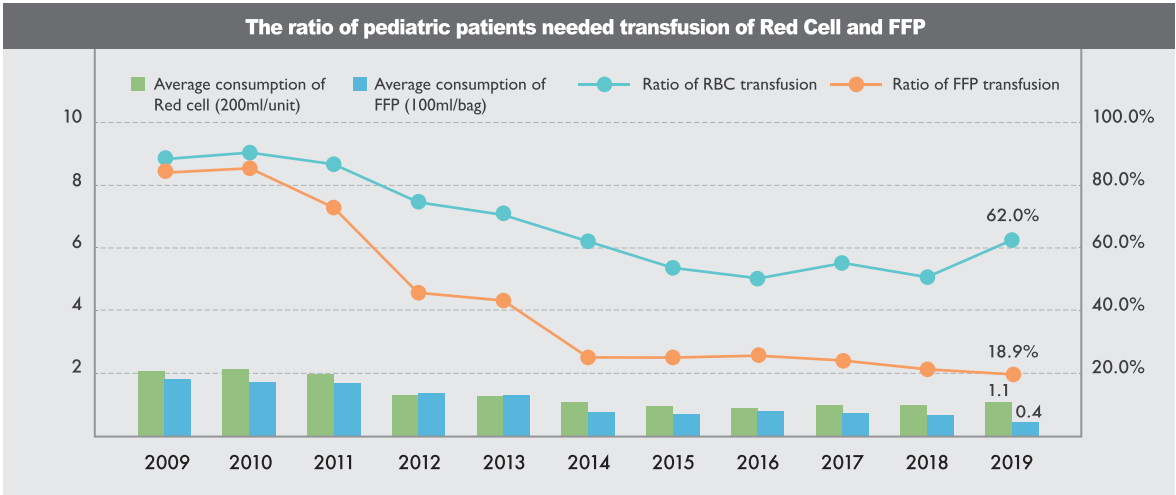
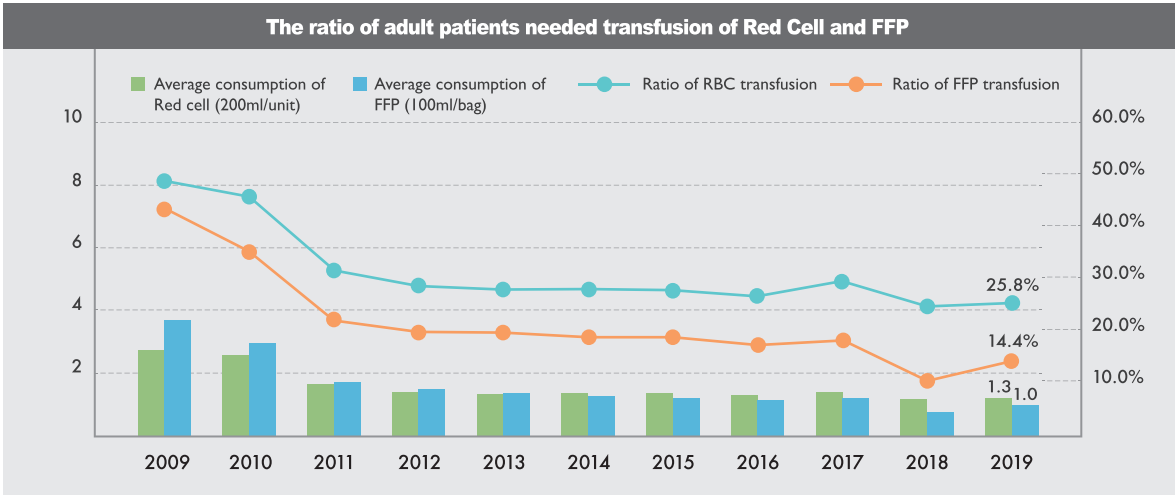
近10年来，医院不断优化急诊手术诊疗流程，在急诊手术接诊量总体攀升的趋势下，急诊手术死亡率始终控制在3.0%以下。



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 2019, our hospital further reduced the total amount of blood product and improved the utilization rate of medical resources.

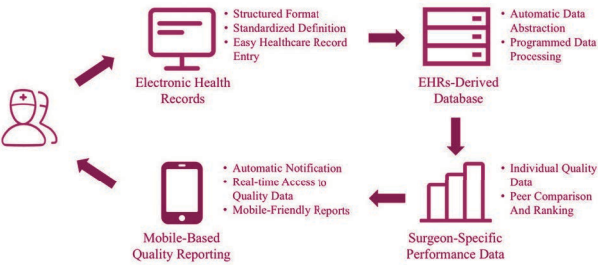
医院严格把控用血指征，血制品使用比例、人均红细胞及血浆用量呈持续下降趋势。2019年，我院进一步降低整体血制品用量，提高医疗资源的利用率。



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

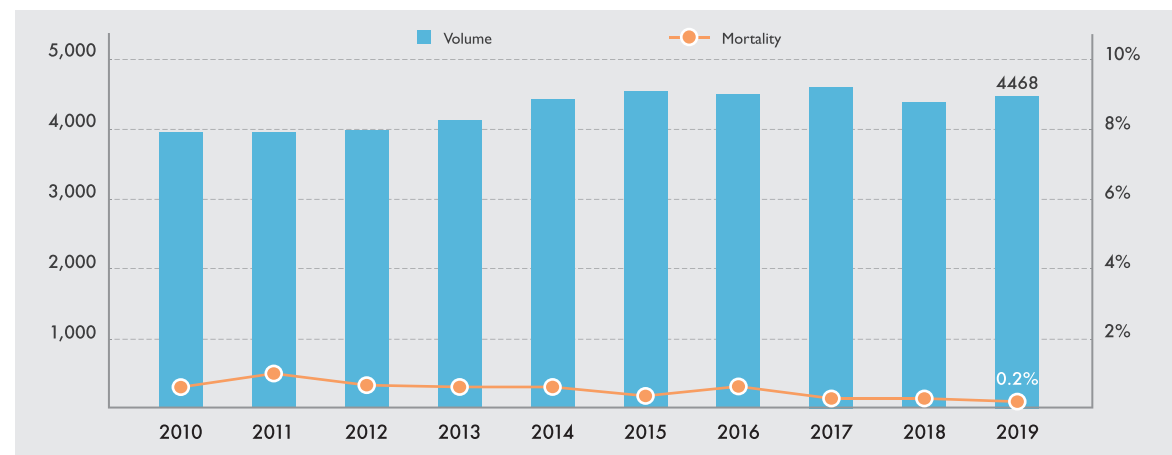
4468

CASE No. OF CONGENITAL HEART SURGERY 2019

先天性心脏病手术 CONGENITAL HEART SURGERY

Congenital heart defect remains the most common anomaly of the neonates. In 2019, the number of congenital heart surgeries reached 4468, with an extremely low mortality of 0.2%.

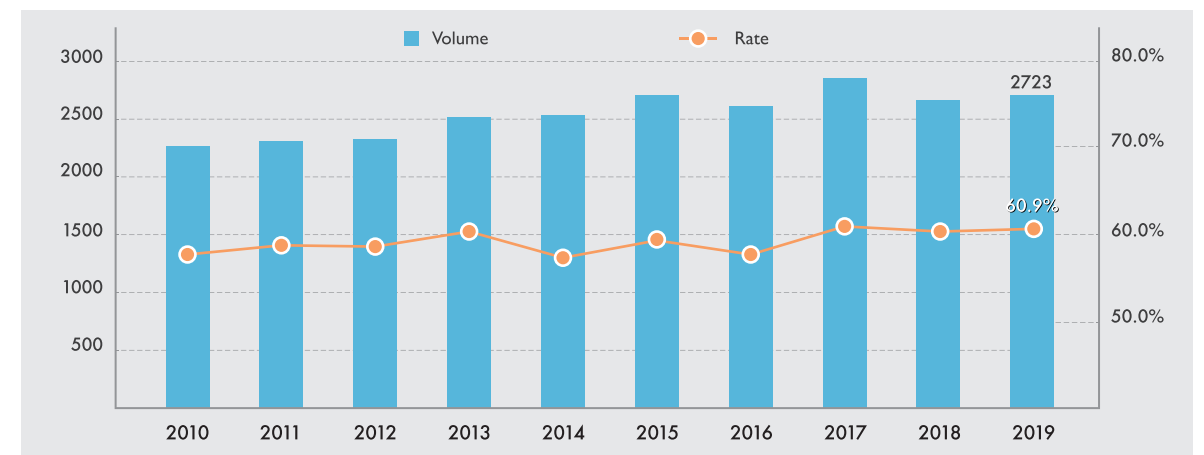
先天性心脏病是中国大陆新生儿最常见的先天性缺陷，在2019年，阜外医院先天性心脏病手术量达到4468例，死亡率为0.2%。



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 2019, more than 60% cases in Fuwai hospital were critical or complex congenital heart defects.

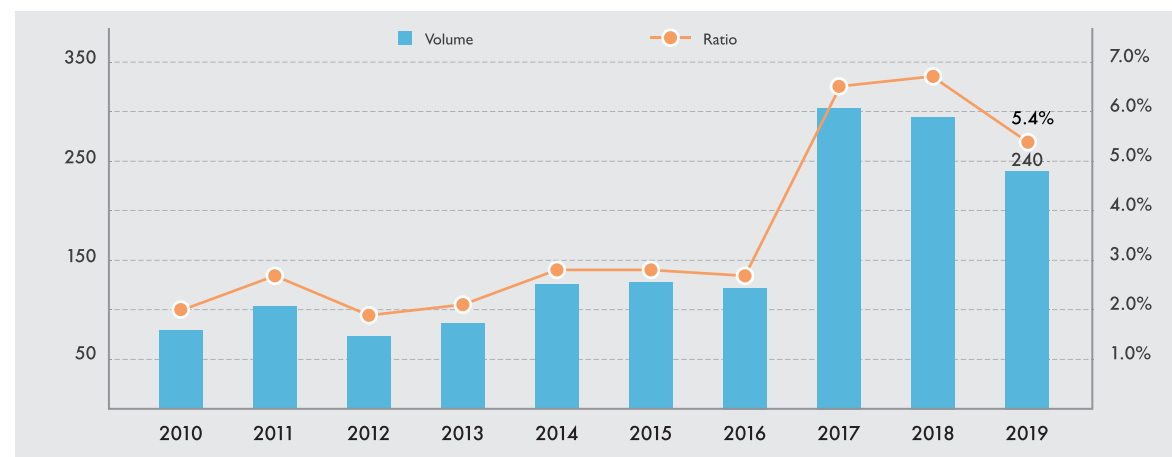
随着外科技术、围术期处理能力的进步和就诊病种结构的变化，危重或复杂先心病手术所占比例逐年增加，在2019年危重或复杂先心病手术所占比例超过60%。



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 2019, the percentage of redo-cardiac surgery was 5.4%.

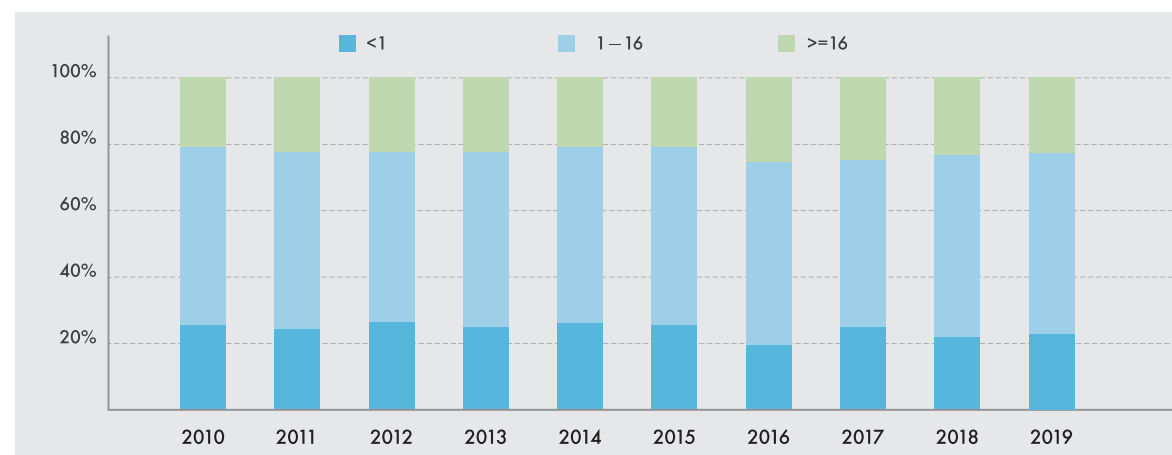
随着越来越多经历过先心病手术的患儿长期存活，近年来二次及多次手术的比例显著增加。2019年，5.4%的先心病手术为二次或多次心脏手术。



手术患者年龄分布 AGE DISTRIBUTION

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.

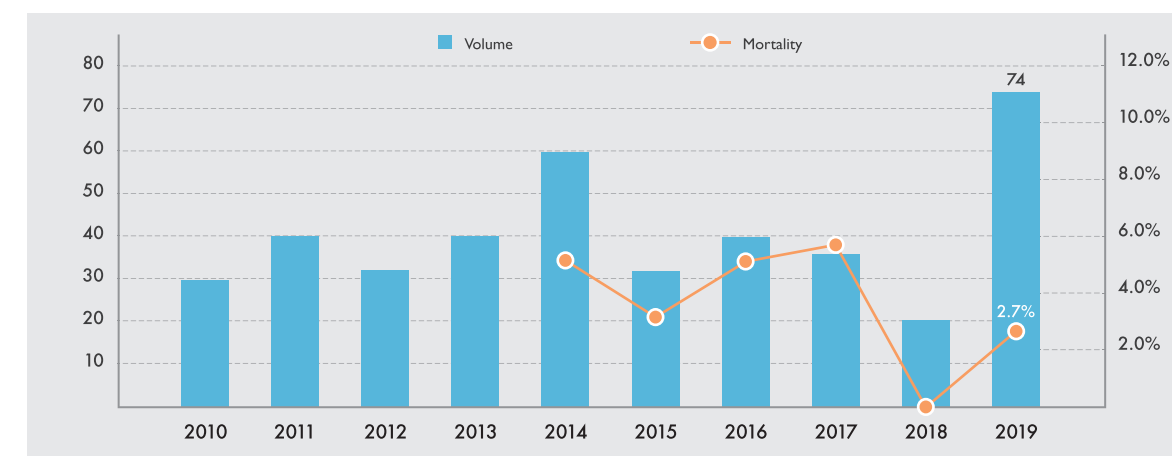
阜外医院成人先天性心脏病手术所占比例近年一直维持在超过20%的水平，反应了先心病外科治疗的新趋势。



新生儿手术量 SURGICAL VOLUME OF NEONATES (≤28D)

Corrective surgery for neonates with complex congenital heart disease presents a major challenge. The surgical volume was significantly increased in 2019 with the establishment of "Green Channel", while the thirty-day mortality has been stable in relatively low level.

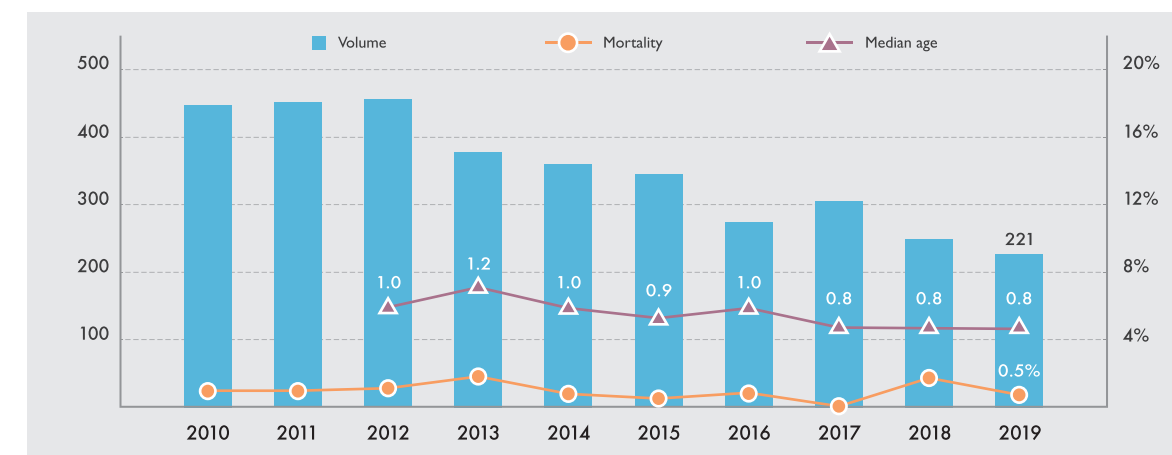
新生儿复杂先天性心脏病矫治术无疑是极富挑战性的工作。外科团队在2019年开通了新生儿就诊绿色通道，在新生儿手术数量明显增加的情况下，术后30天死亡率始终控制在较低水平。



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 2019, the median age of anatomical repair was below 1 year, and thirty-day mortality was 0.5%.

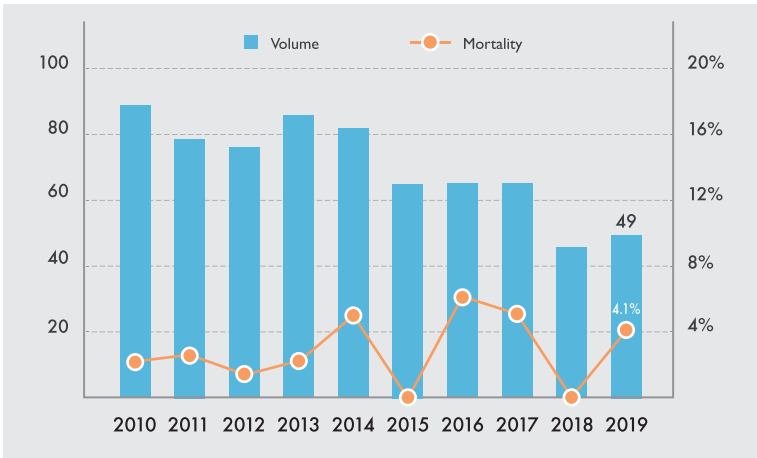
法洛四联症是紫绀类先天性心脏病发病率最高的疾病。阜外医院外科在根治法洛四联症方面积累了丰富的经验，并取得了居国际先进水平的治疗结果。2019年接受根治术患者年龄中位数已小于1岁，术后30天死亡率死亡率仅0.5%。



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.

