

SMART CARE

Heart

SMART CARE Heart



Korea, Global Leader in Cardiovascular Disease Treatment

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MEDICAL KOREA IS
KEY TO HEALTH



"Medical Korea is the national brand that represents Korea's excellence in medical service."

SMART CARE Heart

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Excellence in Cardiovascular Disease Treatment

WHY?
MEDICAL KOREA

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WHY?

Medical Korea

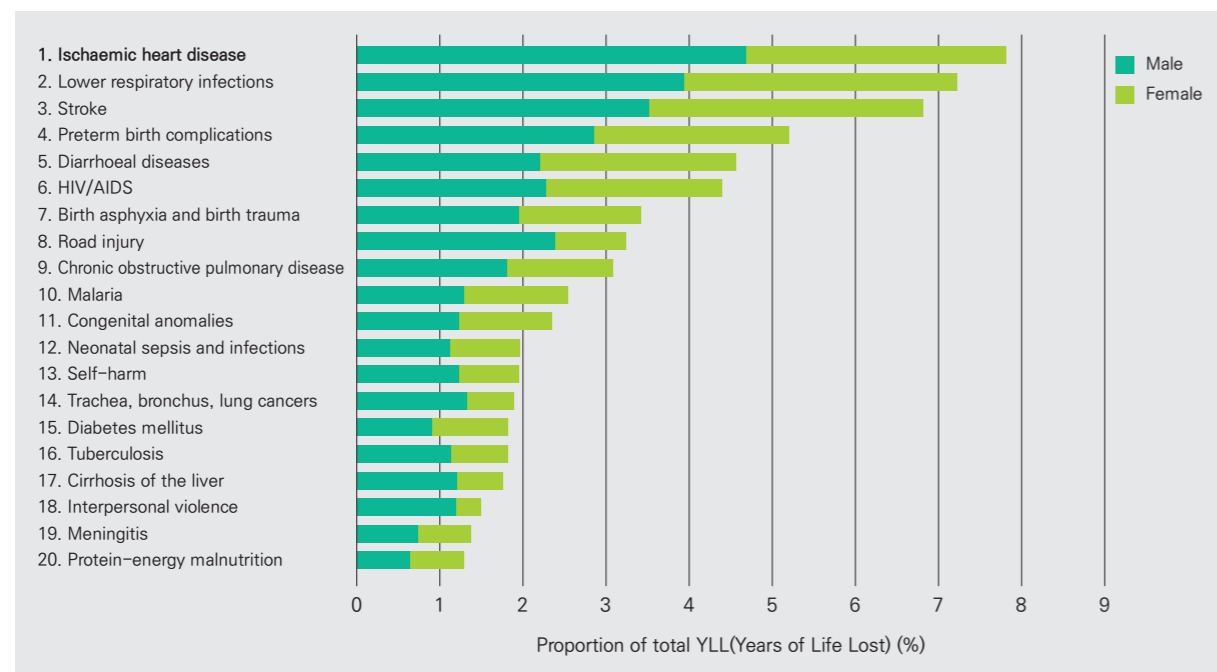
Excellence in Cardiovascular Disease Treatment

Cardiovascular disease is one of the main causes of death worldwide

According to the WHO (World Health Organization), ischemic heart disease attributable to coronary artery stenosis is the leading cause of death around the world.

- Ischemic heart disease is a symptom originating from the obstruction of blood flow due to lipid deposits such as cholesterol accumulating on inner coronary artery walls.
- Ischemic heart disease accounted for 12% of all deaths occurring in OECD countries in 2011.

► The 20 leading causes of YLL (Years of Life Lost), 2012



Source : WHO 2012 Global Mortality Cause

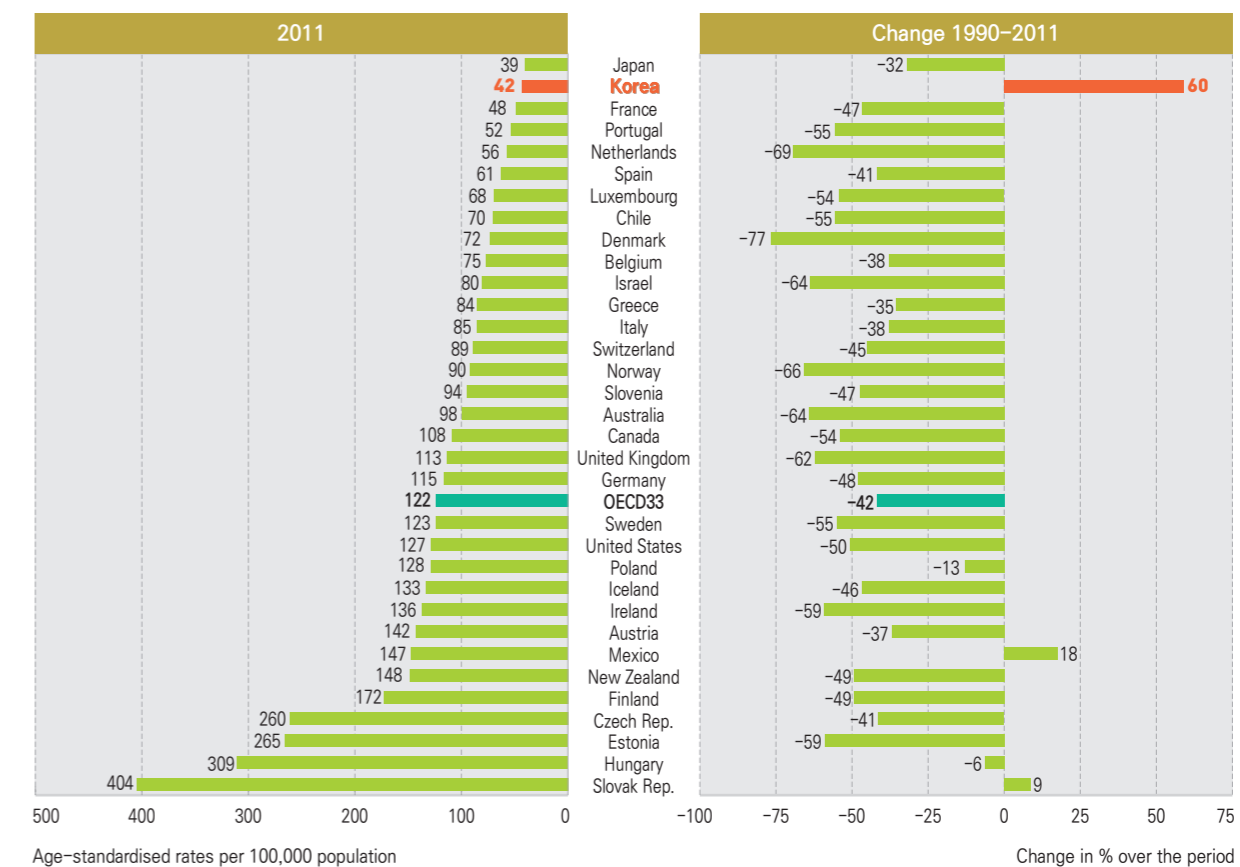
Mortality in Korea related to ischemic heart disease has been decreasing rapidly since 1990

- Countries with the highest mortality rate attributable to Ischemic heart disease: central and eastern European countries
- Country with the lowest mortality rate attributable to Ischemic heart disease: the Republic of Korea (South Korea)
- The mortality rate due to Ischemic heart disease in Korea has decreased 60% on average every year since 1990, thanks to the development of revolutionary treatments.

Factors in the development of cardiac infarction treatment

The introduction of CCU (Coronary Care Unit), advancements in CABG (Coronary Artery Bypass Grafting) and PCI (Percutaneous Coronary Intervention) and the development of new medical equipment and coronary stents.

► Ischemic heart disease mortality, 2011 and change between 1990 and 2011



Source : OECD Health Statistics 2013

Congenital heart defects causing neonatal death

According to U.S. CDC (Center for Disease Control and Prevention), each year 1% of newborn babies are born with CHD (Congenital Heart Defects), and among such babies, those with VSD (Ventricular Septal Defect) account for the greatest number.

- 25% of newborn babies with congenital heart defects are serious cases that would die within the first year of life without surgery, most within 6 months of birth.

► Mortality rate of congenital heart defect treatment in Korea

[unit : %]

	Ventricular Septal Defect	Atrial Septal Defect	Tetralogy of Fallot	Arterial Switch Operation	Coarctation of Aorta / Interrupted aortic arch	Hypoplastic Left Heart Syndrome
Korea	0.6	0.5	0.6	3.7	1.9	12.9
U.S.A	0.7	0.6	1.4	2.6	1.2	15.7
England	0.4	0.3	0.9	2.4	1.9	12.3

Source : Korea Health Industry Development Institute, 2014

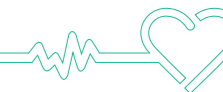
Korea, the country that saves lives

Past: South Korea was dependent on international assistance and learned medical technologies and techniques from overseas countries.

Present: South Korean doctors save the lives of foreign patients in Korea, and teach and train overseas doctors.

Korea achieved its first successful artificial cardiopulmonary bypass surgery in 1959 through the Minnesota project

- 1959:** Korea's medical infrastructure, which was completely destroyed during the Korean War, was reconstructed through the Minnesota project. Korea's cardiac surgery technologies gradually developed as doctors returned to Korea after being trained in overseas countries. They performed successful cardiac surgeries, including the first successful artificial cardiopulmonary bypass surgery in Korea at Seoul National University Hospital in 1959.
- 1984 to late 1990s:** With the establishment of the Korea Heart Foundation, Korea's cardiac surgery technologies kept focusing on surgical solutions for congenital heart defects. In this period, over 4,000 cases of surgery on congenital heart defects and over 4,000 cases of surgery on acquired heart diseases were performed.
- 2000s:** Surgeries on acquired heart diseases such as coronary artery diseases or valvular diseases increased significantly, with a stable operative mortality of around 3%, giving Korea an international reputation for advanced cardiac surgery technologies and skills.



Korea's heart transplant success rate ranks No. 1 in the world

Since the first successful heart transplant in Korea in 1992, Korea has achieved success in transplanting hearts and kidneys simultaneously.

- Korea's short-term cardiac surgery success rate is a record 99%, with a 1-year survival rate of 93.5% and a 5-year survival rate of 86%, figures that are higher than those of any other country in the world.
- The first successful heart transplant for an infant was achieved in 1997, and the early recorded mortality rate and 10-year survival rate were 0% and 76.9%, respectively.

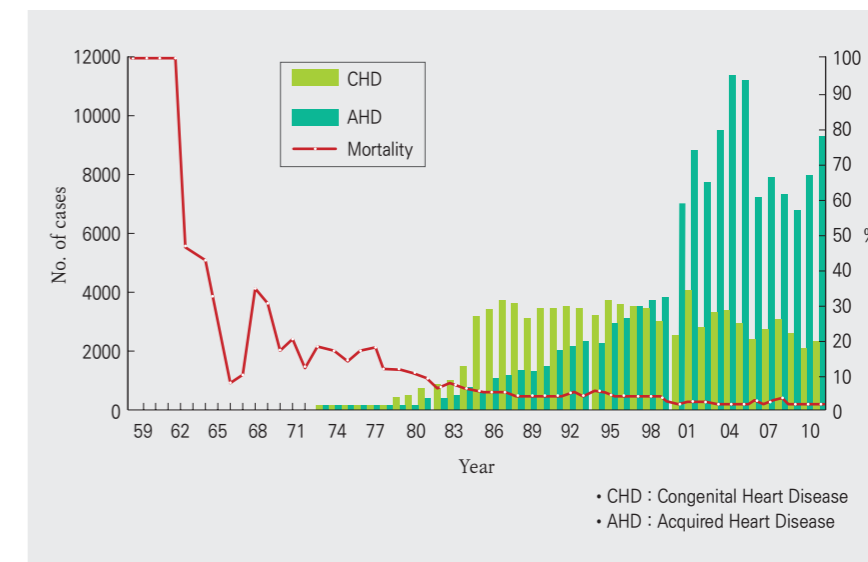
► Korea's heart transplant status

[unit : case]

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
12	29	50	84	65	73	98	107	127	118

Source : KONOS (Korean Network for Organ Sharing), 2015

► Yearly changes in cardiac surgery in Korea

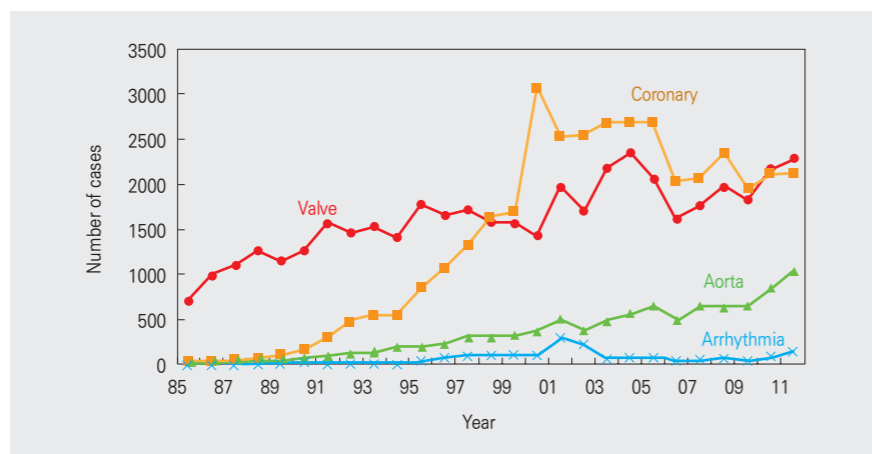


Source : Korean Society for Thoracic & Cardiovascular Surgery

Over 99% of cardiac disease patients treated in Korea survive

- Statistical data from Korea Heart Foundation, 2013
 - Coronary artery disease patients account for 64.8% of cardiac disease patients, and only 0.3% of those patients do not survive treatment.
 - The recorded success rate for congenital heart defect treatments is 97.8%.
- 2012 Statistics from the Korean Society for Thoracic & Cardiovascular Surgery on surgeries performed on patients with acquired heart diseases
 - Valve surgery is the type of heart surgery performed most frequently, followed by coronary artery surgery and aortic surgery.
 - In addition, the average survival rate is 96.5%. This astonishing progress is unprecedented around the world.