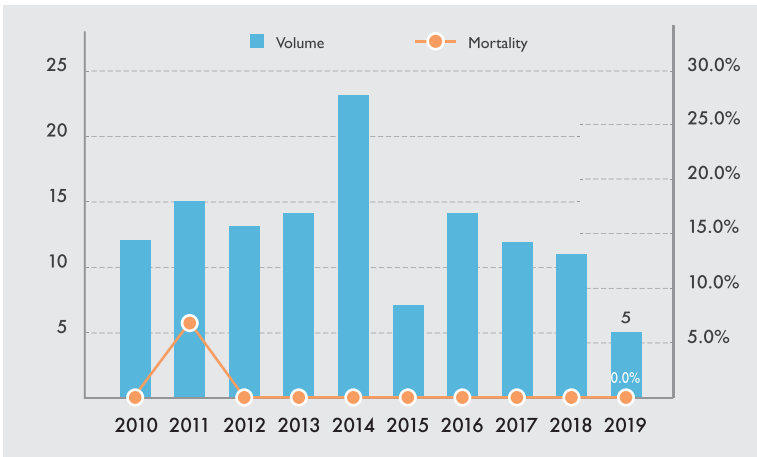
动脉调转手术治疗完全性大动脉转位、右室双出口等畸形是先天性心脏病外科诊治中心成熟的重要标志。阜外医院在这方面成绩斐然，目前手术效果已居全球领先水平。



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). About 170 patients have undergone DRT procedure until 2019; 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2019年，已经完成近170例手术，术后30天和远期随访结果明显优于Rastelli手术。

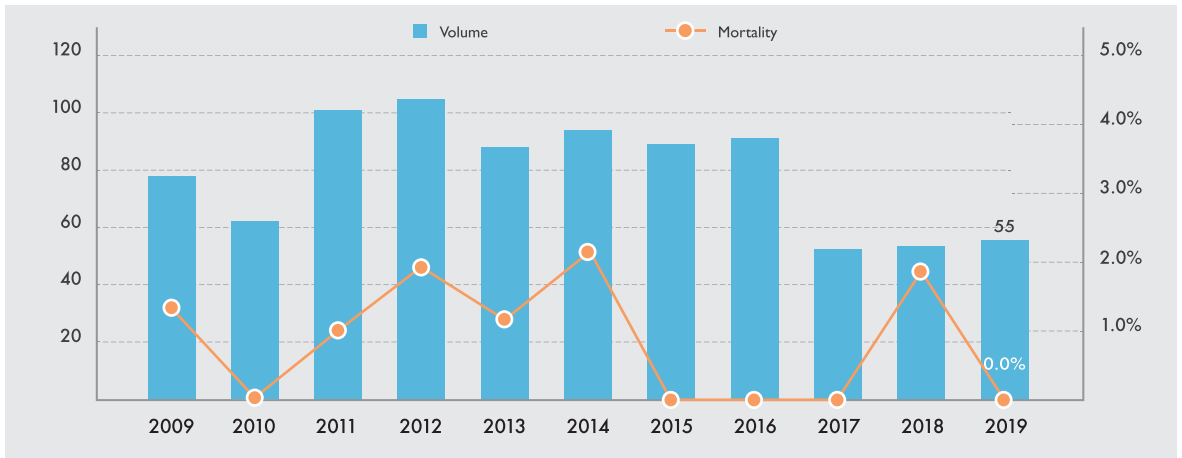


	DRT	Rastelli	Rev.
Case No.	155	67	22
Follow up (month)	72	70	72
In hospital mortality	7(4.5%)	7(10.4%)	3(13.6%)
Follow up mortality	13(8.4%)	9(13.4%)	3(13.6%)
Reoperation rate	13(8.4%)	17(25.4%)	3(13.6%)
Reintervention rate	3(1.9%)	2(3.0%)	3(13.6%)

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 recent 3 years.

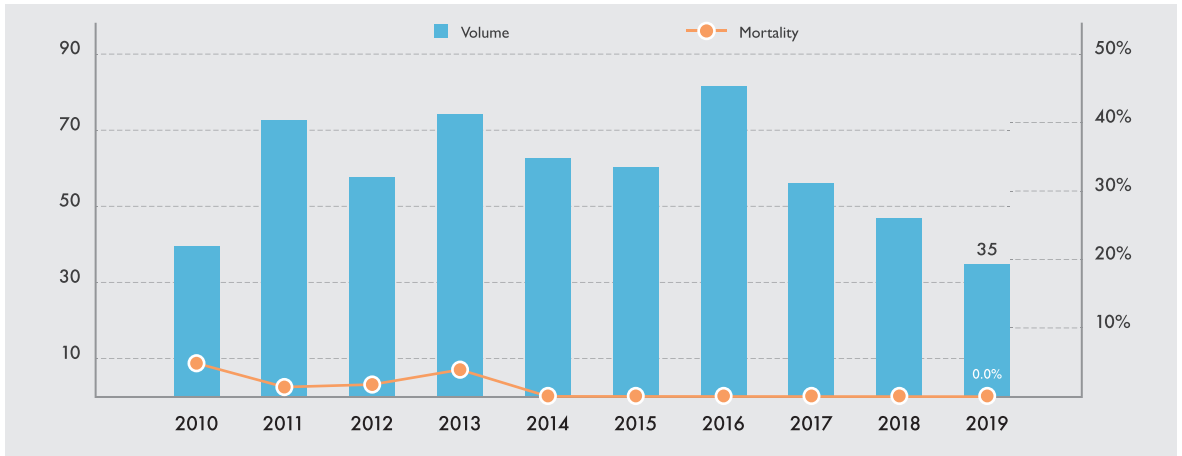
作为复杂先天性心脏病姑息手术治疗的重要术式，阜外医院外科常规开展Glenn手术，同时团队一直致力于严格把控姑息手术适应症，尽力对患儿进行解剖根治，近3年Glenn手术例数较前略有下降。



全腔静脉肺动脉连接术
TOTAL CAVOPULMONARY CONNECTION

As the most popular procedure for single ventricular palliation, the total cavopulmonary connection has been regularly used for several decades. In 2019, the volume of total cavopulmonary connection decreased while more patients underwent anatomical repairs.

作为通用的单心室类姑息手术，全腔静脉肺动脉连接术已经在阜外医院常规开展多年。2019年全腔静脉肺动脉连接手术结果满意，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

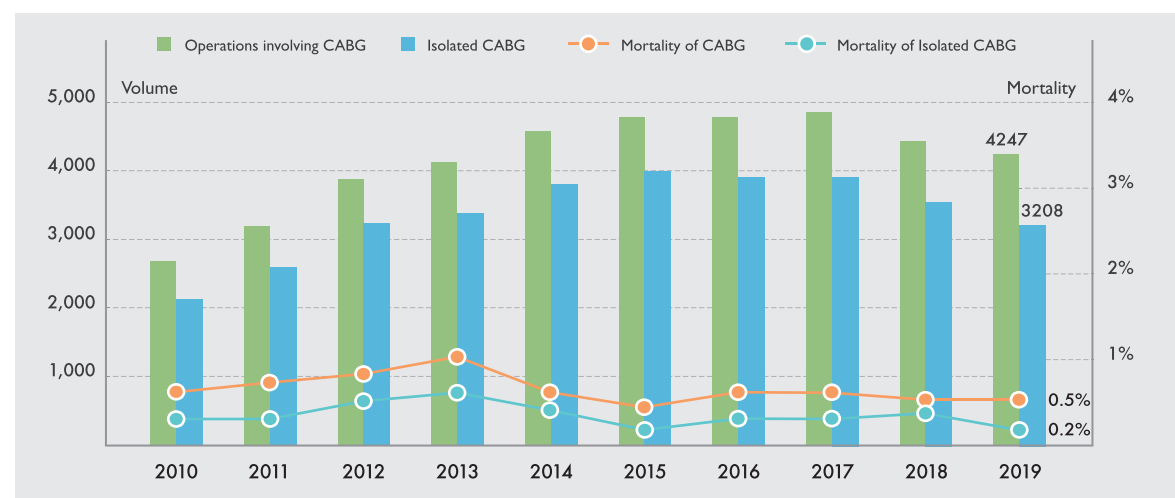
4247

CASE No. OF CABG 2019

冠状动脉旁路移植术 CORONARY ARTERY BYPASS GRAFTING

In mainland China, Fuwai Hospital is the pioneer of coronary artery bypass grafting(CABG). In 1974, cardiac surgeons from Fuwai hospital performed the first CABG in the mainland of China. Beating heart bypass surgery (Off-pump CABG) through median sternotomy was also first performed at Fuwai Hospital in 1996. Thoracoscope assisting CABG was first performed in 1997. The first case of hybrid CABG in China was successfully completed in 1999 at Fuwai hospital as well. In 2019, 4,247 patients received CABG at Fuwai Hospital, with 3,208 receiving isolated CABG. Thirty-day mortality has remained stable over the past 15 years at a level of less than 1%.

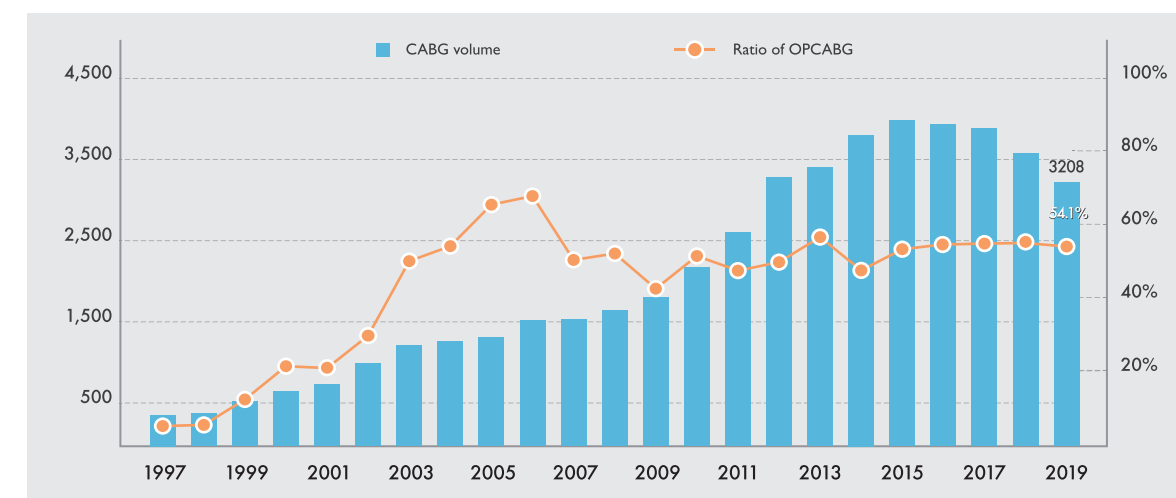
阜外医院心血管外科于1974年实施了中国大陆首例冠状动脉旁路移植术。1996年在国内最早开展胸骨正中切口非体外循环下冠状动脉旁路移植术，1997年率先开展胸腔镜辅助下小切口冠状动脉旁路移植术，1999年完成中国大陆首例杂交冠状动脉旁路移植术。2019年全院完成冠状动脉旁路移植术4247例，其中单纯冠状动脉旁路移植术3208例。单纯冠状动脉旁路移植术后30天死亡率连续15年低于1%。



非体外循环冠状动脉旁路移植术 OFF-PUMP CABG

Recent clinical guidelines have reconsidered the long term outcomes of off-pump CABG, which also prompted 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.

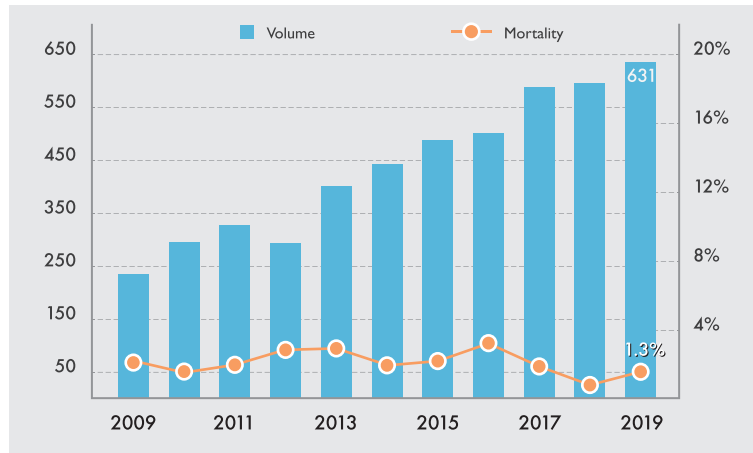
近年来，国际临床指南对非体外循环冠状动脉旁路移植术临床效果的评价趋于审慎。阜外医院心血管外科从患者获益的角度出发，适时调整技术策略应用，严格把控非体外循环冠状动脉旁路移植术手术指征，近10年来总体比例下降，目前已趋于稳定。



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 2019, the Thirty-day mortality rate of this type of surgery has been reduced to 1.3%.

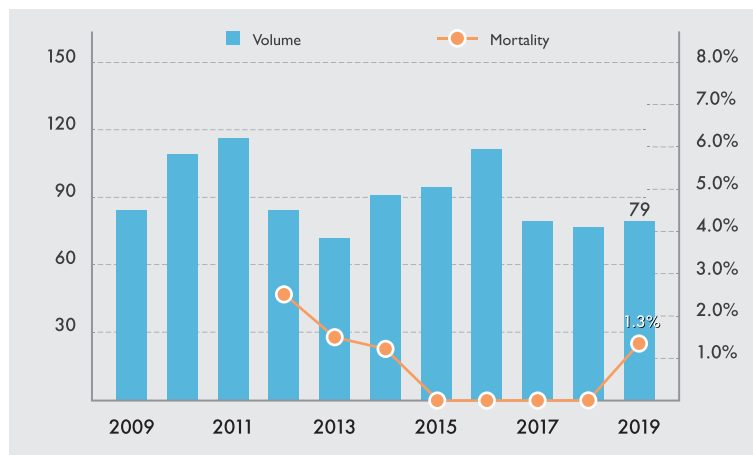
对于50岁以上患者，术前均常规行冠状动脉CT或造影，明确是否合并冠脉疾病，最大程度提高患者行心血管手术的安全性。同期施行冠状动脉搭桥和心脏瓣膜手术，手术难度及复杂性显著增加。在该类手术量逐年增加的情况下，围术期死亡率控制在较低水平。2019年，该类手术术后30天死亡率仅1.3%。



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 recent years, such surgeries have been successfully performed with relatively low surgical mortality.

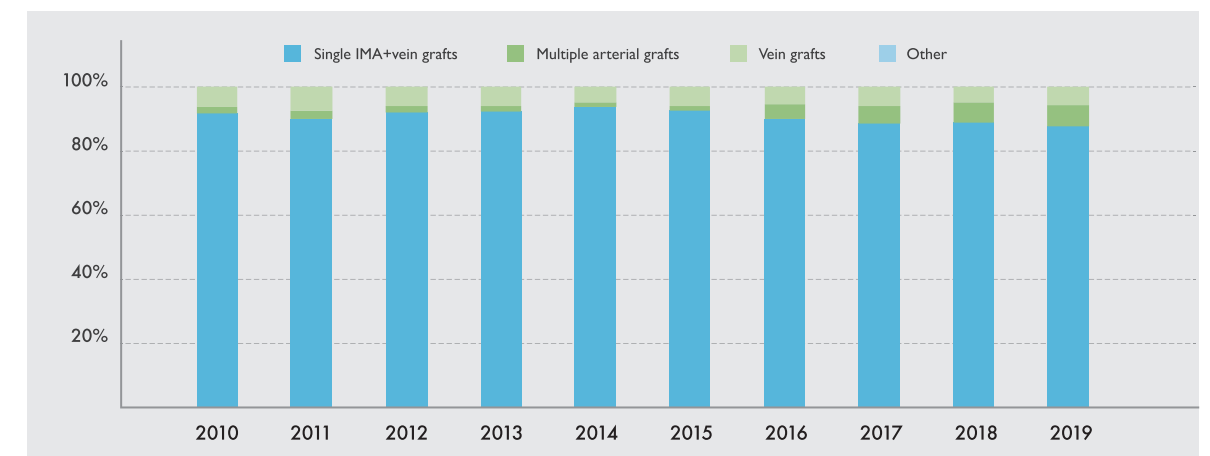
外科手术可显著改善室壁瘤患者远期预后，但该手术难度及风险均较高，对术者及其心脏团队水平提出了更高的要求。阜外医院团队始终将室壁瘤手术死亡率控制在较低水平。



旁路材料选择 CONDUITS IN CABG

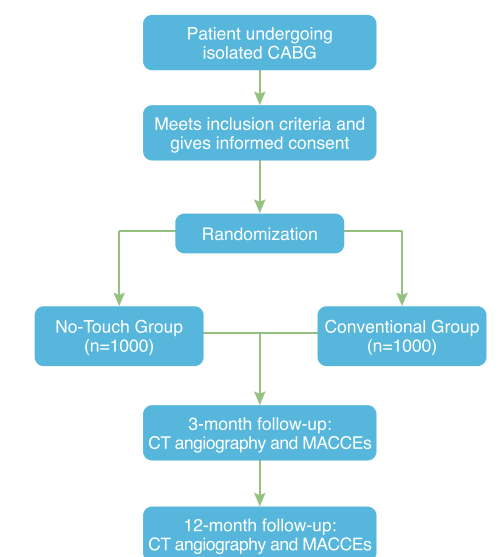
Left internal thoracic artery plus great saphenous vein graft is the standard in current clinical practice. The surgical team of Fuwai Hospital intended to provide individualized optimal revascularization strategies for patients. Newer approaches, such as bilateral internal thoracic artery, total arterial 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，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, the study was officially launched in May, 2017, and was planning to enroll 2000 patients. This study will probably answer whether the No-Touch technique could reduce vein graft occlusion. Interim analysis was performed in August, 2018, and the interim results was presented by Professor Shengshou Hu during the International Coronary Congress 2018 held in Beijing, China, and ICC2019 in New York. Furthermore, Design of the study has been published in American Heart Journal. Enrollment is now completed and follow-up is ongoing as scheduled.



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，参与研究的共有7家中心，计划入组2000例患者，主要研究终点为术后3月随访行冠状动脉CT检查患者血管移植物堵塞率。该研究于2017年5月28日正式启动，研究设计的方法学文章《Rationale and design of a multicenter randomized trial to compare the graft patency between no-touch vein harvesting technique and conventional approach in coronary artery bypass graft surgery》已见刊于《American Heart Journal》。研究中期结果受邀在国际冠脉大会2018（ICC2018，北京）以及ICC2019（纽约）进行大会发言。截至2019年末，已完成全部患者的入组，患者的随访工作以及主要终点的数据分析正在推进中。

中国冠状动脉旁路移植手术风险评估模型的改良和更新

THE UPDATED IN-HOSPITAL MORTALITY RISK MODEL FOR PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING IN CHINA

Sino System for CABG Operative Risk Evaluation (SinoSCORE) was the first cardiac operative risk evaluation system in China and has been widely used across the country. Over the last decade, as the surgical volume of CABG continued to rise in China, the surgical mortality and risk profiles of surgical candidates has also changed. Based on the largest nationwide surgical database（CCSR）in China, Fuwai hospital modified and updated the risk evaluation system as SinoSCORE II. Comparing prior risk assessment tools, the new risk model (SinoSCORE II) showed a better discrimination and calibration performance and may help surgeons and hospitals better identify high-risk patient in future.