▶ Korea's acquired heart disease surgery status



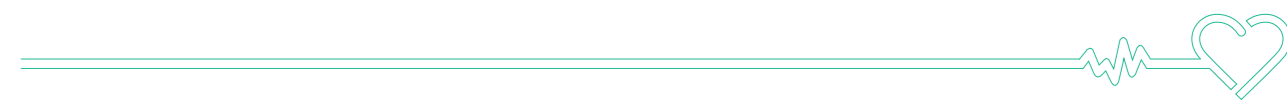
Source : Korean Society for Thoracic & Cardiovascular Surgery

▶ Status of cardiovascular surgery in Korea in 2013

Classification	Total	Congenital cardiac disease	Acquired valvular defects	Coronary artery diseases	Arrhythmia	Other
Total patients	63,308	5,646	3,025	41,026	8,681	4,930
Proportion (%)	100	8.9	4.8	64.8	13.7	7.8
Fatalities	519	127	102	104	0	186
Mortality (%)	0.8	2.2	3.4	0.3	0	3.8

※ Patients classified into Other (4,930) are comprised of patients of aortic diseases (1,544), pericardial diseases (348), cardiac wounds (45), cardiac tumors (133), heart transplant (105), embolization and peripheral angioplasty (2,755).

Source : The Korea Heart Foundation



▶ Statistics on thoracic surgery performed in Korea in 2012

		[unit : person, %]		
Classification	Number (Diagnosis)	Number (Death)	Mortality	
AHD	Valvular heart surgery	2,020	60	2.97
	Coronary artery surgery	1,824	52	2.85
	Aortic surgery	1,093	73	6.68
	Arrhythmia surgery	71	0	0.00
	Cardiac tumor	149	4	2.68
	Cardiac Wall and transplantation	317	11	3.47
	Peripheral vascular surgery	3,482	21	0.60
	Heart and vascular trauma	32	3	9.38
	Others	468	112	23.93
Total	9,456	336	3.55	

Source : Korean Society for Thoracic & Cardiovascular Surgery

Coronary intervention surgery meets the standard set by advanced countries, requiring only 1 or 2 days of hospitalization

- Thanks to advances in coronary intervention techniques and the development of a variety of stents, Korea's surgery success rate reaches 93%.
- The mortality rate of myocardial infarction patients in Korea is 4.9%, which is lower than that of advanced countries (5 to 7%).
- The incidence of MACE (Major Adverse Cardiac Events) in Korea is 12.7%, which is far lower than that of advanced countries (20%).

Korea reduces the mortality of patients with congenital heart defects through surgery and interventional procedures

Korea performs tens of thousands of treatments for congenital heart defects, and currently is reducing the mortality and hospitalization period by applying surgical and interventional treatment.

- The mortality rate of patients with TOF (Tetralogy of Fallot) within the first month after surgery is only 0.6%.
- The mortality rate of patients with ventricular septal defect within the first month after surgery is only 0.6%.
- The mortality rate of patients with atrial septal defects is 0.5%.



The Cardiac and Cerebral vascular Disease Center was established and is operated by the government

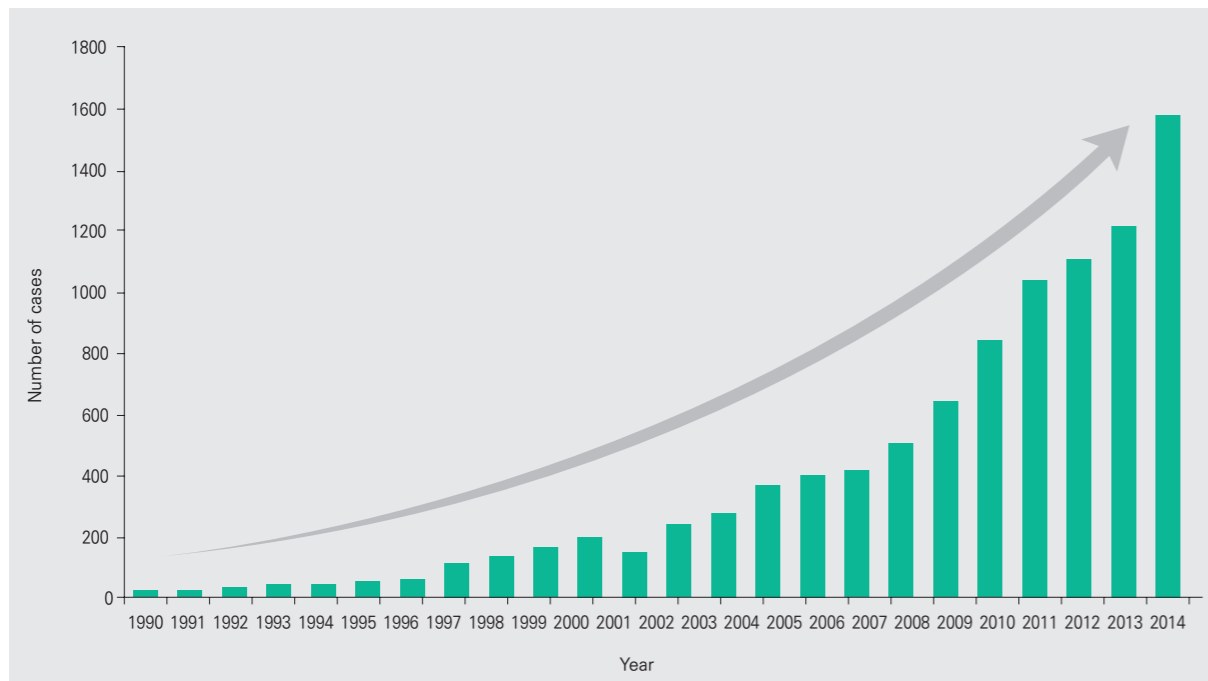
As part of its measures to provide appropriate medical treatment to cardiovascular disease patients in the initial stage in timely manner so as to increase the treatment performance, Korean government established a plan for the 'Institution and Operation of Cardiac and Cerebral Vascular Disease Centers' in 2008.

- After the institution of Cardiac and Cerebral Vascular Disease Center, 96% of the patients takes less than 120 minutes, between arriving to an emergency room to receiving primary coronary angiography.

Korea's continual research produces the world-leading performance

- Korea has provided an exemplary answer to the question regarding the appropriate medication period for patients receiving an antiplatelet agent after a stent insertion. Korea's treatment practice is now recommended by the US FDA and the Korean FDA.
- The number of cardiac specialists from Korea listed in the world's top 3 biographical dictionaries (Marquis Who's Who, IBC, Hippocrates) has been rapidly growing since the 2000s, and Korea is leading the world in the cardiac treatment sector.

► Status of Korean research papers on cardiac diseases listed in international journals



Source : PubMed.gov



Foreign patients from Asian countries visiting Korea

Over 270,000 International patients visited Korea in 2014 to receive medical treatment in Korea (the excluded number of re-visited/re-admitted patients). This number has been growing at an average annual rate of over 30% since Korea started the 'Medical Korea' campaign in 2009.

- International patients in the initial stage : Chinese and Japanese patients
- Current International patients : Central Asian (Russia, Kazakhstan), Southeast Asian (Indonesia, Vietnam), Middle Eastern (UAE, Saudi Arabia)

⊙ Various medical specializations : cancer, cardiac diseases, cerebrovascular diseases, spinal diseases, joint diseases, infertility

► The number of International patients (2009-2014)

[unit : person]						
Classification	2009	2010	2011	2012	2013	2014
The excluded number of re-visited/re-admitted patients	60,201	81,789	122,297	159,464	211,218	266,501
The total number of man-days	162,638	224,260	344,407	474,939	650,411	816,691

Source : Korea Health Industry Development Institute, 2015

► The number of international patients with major severe diseases

[unit : person]					
Classification	2010	2011	2012	2013	2014
Cancer	1,525	2,293	3,767	5,604	5,565
Heart disease	1,101	1,759	2,736	3,717	3,044
Cerebrovascular disease	675	1,006	1,571	2,050	1,910
Severe burn	68	100	150	226	244

Source : Korea Health Industry Development Institute, 2015

International patients with cardiac diseases

- In 2013, the number of International patients visiting Korea for cardiac disease treatments more than tripled, from 1,101 in 2010 to 3,717 (the excluded number of re-visited/re-admitted patients).
- The number of ischemic heart disease patients visiting Korea has quadrupled in 2013.
- Among International patients with congenital heart defects visiting Korea for treatment, the largest numbers are from Mongolia and the United States.

► Status of International patients with major cardiac disease

[unit : person]

Classification	2010	2011	2012	2013	2014
Congenital heart defects (Q20-Q28)	213	287	396	500	390
Ischemic heart disease (I20-I25)	525	875	1,436	1,988	1,454
Other cardiac diseases (I26-I52)	379	591	896	1,239	1,093

Source : Korea Health Industry Development Institute, 2015

► Nationality of patients with congenital heart defects

[unit : %]

Mongolia	USA	Russia	China	Vietnam	Cambodia	Philippines	Malaysia	Haiti	Kazakhstan	Other nationalities
13.3	13.1	16.7	14.6	2.8	0.8	3.1	0.5	0.5	3.3	31.3

Source : Korea Health Industry Development Institute, 2015

► Nationality of patients with ischemic heart disease

[unit : %]

Russia	USA	Mongolia	China	Kazakhstan	Japan	Canada	Uzbekistan	Australia	UAE	Other nationalities
20.5	21.7	10.4	19.1	3.4	0.9	0.6	0.7	0.3	0.8	21.7

Source : Korea Health Industry Development Institute, 2015



Heart Story of International Patients

Jackson, a 57-year-old American male who had been working in China, had been receiving treatment twice a year at a hospital in China. He had recently visited his doctor because he had been suffering from dyspnea, but the doctor was unable to provide a clear diagnosis. As his condition was worsening, Jackson was hospitalized in China, where he was diagnosed with cardiac and renal insufficiency. After requesting the International SOS's air rescue services, Jackson was flown via air ambulance to Samsung Medical Center to receive treatment. Jackson was released three weeks later, after receiving ten days of intensive treatment (including drug therapy) as well as undergoing a coronary artery bypass graft and valvuloplasty.

Lkhagvasuren from Mongolia (female, 28 years), who was diagnosed with Aortic stenosis and mitral stenosis with severe dyspnea, received surgery. She suffered from a recurrence of the disease and visited Korea University Medical Center in Guro in 2006, 5 years later after surgery in Mongolia. As she was diagnosed with severe stenosis in the aortic and mitral mechanical valves, she received surgery in collaboration with thoracic surgeons. Since her surgery and with regular ambulatory care, she has been maintaining good health for 8 years.

Aleksander (a 66-year-old Russian male) had been receiving treatment for apoplexy and high blood pressure, and also had to undergo drug therapy because he had been suffering from severe chest pains. When his condition showed no sign of improving, Aleksander visited Korea in 2012 to receive a more precise exam. After being hospitalized, doctors discovered local narrowing through an cervicothoracic echocardiogram and cephalic MRI. Also, through coronary angiography, doctors discovered a narrowing of the left and right coronary arteries (which mainly pumps blood to the left heart), which was putting Aleksander's life at risk. For this reason, the cardiovascular center immediately decided on a drug-eluting stent procedure. Following the procedure, Aleksander was discharged from the hospital the next day and was able to return to a normal life.



American with ischemic cardiomyopathy flown to Korea via air ambulance due to failure to receive early diagnosis



Mongolian patients visiting Korea for valvular restenosis



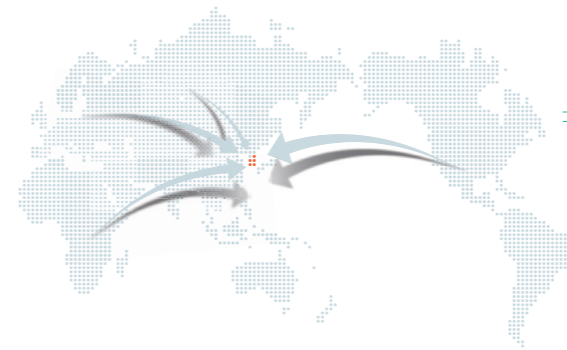
Russian male suffering from apoplexy and high blood pressure visits Korea to receive a more precise examination

POP WHY?

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Medical Charity Program in Korea gives hope to a Pilipino girl

A five-year-old Pilipino girl, Princess Jhonessa, who had had cyanoderma (on her entire limb and lips) since she was born, was unable to receive adequate diagnosis and treatment until the age of four. In May 2014, she was able to receive treatment in Pusan National University Yangsan Hospital thanks to the 'Medical Charity Program,' a project that was launched by the Korea Health Industry Development Institute (KHIDI) and Medical Korea. At the time of her hospitalization, she was diagnosed with **Tetraology of Fallot (TOF)** and suffered from weakness (somasthenia). After continuous treatment for respiratory infection, her condition improved, enabling doctors to perform complete corrective surgery. Following the surgery, Princess Jhonessa quickly recovered and her cardiac function improved. She was even able to smile at the doctors. Having gone through an surgical and treatment process, Princess Jhonessa was able to return home healthy a week later.

In addition, even after a successful corrective surgery, patients frequently require a second surgery due to the recurrence of pulmonary regurgitation or pulmonary stenosis. Under such conditions, the extent to which the function of the right ventricle can be maintained determines the quality of life after the patient grows up. Therefore, the proficiency and experience of medical staff is crucial to the patient's prognosis.

- **Medical charity program** : program intended to provide free medical service by inviting and bringing low-income patients residing overseas to Korea
- **The proficiency and experience of medical staff is critical to the treatment of TOF (Tetraology of Fallot)** : TOF (Tetraology Of Fallot) is a congenital heart defect featuring 4 anatomical abnormalities right ventricular outflow obstruction, ventricular septal defect, overriding of aorta and right ventricular hypertrophy. However, the treatment of TOF varies depending on various factors such as the type and degree of right ventricular outflow obstruction, size and function of pulmonary valve, and whether collateral arteries require a single corrective surgery or several conventional surgeries.



The medical charity launched by Ministry of Health and Welfare of Korea reached Volodkin Danila (male, 6 years) living in Khabarovsk, Russia. Volodkin was suffering from a congenital heart disease, but no local hospital specialized in treating such diseases and his family couldn't afford medical treatment in an overseas country. Fortunately, Korea's Sejong Hospital happened to hear about his story and offered him medical treatment in Korea through the 'Medical Charity' assistance program. "We were so delighted and happy. It was as if we saw a ray of light in the darkness," said his parents. They also added that "We will never forget that our son recovered and become healthy thanks to the support of Korea. We really appreciate your help in saving our son".



Hopes from the Medical Korea Charity Program



The heart of a Mongolian baby aged 1 month is saved by Korea's medical technologies

Bayarmagni (male, 1 month), born in May Mongolia 2013, showed symptoms of dyspnea after birth and was diagnosed with VSD (Ventricular Septal Defect) with pneumonitis and pulmonary hypertension. The baby's condition was severe, and he was examined by Korean doctors Hospital when they visited Mongolian National Hospital No. 3 for preliminary survey and medical assistance.