中国冠状动脉旁路移植手术风险评估模型（SinoSCORE）是我国首个心外科手术风险系统，已被广泛引用于临床。而过去十年间我国搭桥手术量逐年增长，手术死亡率及高危人群特征也发生了明显变化。依托我国最大心外科手术数据库（中国心外科注册登记数据库），阜外医院团队改良并更新了中国冠状动脉旁路移植手术风险评估模型（SinoSCORE II）。相比既往风险评估工具，新研发的SinoSCORE II风险评估模型有更好的辨别度和准确度，可以作为医院和医生更好的甄别手术高危人群的工具。

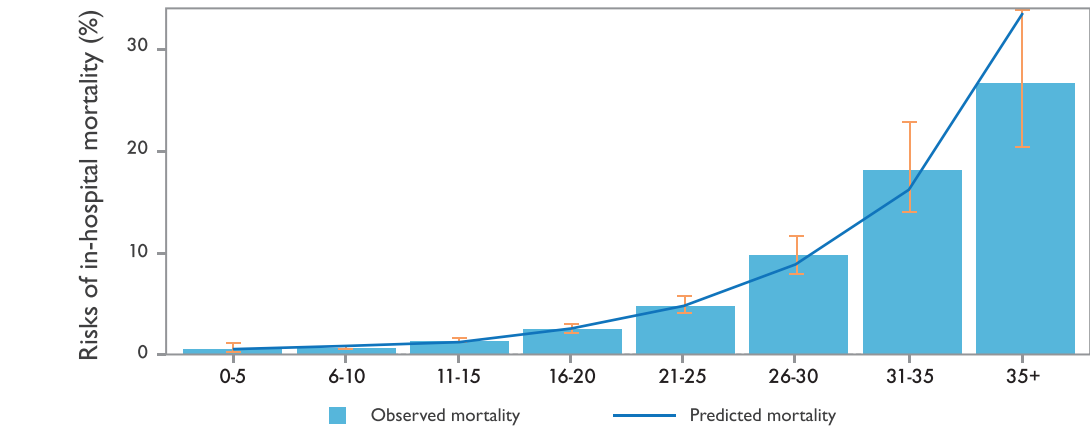
中国搭桥手术院内死亡风险评估模型

In-hospital Mortality Risk Model for Patients Undergoing Coronary Artery Bypass Grafting in China

Risk Factor	Regression Coefficient	P value	OR (95% CI)	Score Points
Age, y				
60-69	0.3763	<0.001	1.46 (1.17-1.81)	3
≥70	0.7393	<0.001	2.09 (1.63-2.69)	5
Body mass index <18.5 kg/m ²	0.3970	0.062	1.49 (0.98-2.26)	3
NYHA class				
III	0.6149	<0.001	1.85 (1.54-2.22)	4
IV	1.2478	<0.001	3.48 (2.62-4.62)	9
Female	0.2533	0.006	1.29 (1.07-1.54)	2
Prior myocardial infarction <21 d	0.5025	0.002	1.65 (1.21-2.25)	4
Prior cerebrovascular accident	0.3135	0.016	1.37 (1.06-1.77)	2
Critical preoperative state	0.7309	<0.001	2.08 (1.39-3.11)	5
Renal function, mL/min				
CC ≥50 to <80	0.1787	0.079	1.20 (0.98-1.46)	1
CC<50 or on dialysis	0.8216	<0.001	2.27 (1.75-2.95)	6
COPD	0.5051	0.033	1.66 (1.04-2.64)	4
Angina	0.4807	<0.001	1.62 (1.30-2.02)	3
Left ventricle ejection fraction, %				
<35	1.3029	<0.001	3.68 (2.45-5.53)	9
≥35 to <45	0.7301	<0.001	2.08 (1.61-2.67)	5
≥45 to <55	0.5250	<0.001	1.69 (1.38-2.07)	4
Prior PCI	0.3348	0.010	1.40 (1.08-1.80)	2
Prior cardiac surgery	1.4751	<0.001	4.37 (2.99-6.39)	10
Non-elective surgery	1.0411	<0.001	2.83 (2.06-3.89)	7
Combined valve surgery	0.9686	<0.001	2.63 (2.14-3.24)	7
Combined surgery except valve	0.7131	<0.001	2.04 (1.59-2.62)	5

风险评估模型不同分值对应院内死亡风险

Observed and predicted risk of in-hospital mortality by total risk score



瓣膜性心脏病 Valve Disease

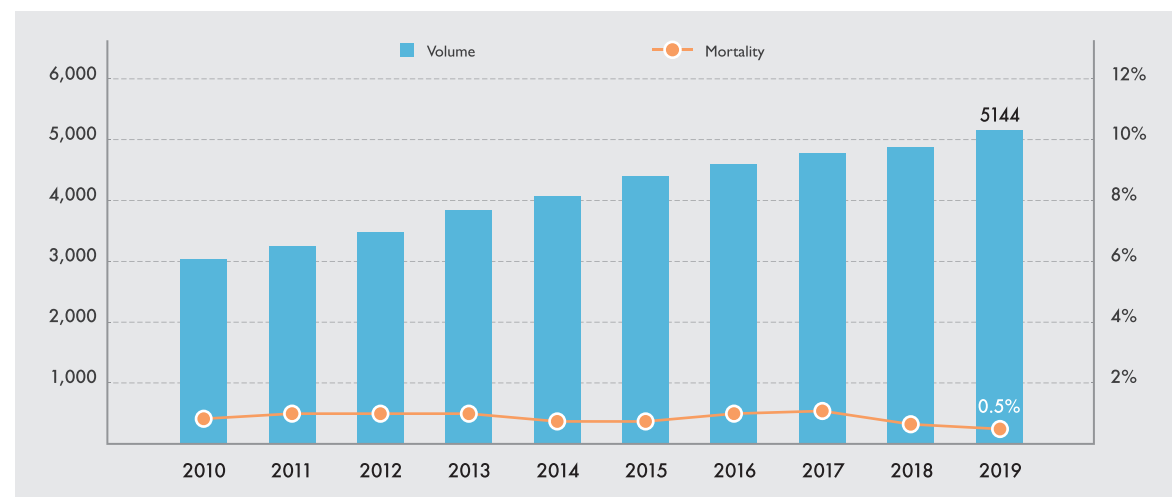
5144

CASE No. OF VALVULAR SURGERY 2019

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 2019, 5,144 patients received valvular operations at our institution with a thirty-day mortality of 0.5%.

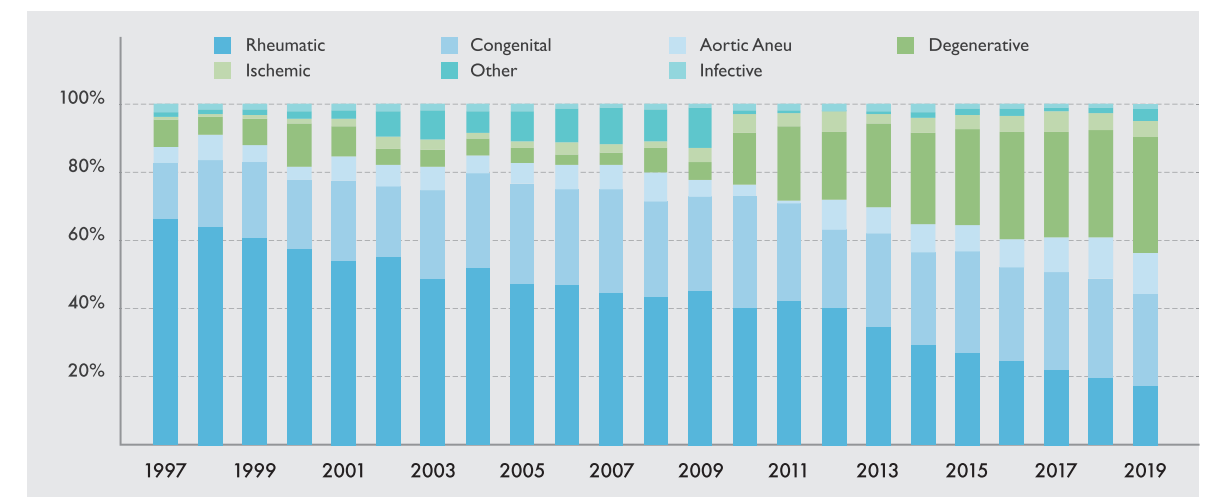
阜外医院是中国最大的瓣膜外科中心，2019年完成心脏瓣膜手术5144例，在手术量持续增长的同时，死亡率始终保持在较低水平，2019年术后30天死亡率为0.5%。



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 2019.

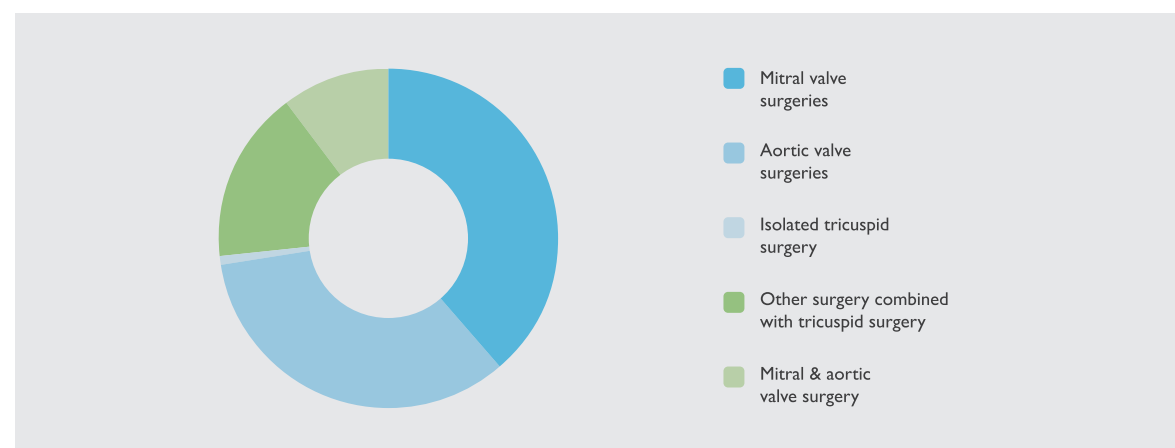
阜外医院收治患者的病因分类基本反映出我国瓣膜病外科的疾病变化谱。一直以来，风湿性病变是我国瓣膜类疾病的主要病因，同时退行性病变比例呈现逐年上升趋势。阜外医院单中心数据显示，当前退行性病变比例已超过风湿性病变，成为目前瓣膜类疾病的主要病因。



手术种类构成 COMPOSITION OF VALVULAR SURGERIES

Mitral valve surgery represented the major proportion of all valvar surgeries in 2019. However, the rate of aortic and mitral valve surgery continued to decline while the volume of tricuspid valvuloplasty increased. Isolated pulmonary valve surgeries were not considered in this chart.

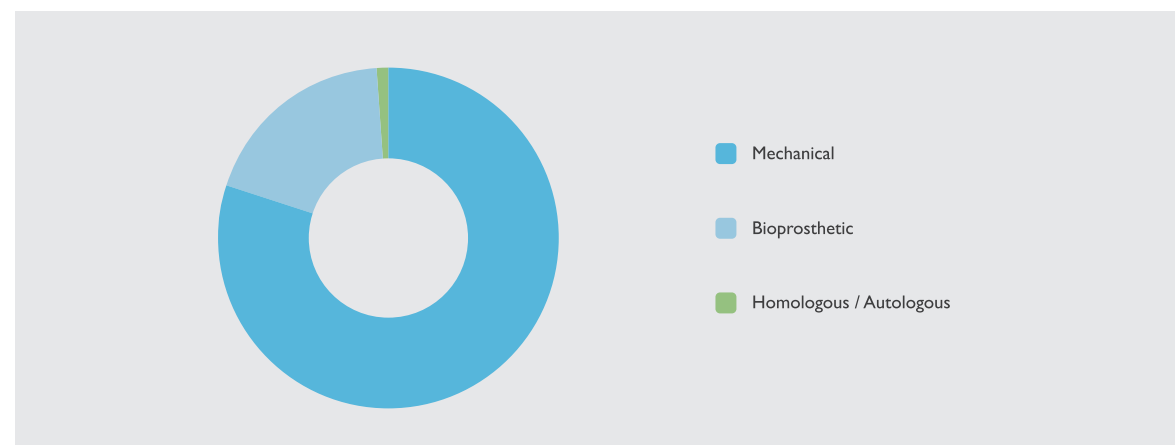
近年来，二尖瓣手术始终在心脏瓣膜手术中占据首位。同时，主动脉瓣联合二尖瓣手术的比例呈下降趋势，而三尖瓣成形术的比例有所增加。单纯肺动脉瓣手术未纳入统计。



人工瓣膜种类 COMPOSITION OF VALVE PROSTHESES

Both the etiology of valvular diseases and main considerations of the patients have significant differences between the main land of China with developed countries. The data from Fuwai hospital showed that mechanical valve accounted for the major type of artificial valve.

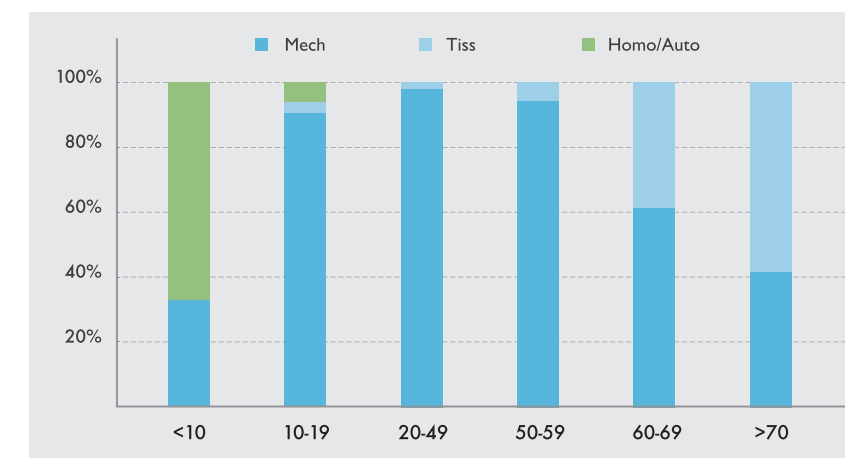
我国瓣膜疾病病因构成，患者在选择人工瓣膜种类时的侧重，均与西方发达国家存在较大差异。阜外医院瓣膜外科的数据显示，人工机械瓣膜始终占据主导地位。



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.

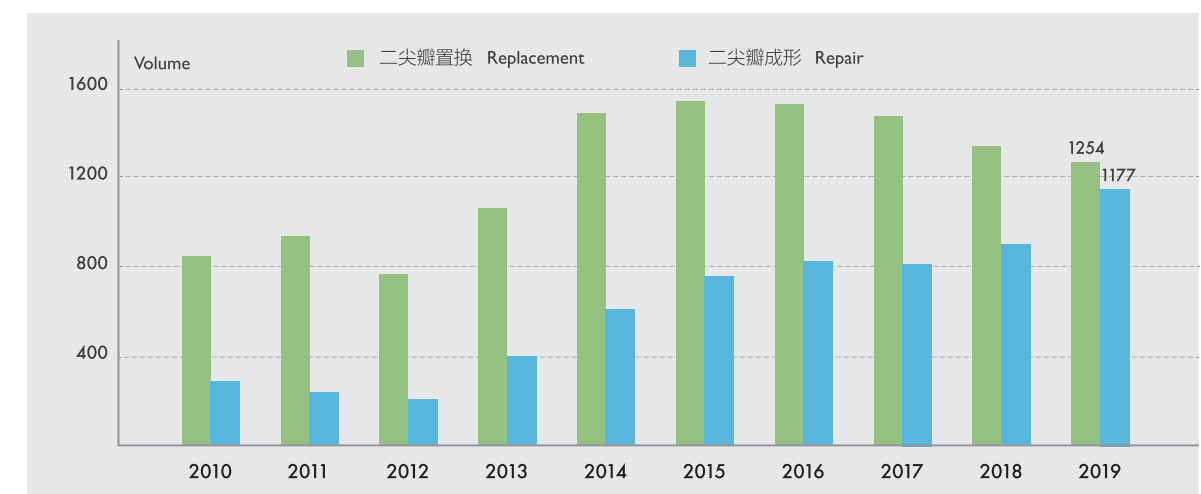
接受心脏瓣膜手术的成年患者，年龄越大使用生物瓣膜的比例越高。



二尖瓣瓣膜成形术 MITRAL VALVE REPAIR

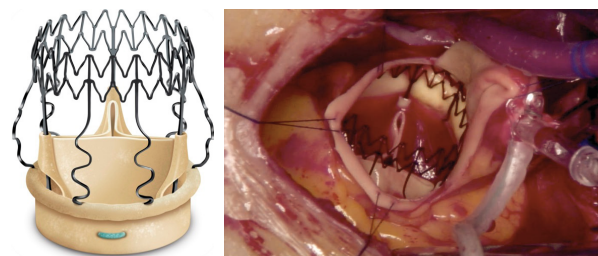
For Fuwai surgical team, the mitral valve repair technique has become the main treatment for patients with mitral valve insufficiency. There were 1,177 such repairs performed in 2019.

在阜外医院，二尖瓣成形术已成为治疗二尖瓣关闭不全的主要术式，2019年共完成1177例二尖瓣成形术。



免缝合主动脉瓣生物瓣临床研究 CLINICAL TRIAL OF SUTURELESS AORTIC BIOPROSTHETIC VALVE

Sutureless aortic bioprosthesis valve replacement (Su-AVR) is a mini-invasive and less time-consuming technique for high-risk old patients. Fuwai hospital leads the first aortic valve clinical trial in China (PERFECT trial). Thirty patients were enrolled. All patients underwent ministernotomy AVR with sutureless valve. There was no in-hospital mortality. No paravalvular leak, re-exploration for bleeding, stroke or kidney insufficiency occurred. One patient (3.3%) needed permanent pacemaker due to complete AVB. At the 1 year's clinical follow-up, no death, paravalvular leak or readmission for adverse cardiovascular events was found.

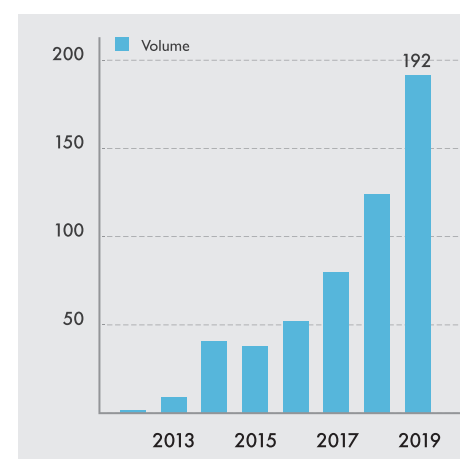


免缝合生物瓣为高龄高危主动脉瓣患者提供了一种创伤小、耗时短的治疗手段。阜外医院牵头完成我国心血管外科首个主动脉瓣临床研究：用于中国注册的PERCEVAL S瓣膜临床研究（PERFECT），并率先完成30例病例入组，采用胸骨上段微创切口完成手术，所有患者住院期间无死亡，1例安装永久起搏器（3.3%），无瓣周漏、二次开胸止血、脑卒中、肾功能不全等严重不良事件。1年随访无死亡，无瓣周漏、心源性再次入院等严重不良事件。

经导管主动脉瓣置入术 TRANSCATHETER AORTIC VALVE IMPLANTATION

In December 2010, the first transcatheter aortic valve implantation (TAVI) procedure was successfully performed at Fuwai hospital. Fuwai Hospital also has been committed to promoting the first clinical trial for domestic transcatheter aortic valve in China. In November 2012, Fuwai surgical team performed first TAVI via ascending aorta in China. In July 2014, Fuwai surgical team performed first transapical TAVI. Our team also applied transfemoral TAVI technique for the patient with aortic insufficiency. In 2019, 192 patients successfully received this minimally invasive procedure.

2010年12月，第一例经导管主动脉瓣置换术在中国医学科学院阜外医院获得成功。阜外医院也牵头开展了我国第一个国产TAVI瓣膜产品的临床试验。2012年11月，阜外内外科团队在国内首先开展了经升主动脉入路的TAVI手术。2014年7月，开展了经心尖入路的TAVI手术，为国内率先开展该入路的中心之一。目前国际上TAVI技术主要用于主动脉瓣狭窄患者，阜外外科团队还成功为单纯主动脉瓣关闭不全患者实施经股动脉介入瓣膜的植入。2019年共完成该类手术192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.

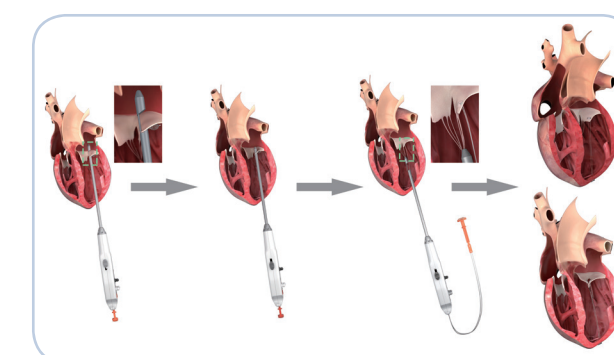
国产新型自膨式肺动脉瓣支架（Venus-P瓣膜）是根据国人法洛四联症跨环补片术后肺动脉瓣大量返流合并右室流出道扩大的解剖特点而研制的。阜外医院完成该新型支架最大组（32例）临床应用研究，并取得了良好的效果。团队受邀在CSI和AATS等国际会议做学术报告，介绍中国经验。



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，实现了一机多能，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

1519

CASE No. OF AORTIC PROCEDURE 2019

The Vascular Surgery Center of Fuwai Hospital has focused more on aortic diseases than peripheral diseases during the past half a century. The first aortic 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 one-step 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 2019, the Fuwai vascular team performed 1,519 aortic procedures and 1,978 peripheral vascular procedures.

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。多年来，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，组建全新的血管外科中心，全面开展额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。

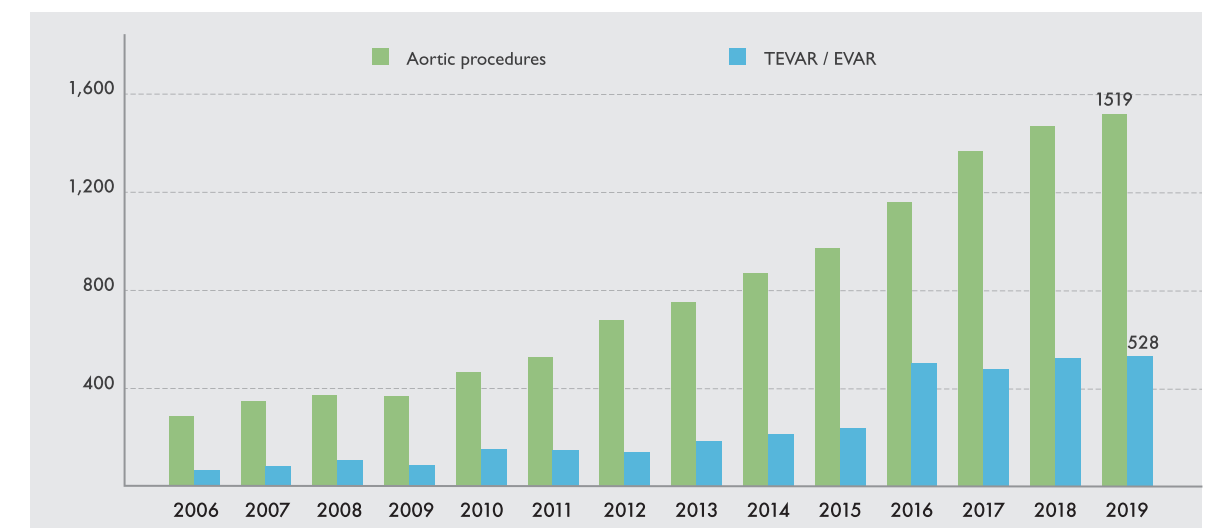
2019年，阜外医院血管外科中心完成各类主动脉手术1519台，各类外周血管手术1978台，在手术数量和质量上都达到了国际先进水平。

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 2019, there were 1,519 aortic procedures performed at the center; this represents an increase of 3.1% from the previous year. Among these procedures, 909 were open surgery, 528 were endovascular aortic repairs and 82 were one-stop hybrid procedures.

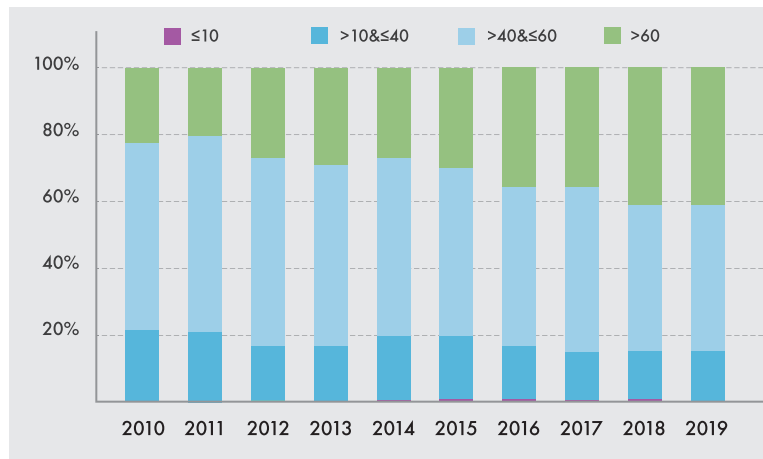
2019年完成主动脉病变的手术治疗1519例，较2018年增长3.1%，其中开放手术909例，主动脉覆膜支架腔内修复术528例，各型主动脉杂交手术82例。



主动脉手术患者的年龄分布
AGE DISTRIBUTION

In recent 10 years, the proportion of patients over 60 years of age who underwent open, endovascular, or hybrid aortic procedures at Fuwai Hospital increased significantly.

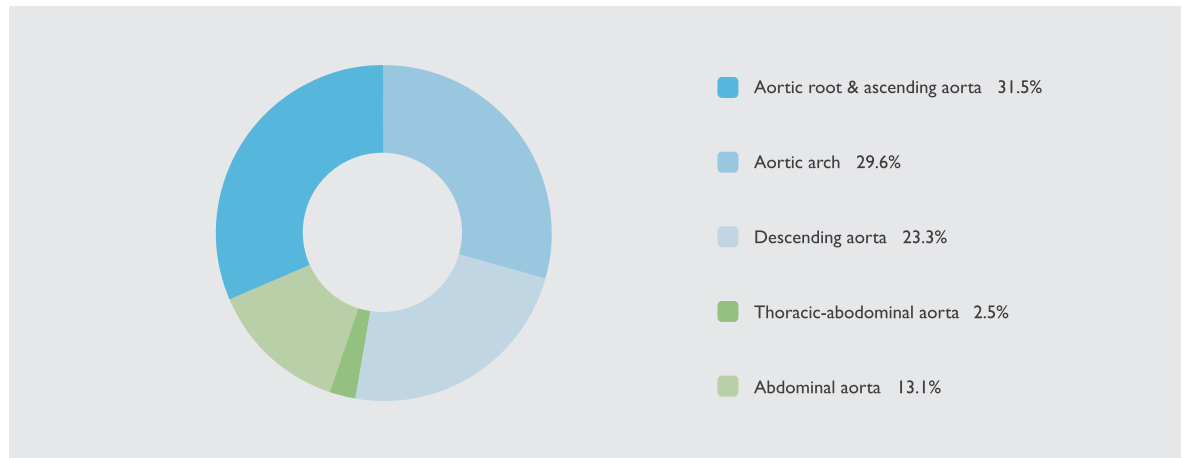
近十年来，接受主动脉外科、腔内和杂交手术的患者中，60岁以上患者比例呈现总体增长的态势。



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

This figure show the composition of open, endovascular, and hybrid aortic procedures at Fuwai Hospital over the past several years. In 2019, 31.5% of procedures were for the aortic root and ascending aorta, 29.6% for aortic arch, 23.3% for descending aorta, and 13.1% for abdominal aorta.

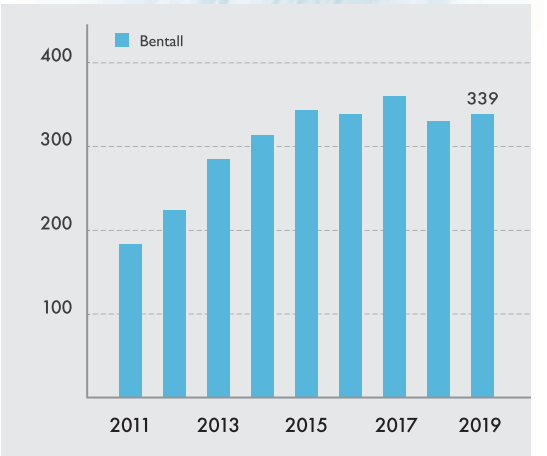
这张图显示了阜外医院2019年主动脉手术部位的构成情况。主动脉根部和升主动脉病变占31.5%，主动脉弓病变占29.6%，降主动脉病变占23.3%，腹主动脉病变占13.1%。



主动脉根部手术
AORTIC ROOT SURGERIES

In 2019, Fuwai hospital performed 561 aortic root operations, including 339 Bentall procedures, 84 Wheat's procedures and 137 David's procedures.

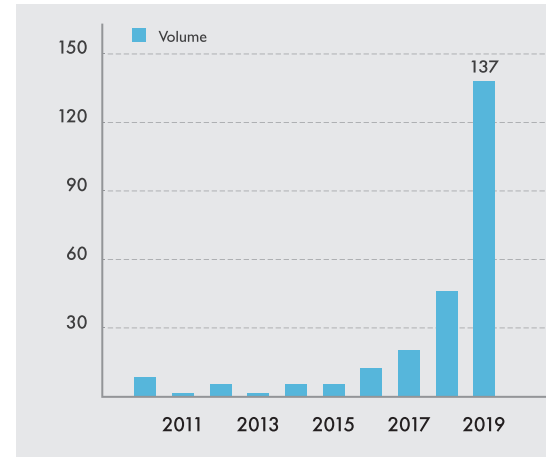
2019年，阜外医院完成主动脉根部手术共计561例，其中Bentall手术339例，Wheat's手术84例，David's手术137例，同时实施了其他心血管手术的患者也计算在内（如Bentall+全主动脉弓替换术）。



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

Valve sparing aortic root replacement preserves the aortic valve, avoiding lifelong anticoagulation and the potential risks associated with prosthetic valves. In 2019, surgeons at Fuwai hospital performed 137 David Procedures, including 127 cases of DAVID I procedure, 10 DAVID II cases and 69 cases of aortic valve repair.

保留主动脉瓣的主动脉根部替换术保留了自身主动脉瓣膜，避免了终身抗凝和与人工瓣膜相关的潜在风险。2019年，阜外医院完成该系列手术137例，其中DAVID I型127例，II型10例，同期行主动脉瓣成形69例。

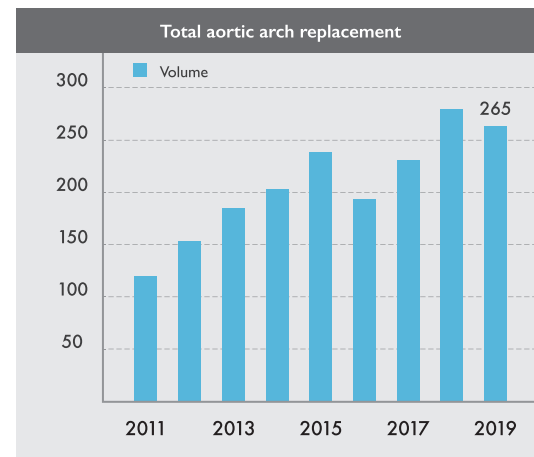


主动脉弓开放手术 OPEN AORTIC ARCH OPERATIONS

In 2019, surgeons at the Vascular Surgery Center performed 397 open aortic arch operations, including 265 total aortic arch replacement, 16 subtotal aortic arch replacement, and 116 partial aortic arch replacement procedures. This 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 chimney or fenestration assisted TEVAR, and hybrid procedures.

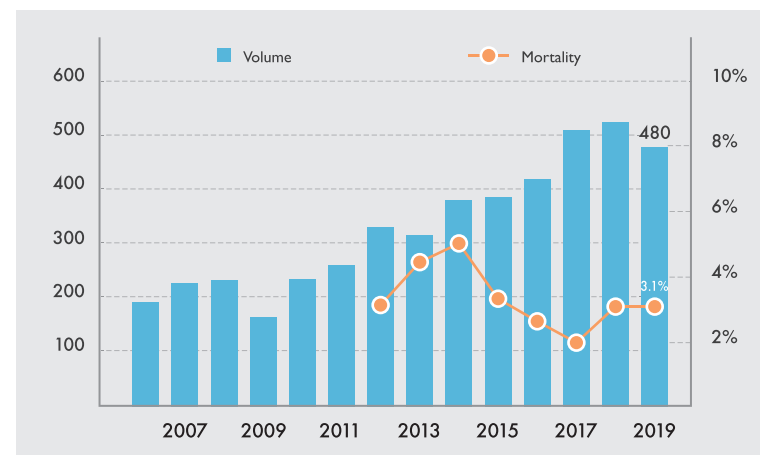
2019年，阜外医院完成主动脉弓部外科手术397例（同时进行了主动脉根部或升主动脉手术的患者也计算在内），其中深低温停循环下的全主动脉弓替换手术265例（不包括杂交手术），次全弓替换手术16例，部分弓替换手术116例。2016年来，主动脉弓外科手术在主动脉手术总量中所占权重有所下降，这与更大比例的主动脉弓部病变患者接受了全腔内修复手术和杂交手术有关，其中包括“烟囱”技术、“预开窗”技术、“原位开窗”技术等腔内微创技术在锚定区不足的患者群中的运用。



主动脉夹层 AORTIC DISSECTION

In mainland of 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 western countries. Lifesaving emergency surgery to repair the dissected aorta is frequently performed by the Fuwai vascular team. In 2019, we performed a total of 480 open, endovascular, and hybrid aortic procedures with a thirty-day postoperative mortality of 3.1%.

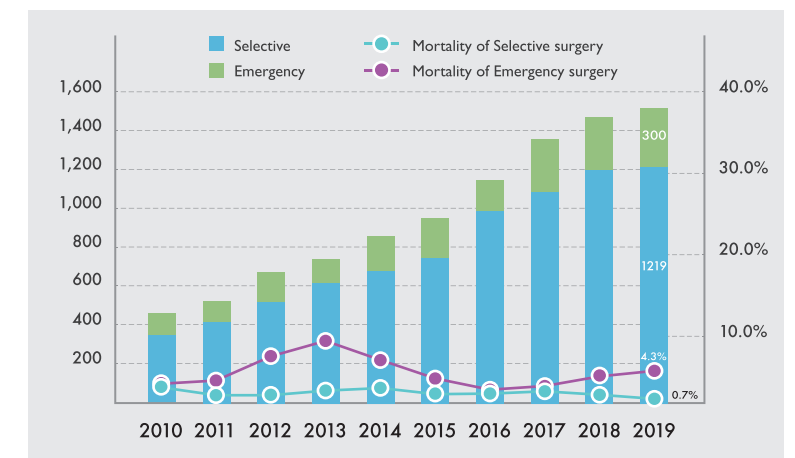
由于高血压总体控制率偏低等原因，我国主动脉夹层发病率偏高，且患者的平均年龄低于欧美发达国家。血管外科团队每年为许多这样的患者实施紧急手术。2019年，完成主动脉夹层手术480例，术后30天死亡率降至3.1%，达世界顶级水平。



主动脉急诊和择期手术 SELECTIVE AND EMERGENCY AORTIC SURGERY

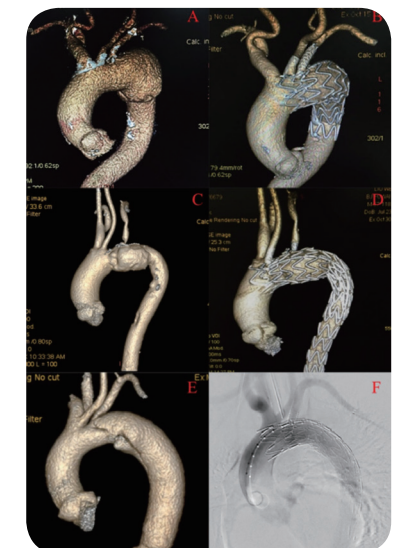
Aortic emergencies, including acute aortic syndrome and aortic rupture, are usually life-threatening. Sudden onset catastrophes of the aorta present immense surgical technique challenges and have high associated risk. The Aortic Emergency Green Channel policy of Fuwai Hospital has been in place for several years and has helped ensure that the majority of emergent aortic patients are treated in an efficient manner. The hospital continues to have one of the highest technical success rates for emergent aortic operations in the world. In 2019, surgeons at Fuwai hospital performed 1219 scheduled surgeries and 300 emergent aortic surgeries, with thirty-day mortality of 0.7% and 4.3%, respectively.

以急性主动脉综合征、主动脉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。2019年，阜外医院为1219例主动脉疾病患者实施了择期手术，为300例患者实施了急诊手术，术后30天死亡率分别低至0.7%和4.3%。

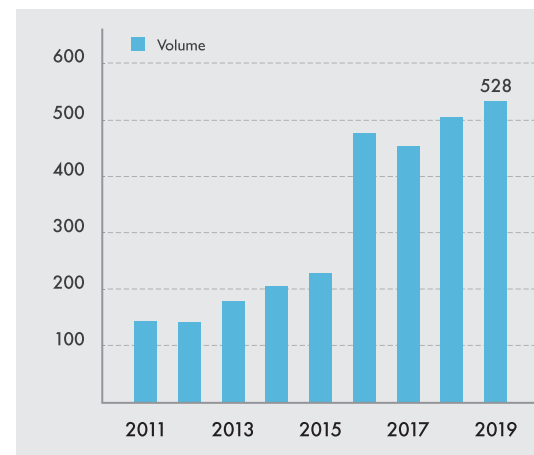


主动脉微创腔内修复术 ENDOVASCULAR AORTIC REPAIR

In 2019, surgeons at the Vascular Surgery Center performed 528 endovascular operations, including 331 TEVAR, 183 EVAR, 7 TEVAR+EVAR simultaneously, and 7 balloon-expandable stent implantations for coarctation of the aorta. Among these cases, 183 patients without enough landing zones for endografts were treated successfully by usage of the chimney, double/triple chimney, snorkel, and fenestration techniques.



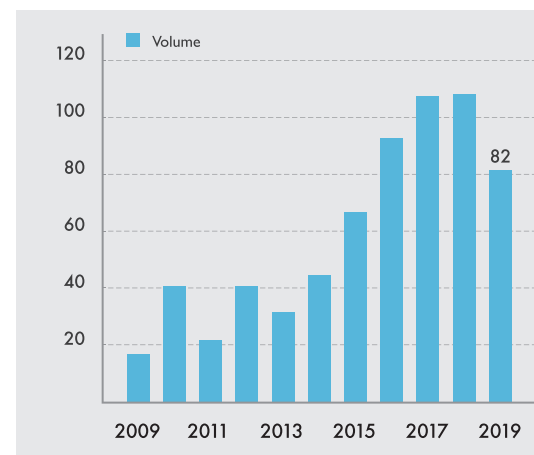
2019年，阜外医院完成主动脉覆膜支架腔内修复术528例，其中胸动脉覆膜支架腔内修复术331例，腹主动脉覆膜支架腔内修复术183例，同期进行胸主动脉和腹主动脉腔内修复手术7例，主动脉缩窄介入支架（球扩式）植入术7例。其中，采取烟囱技术、潜望镜技术、开窗技术等辅助技术为183名锚定区不足的主动脉病变患者实施了腔内修复（大部分患者为主动脉弓部病变）。



主动脉杂交手术 HYBRID AORTIC SURGERIES

In 2019, surgeons at Fuwai performed 82 hybrid operations for arch pathologies. Additionally, dozens 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.

2019年，阜外医院完成各型主动脉杂交手术82例。此外，阜外医院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。

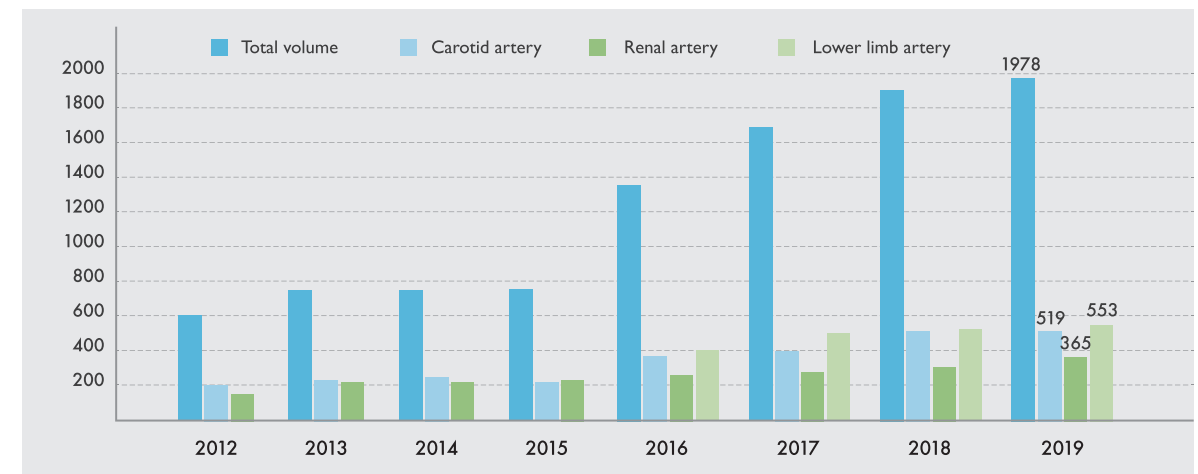


周围血管疾病 Peripheral Vascular Diseases

1978

CASE No. OF PERIPHERAL VASCULAR
PROCEDURE 2019

A dedicated peripheral vascular ward was established at Fuwai Hospital in November 2015. Ward staff includes vascular surgeons and interventional cardiologists. In 2019, the two teams performed 1,978 interventional and open procedures for patients with peripheral vascular diseases, including 1300 cases of these procedures performed by interventional cardiologists and 678 open and interventional procedures performed by vascular surgeons. The procedures performed by interventional cardiologists were not included in the annual surgical volume of Fuwai Hospital.