Bayarmagni, a one-month-old Mongolian child, was admitted to Seoul National University Children's Hospital. She received her medical examination on the date of admission and was subjected to surgery on the next day. Afterwards, she was hospitalized for 2 weeks while doctors reviewed her progress after surgery. She then returned to Mongolia, and has since experienced no side effects. She is growing up in a healthy condition without any complication. She visited Korea again in June 2014 to receive medical examination for an operation prognosis.



10-year-old baby girl from UAE with congenital complex cardiac malformation recovers through two surgeries

A ten-month-old baby girl named Ghala, the youngest child in a six-sibling household in the UAE, had shown apnea accompanied by heart murmur and cyanoderma since birth. The local hospital determined that surgery was required, after undergoing several tests, and recommended either hospitals in the US, Germany or Korea. Ghala was diagnosed with pneumonia and pulmonary hypertension, and ventricular septal defect accompanied by closure of the pulmonary artery. Ghala also intermittently vomited undigested powdered milk due to suffering from gastroesophageal reflux and esophageal reflux. Based on test results following hospitalization in January 2014 at Seoul National University Hospital in Korea, Ghala was diagnosed with ventricular



septal defect as well as aortic collateral artery and aortopulmonary closure defect. Two surgical procedures were necessary given that Ghala's congenital cardiac malformation was of the complex type. Her parents consented and doctors operated twice within the space of ten days. Ghala was able to tolerate the two surgeries remarkably well, and could return home in a healthy state.

On Christmas Eve in 2013, parents of a one-year-old baby girl Samburova Zoia came to Sejong Hospital in the hope of saving their baby daughter. Their daughter suffered from congenital heart disease (ventricular septal defect) and hospitals in Kyrgyzstan and Moscow said that surgery was needed to save her life. While they were uncertain regarding whether such a serious procedure was needed for their baby daughter, Samburova's parents (while looking for hospitals overseas) learned of hospitals in Korea that could perform a more simplified procedure. Luckily, Samburova could be treated with a simple surgical procedure and was able to healthily return back home.



Parents from Kyrgyzstan save daughter through a simple surgical procedure



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Mother and daughter visiting Korea as tourists are surprised by the promptness of Korea's medical treatment process

Ellen, who visited Korea as a tourist in June 2013, was admitted to the emergency room at an adjacent general hospital due to sudden pectoralgia. As she was diagnosed with myocardial infarction, she requested a transfer to Sejong Hospital for treatment. In a life-or-death situation requiring immediate attention, she received the stenting procedure in a timely manner thanks to the prompt action of Korean medical staff supported by a Russian coordinator. Moreover, Ellen's accompanying daughter received a full medical checkup while she was waiting for the recovery of her mother. After they left the hospital, they mentioned that even though they had heard about Korea's advanced medical services, they were astonished by the promptness of the medical service provided by Korea.



Highly advanced surgery not available in Russia is successfully performed in Korea

Vladimir Dubovoi (male, 70 years) was suffering from a thoracoabdominal aortic disease accompanied with aortic dissection. Even major general hospitals in Russia are reluctant to perform surgery to treat this disease due to the poor operation prognosis. In January 2011, Vladimir Dubovoi and his daughter visited Sejong Hospital in Korea for treatment. According to the diagnosis, he had to be subjected to highly advanced surgery requiring simultaneous thoracotomy and laparotomy to perform operations on his thoracic aorta and abdominal aorta. Furthermore, this surgery was very risky, as damage to the abdominal organs and accompanying post-surgery brain spinal and kidney damage were highly probable and the mortality rate after surgery was nearly 10%. Fortunately, the surgery was successful, and he recovered quickly without complications. He communicated his appreciation to the hospital when he left.



Victor Dubovoi (male, 43) is a son-in-law of Vladimir Dubovoi and the husband of Oksana. Oksana brought Victor, who had been suffering from arrhythmia for 6 years, to where her father had received surgery. However, as she had sold her house and received bank loans to pay for her father's surgery, she hesitated considering treatment for her husband. However, her story was heard by representatives of Korea's Gyeonggi provincial government, and they decided to provide surgery for free. The surgery was successful.



Before Aral Bai (49 years) from Kazakhstan was visiting Chonnam National University Hospital, he had received myocardial infarction surgery in Italy, but this treatment failed to entirely cure the disease. As he suffered from dyspnea attributable to a completely clogged right coronary artery, the medical staff at performed an hour-long stenting procedure, inserting 3 stents (metal net to expand the coronary artery) and achieved success in supplying blood via his clogged right coronary artery. "Thanks to the successful stenting procedure, my health has remarkably improved. I really appreciate the efforts of the doctors," said Aral Bai.



Not only her father's but her husband's heart is treated in Korea



Myocardial infarction treatment technologies start a new era of Korean medical treatments

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CHAPTER

Treatment of Congenital Heart Defects

No clear causes and symptoms

Congenital Heart Disease is an anomaly accounting for the largest portion of congenital diseases observed in newborn babies. This disease originates from anatomical problems such as the failure to correctly form or grow a heart, or the improper connection of parts of the heart. Most frequently, surgical treatment is required.

Some congenital heart defects only generate cardiac murmurs without showing noticeable symptoms, or such defects cause infants to frequently catch cold, not gain weight, suffer from shortness of breath, rapid pulse, sweating, etc. Children with congenital heart defects generally show symptoms of dyspnea during exercise. Except in special cases, a specific preventive method is unavailable.

Classified by Cyanosis

Congenital heart defects are classified mainly into cyanotic cardiac diseases and acyanotic cardiac diseases, depending on whether cyanosis is observed or not. Cyanosis influences the supply of oxygen to the entire body; to save the life of a patient with cyanosis, surgical treatment at an early stage is necessary. For acyanotic cardiac diseases, surgical treatment can be performed, and in some cases, no conspicuous symptoms are observed until the patient becomes an adult.



Acyanotic cardiac diseases

Acyanotic cardiac diseases include ventricular septal defect, atrial septal defect, patent ductus arteriosus and pulmonary valve stenosis; symptoms include delays in weight gain, shortness of breath, and excessive sweating. VSD (Ventricular Septal Defect) is the most common form of congenital heart disease, accounting for over 30% of cases. Cardiac symptom starts to be observed from 4 to 8 weeks after birth and completes development within 6 months from birth. PDA (Patent Ductus Arteriosus) is generally observed 2 or 3 times more frequently in female babies than in male babies, and more often in premature infants.

Cyanotic cardiac diseases

TOF (Tetralogy of Fallot) is the most common disease type, includes TOF, Tricuspid atresia, Transposition of great arteries, and total anomalous pulmonary venous return. TOF often generates anoxic seizures, developing cyanosis, shortness of breath and loss of consciousness. Anoxic seizures are generally observed in babies aged 3 to 18 months.

Non-operative treatment

Non-operative treatments are classified into medical treatment and interventional treatment with a catheter. Medical treatment is a temporary measure to mitigate symptoms before and after the surgery. Interventional treatment using a catheter uses a device to close a hole or a balloon to expand a narrowed vessel or valve.

Operative treatment

As most congenital heart defects are generated when a blood vessel is narrowed, clogged, leaked or improperly connected, abnormal lesions are treated through anatomical correction or physiologic correction. Surgical treatments for cardiac malformation are divided mainly into Open Heart Surgery and Non-Open Heart Surgery. Open heart surgery requires the assistance of a heart-lung machine; most congenital heart defects require open heart surgery. Although most cardiac defects are completely cured with a one-stage surgery, some complex congenital heart diseases require several stages of surgery.



Korea achieves success in open heart surgery for extremely low birth weight infants

Open heart surgery can be applicable to most congenital heart defect patients which enables to lead a normal life. Surgery is performed by closing a defective area or widening a narrowed area. Defective valves are repaired or replaced with artificial valves.

Open heart surgery is a surgical method to treat by opening the heart. Although this is difficult to perform on premature babies weighing under 1,200g, Korea has achieved numerous surgical successes on infants with extremely low weight.

Korea's advanced pediatric cardiac surgery technologies

Thanks to the development of echocardiography, diagnoses without cardiac catheterization have become possible, and the medical procedure using balloons replaces surgery on pulmonary stenosis. As the age of patients receiving surgery lowers and surgery performance improves, patients are able to enjoy an almost normal lifespan and an improved quality of life.

Ventricular septal defect surgery

This is a surgery that closes the hole on the interventricular septum between the right ventricle and the left ventricle using artificial materials. Korea shows a success rate of 99.4% for this surgery, and the average hospitalization period is 20.9 days.

TOF (Tetralogy of Fallot) treatment depends on the proficiency of medical staff

TOF (Tetralogy of Fallot) is a congenital heart defect featuring 4 anatomical abnormalities: right ventricular outflow obstruction, ventricular septal defect, aortic overriding and right ventricular hypertrophy. However, the treatment of TOF varies depending on various factors including the type and degree of right ventricular outflow obstruction, size and function of pulmonary trunk valve, and whether collateral arteries require only a single corrective surgery or several conventional surgeries.

In addition, even after successful surgery, cases requiring a second surgery due to the recurrence of pulmonary regurgitation or pulmonary stenosis often occur. Under such conditions, how well the right ventricle's function is maintained determines the quality of life after the patient grows up. In Korea, the success rate of TOC surgery is 99.4%, and the average hospitalization period is 16.1 days.



Treatment of transposition of great arteries

The treatment for the transposition of large arteries is surgery to correct the reversed connection between ventricles and large vessels. In the past, Senning operation (surgery that changes the path of arterial and venous blood in the atrium) was generally used, but nowadays most patients receive an aorta replacement (surgery that changes the location of aorta and pulmonary artery). In Korea, aorta replacement has a success rate of 99.3% and an average hospitalization period of 16.1 days. In addition, the corrective Lecompte procedure for ventriculoarterial concordance is a surgical treatment method beyond ventriculoarterial discordance accompanying ventricular septal defects and right ventricular outflow obstructions.

Fontan surgery

This method is used to connect the right atrium and the pulmonary artery directly when the use of the right ventricle is not available, and it is applied to right ventricular hypoplasia patients, tricuspid atresia patients and single ventricle patients. Recently, a medical technique has evolved to connect the vena cava to the pulmonary artery using a graft.

Fontan surgery performed in conjunction with the arrhythmias treatments and the insertion of a permanent pacemaker is safe and it improves clinical symptoms and arrhythmia. In Korea, the average hospitalization period is 19.7 days and the success rate is 99.9%. Specifically, the survival rate of patients who received surgery on a single ventricle accompanying isomeric syndrom in Korea is 73%, which is much better than that of other advanced countries such as the United States (53%), Japan (68%) and France (69%).

Aortic coarctation treatment

The more severe the symptoms of aortic coarctation are the more quickly the infant patient requires surgical treatment after birth. Most infant patients receive surgery and a cardiovascular procedure is performed when the area of surgery is narrowed again or the symptom is observed at a relatively late age. The narrowed aorta is cut and sutured or widened using a patch. Local brain perfusion aortic arch corrective surgery is a good method for reducing neurological complications. The average hospitalization period for patients with aortic coarctation and aortic arch interruption is 37.6 days and the surgery success rate has reached 98.1%.

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Intervention treatment of pediatric cardiology

For the treatment of pediatric cardiology, Korean medical institutions provide non-surgical treatments such as valvuloplasty and angioplasty using a balloon, atrial septal incision using a balloon and knife, patent ductus arteriosus closure using a special tool, intravascular stenting, device closure procedure for atrial septal defects, balloon pulmonary valvuloplasty for pulmonary atresia patients, pediatric arrhythmia treatment using an artificial pacemaker treatment.

In particular, the mortality rate for patients receiving the interventional closure procedure, balloon expansion procedure or stenting procedure in Korea is less than 1%, which is outstanding. If the atrial septal defect or patent ductus arteriosus is small and appropriate for anatomical therapeutics, interventional procedure may be used instead of surgery. This method is a technique for closing the defect by inserting a closing device via the femoral vein instead of the surgical method of chest incision. This minimizes the complications from chest incisions as well as the risks and inconveniences of anesthesia.

However, if surgical treatment is necessary due to changes in the condition of the patient while in interventional treatment, thoracotomy can be performed immediately by a hybrid surgical team on standby. Atrial septal defect surgery closes the hole between the right atrium and left atrium using the patient's pericardium or artificial materials. In Korea, the success rate is 99.5%.

► Annual Number of Congenital Cardiac Surgery Cases in Korea



Source : Korean Society for Thoracic & Cardiovascular Surgery

► Mortality of Patients Who Received Congenital Cardiac Surgery in the United States from 2007 to 2009

Variable	Overall, n = 2022	Cardiac ICLI, n = 14037	Other ICU, n = 6885	P
In-hospital mortality, n (%)				
Overall	748 (3.8)	500 (3.6)	284 (4.1)	.04
STS-EACTS 1	40 (0.5)	20 (0.4)	20 (0.8)	.05
STS-EACTS 2	116 (2.0)	69 (1.8)	47 (2.4)	.13
STS-EACTS 3	75 (3.0)	38 (2.2)	37 (4.7)	<.001
STS-EACTS 4	360 (8.5)	237 (8.1)	123 (9.5)	.12
STS-EACTS 5	193 (19.6)	136 (18.5)	57 (22.9)	.14

Source : STS database, Burstein DS, et al. Pediatrics 2011;127:e1482-9

CHAPTER



Acquired Heart Disease Treatment

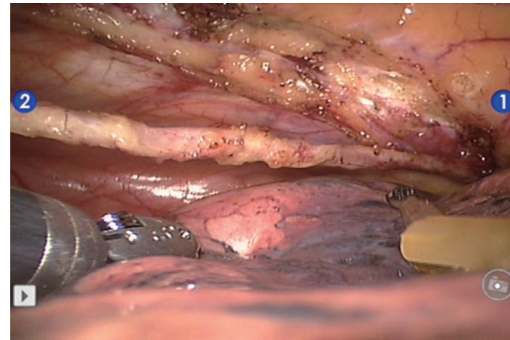
World's leading coronary artery bypass technologies

Korea features a relatively high level of OPCAB (Off-Pump CABG). In addition to the stability and effectiveness of OPCAB, a number of research activities are being performed on the opening of graft, on surgical techniques using a complete arterial catheter, on minimally invasive surgical techniques, and on protecting the brain using techniques that involve no touching of the aorta, etc.

About 2000 cases of coronary artery bypass are performed annually, and the mortality rate is only 2 to 3%, which is similar to the mortality rate of 2.5% provided by the US STS (Society of Thoracic Surgeons). Coronary artery bypass surgery requires an average hospitalization period of 20 days and OPCAB requires an average hospitalization period of 15 days and has a mortality rate under 1%.

- Use of heart-lung machine: general coronary artery bypass and OPCAB
- Associated diseases: simple and complicated
- Incision area: general and minimally invasive direct coronary artery bypass (MIDCAB), robot cardiac surgery



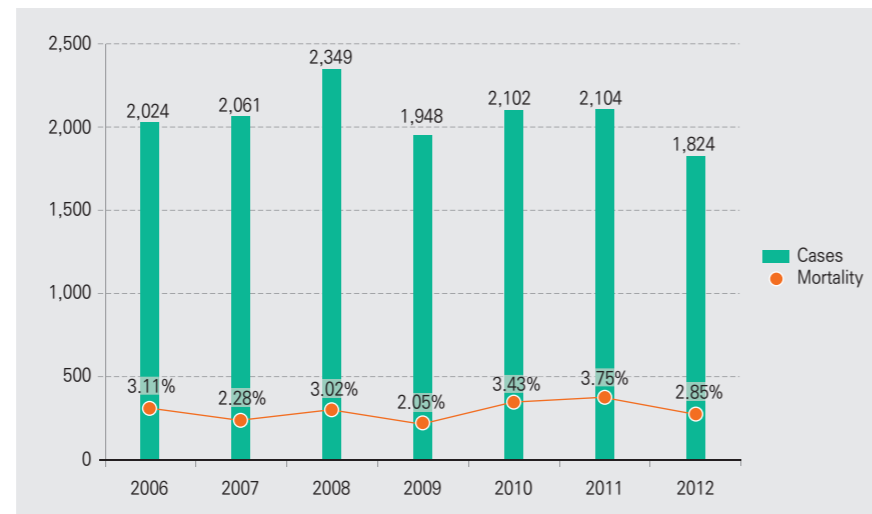


Coronary artery bypass surgery using a robot (Internal thoracic artery sampling)



MIDCAB (Minimally Invasive Direct Coronary Artery Bypass) surgery

▶ Annual number of coronary artery bypass surgeries and mortality rates



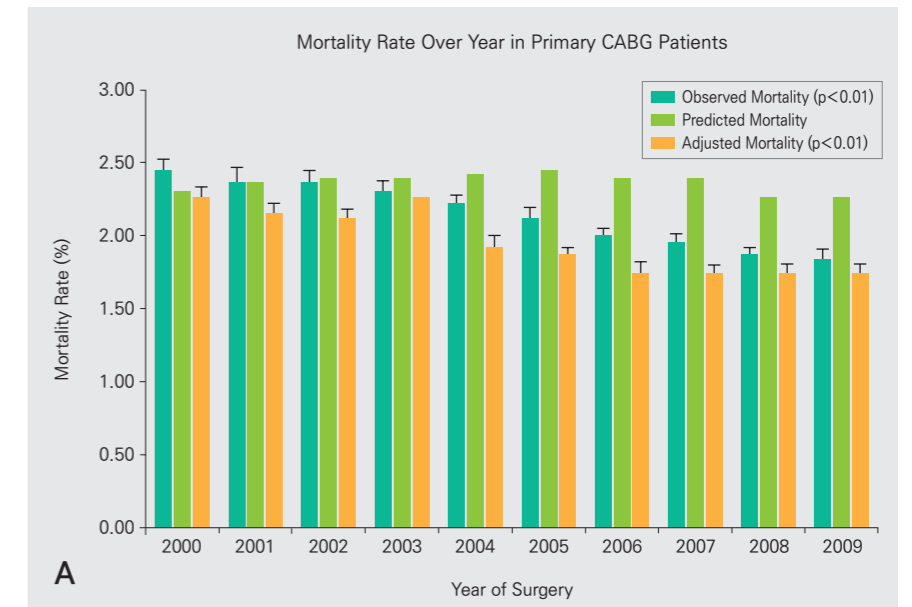
Source : Korean Society for Thoracic & Cardiovascular Surgery

Aortic surgery produces outstanding long term survival rate

In parallel with the increase in the average lifespan, the adoption of a more western diet in Korea has also increased the prevalence of aortic diseases, requiring more aortic surgeries. In addition, state-of-the-art medical techniques such as complicated surgery on aortic arch, intravascular stenting, and grafting and hybrid surgical technologies are emphasized. In Korea, over 1,000 cases of aortic surgery are performed annually and the average mortality ratio and hospitalization period are 4.7% and 19 days, respectively.

Aortic aneurysm is subjected to surgery when its size is enlarged or pain is generated, or symptoms of rupture are observed. Surgery is performed by replacing the damaged vessel with an artificial vessel through surgical thoracotomy, or through percutaneous stenting or grafting, or with a hybrid surgical procedure. Although aortic surgery is complicated and takes a longer period of time, it delivers an outstanding long term survival rate, so this method is widely used as the primary treatment method for aortic diseases. However, aortic surgery can produce cause cerebrovascular complications and spinal cord injury; consequently, aortic surgery requires deliberate care before and after surgery by experienced medical staff.

▶ Annual mortality rate of patients subjected to coronary artery bypass surgery in the United States

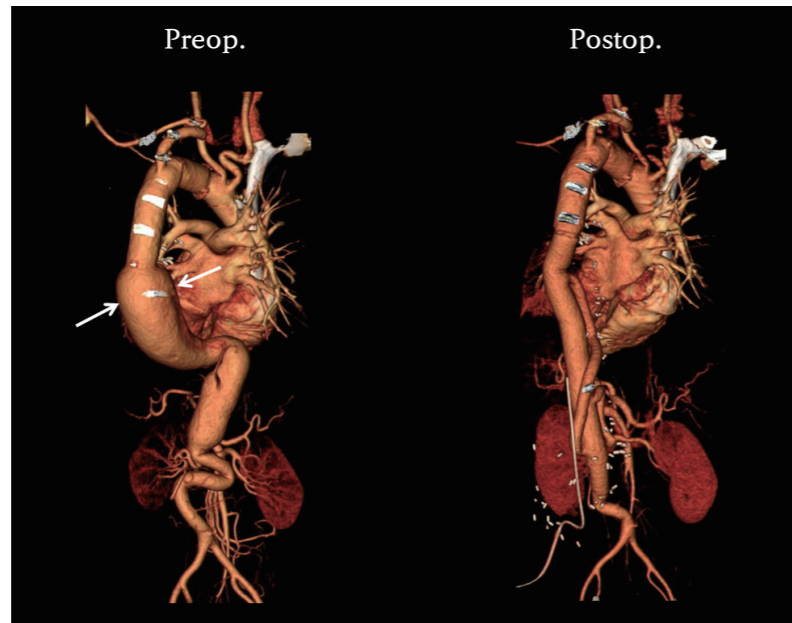
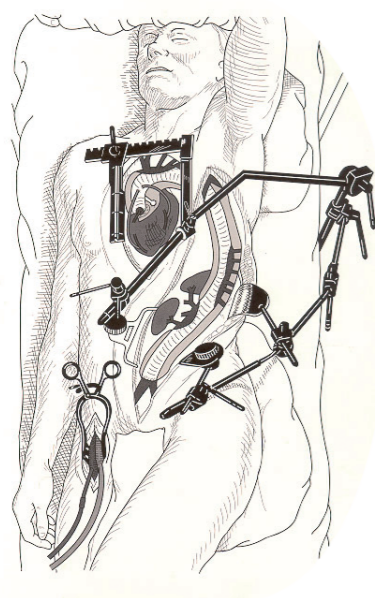


Source : STS database, ElBardissi AW, et al. J Thorac Cardiovasc Surg 2012;143:273-81

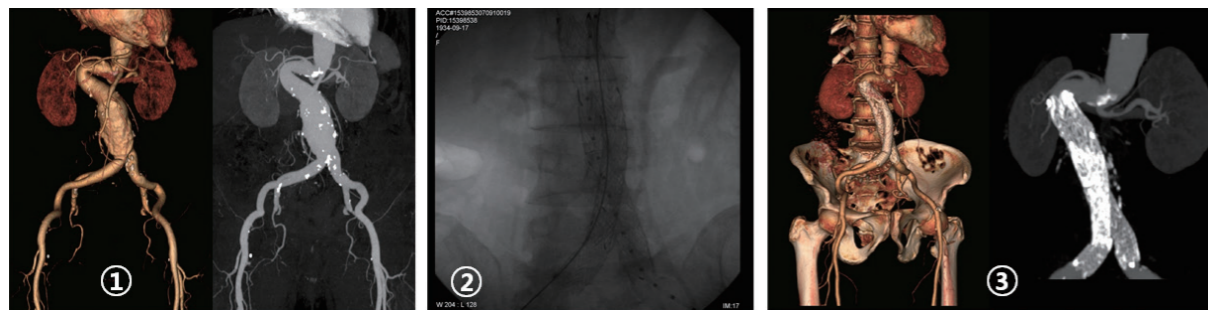


Aorta surgery

- Depending on location: Aortic root, ascending aorta, arch aorta, descending thoracic aorta, and abdominal aorta
- Depending on acuteness: Acute and chronic aortic disease
- Depending on cause: Aortic dissection, intramural hematoma, aortic aneurysm, and false aneurysm
- Includes carotid endarterectomy procedure and peripheral arterial procedure
- Includes latest health technologies such as endovascular stent grafting (EVAR, TEVAR) and hybrid surgical approach

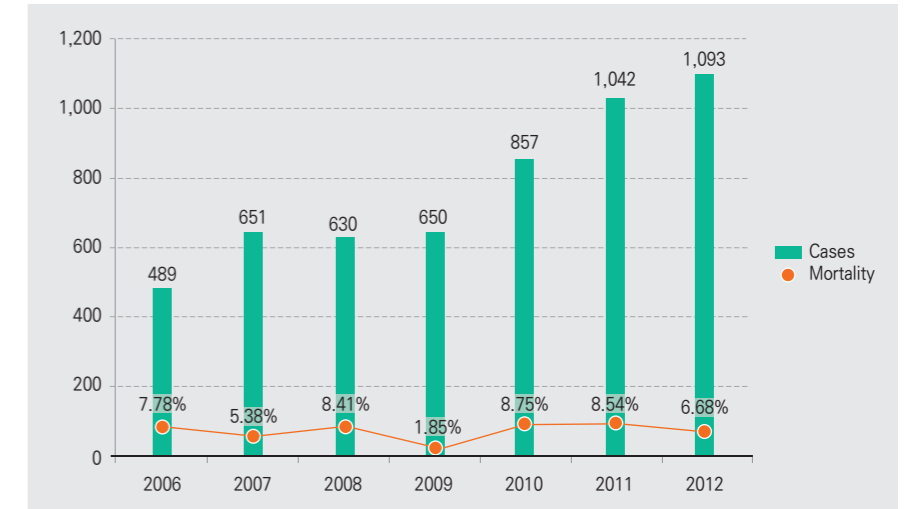


Thoracoabdominal aortic aneurysm surgery scene CT footage before (left) and after (right) surgery on thoracoabdominal aortic aneurysm



View of EVAR (②) procedure on abdominal aortic aneurysm (①) and CT footage after surgery (③)

▶ The number of annual aortic surgery cases and relevant mortality rate in Korea



Source : Korean Society for Thoracic & Cardiovascular Surgery

Valve surgery with world-leading performance

Over 2,000 cases of valve surgery are performed in Korean medical institutions annually with a mortality rate of 2 to 3 %, far less than that of the United States (5 to 7%), demonstrating Korea's excellence. In addition, the mortality rate of patients subjected to surgery from Korea's major medical institutions is approximately 1.5% and the average required hospitalization period is 19 days.

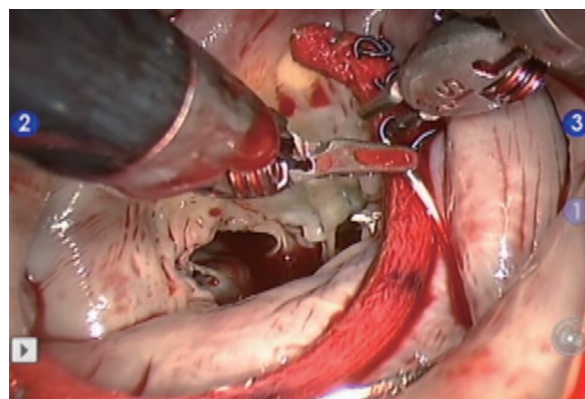
Valve surgery can be divided into replacement and angioplasty. While replacement using mechanical valves delivers outstanding long-term durability, patients must receive warfarin and blood tests for the rest of their lives and still risk side effects such as cerebral hemorrhage and cerebral infarction. However, valvuloplasty or valve replacement using a tissue valve requires the administration of warfarin for only 2 to 4 months. The surgical method depends on the age of the patient, the associated diseases and the consent of the patient or guardian.

Valvuloplasty requires monitoring at regular intervals due to the risk of recurrence over the long term, and tissue valve replacements only last 10 to 15 years, requiring further surgery. In addition, the application of tissue valves may not be available to women who are pregnant or over the age of 65.