2015年11月，阜外医院新设外周血管疾病治疗团队，由血管外科医师和内科介入医师共同组成，主要以外周动脉疾病和各类静脉疾病的介入和外科治疗作为主攻方向。2019年共实施手术1978例，其中血管外科医师实施各类外周血管开放及介入手术678例，内科介入医师实施外周血管介入手术1300例。内科介入医师实施的外周动脉疾病和各类静脉疾病的介入手术量在阜外医院内科年报中体现，不计入阜外医院外科年报的手术总量。



微创心脏外科

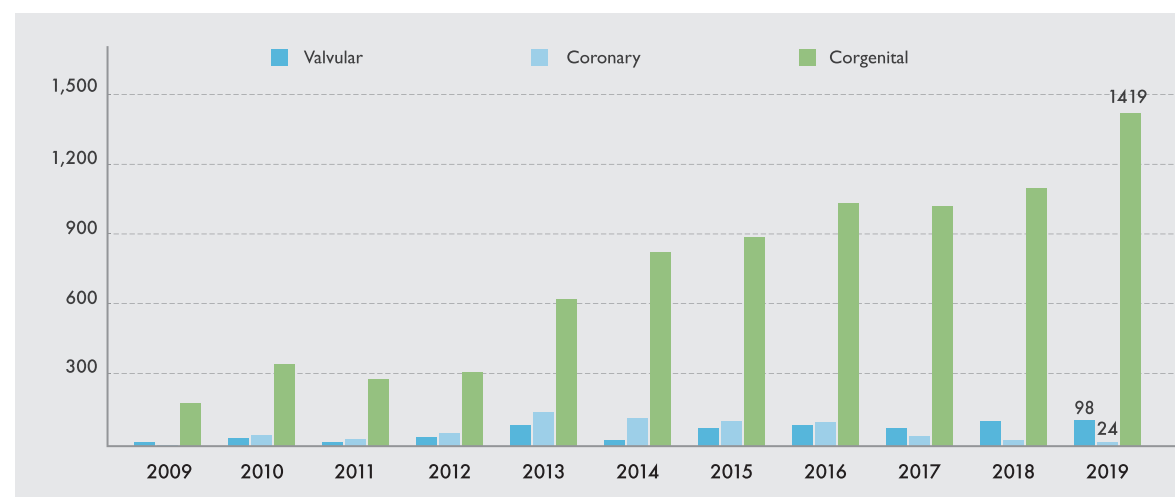
Minimally Invasive Cardiac Surgery

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, have been performed as routine , and the volume has increased steadily 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。阜外医院常规开展各类小切口心脏手术，手术量呈现持续稳定增长。

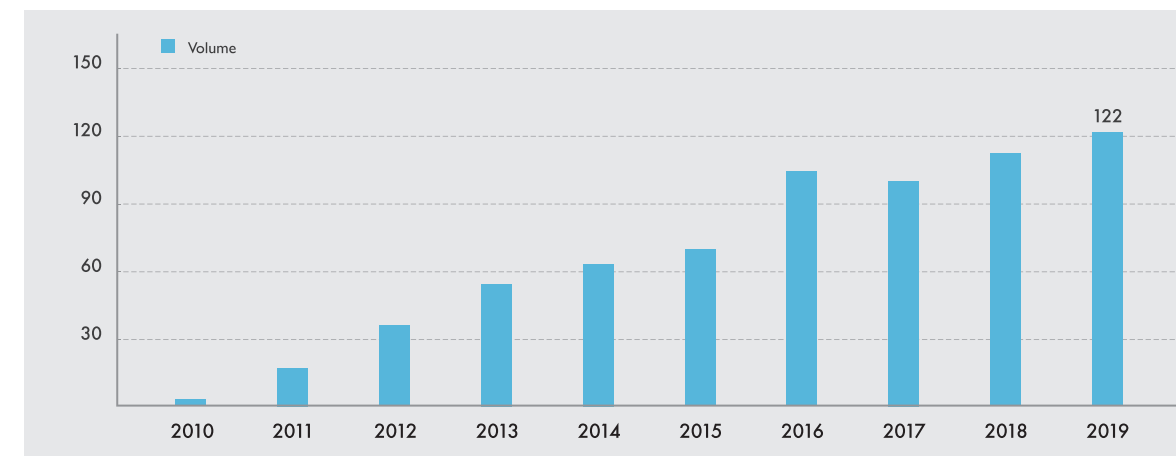


胸腔镜辅助心脏手术

VIDEO-ASSISTED THORACOSCOPIC CARDIAC SURGERIES

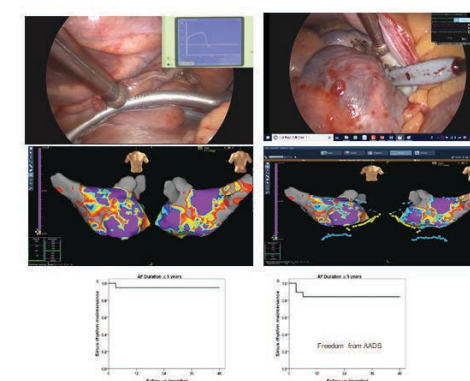
Video assisted thoracoscopic cardiac surgeries are routinely performed at Fuwai Hospital for congenital heart disease, mitral valve repair or replacement, and minimally invasive coronary artery bypass surgeries. Favorable outcomes were achieved for persistent atrial fibrillation by using hybrid thoracoscopic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

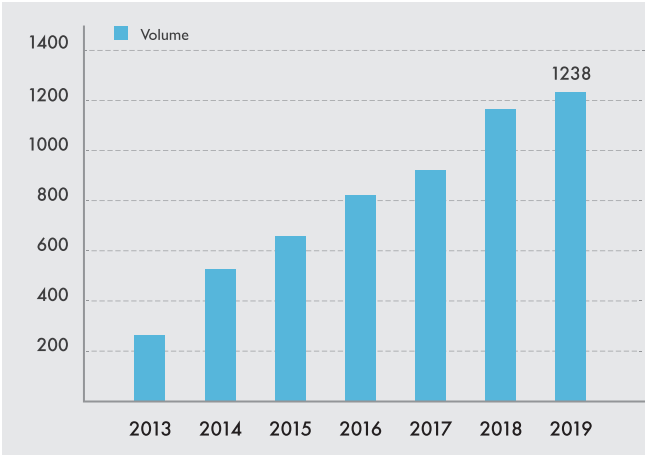


Stand-alone thoracoscopic epicardial ablation with modified mini-Maze lesion set on beating heart, and simultaneous thoracoscopic epicardial ablation and catheter endocardial ablation were introduced to treated persistent or long-standing persistent atrial fibrillation at Fuwai Hospital. The result showed that one-year sinus rhythm maintenance was 84.2% for patients with persistent atrial fibrillation underwent stand-alone thoracoscopic epicardial ablation, 74.1% for patients with intractable atrial fibrillation with significantly dilated left atrium underwent one-stage hybrid ablation. 271 cases of thoracoscopic epicardial ablation for atrial fibrillation have been successfully performed at Fuwai Hospital since 2010.

阜外外科团队采用胸腔镜下改良迷宫消融或同期联合介入消融治疗持续性或长程持续性房颤。结果显示，对于持续性房颤，胸腔镜下改良双房消融1年窦律维持率为84.2%。对于左房明显增大（>50mm）的难治性房颤患者，同期复合消融1年窦性心律维持率为74.1%。阜外医院自2010年开展胸腔镜房颤治疗，至2019年共完成271例。

无放射线经皮介入技术
PERCUTANEOUS AND NO-FLUOROSCOPY PROCEDURE

The Structural Cardiology team of Fuwai Hospital pioneered percutaneous interventional treatment of more than ten types of structural heart disease using ultrasound instead of radiation (Percutaneous And No-fluoroscopy procedure). This procedure has the great advantages of protecting patients and doctors, and reduces hardware requirements. Also, this procedure is cost-saving, suitable for promotion, and realizes the outpatient surgical treatment of common structural heart disease, which not only reduces the suffering of patients, but also obviously saves medical expenses. The technology has been widely recognized currently, and the Fuwai Hospital team has been invited to carry out this procedure in more than 20 countries and regions including Canada, France, Russia, Turkey, Hong Kong, Kenya and Tanzanian and so on. More than 300 trainees from Europe, America, Asia and Africa have been trained. In order to reduce the learning curve of new technology, the team has developed a variety of new devices dedicated to this technology, such as new catheters, guidewires, delivery systems, etc. Four instruments have been licensed at home and abroad, significantly reducing technical difficulty, improving the surgical success rate for younger doctors, and promoting the promotion and application of new technology.



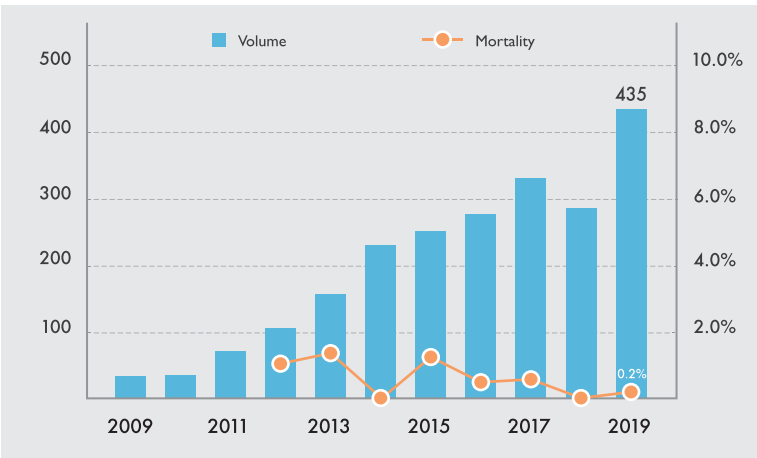
阜外医院结构性心脏病团队在国际上原创了一种无放射线经皮介入技术，用经胸超声替代放射线进行经皮介入治疗十余种结构性心脏病，具有保护患者、保护医生、节约费用、硬件要求低、适合推广的巨大优势，实现了门诊手术治疗常见结构性心脏病，不但减轻患者痛苦，而且明显节约医疗费用。该技术得到国内外同行广泛认可，阜外医院团队多次受邀到加拿大、法国、俄罗斯、土耳其、香港、肯尼亚、坦桑尼亚等二十余个国家和地区现场演示手术;培训了来自欧美、亚洲、非洲的国内外学员300余人。为了降低新技术的学习曲线，团队研发了多种超声引导技术专用的新型器械，如新型导管、导丝、输送系统等，四项器械已经获得国内外上市许可证，明显降低技术难度，提高年轻医生的手术成功率，促进了新技术的推广应用。



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 435 procedures have been successfully performed with thirty-day mortality of 0.2% in 2019. The mean peak left ventricular outflow gradient decreased from 83.6 ± 29.6 mmHg to 14.7 ± 11.0 mmHg in the adults, and decreased from 75.0 ± 29.5 mmHg to 13.7 ± 10.2 mmHg in children and adolescents.



近年来，该手术的手术量持续增长并取得良好治疗效果。2019年累计完成435例，术后30天死亡率仅0.2%。成年人患者平均左室流出道峰值压差从术前的 83.6 ± 29.6 mmHg降至术后的 14.7 ± 11.0 mmHg；儿童及青少年患者平均左室流出道峰值压差从术前压差 75.0 ± 29.5 mmHg降至术后的 13.7 ± 10.2 mmHg。

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 60% of the total morrow procedures. Simultaneous mitral valve repair was performed in 35.9% patients, while only 0.5% patients received mitral valve replacement.

Surgical procedures	Number
Isolated Modified Morrow	165 (37.9%)
Modified Morrow combined with other procedures	270 (62.1%)
CABG or myocardial bridge unroofing	79 (18.2%)
Mitral valve repair	156 (35.9%)
Mitral valve replacement	2 (0.5%)
Maze procedure	19 (4.4%)

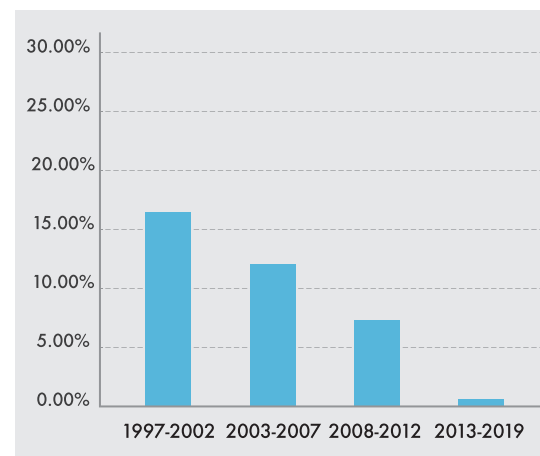
Morrow联合其他手术的术式在所有肥厚梗阻心肌病手术中占比超过60%，其中同期行二尖瓣成形手术比例为35.9%，二尖瓣置换比例仅为0.5%。

肺动脉内膜剥脱术 Pulmonary Endarterectomy Surgery

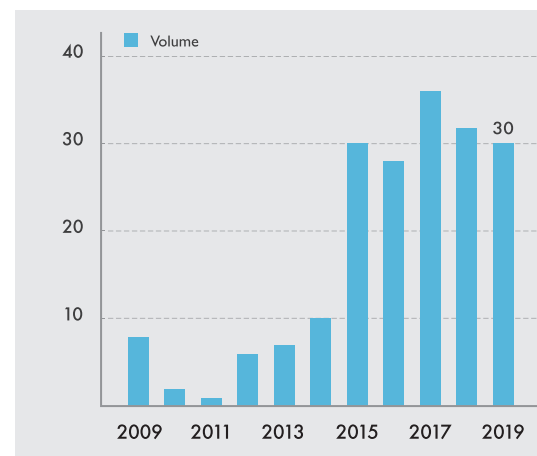
From 1997 to 2019, a total of 241 cases of pulmonary endarterectomy had been accomplished at Fuwai Hospital. The latest 150 patients had a peri-operative mortality rate under 1%. Meanwhile, our center firstly carried out pulmonary endarterectomy + sequential pulmonary balloon angiography hybrid therapy strategy in mainland China.

阜外医院自1997年至2019年共开展肺动脉内膜剥脱术241例（全国第一），最近150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，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

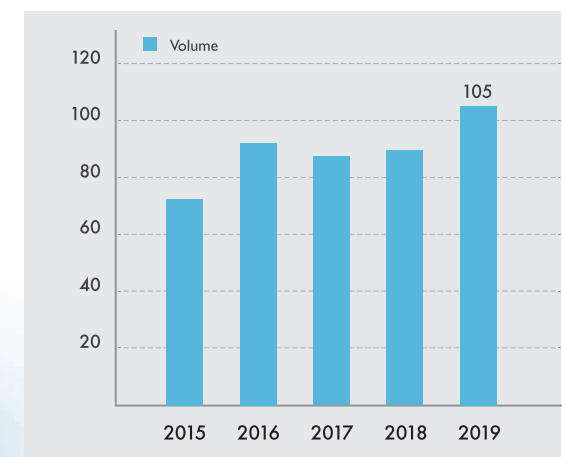


心衰及移植 Heart Failure and Transplantation

心脏移植手术量 HEART TRANSPLANTATION

928 patients have undergone heart transplantation at Fuwai Hospital; 105 of these transplantations were in 2019.

阜外医院外科团队在院内完成心脏移植928例，其中2019年完105例。

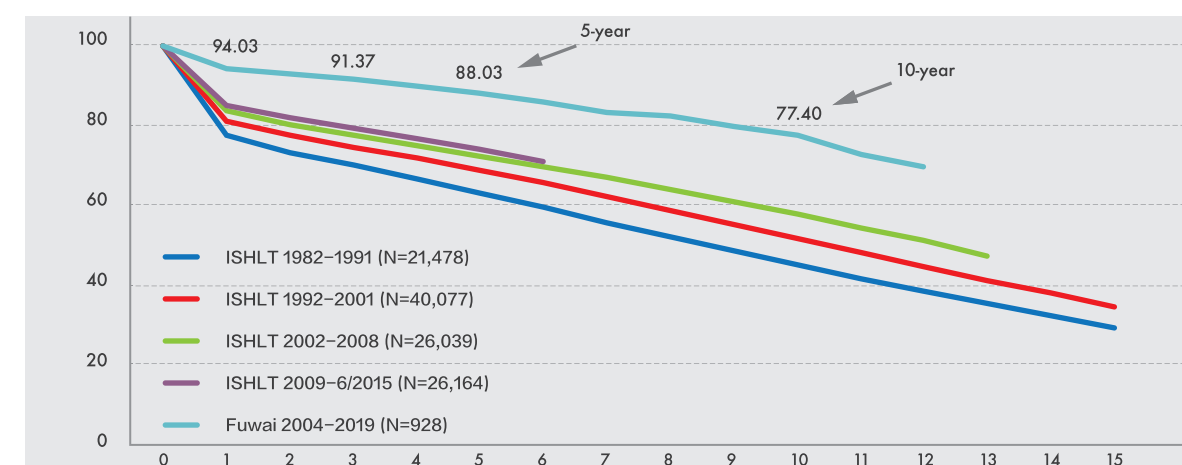


心脏移植生存率图

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

At Fuwai Hospital, the one-year, three-year, five-year and ten-year survival rate after heart transplantation was 94.03%, 91.37%, 88.03% and 77.40%, respectively, which are significantly higher than those of ISHLT.

阜外医院移植后患者1年生存率为94.03%，3年生存率91.37%，5年生存率88.03%，10年生存率达77.40%；明显高于国际心肺移植协会（ISHLT）统计的同期生存率。



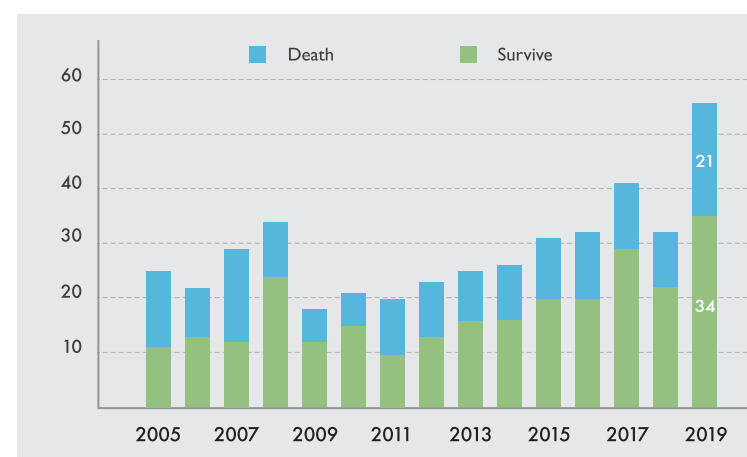
ECMO的应用

APPLICATION OF ECMO

In 2019, there were 55 cases of ECMO in Fuwai hospital, including 44 adults and 11 children. The overall survival rate was 61.8%. 65.9% (29/44) ECMO in adult patients was used to support postoperative cardiogenic shock. Meanwhile, 4 ECPR, 24 ECMO combined with IABP (54.5%), 18 ECMO with CRRT (40.9%) were performed. The postoperative 30-days survival rate was 63.6% (28/44). There were 11 cases of pediatric ECMO, 1 case of ECMO plus CRRT, and the 30-days survival rate was 54.5% (6/11).