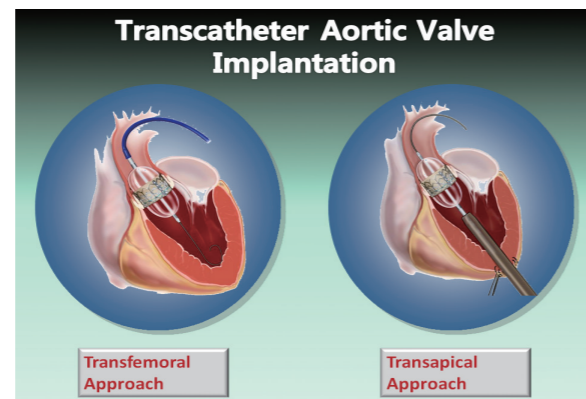


Valve surgery

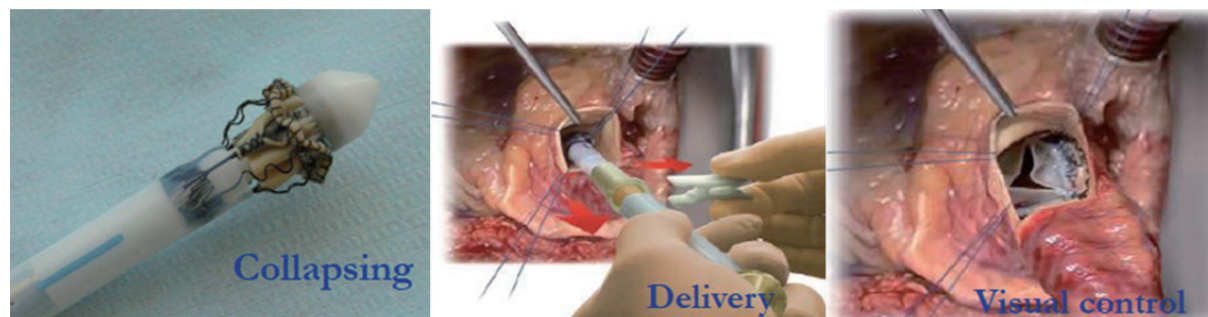
- Depending on location: Aortic valve, mitral valve, tricuspid valve, and pulmonary valve
- Depending on cause of disease: Rheumatoid, degenerative, congenital, and endocarditis
- Depending on pathophysiology: Stenosis, insufficiency, and primary disease accompanied by stenosis and insufficiency
- Depending on surgical method: Valve replacement, valvuloplasty, and Ross procedure
- Depending on artificial insertion: Mechanical valve replacement, tissue valve replacement, and homograft valve
- Arrhythmia surgery: If accompanied by exclusive arrhythmia surgery of valve surgery
- Includes latest health technologies such as robot surgery, TAVI, and sutureless valve



View of mitral valvoplasty using a robot

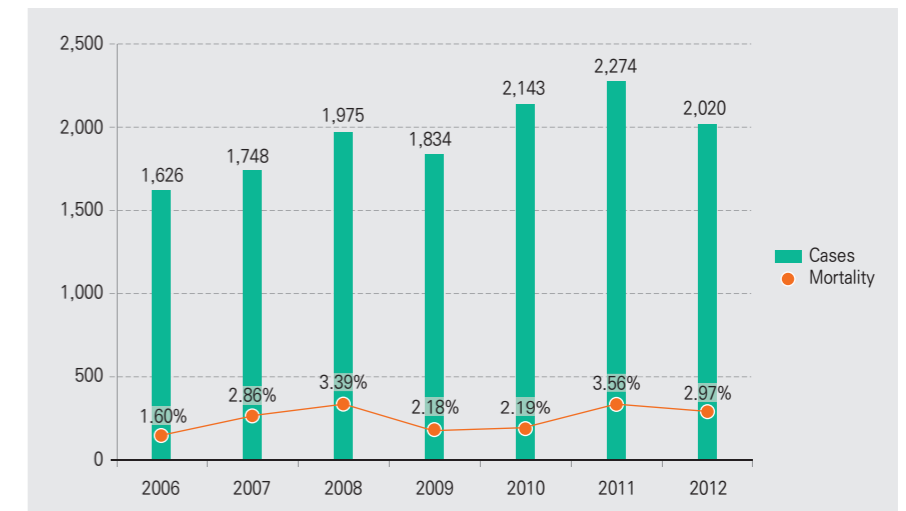


TAVI



Sutureless aortic valve replacement

Annual number of valve surgery cases and mortality in Korea



Source : Korean Society for Thoracic & Cardiovascular Surgery

Periodical trends in mortality of patients subjected to valvular surgery in the United States

Period: Procedure	Overall		1: 1993-1997		2: 1998-2002			3: 2003-2007			p value
	n	UOM	n	UOM	n	UOM	AORM	n	UOM	AORM	
All	623,039	6.3%	136,071	7.2%	194,425	6.6%	-	292,543	5.6%	-	
A	338,143	4.9%	76,018	5.6%	105,852	5.2%	0.85	156,273	4.4%	0.72	<0.001
M	211,167	6.9%	46,000	8.3%	67,572	7.3%	0.83	97,595	5.8%	0.67	<0.001
T	5,803	10.0%	1,000	11.2%	1,652	10.2%	0.87	3,151	9.6%	0.81	>0.100
AM	39,260	10.7%	8,469	10.9%	12,089	11.3%	0.90	18,702	10.2%	0.74	<0.031
MT	21,056	9.7%	3,328	12.3%	5,316	10.6%	0.87	12,412	8.7%	0.68	<0.001
AT	2,236	13.2%	316	19.0%	517	13.4%	0.85	1,403	11.8%	0.78	<0.007
AMT	5,374	14.0%	940	17.5%	1,427	13.5%	0.67	3,007	13.1%	0.63	<0.001

The p values are for the adjusted comparisons.

A=aortic; AM=aortic-mitral; AMT=aortic-mitral-tricuspid; AT=aortic-tricuspid; M=mitral; MT=mitral-tricuspid; n=number of procedures; T=tricuspid.

UOM: Unadjusted Operative Mortality

AORM: Adjusted Odds Ratios for Mortality

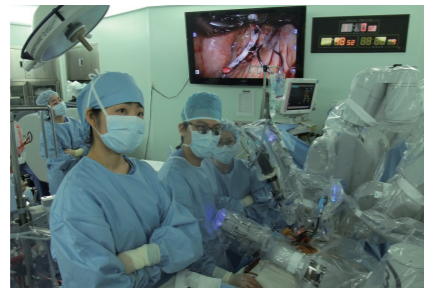
Source : STS database, Lee R, et al. Ann Thoracic Surgeon 2011;91:677-84

**Minimally Invasive
Cardiovascular Surgery**

Minimally invasive surgery is widely used in coronary artery bypass, congenital cardiac surgery and mitral valvular surgery. A wide range of minimally invasive surgical techniques can be used to make wounds inconspicuous: endoscopy, thoracoscopic methods using special equipment operated by voice-recognition software, Da Vinci surgical robots, etc.

Minimally invasive surgery require special equipment and experienced medical staff to maintain the minimum invasive extracorporeal circulation, and require a CT scan to check the state of peripheral blood vessels for tube insertion before surgery.

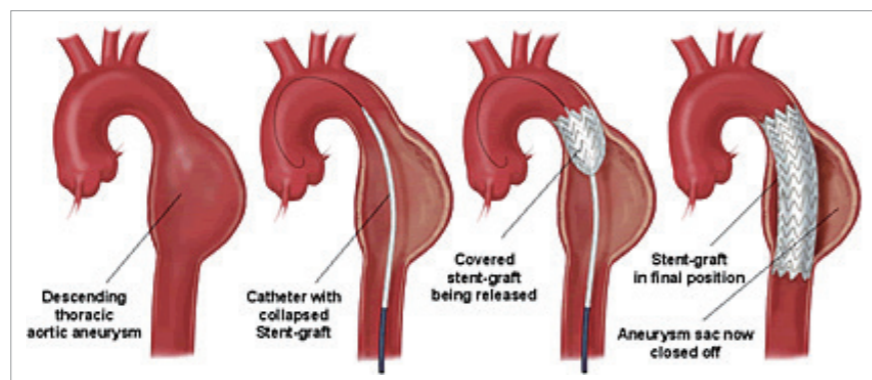
- Advantages of minimally invasive surgery: cosmetic excellence, rapid recovery, less pain and fewer long-term complications
- Drawbacks of minimally invasive surgery: higher costs, higher technical level, longer operation time, difficult to resolve complications when they occur
- MIDCAB (Minimally Invasive Direct Coronary Artery Bypass)
- Minimally invasive cardiac surgery through right thoracotomy (valvular surgery, interauricular septal defect surgery, Right Anterior Small Thoracotomy)
- Robot-Assisted Cardiac Surgery
- Scene hybrid, endovascular and robot surgery



Robot-Assisted Cardiac Surgery



Console for robot surgery



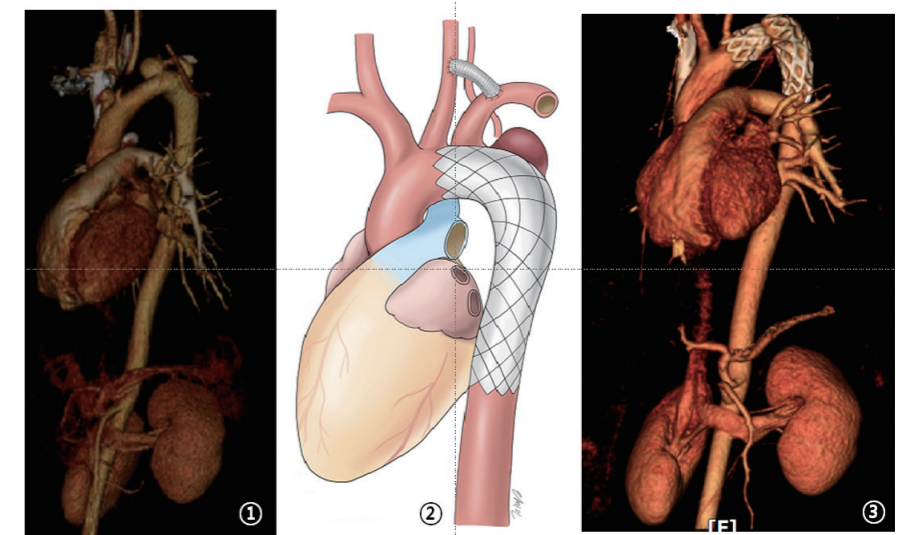
Stenting-Grafting for aortic aneurysm



Hybrid Operating room



View of hybrid surgery



Hybrid TEVAR (2) for thoracic aortic aneurysms (1) and CT image after surgery (3)

Interventional Procedure for Acquired Cardiac Disease

Complications minimized thanks to more than 30 years of experience

Korea's cardiovascular intervention skills go global

Since the initial introduction of cardiovascular intervention to Korea in 1987, Korea has been performing tens of thousands of procedures using not only new treatment skills such as balloon angioplasty, stenting or coronary atherectomy, but also new medical devices such as intravascular ultrasound, doppler guidewire and pressure guidewire. After light sedation, interventions performed to cure coronary artery diseases approach the problematic coronary artery with a guidewire and catheter through the femoral artery or radial artery to expand the narrowed area. As this method requires a shorter hospitalization period and simple treatments, multiple performances of these procedures are available.

Diagnostic coronary angiography rarely causes surgical complications and generates a mortality rate of only 0.14 to 0.75%. After diagnostic coronary angiography, coronary intervention is performed and the mortality rate of patients with acute myocardial infarction who receive this procedure is only 1.2 to 5.5% in Korea, which is similar to that of the United States (3.5%). The rate of recurrence within 1 year is 2.5 to 9.5%, and the average hospitalization period is 3.0 to 9.5 days, closely matching statistics in the United States and European countries.

Angina patients generally present with complicated lesions and stenosis in multiple areas due to the chronically developed disease. The mortality rate, the rate of recurrence within 1 year and the hospitalization period in Korea are 0.1 to 1.4%, 2.4 to 6.0% and 1.7 to 4.0 days, respectively. This is outstanding compared to overseas countries. Even Korea's medical technologies to treat left main vessel diseases or chronic total occlusion, which used to be difficult to treat surgically, are setting the global standard, and a number of foreign physicians are visiting Korea to learn Korea's techniques.

Coronary angiography

Coronary angiography is a medical examination that injects a contrast medium to identify the location and degree of coronary artery narrowing. This is essential for balloon dilatation or stenting, the most accurate method for diagnosing angina pectoris or myocardial infarction. After inserting a thin plastic catheter with a diameter of 2 to 3mm to the cardiac coronary artery via the femoral artery or radial artery, the contrast medium is injected into the coronary artery and images are taken.

Balloon dilatation

Balloon dilatation is the medical procedure for facilitating blood flow by inflating a balloon inserted in the narrowed coronary artery identified by coronary angiography. Even if the vessel is successfully dilated through the balloon dilatation, it has been reported that 20 to 30% of patients show symptoms of a re-narrowed blood vessel after a certain period of time. To resolve such problems, recently a method of stenting has been widely used. In addition, if the inner diameter of the vessel is too narrow to allow the insertion of a stent, dilatation is performed using a balloon coated with a drug (to avoid granulation) to prevent the re-narrowing of the dilated vessel.

Stenting

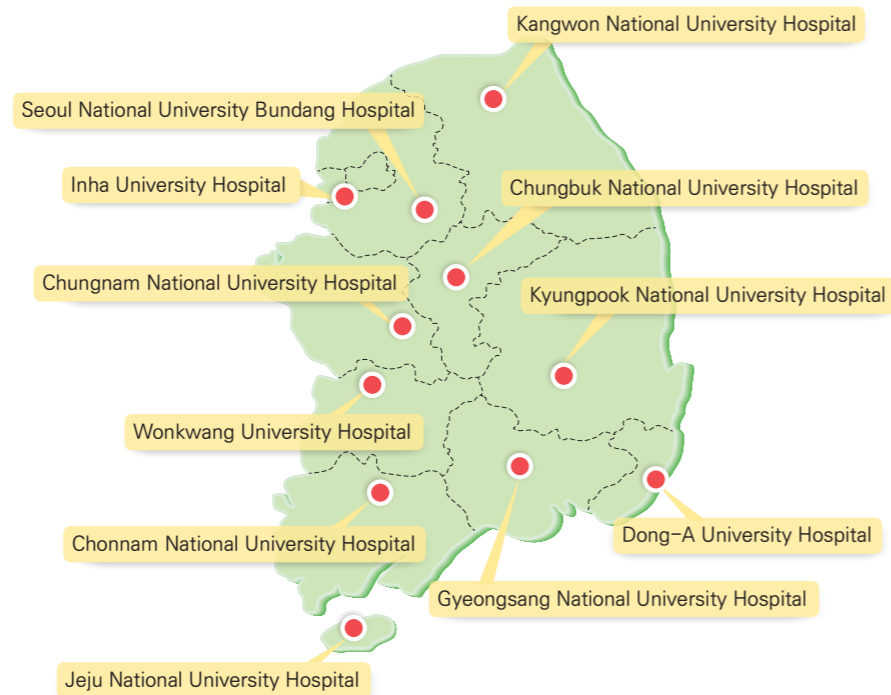
Stenting is a method of inserting a stent (metal net) to prevent the vessel from being re-narrowed. As blood clots may be generated from the reaction of the body to the foreign substance (stent), and granulation may be observed inside the stent, a new stent thrombosis technique has been developed and is presently being used to gradually discharge a drug suppressing granulation on the stent. Although stent thrombosis is remarkably successful at reducing restenosis, it may cause blood clots to develop in the stent due to delays in the healing of the inner wall of the stented vessel; consequently, the patient is required to receive an antiplatelet agent for at least 1 year. Recently stent technologies that the metal body of the stent is melted away



State-of-the-art Medical System and Treatment Program

Operating Cardio-Cerebrovascular disease centers in 11 districts across the country

According to the comprehensive Cardio-Cerebrovascular disease preventive plan, Cardio-Cerebrovascular disease centers have been operating in 11 districts across the country since 2008 (24-hour operation). These centers provide professional treatment services in a timely manner, including CP (Critical Pathway) development and distribution, and early rehabilitation. Recently, they have been expanding the scope of their services to non-surgical treatments such as percutaneous stenting-grafting and hybrid procedures to attract foreign patients around the world.



Adequacy evaluation launched to improve and standardize the quality of Korea's medical services

Korea's Health Insurance Review & Assessment Service has been performing adequacy evaluation on ischemic heart diseases since 2008 to improve and standardize the quality of Korea's medical service. The scope of evaluation is expanding to cardiovascular diseases such as valvular diseases or aortic diseases.

Launching specialized treatment support programs, such as the one-stop service

Korea's major specialized cardiovascular treatment centers are operating specialized support programs such as Advanced Practice Nurse Program, management of pain, nutrition, wound, infection and bedsore, operation of step-down care unit, elderly cardiac surgery, cardiac rehabilitation, cardiac transplant and organ performance management, one-stop services, anesthesia care, management of outpatient treatment and medication, referral center, congenital heart defect centers and pacemaker centers.

Cardiopulmonary Bypass Machine

To enable doctors to perform thoracotomy, this mechanical device is required for open heart surgery, and diverts the blood via the aorta and vena cava of the patient using a cannula. The world's first cardiac surgery that used a cardiopulmonary bypass machine was performed in 1953. This device has been improved through a number of technical developments so that now it can function safely even in cases of long term extracorporeal circulation.



Membrane Oxygenator

An oxygenator is one of the components of the cardiopulmonary bypass machine, which performs the role of the lungs during extracorporeal circulation. It discharges the carbon dioxide and supplies oxygen to the blood. Membrane oxygenators are divided into bubble-type oxygenators and membrane oxygenators.



Cell saver

A cell saver is essential equipment for performing anhydremic cardiac surgery. It filters and concentrates blood discharged out of the vessel during the surgery and after centrifugation, cleans and re-injects centrifuged red blood cells. In addition to cardiac surgery, this equipment can be used for other complicated surgeries that involve a large amount of bleeding. This equipment is also crucial for patients who refuse to receive transfusions.



IABP (Intra-Aortic Balloon Pump)

This equipment is used to assist the function of the left ventricle in the event of cardiogenic shock in which the blood pressure is not maintained due to temporary deterioration of the cardiac function. A balloon is inserted in the descending aorta via the femoral artery, and the balloon is inflated and deflated in synchronicity with the heartbeat in order to reduce the afterload of the heart and increase the blood flow via the coronary artery for the purpose of decreasing oxygen consumption and increasing supply.





TAH (Total Artificial Heart)

This equipment is designed to completely replace all cardiac functions, including both atria and ventricles. Although not permanent so far, this device is the only substitute to a cardiac transplant for patients with heart failure on terminal .



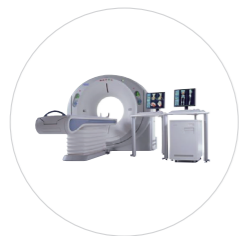
Cardiovascular angiography

This equipment performs coronary angiogram, which is an examination method enabling observations of blood vessels on X-ray images by injecting a contrast medium in the coronary artery of the patient using a catheter. Coronary angiogram is an important method for identifying clogged vessels and for playing the critical role of determining the treatment method later.



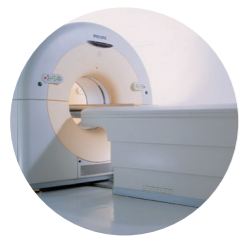
Echocardiography

Echocardiography is an examination method for observing the heart's movement in real time using ultrasound. This method also enables observations to be made in real time in a noninvasive manner so that information can be acquired on abnormalities in the cardiac anatomical structure, cardiac functions and intracardiac valvular functions. This highly accurate examination method is the basic method for most heart cardiac diseases



Coronary CT

Coronary CT is a cutting edge radiology examination method that visualizes the cardiac vessels of the pumping heart using a contrast medium and a high speed CT scan. This method enables examinations not only of coronary artery diseases such as angina pectoris or myocardial infarction, but also of the cardiac structure, cardiac muscle and abnormalities in the pericardium.



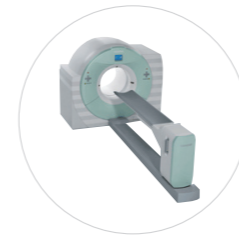
Cardiac MRI

This imaging diagnosis technique is used to diagnose the anatomical abnormalities of cardiac diseases without the use of a toxic contrast medium. It is used for the diagnosis of anatomical abnormalities, evaluation of cardiac functions, measurement of blood flow rate, evaluation of myocardial perfusion, evaluation of infarcted myocardium and myocardial viability, and coronary artery imaging.



Myocardial perfusion scan (SPECT)

The myocardial perfusion scan is an examination method based on nuclear medicine, which obtains tomographic images of the heart using radiopharmaceuticals material. This method is widely used for the diagnosis of coronary artery disease, for prediction or prognosis, and for judgment prior to treatment.



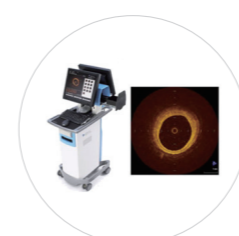
Positron emission computer tomography (PET-CT)

PET-CT is a cutting edge examination method combining Positron Emission Tomography (PET) and Computed Tomography (CT). Its advantage is that it obtains functional images and morphological images of cardiac diseases at the same time. As it can obtain additional information about tissue functions and metabolic changes, it is useful for diagnosing cardiovascular disease and for tracking the progress of a disease.



Intravascular Ultrasound (IVUS)

Intravascular ultrasound is a technique for viewing the coronary artery from the inside of the vessel using high frequency ultrasound. As it can provide detailed information about the inside of the vessel, and such information cannot be gained using general coronary angiography, this method is widely used and plays a critical role in determining appropriate medical procedures and treatments.



Optical Coherence Tomography

Optical Coherence Tomography (OCT) uses cutting-edge equipment to obtain intravascular information using optical principles. Compared to intravascular ultrasound, which is used for intravascular imaging, OCT produces images more than 20 times clearer.

Excellence in Cardiovascular Disease Treatment

HOW?
MEDICAL KOREA

SMART CARE
Heart





HOW?

Medical Korea

CHAPTER



Risk Factors



Controls risk factors through the improvement of lifestyle

The more risk factors you have, the greater chance of developing coronary artery disease. In addition, some risk factors for heart disease, such as age and family history, cannot be controlled. However, most risk factors can be controlled by changing your lifestyle and regularly taking medicine. The possibility of coronary artery disease and stroke varies depending on how well you control the risk factors, which will consequently increase the quality of your life and your life expectancy.

⚠ Risk factors (WARNING)

Dyslipidemia

Abnormal cholesterol level leads to increased risk of atherosclerosis.

- Risky when total cholesterol exceeds 200mg/dL, LDL cholesterol exceeds 100mg/dL or a value recommended by a doctor
- Risky when HDL cholesterol is below 40mg/dL (50mg/dL for female) and neutral fat exceeds 150mg/dL

High blood pressure

The inner arterial wall can be damaged when the blood pushes it too hard due to high blood pressure.

- High blood pressure exists if the systolic blood pressure exceeds 140/90mmHg.

Smoking

Smoking damages the arteries, and makes arteriosclerotic plaques accumulate more easily, leading to more blood clots, which increases the possibility of stroke.

Diabetes

If the blood sugar level is not controlled and maintained at an optimal level, the artery is damaged. Diabetes increases the possibility of silent myocardial infarction.

- Dangerous when the hemoglobin A1c (HbA1C) exceeds 6.5%.

Overweight

Abdominal obesity increases the risk of heart diseases directly.

- Dangerous when the size of waist exceeds 90cm for males and 85cm for females.

Stress

If subjected to stress, the heart rate and blood pressure increase, feelings such as depression, anxiety and anger may arise, and overall health may be adversely affected.

CHAPTER



Symptoms



If you experience chest pain, shortness of breath or sudden chest pain, go to the nearest hospital

If one experiences any of the following symptoms due to an insufficient supply of oxygen that is a consequence of narrowed vessels or necrosis of adjacent tissues, visit the nearest hospital immediately for consultation and examination. Before visiting a Korean medical institution, patients are required to be treated by a local doctor in order to reduce the risk of mortality.

Chest pain

Chest pain occurs when oxygen and nutrition are insufficiently supplied by the heart due to a narrowed or clogged coronary artery. This phenomenon is called angina. Angina patients must be appropriately treated to prevent angina from developing into myocardial infarction.

Dyspnea, swelling, palpitations

Stenosis or regurgitation occurs in the cardiac valve when blood flows backwards to the heart, causing blood circulation disorders in the entire body. If this symptom becomes chronic, the pulmonary venous pressure increases, generating pulmonary edema, which results in cardiac insufficiency and a subsequent shortness of breath. When the disease develops via pulmonary arterial hypertension into dysfunction on the right side of the heart, the patient experiences anasarca, in which the legs become swollen and the skin loses elasticity. One of the most frequent complications from valvular diseases is atrial fibrillation, which is a kind of arrhythmia. In the initial stage, the main symptom is temporary palpitations; later, it develops into tachycardia or bradysphygmia, causing inconvenience.

Sudden chest pain and shock

Aortic diseases can be classified mainly into aortic dissection and aortic aneurysm. Aortic aneurysm does not exhibit any symptoms for a long time if the vessel is stretched to a certain size and does not rupture. The representative symptom is pain from pressure on an adjacent internal organ or a husky voice due to pressure on the laryngeal nerve. Acute aortic dissection may be accompanied by severe pain being stabbed with a knife, and dyspnea or shock.



WHY?

WHAT?

HOW?

WHERE?



Diagnosable with electrocardiogram and echocardiography

If cardiac disease is suspected, the state of the heart and vessels must be checked at the nearest hospital through electrocardiogram or echocardiography, and then a Korean medical institution should be visited for more precise examination and treatment

Electrocardiogram

An electrocardiogram measures the flow of electricity in the heart through an electrode attached on the skin, as shown in the diagram. An electrocardiogram facilitates the detection of myocardial infarction requiring emergency treatment

Myocardial enzyme test

Myocardial Infarction can be identified through a blood test, as the cardiac enzyme existing in the cardiac muscle of myocardial Infarction patients is discharged through the blood. As the cardiac enzyme's value does not increase in the initial stage of myocardial infarction, blood tests are performed at regular intervals.

Echocardiography

When myocardial infarction occurs, a part of the cardiac muscle dies and loses its function, causing ventricular wall motion abnormalities. In severe cases, the dead cardiac muscles become thinner than the normal cardiac muscles and cardiac function deteriorates. Echocardiography provides important information for evaluating ventricular wall motion abnormalities and cardiac function.

Nuclear medicine test

This method accurately evaluates the location and degree of angina pectoris or myocardial infarction by imaging the absorption of an extremely small amount of weak radioactive isotopes injected into a vein.



Cardiac chest computed tomography (CT), Cardiac magnetic resonance imaging (MRI)

CT or MRI examinations can be used to diagnose and evaluate the degree of myocardial infarction as well as to evaluate the recovery of cardiac muscle

24-hour Holter test

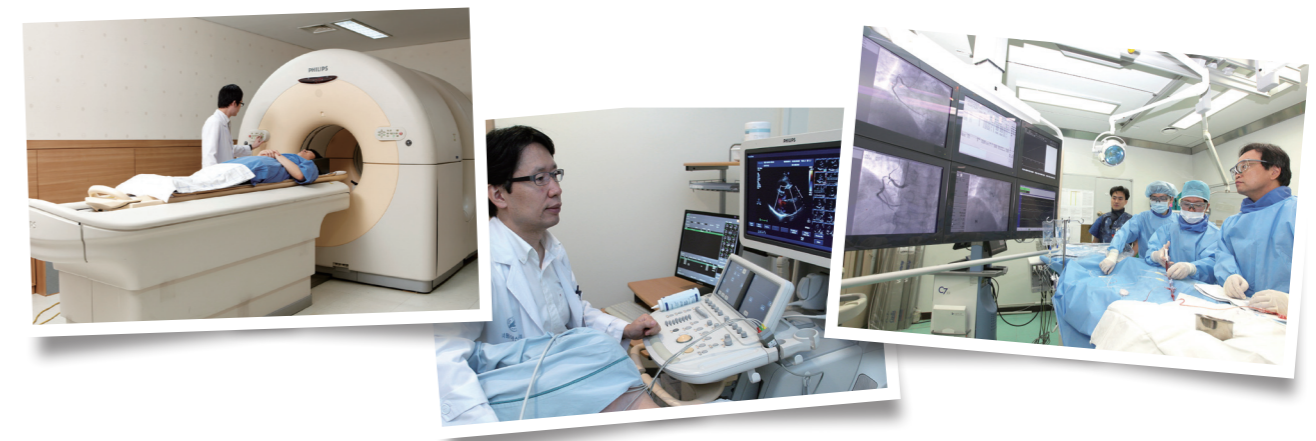
This examination produces electrocardiogram images for 24 hours and can be used to diagnose variant angina or myocardial ischemia arrhythmia

Exercise stress test

Also known as the treadmill test, in this examination, angina pectoris is deliberately induced by exercise and electrocardiogram images are created as chest pain occurs. The patient with examination electrodes attached to the chest is observed with specially designed equipment while increasing exercise intensity step by step.

Coronary angiography

This method takes X-rays of coronary arteries after injecting a contrast medium using a thin tube inserted through the inguinal arterial blood vessels. With this method, you can visually check how the vessel has narrowed. This examination is also essential to performing balloon dilatation or stenting.





Information on Korean Medical Services for International Patients

 **The Entry**

To reduce the treatment period in Korea and receive medical attention as quickly as possible, prepare your medical condition and treatment history, get counseling and make reservations at a desired Korean medical institution and provide your most recent health information available to the appropriate medical institution.

To enter Korea, depending on your nationality, you might require a VISA. Where necessary, you might require a medical VISA to enter Korea. You can get a medical VISA by submitting an application to the relevant diplomatic office, or your desired Korean medical institution or agency may submit the application on your behalf.

If you are subject to a tourist Visa (C-3-2) or a no-visa entry (up to 60 days allowed according to the agreement between countries), and if you require more time for treatment, your medical institution can support you in getting a medical VISA. If you enter Korea with a medical VISA (C-3-3, allows patients to stay in Korea for 90 days), but you need more days for treatment, your medical institution will help you switch your VISA to a long-term medical VISA (G-1-10, allows patients to stay in Korea for 180 days).