2019年外科团队共完成55例ECMO，其中成人44例，小儿11例。总体生存率61.8%。

成人ECMO患者用于支持术后心源性休克者占65.9%（29/44），ECPR 4例，ECMO联合IABP共24例（54.5%），联合CRRT 18例（40.9%），术后30天生存率63.6%（28/44）；小儿ECMO共11例，合并CRRT 1例，术后30天生存率54.5%（6/11）。



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

心力衰竭是心血管疾病领域唯一呈持续增长趋势的疾病，终末期阶段、难治性和合并心源性休克的心衰患者死亡率仍居高不下。心室辅助外科技术治疗心衰患者目的包括（1）心脏移植前过渡支持：体重过大、血型稀有、营养状态差和急性心衰发作血流动力学不稳定，但无合适供体的患者；（2）心脏功能恢复：爆发性心肌炎、部分缺血心肌病和早期扩心病患者；（3）长期替代治疗：PRA抗体强阳性、高龄、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；（4）决策治疗：对重症心衰患者长期生命支持，等待进一步决策。

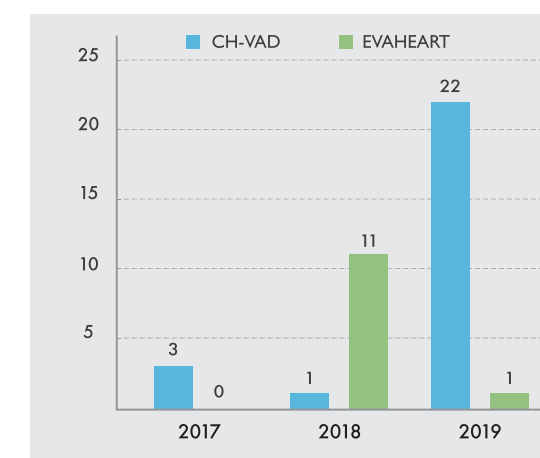
2017年6月，胡盛寿院士人工心脏团队成功开展中国第1例心室辅助装置治疗合并心源性休克的心衰患者。该装置CH-VAD是中国第1个具有完全自主知识产权的第三代磁悬浮离心血泵，也是在全球首次应用于临床。2018年1月，开展EVAHEART I心室辅助装置安全性和有效性评价临床试验，并于2019年8月获得国家药监局正式临床应用许可批件。2019年1月，开展CH-VAD安全性和有效性评价临床试验。

截至2019年12月底，阜外团队累计完成38例心室辅助装置植入术（分中心6例），其中EVAHEART I植入术12例，CH-VAD植入术26例。病因分布：扩张型心肌病21例(53.85%)，缺血性心肌病11例(28.21%)，瓣膜性心肌病5例(12.82%)，化疗药物心肌病1例（2.6%）。术前状态评估：NYHA IV级 38例，INTERMACS 1级 12例，2级22例，3级4例。结果显示，植入装置患者30天和1年生存率分别为100%和94%。

第一阶段：以“人道主义豁免”形式，应用第三代磁悬浮心室辅助装置救治危重心衰患者4例。该4例患者均为INTERMACS 1级状态，1例患者术后192天行心脏移植术，1例患者术后166天心功能恢复撤除装置，1例患者带装置长期生存达32个月，1例患者术后35天死于多器官功能衰竭和感染。

第二阶段：完成中国第一个心室辅助装置安全性和有效性评价临床试验，并获得国家药监局正式临床应用许可批件。团队共完成12例手术，术后30天、1年和2年生存率为100%，生活质量显著提高。

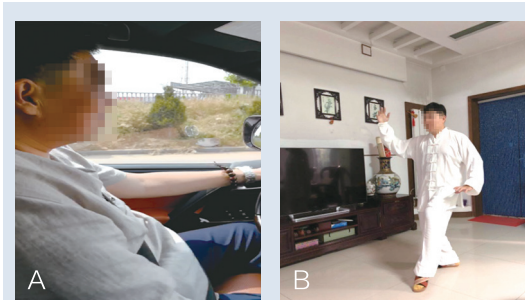
第三阶段：正式开展中国首个自主知识产权第三代磁悬浮心室辅助装置临床试验，救治危重心衰患者17例。该17例患者术前均依赖静脉血管活性药物，40%的患者依赖短期机械循环支持后仍血流动力学不稳定。术后患者生活质量评分显著增加，30天NYHA分级恢复至II级比例80%，60天恢复至I级者88%，6分钟步行距离均在术后60天恢复至正常范围。除1例术后33天死于多器官功能衰竭外，其余16例均携带装置长期生存。



阜外医院2017-2019心室辅助装置植入类型和数量

Type and number of ventricular assist device implantation in Fuwai hospital from 2017-2019

Heart failure is the only disease that shows a continuous growth trend in the field of cardiovascular diseases. The mortality rate of patients with heart failure in end-stage, refractory and complicated cardiogenic shock is still high. The purposes of ventricular assisted surgical techniques to treat patients with heart failure include (1) Bridge to transplantation: patients with overweight, rare blood types, poor nutritional status, and hemodynamic instability in acute heart failure episodes, but there are no suitable donors; (2) Bridge to recovery: patients with fulminant myocarditis, partial ischemic cardiomyopathy and early heart dilatation; (3) Destination therapy: patients with strong PRA antibody, advanced age, combined renal insufficiency, chemotherapy drug cardiomyopathy, etc. who are not suitable for heart transplantation; (4) Bridge to decision: long-term life support for patients with severe heart failure, waiting for further decision-making.



植入式磁悬浮心室辅助装置治疗危重心脏衰竭患者

- A. 中国第1例携带心室辅助装置长期生存患者;
B. 中国第1例心功能恢复撤除心室装置患者

Implantable magnetic suspension ventricular assist device for the treatment of critically ill heart failure patients. A. China's first patient with long-term survival with ventricular assist device; B. China's first patient with cardiac function recovery and removal of ventricular device

The first stage: in the form of "humanitarian exemption", the third-generation magnetic suspension ventricular assist device was used to treat 4 patients with critical heart failure. The 4 patients were all in INTERMACS grade 1 state. 1 patient underwent heart transplantation 192 days after surgery, 1 patient had a cardiac function recovery and device removal 166 days after surgery, 1 patient had a device with a long-term survival of 32 months, and 1 patient died of multiple organ failure and infection 35 days after surgery.

The second stage: Completion of the first clinical trial for the evaluation of the safety and effectiveness of ventricular assist devices in China, and the approval of the official clinical application license from the State Food and Drug Administration. The team completed a total of 12 operations. The 30-day, 1-year, and 2-year survival rates were 100%, and the quality of life was significantly improved.

The third stage: officially launching China's first independent intellectual property rights third-generation magnetic levitation ventricular assist device clinical trial, to treat 17 patients with critical heart failure. The 17 patients relied on intravenous vasoactive drugs before surgery, and 40% of patients remained hemodynamically unstable after relying on short-term mechanical circulatory support. Postoperative patients' quality of life scores increased significantly. The proportion of NYHA grades recovered to Grade II at 30 days was 80%, and those recovered to Grade I at 60 days was 88%. The 6-minute walking distance returned to the normal range at 60 days after surgery. Except for one patient who died of multiple organ failure 33 days after surgery, the remaining 16 patients all survived with the device for a long time.

In June 2017, Academician Hu Shengshou's artificial heart team successfully launched the first ventricular assist device in China to treat heart failure patients with cardiogenic shock. The device CH-VAD is the first third-generation magnetic suspension centrifugal blood pump with completely independent intellectual property rights in China, and it is also the first clinical application in the world. In January 2018, the team conducted the clinical trial for the evaluation of the safety and effectiveness of the EVAHEART I ventricular assist device, and received the official approval of the State Drug Administration for clinical application in August 2019. In January 2019, the team conducted the clinical trial for the evaluation of the safety and effectiveness of CH-VAD in China.

As of the end of December 2019, the Fuwai team had completed a total of 38 cases of ventricular assist device implantation (6 in Fuwai subcenters), including 12 cases of EVAHEART I implantation and 26 cases of CH-VAD implantation. Etiology distribution: 21 cases of dilated cardiomyopathy (53.85%), 11 cases of ischemic cardiomyopathy (28.21%), 5 cases of valvular cardiomyopathy (12.82), and 1 case of chemotherapeutic cardiomyopathy. Preoperative state assessment: 38 cases of NYHA grade IV, 12 cases of INTERMACS grade 1, 22 cases of grade 2, and 4 cases of grade 3. The results show that the 30-day and 1-year survival rates of patients with implanted devices are 100% and 94%, respectively, leading the domestic and international advanced level.

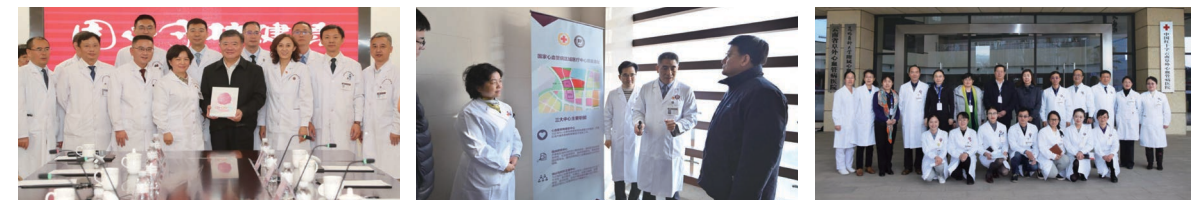


EVAHEART I 心室辅助装置治疗危重心脏衰竭患者

EVAHEART I ventricular assist device for the treatment of patients with critical heart failure

分院建设 Subcenters

云南省阜外心血管病医院 Fuwai Yunnan Cardiovascular Hospital



Fuwai Yunnan Cardiovascular Hospital (FYCH) is a high-level third-class hospital for cardiovascular diseases, which is jointly built by the People's Government of Yunnan Province and Fuwai Hospital. After 4-year construction, the hospital officially began providing medical services to the public on September 19, 2017.

At moment, there are 14 wards including Adult Cardiac Surgery, Pediatric Cardiac Surgery, Vascular Surgery, Cardiac Arrhythmia, Coronary Heart Disease, Hypertension, Comprehensive Internal Medicine (Pulmonary Vascular Disease & Coronary Heart Disease). 456 beds are available.

The number of outpatient or emergency visits, hospitalization, and discharged patients were 56,364, 12,332 and 12,210 respectively. 6,905 procedures were performed, including 5,269 interventional procedures and 1,636 surgical operations. We have screened 838077 children in 1840 schools in 2019, and provided treatment for 1152 children with CHD. As one part of national medical diplomacy plans, FYCH is taking an active part in the national "Belt and Road Initiative", with the combination of our advantages in clinical techniques, to promote the international influence of Fuwai Brand, so as to accelerate the academic communications with countries like Myanmar, Cambodia Laos, and Nepal.

云南省阜外心血管病医院是由云南省人民政府与中国医学科学院阜外医院合作共建的高水平三级甲等心血管病专科公立医院。经过四年的筹建，2017年9月19日，医院正式对外收治门诊、住院病人。目前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)等14个病区，共456张床位。

2019年门急诊挂号56364人，入院12332人，出院12210人，共完成介入手术5269台，外科手术1636台。全年共完成1840所学校的先心病免费筛查，筛查人数838077人，救治患儿1152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。



国家心血管病中心华中分中心 阜外华中中心血管病医院

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, Fuwai Central China Cardiovascular Hospital, as a high-level third-class hospital located in the central China, Henan Province, 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. Fuwai Central China Cardiovascular Hospital officially began providing medical services on December 16th, 2017.

As a regional hospital, Fuwai Central China Cardiovascular Hospital has 1000 beds, distributed in 34 wards for 15 clinical specialties. There are 1,301 employees. In 2019, we had a total of 231,518 outpatient visits and 34,409 hospitalizations. 21,052 operations were successfully completed, including 4,705 cardiac surgical cases and 14,602 intervention procedures. Under the leadership of Dr Shengshou Hu, 103 senior specialists from Fuwai Hospital have made 888 visits to Fuwai Central China Cardiovascular Hospital, dedicating to outpatient caring, ward rounding, procedure performing, consultation and lecturing. Hence, the local patients are able to truly enjoy the first-class medical service without long distance arduous travel.

国家心血管病中心华中分中心、阜外华中中心血管病医院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。2017年12月16日，阜外华中中心血管病医院正式投用。

阜外华中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。2019年，医院门急诊量231518人次，出院人数34409人次，手术例数21052例（其中：心血管外科手术例数4705例，心血管介入手术例数14602例）。在胡盛寿院士的带领下，阜外医院先后有103名专家来豫开展门诊、查房、手术、会诊及讲学888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



Shenzhen city, which is the core engine city of the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), is also known as the demonstration pilot zone for socialism with Chinese characteristics, owns superior mechanisms for public hospital reform and innovation. Located at Shenzhen, Fuwai Hospital Chinese Academy of Medical Sciences, Shenzhen (hereinafter referred to as Fuwai Shenzhen Hospital), aims to build a world-class medical center for cardiovascular diseases excelling in both health care services and medical research.

Upholding the core value of high quality and innovation from Beijing Fuwai Hospital, clinical service capacity of the Fuwai Shenzhen Hospital has significantly improved. In 2019, the number of outpatient visits reached 164,731, and the discharged reached 15,559. The surgical team of Fuwai Shenzhen Hospital performed 1,407 operations in 2019 with a year-on-year growth of 15%, while the mortality rate decreased by 25%, the total volume of blood transfusion per case dropped by 84%. Led by Dr. Shengshou Hu, Member of the Chinese Academy of Engineering, the surgical team had successfully carried out two cases of implantation of the third-generation ventricular assisting devices, and 5 cases of heart transplantation. Those surgical techniques, to our knowledge,

were firstly applied in Shenzhen city, Guangdong province and even southern China area. With all those improvements, the first-class health care service was made available to the patients with cardiovascular diseases in Shenzhen and the surrounding areas.

2019年，中国医学科学院阜外医院深圳医院立足先行示范区、粤港澳大湾区核心引擎城市和国家公立医院改革示范城市的体制、机制和创新环境优势，对标国内外最优医院，建设国际先进、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。

秉承阜外品质与创新的宗旨，2019年总体诊治服务能力和规模显著提升。2019年，医院门急诊量达164731人次，出院人数15559人次；手术量1407例，较去年同期增长15%，死亡率下降25%，手术例均用量下降84%。在胡盛寿院士的带领下，先后开展了2例第三代磁悬浮“人工心脏”心室辅助技术、5例心脏移植术等多项临床诊疗新技术和高难度心脏手术，多次创下华南地区、广东省或深圳市的“首例”，使深圳市及周边地区的心血管病患者在家门口享受国家一流水准的医疗服务的目标初步成为现实。



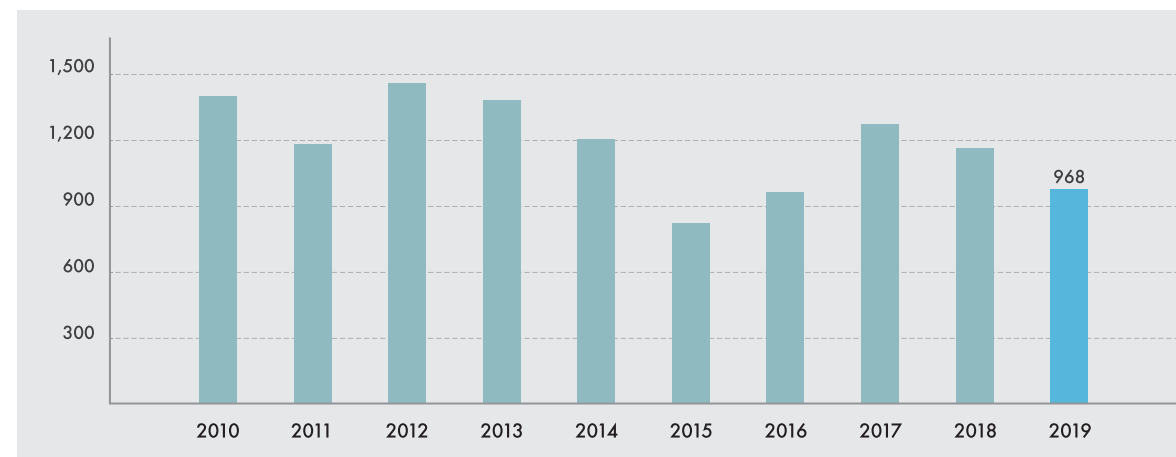
技术协作 Domestic Collaboration Network



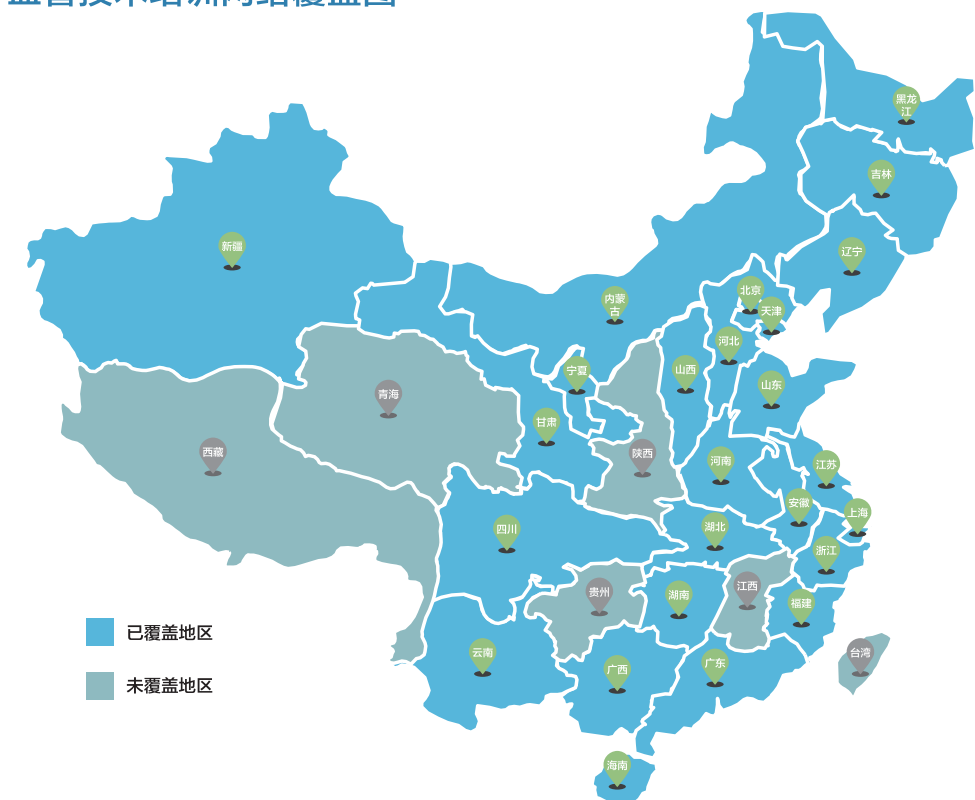
Fuwai Hospital has provided support and training to 96 hospital since 2009. During 2019, Fuwai Hospital provided guidance and training to more than 30 training bases, and established 15 training centers. They have completed in total of 6348 cases of cardiovascular surgeries, 968 cases of them were completed under the guidance of Fuwai Hospital.