If you are accompanied, it is recommended that your companion be issued with documentary evidence by the embassy demonstrating your family relationship, so that they can be issued the same VISA as you. In addition, as you and your companion may be required to demonstrate a family relationship, please be prepared to do so before entering Korea.



You can receive information of concierge services such as transportation, accommodation, food, etc. from your medical institution or agency. However, in some cases, such services may have fees, so please be informed before entry in order to minimize inconvenience and confusion. In addition, when you need pickup or ambulance service, you are required to submit a request to the applicable medical institution in advance. You are advised to check whether interpretation services are provided.

Before going to Korea, check the reservation information with the medical institution in Korea and provide the medical institution with your departure and arrival information as well as with your contact information during your stay in Korea. In addition, please acquire the contact information of your liaison at your medical institution in Korea and get in touch with him or her when you arrive in Korea.

 **On Arrival**

If you must have personnel on standby at the medical institution or agency, or if you must directly move to the medical institution or other form of accommodation, you should be aware of the transportation information and take necessary action. In the event that you experience any problem during transportation, you should contact the appropriate professionals for immediate help. In addition, if you need to rent a mobile phone in Korea, discuss this with your medical institution in advance to see whether you may rent it from them. If this service is not available, you can rent a mobile phone at the airport.

If you enter Korea earlier than the scheduled date set by the medical institution for treatment, you should pay careful attention to your health condition. For emergency purposes, keep the contact information of your medical institution in your bag or pocket.





During Treatment

Before being treated at a medical institution, please consult with your designated doctor and nurse in advance and determine whether a coordinator should provide interpretation services or not. When you are admitted into the hospital, please consult with the hospital about your meals. Follow the instructions given by your doctor and nurse to ensure fast recovery after treatment. You are also recommended to receive or secure information about the health management facilities furnished by the hospital.



End of Treatment

When you leave the hospital, you will be issued medical records and examination results, and you may be prescribed up to 3 months of medicine. Make sure a prescription written in English is enclosed. Request assistance from the medical institution to prevent problems when returning to your country. When paying the fees for the medical service, check the details and make any necessary inquiries before making payment. Check your next schedule to see whether you are required to visit the hospital again. Be aware of the instructions that you are required to follow in your country for follow-up treatment or health management. Whenever necessary, to ensure a safe departure to your country, please notify the medical institution of your departure schedule.



International Healthcare Services

Major medical institutions in Korea offer international healthcare centers to provide medical services for foreign patients. These services include interpretation, medical reception and request service, customized care service, VISA extension service, airport pickup service, and a 24-hour call service, all of which are intended to ensure prompt medical services for international patients.



POP WHY?

WHAT?

HOW?

WHERE?

SMART CARE Heart

Excellence in Cardiovascular Disease Treatment

WHERE? MEDICAL KOREA



"This part of hospital introduction is mainly constructed by voluntary participation of each hospital. It may be different from real clinical practice. Some part may be omitted by incident. If you have any question, please feel free to contact with international support team of each hospital."



WHERE?

Medical Korea

Status of Major Cardiac Centers

List of major cardiac centers

	Asan Medical Center	P.66
	Chonnam National University Hospital	P.70
	Chungnam National University Hospital	P.72
	Jeju National University Hospital	P.74
	Kangwon National University Hospital	P.76
	Konkuk University Medical Center	P.78
	Korea University Anam Hospital	P.80
	Korea University Guro Hospital	P.83
	Kyungpook National University Hospital	P.85
	Pusan National University Yangsan Hospital	P.88
	Samsung Medical Center	P.91
	Sejong General Hospital	P.94
	Seoul National University Bundang Hospital	P.98
	Seoul National University Hospital	P.101
	Seoul St. Mary's Hospital, The Catholic University of Korea	P.105
	Severance Hospital, Yonsei University College of Medicine	P.109

* 8 centers in Seoul and 8 centers in the region
* Listed in alphabetical order

Procedures in major cardiac centers

Pediatric Cardiac Surgery & Cardiology

- **1st stage operation for HLHS or variants**
Pusan National University Yangsan Hospital
- **Arterial switch operation**
Pusan National University Yangsan Hospital
Sejong General Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
- **ASD repair**
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine
- **CoA/IAA repair**
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Hospital
Severance Hospital, Yonsei University College of Medicine
- **Complete AVSD repair**
Sejong General Hospital
- **Congenital heart Intervention**
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine
- **Fontan operation**
Pusan National University Yangsan Hospital
Seoul National University Hospital
- **TOF repair**
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Hospital
- **VSD repair**
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

WHY?

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Cardiac Surgery

- **Abdominal Aortic Aneurysmectomy**
Asan Medical Center
Konkuk University Medical Center
Samsung Medical Center
Seoul National University Bundang Hospital
Severance Hospital, Yonsei University College of Medicine

- **Aortic Arch Replacement**
Asan Medical Center
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea

- **Aortic Valve Operation**
Asan Medical Center
Konkuk University Medical Center
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

- **Ascending Aortic Aneurysmectomy**
Asan Medical Center
Konkuk University Medical Center
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

- **Coronary Artery Bypass Graft**
Asan Medical Center
Konkuk University Medical Center
Korea University Anam Hospital
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea

- **Descending Thoracic Aortic Aneurysmectomy**
Asan Medical Center
Konkuk University Medical Center
Samsung Medical Center
Seoul National University Bundang Hospital
Seoul National University Hospital
Severance Hospital, Yonsei University College of Medicine

- **Mitral Valve Operation**
Asan Medical Center
Konkuk University Medical Center
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

Cardiac Surgery

- **OPCAB Off-Pump Coronary Artery Bypass Surgery**
Asan Medical Center
Konkuk University Medical Center
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

- **Thoracoabdominal Aortic Aneurysmectomy**
Seoul National University Bundang Hospital
Severance Hospital, Yonsei University College of Medicine

- **Tricuspid Valve Surgery**
Asan Medical Center
Konkuk University Medical Center
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

Cardiology

- **Acute Myocardial Infarction**
Asan Medical Center
Chonnam National University Hospital
Chungnam National University Hospital
Jeju National University Hospital
Kangwon National University Hospital
Korea University Anam Hospital
Korea University Guro Hospital
Kyungpook National University Hospital
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

- **Angina Pectoris**
Asan Medical Center
Chonnam National University Hospital
Chungnam National University Hospital
Jeju National University Hospital
Kangwon National University Hospital
Korea University Anam Hospital
Korea University Guro Hospital
Kyungpook National University Hospital
Pusan National University Yangsan Hospital
Samsung Medical Center
Sejong General Hospital
Seoul National University Bundang Hospital
Seoul National University Hospital
Seoul St. Mary's Hospital, The Catholic University of Korea
Severance Hospital, Yonsei University College of Medicine

POP WHY?

WHAT?

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WHERE?

Cardiology

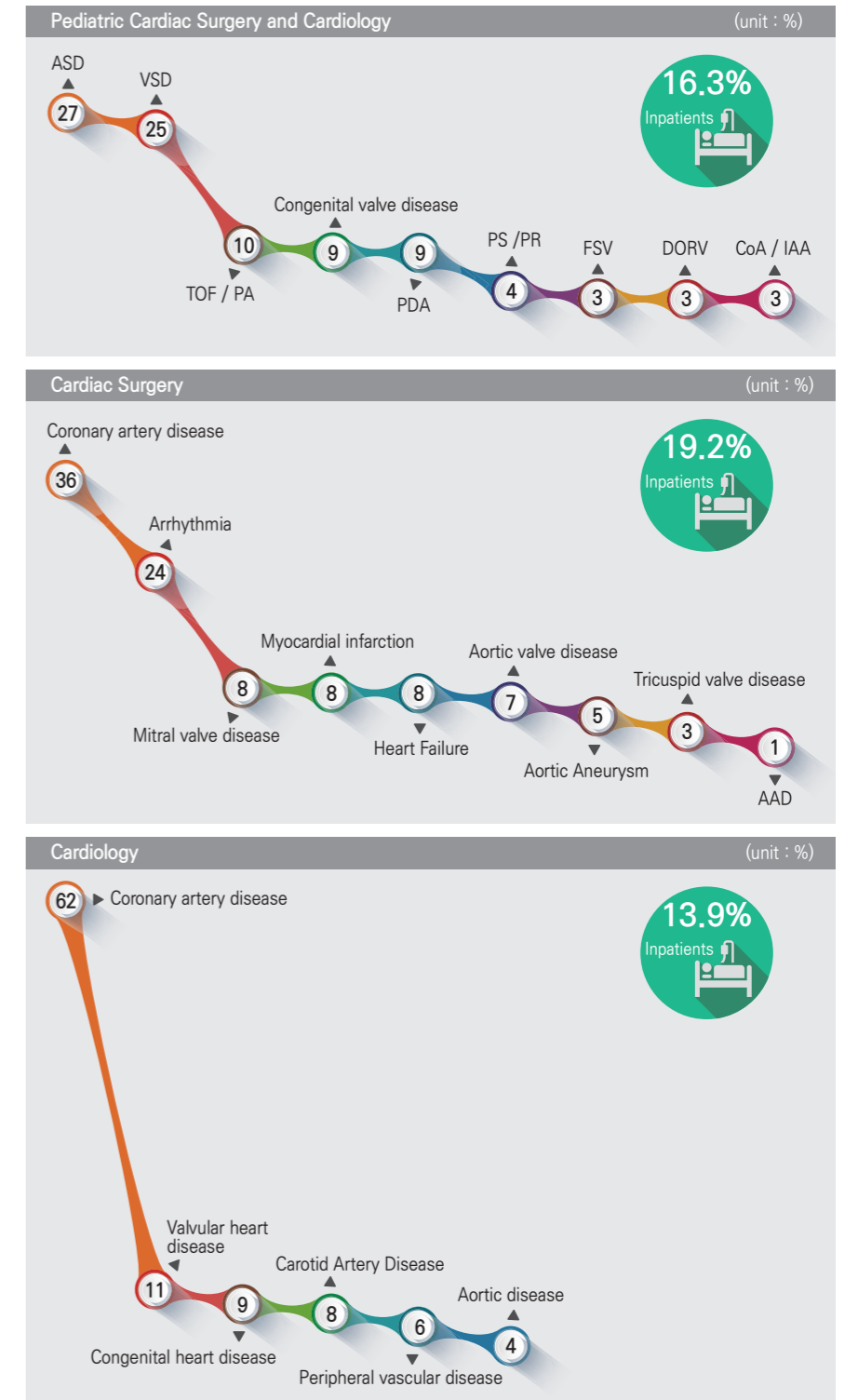
- Aortic Disease**
 Asan Medical Center
 Chonnam National University Hospital
 Chungnam National University Hospital
 Korea University Guro Hospital
 Kyungpook National University Hospital
 Sejong General Hospital
 Seoul National University Bundang Hospital
 Seoul National University Hospital
 Seoul St. Mary's Hospital, The Catholic University of Korea
 Severance Hospital, Yonsei University College of Medicine
- Aortic Stenosis**
 Asan Medical Center
 Chonnam National University Hospital
 Seoul National University Hospital
 Severance Hospital, Yonsei University College of Medicine
- Carotid Artery Disease**
 Asan Medical Center
 Chonnam National University Hospital
 Chungnam National University Hospital
 Korea University Guro Hospital
 Sejong General Hospital
 Severance Hospital, Yonsei University College of Medicine
- Congenital Heart Disease**
 Asan Medical Center
 Chonnam National University Hospital
 Chungnam National University Hospital
 Pusan National University Yangsan Hospital
 Seoul National University Bundang Hospital
 Seoul National University Hospital
 Seoul St. Mary's Hospital, The Catholic University of Korea
 Severance Hospital, Yonsei University College of Medicine
- Mitral Stenosis**
 Asan Medical Center
 Chonnam National University Hospital
 Chungnam National University Hospital
 Sejong General Hospital
 Severance Hospital, Yonsei University College of Medicine
- Peripheral Arterial Disease**
 Asan Medical Center
 Chonnam National University Hospital
 Chungnam National University Hospital
 Jeju National University Hospital
 Korea University Anam Hospital
 Korea University Guro Hospital
 Pusan National University Yangsan Hospital
 Samsung Medical Center
 Sejong General Hospital
 Seoul National University Bundang Hospital
 Seoul National University Hospital
 Seoul St. Mary's Hospital, The Catholic University of Korea
 Severance Hospital, Yonsei University College of Medicine

* Listed in alphabetical order

Statistics of Diseases and Procedures in major cardiac centers

Disease-specific patient status and admission rate

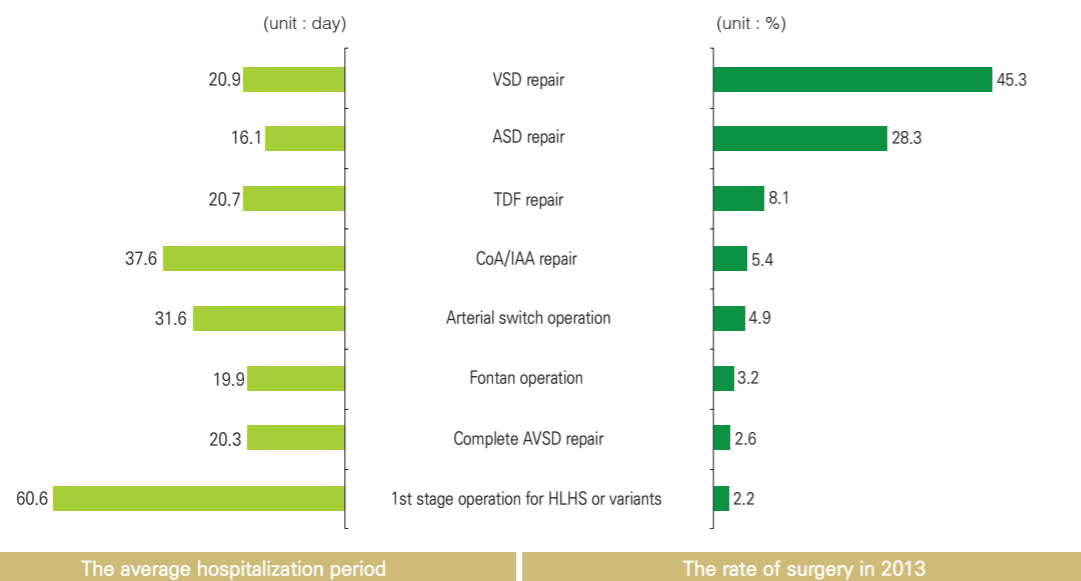
* The excluded number of re-visited/re-admitted patients



* The figure is a comprehensive data in the main institutions. This may differ from the performance of individual institutions.