2009年至今，阜外医院共向96家医院提供帮扶工作。2019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，新增培训中心15家。全年完成各类心血管外科手术6348例，其中阜外医院指导完成968例。

技术协作手术量
CARDIOVASCULAR SURGERIES PERFORMED BY FUWAI SURGICAL TEAM IN
TECHNIQUE COLLABORATION PROGRAM

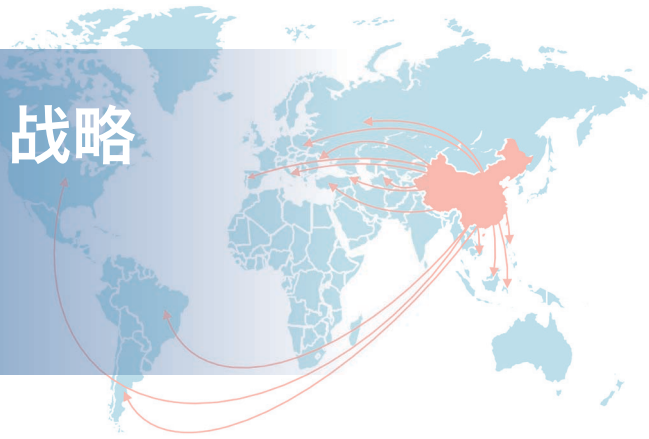


心血管技术培训网络覆盖图



积极融入“一带一路”战略

Integration of "One Belt and One Road" Strategy



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

In 2019, in addition to continuing to carry out operation demonstration and physician exchange training programs in countries like Russia and Argentina, the experts of Fuwai Hospital completed 35 cases of consultation and operation demonstration in countries along the line of "One Belt and One Road", covering 6 countries, and held 10 cardiovascular advanced training classes for doctors in these countries, and trained more than 79 advanced doctors.

The center signed cooperation contracts with 10 international medical centers along the line of "One Belt and One Road", including Indonesia, Philippines, Burma, Laos, Cambodia, Thailand, Nepal, Pakistan, Kazakhstan and Uzbekistan. Additionally, the center supported the integration of Fuwai Yunnan Cardiovascular Hospital into the national strategy of "One Belt and One 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 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。

2019年，阜外医院专家团队除继续在俄罗斯、阿根廷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35例，范围覆盖俄罗斯、葡萄牙、阿根廷、白俄罗斯、乌兹别克斯坦、越南等6个国家，举办10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79人次。

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、乌兹别克斯坦等10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）2019 深圳心血管健康和疾病防治高峰论坛 CHINA HEART CONGRESS (CHC) 2019 CARDIOVASCULAR HEALTH SUMMIT – SHENZHEN

The China Heart Congress (CHC) 2019 Cardiovascular Health Summit – Shenzhen sponsored by National Center for Cardiovascular Diseases (NCCD), Chinese Circulation Journal and Beijing Kaiqi Cardiovascular Foundation was successfully held from November 1 to November 3, 2019 in Shenzhen, China.

As one of the largest and most educational cardiovascular conferences in Asian-Pacific Region, 1,485 participants attended the meeting. As we all know, cardiovascular disease is the leading cause of death in China and in the world, and causes huge economic burden. The theme of CHC 2019 Cardiovascular Health Summit – Shenzhen is “New Era · New Journey - Innovation, Translation, and Cooperation”. CHC 2019 Cardiovascular Health Summit – Shenzhen has been designed to provide an innovative and comprehensive overview of the latest research developments in cardiovascular medicine. It includes more than 10 scientific sessions, which has covered the topics in epidemiology and prevention, cardiovascular imaging, general and interventional cardiology, cardiovascular surgery in depth.

中国心脏大会（CHC）2019 深圳心血管健康和疾病防治高峰论坛于2019年11月1日-3日在深圳成功召开。本届大会由国家心血管病中心、《中国循环杂志》社和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”。目前中国心血管病防治工作在取得初步成效的同时，又面临新的严峻挑战。虽然年龄标化的心脑血管病死亡率下降，但随着人口老龄化及城镇化进程的加速，我国心血管病的发病和死亡人数持续增加。新时代开启新征程，新时代呼唤新作为，新时代承担新使命，新时代交出新答卷。本届大会内容丰富，包括全体大会、10余个分论坛以及卫星会；对心血管流行病学和人群预防、心血管疾病影像和检验、心血管内外科治疗等方面均安排了详尽的讨论。今年大会还重点加强心血管大数据、结构性心脏病、血管疾病、创新技术、基层培训等专题论坛，并将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病精准医学研究的前沿与成果。会上来自我国和世界各地的专家学者将最新学术研究成果进行了分享，并对心血管病医、教、研、防及产业的信息进行了交流，来自31个省市自治区的1485名学员通过学习了解到了当前国内外心血管病疾病的前沿动态。



中国心脏大会（CHC）2019创新技术手术直播周 LIVE DEMONSTRATION WEEK ON INNOVATIVE TECHNOLOGIES, CHINA HEART CONGRESS 2019

The Live Demonstration Week on Innovative Technologies of China Heart Congress 2019, which was jointly sponsored by National Center for Cardiovascular Diseases, Chinese Circulation Journal and Beijing Kaiqi Cardiovascular Foundation, has been held from October 28 through October 31, and from November 5 through November 8. Skilled surgeons and cardiologists have shown the audience innovative techniques through live operation demonstration in the field of cardiovascular surgery and interventional cardiology. The surgical part of this live demonstration invited experts of adult cardiac surgery and vascular surgery from foreign countries and the domestic, to perform 15 state-of-the-art cardiovascular operations and show them to the general audience using live and online broadcast techniques. This live demonstration emphasized integrality of surgery process, devoted to providing clear education information, thoroughly explaining and discussing about the screening of patients, pre-operation evaluation of risks and benefits, guidance of imaging technology, choosing of instruments, and details of the operations. The surgical, imaging and instruments techniques are changing rapidly, the quality and effectiveness of cardiovascular surgery have improved significantly. This live demonstration brought the exemplary and leading role of Fuwai surgical team into full play, and improved the quality of specialized medical care.

由国家心血管病中心、《中国循环杂志》社、北京楷祺心血管公益基金会三方联合主办的“创新技术手术直播周”活动于2019年10月28日-2019年10月31日及11月5日-8日进行，由技术精湛的外科和介入专家为大家呈现与心血管疾病相关的外科和介入创新技术手术演示。本次直播周外科部分联合国内外专家围绕大血管外科和成人心脏外科版块，通过在线直播的方式将15台采用目前最先进技术的体外手术展现在广大观众面前。本次直播强调演示的完整性，提供明确的教育信息，并结合患者筛选、术前评估风险与获益、策略制定、影像学指导、器械选择和术中操作细节等多方位向大家讲解与讨论。心血管外科手术日新月异，医疗影像检查手段和新型器材也不断推陈出新，服务能力明显提升。本次直播充分发挥阜外医院外科团队的示范、引领作用，提升专科服务能力。





2019心律失常外科治疗国际会议（STARS 2019） SURGICAL TREATMENT OF ARRHYTHMIAS AND RHYTHM DISORDERS 2019



On November 22 and 23, the Surgical Treatment of Arrhythmias and Rhythm Disorders 2019 (STARS 2019) was held at Fuwai Hospital, National Center for Cardiovascular Diseases (NCCD). This premier event of surgical treatment for arrhythmias was held in China for the first time, which comprehensively displayed the advancement of international basic and clinical research in the field of arrhythmias, described current status, new progress and future development trends of surgical treatment for arrhythmias in China and around the world. Professor Ralph Damiano, the chief of cardio-thoracic surgery department, medical school of Washington University, and Professor Zhe Zheng of Fuwai

Hospital co-chaired this meeting. Professor Edgerton James (US), Professor Niv Ad (US), Professor Weimar Timo Hans (Germany), Professor Mark La Meir (Belgium), Professor Jichao Zhao (New Zealand), Professor Nitta Takashi (Japan) and 33 Chinese experts in the field of interventional or surgical treatment for arrhythmias were invited to give speeches. There were approximately 200 participants. This event included 10 sections, 35 oral presentations and 12 discussion panels. During the event, Professor Ralph Damiano and Professor Edgerton James presented the key-note address entitled "The evolution and current role of the Cox Maze IV procedure" and "Thoracoscopic ablation for lone atrial fibrillation on the beating heart: challenges and opportunities", respectively. Professor Ralph Damiano performed one live MAZE IV operation. Doctors Zhe Zheng and Yan Yao presented one live demonstration operation of simultaneous hybrid ablation for long-standing persistent atrial fibrillation successfully. Participants discussed diseases including atrial fibrillation, ventricular tachycardia, inappropriate sinus tachycardia, Ebstein anomaly with Wolff-Parkinson-White syndrome, long QT syndrome, Catecholamine-sensitive ventricular tachycardia. The mechanisms of diseases, guidelines interpretation, clinical practice sharing were thoroughly mentioned. This event has provided one platform for sharing and discussion for experts in arrhythmias and promoted the development of surgical treatment for arrhythmias internationally.

2019心律失常外科治疗国际会议（STARS 2019）于2019年11月22日和23日在国家心血管病中心阜外医院召开。这是心律失常外科治疗领域顶级盛会首次在中国举办，全方位展示国际心律失常基础研究和临床诊治技术的新成果，介绍中国、亚洲国家和美欧等国家目前心律失常外科治疗的现状、新进展以及未来发展趋势。

本次大会，华盛顿大学医学院胸心外科主任Ralph Damiano教授和阜外医院郑哲教授作为共同主席，特邀请Edgerton James教授（美国）、Niv Ad教授（美国）、Weimar Timo Hans教授（德国）、Mark La Meir教授（比利时）、Jichao Zhao教授（新西兰）、Nitta Takashi教授（日本）及中国心律失常内外科治疗领域的33位专家做大会主持和发言，近200名参会者。本次会议共10个章节，35个发言，12场讨论。会议期间Ralph Damiano教授和Edgerton James教授分别进行题为“Cox迷宫IV手术的发展及现状”和“胸腔镜下不停跳消融治疗孤立性房颤：挑战和机遇”的主旨演讲。同时Ralph Damiano教授成功进行Maze IV手术现场演示，郑哲和姚焰教授成功进行同期复合消融治疗长程持续性房颤的手术现场演示。会议讨论的疾病涉及房颤、室速、不适当窦性心动过速、三尖瓣下移畸形合并预激综合征、长QT间期综合征、儿茶酚胺类敏感性室速。内容涵盖机制研究进展，指南解读，临床经验分享，热点问题激烈讨论。本次会议，为来自不同国家的各位心律失常专家提供分享与讨论的平台，促进国际心律失常外科治疗的发展。



中国第一届人工心脏治疗心脏衰竭临床高级培训会 THE 1ST CHINA ADVANCED CLINICAL TRAINING CONFERENCE ON ARTIFICIAL HEART SURGERY TECHNIQUE

On August 13, 2019, "The 1st China Advanced Clinical Training Conference on Artificial Heart Surgery Technique" was successfully held in Beijing Fuwai Hospital. Academician Hu Shengshou instructed the team of Professor Dong Nianguo of the Union Hospital of Huazhong University of Science and Technology, the team of Professor Cheng Zhaoyun of Fuwai Hospital of Huazhong University of Science and Technology, and the team of Professor Liu Zhigang of Tianjin Teda International Cardiovascular Hospital from the aspects of theory, in vitro animal models and surgical practice.

The theme of this seminar is to standardize, develop and improve the technical level of clinical application of artificial heart in China. Main contents of the conference included: 1) Introduce the latest guidelines, indications, preoperative evaluation, complications, postoperative management, anesthesia, monitoring, follow-up management and other issues of artificial heart clinical application; 2) Observe the third-generation magnetic suspension ventricular assist device on site Practice training on composition and operation, simulative operation on the animal heart and implantation of artificial heart pump body; 3) For typical cases, introduce and demonstrate the implantation surgery process, and answer key questions during the operation.

2019年8月13日,中国“中国第一届人工心脏治疗心脏衰竭临床高级培训会”在北京阜外医院成功举办。胡盛寿院士从理论、动物模型和手术实践方面，分别对华中科技大学附属协和医院董念国教授团队、华中阜外医院程兆云教授团队和天津泰达国际心血管病医院刘志刚教授团队开展了针对性培训。

本次研讨会主题是规范、发展和提高我国人工心脏临床应用技术水平，主要内容：1)介绍人工心脏临床应用的最新指南、适应症、术前评估、并发症、术后管理、麻醉、监护、随访管理等问题；2)现场观摩第三代磁悬浮心室辅助装置的组成和运行进行实践培训，在动物心脏上进行模拟操作缝合植入人工心脏泵体；3)针对典型病例，介绍植入手术过程并进行演示，术中対关键问题进行答疑。





第四届中国血管大会 THE 4TH CHINA VASCULAR CONGRESS

On September 20, 2019, the 4th China Vascular Congress (CVC 2019) was successfully held in Tianjin. This academic event to discuss the progress of surgical, endovascular, and hybrid treatment for aortic, peripheral arterial, and venous diseases was attended by 1,300 domestic cardiovascular surgeons and more than 20 foreign experts from over 10 countries and. One of the features of CVC 2019, "Medical Skill & Healing Art Symposium," which 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 "One Belt and One Road," the National Society of Vascular Surgery signed the Memorandum of Understanding with Republican Specialized Scientific and Practical Specialized Surgery Center named after Academician V.Vakhidov.

2019年9月20日，第四届中国血管大会（China Vascular Congress, CVC）在天津隆重开幕，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。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乌兹别克斯坦共和国瓦霍多夫院士纪念外科专业研究和临床实践中心在CVC2019开幕式上签署了学术合作备忘录。



中国心脏大会(CHC) 2019先心病论坛暨第四届阜外国际复杂先心病高峰论坛 CHINA HEART CONGRESS 2019 CONGENITAL HEART DISEASE FORUM AND THE 4TH FUWAI INTERNATIONAL CONFERENCE OF COMPLEX CONGENITAL HEART DISEASES

From November 28, 2019 to December 1, 2019, China Heart Congress 2019 Congenital Heart Disease Forum and the 4th Fuwai International Conference of Complex Congenital Heart Diseases, which were known as the best congenital cardiac forum in China, were perfectly held in Beijing. Top pediatric cardiac surgeons from USA, France, Germany, South Korea, Professor Hu Shengshou, Professor 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, focusing on the surgical strategies for newborns with critical congenital heart diseases; surgical treatment of congenital valvular disease in pediatric patients; surgical strategies for corrected transposition of great arteries and other conotruncal defects and anatomic or physiological decisions for borderline complex congenital heart disease. Best surgeons had a deep discussion and shared the international advanced experience during the meeting. In addition, several surgical videos from these masters were presented, which made the audience enjoyed and benefited a lot.

2019年11月28日至2019年12月1日中国心脏大会先心病论坛暨第四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危重症新生儿的外科治疗策略、低龄低体重婴幼儿瓣膜病的外科治疗、矫正性大动脉转位及其它圆锥动脉干畸形的外科治疗以及边缘复杂先心病的解剖或生理矫治决策等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。





第十二期 国家复杂先天性心脏病研讨会暨培训班： 完全型大动脉转位的外科治疗再认识 THE 12TH COMPLEX CONGENITAL HEART DISEASE NATIONAL SYMPOSIUM & TRAINING COURSE ON RE-RECOGNITION OF SURGICAL TREATMENT OF TRANSPOSITION OF GREAT ARTERIES.

The 12th Complex Congenital Heart Disease Training Course was held from March 28th to March 30th 2019, whose topic was “re-recognition of surgical treatment of transposition of great arteries (TGA).” More than 300 surgeons, anesthesiologist and intensivists from all over the country took part in this forum. As usual, several live shows of surgery for challenging cases were presented during the conference. The theses of this meeting was re-recognition of surgical treatment of transposition of great arteries. TGA accounts for a large proportion of complex congenital heart disease. Its surgical treatment embodies the management level of congenital heart disease in an advanced medical center. From the decision of surgical timing and strategies, the recognition on TGA management has evolved several times which is still challenging. How to design an optimal and beneficial treatment strategy based on cardiac function and anatomy is always a big concern for all pediatric cardiac surgeon. Experienced surgeons shared their precious concepts and deeply discussed clinical cases. As a result, participants had a comprehensive understanding of the preoperative diagnosis, surgical indications, surgical options, surgical operation points, anesthesia extracorporeal circulation management and perioperative comprehensive management from the meeting, and had a further understanding of the improvement and innovation of treatment strategy for transposition of great arteries.

2019年3月28日-30日，第十二期复杂先心病研讨班暨“完全型大动脉转位的外科治疗再认识”在中国医学科学院阜外医院成功举办。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完全型大动脉转位的外科治疗再认识。完全型大动脉转位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。从手术时机和手术方式的选择，其手术理念几经演化，仍有挑战。如何根据心脏功能和解剖选择正确治疗策略，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。参会者全面了解大动脉转位的术前诊断，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。



第十一届阜外主动脉病变治疗研讨会 THE 11TH FUWAI AORTIC SYMPOSIUM

The 11th Fuwai aortic symposium was successfully held at Fuwai Hospital in the early of 2020. This conference focused on “Surgical treatment of aortic root disease” and topics of other aortic diseases which covered surgical, endovascular and hybrid treatment. We had the honor to invite the aortic surgery team of Massachusetts General Hospital and Yale University to communicate with us, including professor Duke E. Cameron, director of the cardiovascular surgery center in Massachusetts General Hospital; professor John A. Elefteriades, director of cardiothoracic surgery department in Yale University.

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

“第十一届阜外主动脉病变治疗研讨会”于2020年初在阜外医院圆满召开。本届会议以“主动脉根部疾病的外科治疗”为重点，并涵盖其他主动脉疾病的外科、杂交和腔内治疗。本次研讨会特邀美国麻省总医院心血管外科中心主任Duke E. Cameron教授、美国耶鲁大学心胸外科主任John A. Elefteriades教授一行与会交流。

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 and 讨论。





国家心血管病专家委员会血管外科专委会(NSVS)下肢动脉疾病学组成立大会暨阜外医院下肢动脉硬化闭塞症腔内治疗论坛

ENDOVASULAR TREATMENT FORUM OF ARTERIOSCLEROSIS OBLITERANS

On November 15th, 2019, the founding meeting of the special committee of vascular surgery (NSVS) of the National Committee of Cardiology and the endovascular treatment forum of arteriosclerosis obliterans were held in Fuwai Hospital.

The lower extremity arteriology group was established at this conference, which was composed of over 120 distinguished experts in the treatment of lower extremity artery in China. This conference announced the formal establishment of the special committee of vascular surgery (NSVS) of the National Committee of Cardiology, and launched academic communication and discussion on the medical quality control of lower extremity artery disease in China and the progress of prevention and endovascular treatment of lower extremity arteriosclerosis obliterans. Academician Hu Shengshou proposed to establish the National Expert Committee on cardiovascular disease, which aims to build an expert working platform, to provide suggestions for the prevention and control of cardiovascular disease in China, and to promote the top-level design and long-term plan for the National Center for cardiovascular diseases. Based on the epidemic characteristics and actual situation in China, National Center for cardiovascular diseases would explore the prevention and control strategies and measures, which would be safe, effective, affordable and suitable with the basic national conditions of China.

2019年11月15日，国家心血管病专家委员会血管外科专委会(NSVS)下肢动脉疾病学组成立大会暨阜外医院下肢动脉硬化闭塞症腔内治疗论坛在阜外医院隆重召开。

此次大会成立的下肢动脉学组，集中了国内120余名下肢动脉治疗专家，代表了国内的最高水平。此次大会宣布了国家心血管病专家委员会血管外科专委会(NSVS)下肢动脉疾病学组的正式成立，并围绕中国下肢动脉疾病医疗质量控制，下肢动脉硬化闭塞症防控及腔内治疗进展展开交流讨论。会上胡盛寿院士提出成立国家心血管病专家委员会的目的，就是搭建专家工作平台，为我国心血管病防治事业献计献策，帮助国家心血管病中心做好顶层设计和长远规划；立足于我国疾病流行特点和实际情况，探索适合我国国情的心血管病防治策略和安全有效且负担得起的防治措施。



成立国家心血管病专家委员会的目的，就是搭建专家工作平台，为我国心血管病防治事业献计献策，帮助国家心血管病中心做好顶层设计和长远规划；立足于我国疾病流行特点和实际情况，探索适合我国国情的心血管病防治策略和安全有效且负担得起的防治措施。



中国医药教育协会血管外科委员会第一届年会

ANNUAL MEETING OF VASCULAR SURGERY SPECIAL COMMITTEE OF CHINA PHARMACEUTICAL EDUCATION ASSOCIATION

On November 16th, 2019, the first annual meeting of vascular surgery special committee of China Pharmaceutical Education Association was successfully held in Beijing. The conference is sponsored by China Medical Education Association, coorganized by vascular surgery Professional Committee of China Medical Education Association and China primary health care foundation, and jointly organized by Beijing hospital and Fuwai Hospital of Chinese Academy of Medical Sciences. Prof. Teik Choon SE from Cambridge University and more than 200 experts in vascular surgery attended the meeting.

In the main conference hall, with the theme of round table cases explanation, 8 cases were shared respectively. Case sharing was conducted in the form of TED speech, and full time was given to discuss and question. The speakers answered questions on site, which were closely linked, and shared wonderful cases for colleagues in the field of medicine.

2019年11月16日，中国医药教育协会血管外科专委会第一届年会在北京成功举办。本次大会由中国医药教育协会主办，中国医药教育协会血管外科专业委员会、中国初级卫生保健基金会协办，北京医院、中国医学科学院阜外医院共同承办。剑桥大学Teik Choon SE教授以及来自全国各地的200余名血管外科专家出席会议。

主会场上，以拨丝抽茧之圆桌病例详解为主题，分别进行了8个病例分享，病例分享以TED演讲形式进行，并给予充分时间讨论并质疑，讲者现场答疑，为在场医学界同仁分享了一场精彩纷呈的案例。





第八届中国心脏重症大会 THE 8TH CHINA HEART CRITICAL CARE CONGRESS

From 14 to 16, June 2019, the 8th China conference on cardiac critical care medicine was held at Yellow River Yingbin Hotel in Zhengzhou, Henan province. Nearly 500 experts from China and overseas served as key speakers and sub-forum hosts, and more than 6,000 people in the field of cardiac critical care medicine attended the conference. The theme of the conference was "Cardiac critical care medicine, regulation and improvement". The conference set 24 sub-forums and focused on new technologies, new ideas and new breakthroughs on cardiac critical care, and conducted in-depth discussions and communication on frontier developments and hot issues in the field of cardiac critical care.

Professor Zhang Haitao, President of the conference, addressed the opening ceremony and delivered a wonderful speech entitled "Where is Mount Everest on Cardiac Critical Care Medicine? How to climb it?" He drew the skeleton of cardiac critical care medicine with a mind map and analyzed the status quo, the bottleneck and future breakthrough on cardiac critical care medicine. He observed that "heart dysfunction, multiple organ dysfunction, and peripheral infection" may be regarded as the "Mount Everest" of cardiac critical care medicine, and he proposed reasonable and effective ways to climb the "peak", explaining profound matters in a simple way.

The conference announced the results of the "Chinese star doctors of cardiac critical care medicine". Through voting, the awards finally went to 36 individual doctors and units, who were recommended by local hospitals, sub-committees and industry experts and had gone through strict evaluation by the evaluation team.

2019年6月14日至16日，第八届中国心脏重症大会在河南郑州黄河迎宾馆召开。来自国内外近500位专家担任专题讲者及分论坛主持人，6000余名心脏重症同道与会学习，大会以“心脏重症·规范与提高”为主题，共设置24个分会场及分论坛版块。共同聚焦心脏重症新技术、新理念、新突破，围绕心脏重症领域前沿进展、热点问题进行了深入探讨交流。

大会主席张海涛教授在开幕式致辞并发表了题为《心脏重症的珠峰在哪里？如何去攀登》的精彩演讲。他以思维导图的形式展示了心脏重症的脉络，并分析介绍了心脏重症的发展现状、面临瓶颈以及未来突破。他提出“心功能不全、合并多脏器功能不全、合并外周感染”可谓心脏重症之“珠峰”，通过深入浅出的讲解，为如何接受挑战、攀登“高峰”提出了合理有效的方式与途径。

此次大会揭晓了“中国心脏重症之星”评选结果。经各地医院、各级分会、业界专家推荐及评审工作组对参评者的严格考量，最终投票产生36位获奖人及获奖单位。



国家心血管病专家委员会麻醉专业委员会成立大会 THE ESTABLISHMENT MEETING OF THE ANESTHESIA COMMITTEE OF NATIONAL EXPERT COMMITTEE ON CARDIOVASCULAR DISEASE

On November 8, 2019, with the approval of the National Center for cardiovascular diseases, the establishment meeting of anesthesia Professional Committee of the National Expert Committee on cardiovascular diseases was successfully held in Beijing. Professor Zheng Zhe, Secretary of the CPC committee of the National Center for cardiovascular diseases and Chinese Academy of Medical Sciences Fuwai Hospital, Professor Shu Zhang, CPPCC National Committee member and Secretary-General of the expert committee of the National Cardiovascular Center and Famous senior expert of cardiovascular anesthesia Professor Xiaoqin Hu, Professor Shuozeng Deng, Professor Enming Qing and Professor Yuliang Xue Attended the establishment meeting.

The meeting was chaired by Professor Shu Zhang, Secretary-General of the expert committee of the National Center for cardiovascular diseases. All members voted on the spot. Professor Jin Liu, Huaxi Hospital, Sichuan University elected as chairman. Professor Yuguang Huang from Beijing Union Medical College Hospital, Professor Zheng Guo from Shanxi Medical University, Professor Junmei Xu from The Second Xiangya Hospital of Central South University, Professor Xiaoming Deng from Changhai Hospital, Professor Fuxia Yan from Fuwai Hospital, CAMS&PUMC, Professor Tiezheng Zhang from Northern War Zone General Hospital and Professor Sheng Wang from Guangdong Provincial People's hospital were elected vice chairman of the Committee. In addition, 25 members of the Standing Committee and 48 members were elected in the meeting. Professor Fuxia Yan from Fuwai Hospital was appointed Secretary-General of the Committee.

2019年11月8日，经国家心血管病中心批准，国家心血管病专家委员会麻醉专业委员会成立大会在京成功召开。国家心血管病中心党委书记、中国医学科学院阜外医院党委书记郑哲教授，全国政协委员、国家心血管病中心专家委员会秘书长张澍教授及心血管麻醉老一辈著名专家胡小琴主任、邓硕曾主任、卿恩明主任和薛玉良主任出席成立大会。

会议由国家心血管病中心专家委员会秘书长张澍教授主持，并通过现场投票进行选举。四川大学华西医院刘进教授当选主任委员。北京协和医院黄宇光教授、山西医科大学郭政教授、中南大学湘雅二医院徐军美教授、长海医院邓小明教授、中国医学科学院阜外医院晏馥霞教授、北部战区总医院张铁铮教授、广东省人民医院王晟教授当选副主任委员。此外，选举还产生常委25名、委员48名。国家心血管病中心主任办公会任命中国医学科学院阜外医院晏馥霞教授担任委员会秘书长。





2019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 2019 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. Fuwai International Cardiovascular Anesthesia Forum was held simultaneously since 2018. The symposium invited Professor Michael Schumacher from University Paris Sud and University Paris Saclay, France who Introduced the latest progress of basic research on hormones in neuroprotection; Dr. Hermann Kuppe from Berlin Heart Center, Germany who analyzed the development trend of pediatric cardiac surgery anesthesia through the display and interpretation of a large number of clinical research data, which has important reference value for the choice of pediatric surgical anesthesia in the future; Dr. Zhiyi Zuo from University of Virginia School of Medicine, Charlottesville, Virginia UK who showed us his achievements in basic research and clinical trials, and systematically explained how anesthesiologists can reduce the incidence of postoperative cognitive dysfunction and Dr. Daqing Ma from Imperial College London, Chelsea and Westminster Hospital, UK who presented the latest development of cardiovascular surgery complications and treatment measures. The symposium 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 discussed in-depth anesthesia for special types of heart disease and interventional treatment of heart disease. Colleagues from all over the country were invited to engage in cardiovascular anesthesia, surgery, cardiopulmonary bypass and perioperative management.

随着心血管外科和介入治疗的不断发展，心血管麻醉也面临着新的机遇和挑战，新概念、新理念、新技术不断涌现，从而对心血管麻醉医师提出了更高的要求。

“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。从2018年开始，我们同期举办了阜外国际心血管麻醉论坛。本次论坛邀请法国巴黎萨克雷大学的Michael Schumacher教授介绍了激素在神经保护作用方面目前基础研究的最新进展；德国柏林心脏中心Hermann Kuppe教授通过展示和解读大量临床研究数据分析了小儿心脏手术麻醉的发展趋势，对今后小儿手术麻醉方式的选择有重要参考价值；美国弗吉尼亚大学医院的左志义教授介绍了自己在基础研究和临床试验方面的成果，系统阐述了麻醉医生怎样才能减少术后认知功能障碍的发生；英国伦敦帝国理工学院、切尔西和威斯敏斯特医院的马大青教授介绍了心血管手术并发症的

发生机制及治疗措施的最新进展。大会先后围绕“心脏麻醉前沿”、“先心病手术围术期管理进展”、“心血管麻醉监测及器官保护”、“特殊麻醉与围术期管理”和“食道超声技术在心脏手术围术期的应用”专题展开了热烈讨论与交流，众多国内外专家学者的精彩报告为与会者奉上了一场学术盛宴。



2019年体外循环质量控制高峰论坛暨阜外医院体外循环科成立25周年纪念活动 2019 CARDIOPULMONARY BYPASS QUALITY CONTROL SUMMIT AND 25TH ANNIVERSARY COMMEMORATION FOR DEPARTMENT OF CARDIOPULMONARY BYPASS OF FUWAI HOSPITAL

2019 Cardiopulmonary Bypass Quality Control Summit and 25th Anniversary Commemoration for Department of Cardiopulmonary Bypass of Fuwai Hospital were successfully held in Beijing Fuwai Hospital From September 20th to 21st, 2019. A total of nearly 200 professionals and colleagues participated in this grand event.

This meeting first reviewed the 25-year history of the development of the cardiopulmonary bypass center of Fuwai Hospital. President Hu Shengshou delivered a speech and presented the Lifelong Achievement Award to Professor Long Cun. Subsequent discussions focused on "cardiopulmonary bypass quality control". Representatives from each center shared management quality control experience. At the same time, the National Cardiovascular Disease Quality Control Center's Extracorporeal Circulation and Extracorporeal Life Support Expert Group Working Group was established, and the first working meeting was held.

2019年9月20日-21日，2019年体外循环质量控制高峰论坛暨阜外医院体外循环科成立25周年纪念活动在北京阜外医院成功举办，共有近200位业内人士及本院同仁参加此盛会。本次会议首先回顾了阜外医院体外循环中心25年的发展历程，胡盛寿院长致辞并向龙村主任颁发终身成就奖，业内专家和本院兄弟科室代表发言祝贺体外循环科建科25周年，随后会议围绕“体外循环质量控制”展开了热烈讨论，各个中心代表分享了管理质控经验，并同时召开了国家心血管病专业质控中心体外循环及体外生命支持专家组工作组成立大会及第一次工作会议。





2019年阜外外科团队在国际专业学术会议上的发言 PRESENTATIONS OF FUWAI SURGICAL TEAM IN INTERNATIONAL MEETINGS 2019

European Society of Cardiology 2019

Dr. Chaowu Yan

The Combined Use of Radiofrequency-ablation and Balloon-dilation (CURB) in the Creation of a Stable Inter-atrial Communication: First-in-man use for Patients with Severe Pulmonary Arterial Hypertension

Transcatheter Cardiovascular Therapeutics 2019

Dr. Xu Wang

Transcatheter Aortic Valve Implantation in Pure Native Aortic Valve Regurgitation

Transcatheter Cardiovascular Therapeutics 2019

Dr. Xiangbin Pan

The Minimalist Approach to PFO Closure: the Chinese Experience.

ICCVA-ASCA 2019

Dr. Chenghui Zhou

Understanding and Applying Meta-Analysis & Systematic Review: Case Examples

13th Biennial Myanmar Conference of Anaesthesia and Intensive Care

Dr. Jia Yuan

Ultrafast-track Anesthesia of Tetralogy of Fallot.

17th International Congress of Cardiothoracic and Vascular Anesthesia & 13th Meeting of the Asian Society of Cardiothoracic Anesthesia

Dr. Jia Yuan

On Table Extubation of Tetralogy of Fallot

The 37th Annual International Symposium: Clinical Update in Anesthesiology, Surgery and Perioperative Medicine 2019

Dr. Hushan Ao

Perioperative Infection and Thrombosis in Cardiovascular Surgery

EACTA 2019

Dr. Hushan Ao

Introduction of CSCTVA

American Association for Thoracic Surgery 99th Annual Meeting

Dr. Shoujun Li

Double-root-transposition

American Association for Thoracic Surgery 99th Annual Meeting

Dr. Sheng Liu

The hybrid therapy strategy for patients with chronic thromboembolic pulmonary hypertension

OPCAB master class APAC 2019

Dr. Sheng Liu

The second arterial graft

American Association for Thoracic Surgery 99th Annual Meeting

Dr. Cuntao Yu

Midterm Outcomes of One-Stage Hybrid Aortic Arch Repair for Standard Type A Aortic Dissection: A Single Center's Experience

The 17th international congress of cardiothoracic and vascular anesthesia 2019

Dr. Xu Wang

Postoperative Fluid Management in Children after Cardiac Surgery

Asia-Pacific Extracorporeal Life Support Organization (APELISO) 2019 Conference

Dr. Bingyang Ji

VA ECMO in complicated acute myocardial infarction

Leipzig Interventional Course 2019

Dr. Chang Shu

How to Manage Aortic Arch Pathology: Open, Hybrid, Chimney or Fenestration

2019 The 10th Annual International Conference on Cardiovascular Disease

Dr. Chang Shu

1. How to Manage Aortic Arch Pathology: Open, Hybrid,

Chimney or Fenestration

2. Live Case Transmission: TEVAR

CICE 2019

Dr. Chang Shu

1. TEVAR for Type B Aortic Dissections Novel Technique from China

2. Chinese Experience with Abdominal Aneurysm Endovascular Repair

Aortic Asia 2019

Dr. Chang Shu

Chimney, Fenestration & Hybrid Operation: Which One Should be the First Option for the Aortic Arch Pathology?



Porto LIVE 2019

Dr. Chang Shu

- 1.Live Case Transmission: On table Fenestration Assisted TEVAR
- 2.In-situ Fenestration Assisted TEVAR for Aortic Arch Disease

Charing Cross 2019

Dr. Chang Shu

Special Design to Prevent Endoleak: Skirt Stent Graft Applied in the Aortic Arch Pathology

2019 Complex Cardiovascular Catheter Therapeutics

Dr. Chang Shu

Live Case Transmission: Novel Chimney Stent-graft for LSA Revascularization in TEVAR

The 13th International Joint Meeting on Cardiovascular Disease

Dr. Chang Shu

Endovascular Treatment for Aortic Arch Pathologies: Open, Hybrid, Chimney, On-the-table Fenestration or In-situ Fenestration Technique

Complex Aortic Surgery News

Dr. Chang Shu

Total endovascular. Fenestration and more

London Aorta 2019

Dr. Chang Shu

New ideas in the management of complicated Type B dissection

Congress of Asian Society for Vascular Surgery 2019

Dr. Chang Shu

Overview of Abdominal Aortic Aneurysm in ASIAN Country



Veith Symposium 2019

Dr. Chang Shu

- 1.With Aortic Arch Lesions (Aneurysms And Dissections), When Should The Treatment Be Fenestrated or Branched TEVAR (F/B/TEVAR), Chimney TEVAR (Ch/TEVAR), Hybrid or Fully Open Surgical Repair
- 2.The SKIRT StentGraft to Prevent Endoleaks from Fenestrated and Chimney TEVARs: How Does It Work

Pacific Northwest Endovascular Conference 2019

Dr. Chenyang Shen

Endovascular Therapy for Complex Aortoiliac Occlusion Disease

European Society for Vascular Surgery 33rd Annual Meeting

Dr. Chuan Tian

Endovascular Treatment in Type B Aortic Intramural Hematoma Patients

European Association for Cardio-Thoracic Surgery 2019

Dr. Chuan Tian

Native versus Prosthetic Ascending Aorta as Proximal Landing Zone for Hybrid Arch Repair

European Association for Cardio-Thoracic Surgery 2019

Dr. Xiaogang Sun

Renal Protective Effect of Aortic Balloon Occlusion Technique in Total Arch Replacement with Frozen Elephant Trunk



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 China, 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 2019, 30 new postgraduates were enrolled in the surgical system of Fuwai Hospital, 23 postgraduates graduated successfully. At present, there are 96 postgraduates in the surgical system of Fuwai Hospital. Meanwhile, a total of 204 doctors in China successfully completed the continuing education training programs in our surgical department, among which 58 were cardiac surgeons.

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。

2019年，阜外医院外科系统新入学研究生30名，23名研究生顺利毕业，目前在校研究生96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，其中心外科医师58名。





2019年阜外外科团队举办的专业学习班 TRAINING PROGRAM AND WORKSHOP 2019

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
一期：12月26-28日

2019 CTEPH外科治疗高峰论坛
2019 Surgical Treatment for CTEPH Summit
11月29日

心血管外科微创技术暨房颤治疗高级培训班
Advanced Training Program for Minimally Invasive Cardiovascular surgery, Training Courses for Surgical Treatment of Atrial Fibrillation
第一期：6月14-15日
第二期：10月20-21日
加办：12月16日

冠状动脉旁路移植术临床学习班
Training Courses for Coronary Artery Bypass Grafting
第一期：6月13-15日
第二期：11月8-9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：7月4-7日
第二期：11月4日

肥厚型梗阻性心肌病外科治疗培训班
Surgical Treatment of Hypertrophic Obstructive Cardiomyopathy
11月2-3日

心外科搭桥进阶技术研讨会
Advanced Seminar for Coronary Artery Bypass Grafting
7月4-7日

心脏生物瓣膜移植培训班
Training Courses for Cardiac Bioprosthetic Valve Replacement
一期：10月28-31日
加办：11月8-9日

ECMO模拟培训学习班
Training Courses for ECMO
第一期：4月13-14日
第二期：5月11-12日
第三期：6月29-30日
第四期：10月19-20日
第五期：11月29日
第六期：12月14-15日

FW-SAVE系统模拟和理论学习班
Training Course for FW-SAVE System
第一期：6月14日
第二期：9月20日

体外循环理论技术和模拟实践学习班
Training Course for Cardiopulmonary Bypass: Theory and Practice
7月25-26日

主动脉腔内技术学习班
Training Courses for Endovascular Aortic Repair (EVAR)
3月11-13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 National Society of Vascular Surgery
8月22日

主动脉夹层多中心注册登记研究项目研讨会
Seminar on Multicenter Registration of Aortic Dissection
6月21日

中国医学科学院阜外医院心血管外科手术室管理研讨班——暨信息化在手术室建设中的应用
Seminar on Management of Cardiovascular Operation Room, and the Application of Information Technology in Operation Room, Fuwai Hospital, Chinese Academy of Medical Sciences.
12月21号

科研 Research

During 2019, the Fuwai surgical team published
94 SCI articles and continued to improve its communication
of new knowledge in the field of cardiovascular
surgery research.

2019年阜外医院外科系统共发表SCI论文94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。

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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。



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

2011年，心血管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。

1956

1962

2004

2011

2014

1958

1994

2013

2015

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 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。

致 谢

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In 2019, 78 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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