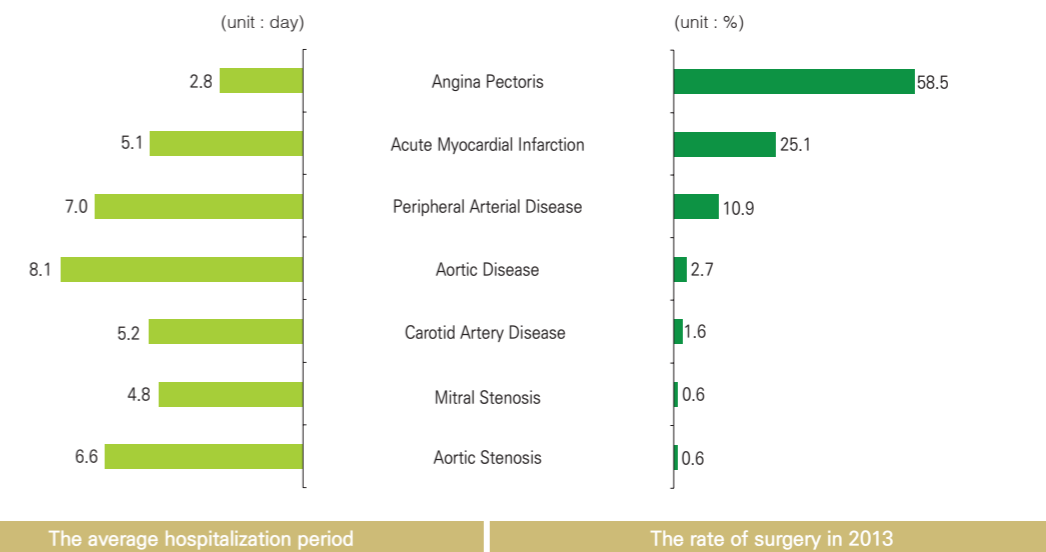


Status of Pediatric Cardiac Surgery and Cardiology



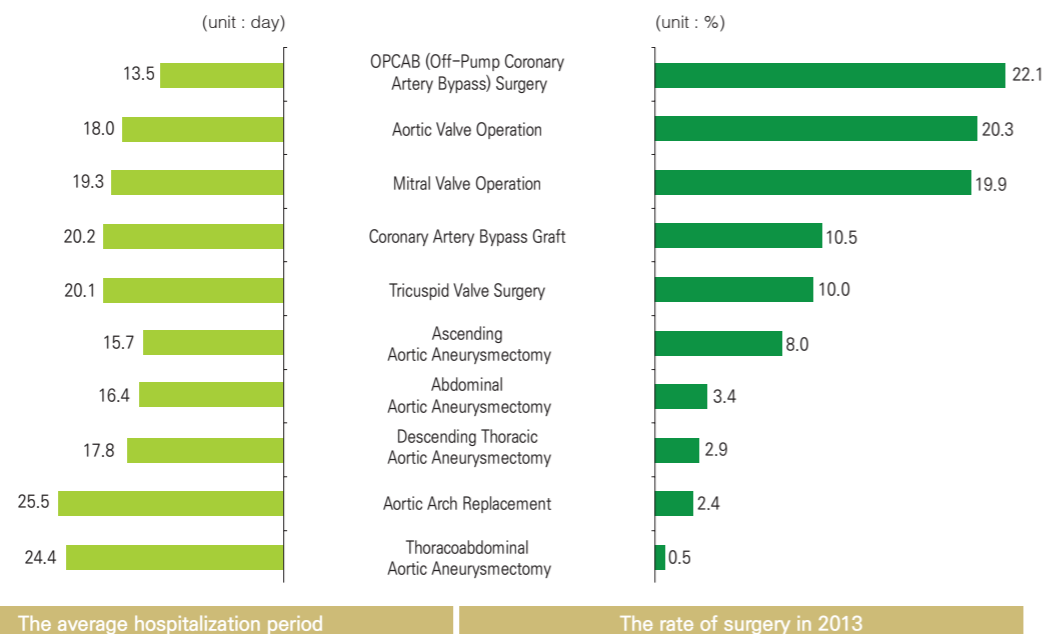
* The figure is a comprehensive data in the main institutions. This may differ from the performance of individual institutions.

Status of Cardiology



* The figure is a comprehensive data in the main institutions. This may differ from the performance of individual institutions.

Status of Cardiac Surgery



* The figure is a comprehensive data in the main institutions. This may differ from the performance of individual institutions.



Asan Medical Center

- Address. (05505) 88, Olympic-ro 43-Gil, Songpa-Gu, Seoul, Korea
- Homepage. <http://eng.amc.seoul.kr>
- Telephone. 82-2-3010-5001

Asan Medical Center (AMC) is the parent hospital of eight hospitals under the Asan Foundation. Since its establishment in 1977, Asan Foundation has opened hospitals in rural areas where modern medical resources are scarce, fulfilling the mission of the late Chairman Chung Ju-Yung – ‘to help the underprivileged of our society.’

Global Medical Complex

Asan Medical Center is Korea’s largest medical institution with 2,704 beds and occupying more than 281,000m² in total floor space. AMC has led the medical development of Korea by striving to increase patient satisfaction with the best medical staff, optimum treatment, and cutting-edge medical technology based on advanced medical system. As a result, AMC treats 11,380 outpatients, 2,519 inpatients, and 310 emergency patients on average per day, and performs 59,947 cases of high-level operations per year. AMC, the leading hospital in Korea, is where the most domestic patients visit.

Creating Global Standard

The development of medicine is possible when research in basic medicine, endless clinical trials and treatment experience, advanced medical techniques, and life respecting spirit are organically combined. As the hospital leading Korea’s medical development, Asan Medical Center is focusing not on domestic competition but to become the ‘Global Standard Hospital in the World of Medicine.’ With Asan Institute for Life Sciences and Clinical Research Center, AMC is striving to conquer cancer through clinical research and Industry-University-Institute Collaboration related R&D in basic medicine and new drugs.

The Most Respected Hospital in Korea

Since 2007, Asan Medical Center has been selected as Korea’s Most Respected Hospital for 9 consecutive years for being “the hospital which provides the highest quality care in Korea, stands by its neighbors at all times, fulfills the spirit of sharing, and satisfies the patients by respecting their rights.” AMC has treated over 1.5 million underprivileged patients through donations since its establishment in 1989. AMC has been striving to become a hospital consoling patients in pain by practicing its goals such as ‘sustaining the best medical standard,’ ‘neighbor to those in need,’ and ‘sharing and consideration.’

- Tertiary Care Teaching Hospital (Established in 1989)
- Number of Patients (2014). 635,358 (Inpatients 91,545)*
- 1,688 Doctors
- 3,454 Nurses and 2,617 Staffs
- 60 Departments and 43 Centers
- 2,704 Beds
- Children’s Hospital, Heart Institute
- International Healthcare Center

* Excluded number of re-visited/re-admitted patients

Children’s Hospital opened its doors to care for the mental and physical health and happiness of the up-and-coming generation, who represent our future. In today’s healthcare sector, treating very serious pediatric cases is generally considered costly and unprofitable. As a result, there are not enough pediatric wards or specialized medical professionals to serve the youngsters who have serious medical issues or rare and intractable diseases. Despite the current reality, AMC is committed to providing unstinting investment and support for things like research and treatment for rare and intractable diseases, a neonatal ICU, and intensive care for severe pediatric cases.

- 137 Doctors (78 Specialists)
- 305 Nurses and 71 Staffs

- 20 Departments
- 257 Beds

Heart Institute is comprised of 3 clinical divisions of Cardiology, Cardiac Surgery, and Vascular Surgery. Through multidisciplinary treatment process with other departments, Heart Institute provides comprehensive heart disease treatment service. Also, it operates world-class Same-day Admission, Cardiac Screening Room, and Hybrid Operating Room. With 8 specialized sub-centers for Ischemic Heart Disease, Aortic Disease, Valvular Heart Disease, Atrial Fibrillation, Cardiovascular Disease Prevention & Rehabilitation, Heart Failure & Cardiac Transplantation, Cardiac Imaging, and Peripheral Vascular Disease, Heart Institute provides differentiated specialized treatment for patients.

- 82 Doctors (54 Specialists)
- 219 Nurses and 64 Staffs

- 3 Departments
- 173 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	Da Vinci robot (robotic surgery system)
Hybrid	Angio suite (angiography)
Heart and lung transplant	Transplant team
	Separate aseptic room
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	ROTABLATOR
Percutaneous mitral commissurotomy	Anesthesia machine
Transcatheter aortic valve implantation	Computerized spirometry
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	
Renal denervation	

Medical Support Programs for treatment

Support Programs	
Nurse program – Physician assistant	Organ transplant survival data management
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bed sore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication management program for cardiovascular patients
Geriatric program – Elderly cardiac surgery	Congenital heart disease center program
Cardiac rehabilitation program	Pacemaker center program
Heart transplant patient management team and facilities	

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	39	19	3	8	5	3	1
Coordinator	10	4	1	1	2	1	1
Medical form		Y	-	Y	Y	-	Y
Information (leaflet)		Y	Y	Y	Y	Y	Y
Signboard		Y	-	-	-	-	-
Facilities for foreign patients	Treatment rooms (3 rooms), Rest area, Facilities for religion						

* For inquiries: 82-2-3010-5001 (int@amc.seoul.kr)

Medical Procedures and Process for treatment

Cardiac Surgery

- Coronary artery bypass graft
 - Aortic surgery
 - Mitral valve surgery
 - Tricuspid valve surgery
 - Aortic valve surgery
 - Pulmonary valve surgery
 - Davinci robot heart operation
 - Heart transplantation
 - EVAR/TEVAR
 - MCS (Mechanical circulatory system) operation
 - Arrhythmia operation
- ↓ Acute aortic syndrome hotline
 - ↓ Cardiac rehabilitation program for CABG patients
 - ↓ Cardioversion process for cardiac surgery patients
 - ↓ ECMO team process for over night duty
 - ↓ Hybrid operating system
 - ↓ Heart team approach
 - ↓ NRICU care after carotid endarterectomy

- Randomized Trial of Stents versus Bypass Surgery for Left Main Coronary Artery Disease, Park SJ, Kim YH, Park DW et al. NEJM. 20110505.1718-1727
- Long-term safety and efficacy of stenting versus coronary artery bypass grafting for unprotected left main coronary artery disease: 5-year results from the MAIN-COMPARE (Revascularization for Unprotected Left Main Coronary Artery Stenosis: Comparison. Kang SJ, Kwon HC, et al. J Am Coll Cardiol. 20100706. 117-124
- Outcomes of Patients With Acute Type A Aortic Intramural Hematoma. Song JK, Lee JW, Lim JH et al. Circulation.20091101.2046-2052
- Long-Term Outcomes of Mechanical Valve Replacement in Patients With Atrial Fibrillation. Kim JB, Moon JS, Moon SH, et al. Circulation.20120501.2071-2080
- Geometric changes after tricuspid annuloplasty and predictors of residual tricuspid regurgitation: a real-time three-dimensional echocardiography study. Kang DH, Kim DH, et al. Eur Heart J. 20101201.2871-2880
- Comparison of Early Surgery Versus Conventional Treatment in Asymptomatic Severe Mitral Regurgitation. Kang DH, Song JK, et al. Circulation. 20090217.797-804
- Percutaneous Versus Surgical Revascularization in Patients With Ischemic Mitral Regurgitation. Kang DH, Kim DH, et al. Circulation. 20110913.156-162

Cardiology

- Percutaneous coronary intervention
 - Transcatheter aortic valve implantation
 - Percutaneous mitral valvuloplasty
 - Device closure (ASD, VSD, PFD)
 - Alcohol septal ablation
 - Peripheral angioplasty
 - Carotid stenting
 - Radiofrequency catheter ablation
 - ICD & P-M insertion
- ↓ Cardiovascular disease hotline for doctor
 - ↓ AMI Fast tract
 - ↓ Cardiac rehabilitation program
 - ↓ Heart team approach
 - ↓ One-day program
 - ↓ Hybrid operation system
 - ↓ Intensive care for high risk group
 - ↓ Cardiovascular image & CT core lab

- Trial of Everolimus-eluting Stents or Bypass Surgery for Coronary Disease Park JS, Ahn JM et al NEJM 2015;372:1204-1212
- Stent versus Coronary-Artery Bypass Grafting for Left Main Coronary Artery Disease Seung KB, Park DW et al. N Engl J Med 2008;358:1781-1792
- A Paclitaxel-Eluting Stent for the Prevention of Coronary Restenosis Park SJ, Shim WH et al. N Engl J Med 2003; 348: 1537-1545
- Extent, location, and clinical significance of non-infarct-related coronary artery disease among patients with ST-elevation myocardial infarction. Park DW, Clare RM et al. 2014 Nor 19;312 (19):2019-27
- Duration of dual antiplatelet therapy after implantation of drug-eluting stents Park DW, Park SJ et al. 2010; 362:1374-1382
- Early percutaneous mitral commissurotomy vs. conventional management in asymptomatic moderate mitral stenosis Kang DH, Park SJ et al. Eur Heart J 2012;33 (12):1511-7
- Restenosis and adverse clinical events after successful percutaneous mitral valvuloplasty: immediate post-procedural mitral valve area as an important prognosticator Song JK, Park SJ et al. Eur Heart J 2009;30 (10):1254-62





Chonnam National University Hospital

- Address. (61469) 42, Jebong-ro, Donggu, Gwangju, Korea
- Homepage. <http://eng.cnuh.com>
- Telephone. 82-62-220-6016

Chonnam National University Hospital has tried our best for the development of medicine in the country and the health improvement of local residents, with over 100 years of tradition from the early age of Korea's modern medicine up to the present since the foundation of Gwangju Jahye Clinic in 1910. Chonnam National University Hospital have a complete multi-hospital system including the Main Hospital, Chonnam National University Hwasun Hospital (cancer center), Chonnam National University Bitgoeul Hospital (rheumatoid & degenerative arthritis center), Chonnam National University Dental Hospital, and have concentrated on professional treatment for diseases.

- Tertiary Care Teaching Hospital (Established in 1910)
- Number of Patients (2013). 1,225,707 (Inpatients 327,031)*
- 537 Doctors (197 Specialists)
- 689 Nurses and 609 Staffs
- 39 Departments and 6 Centers
- 1,014 Beds and 62 Beds for foreign patients (main hospital)
- Cardiovascular Center
- International Healthcare Center

* Included number of re-visited/re-admitted patients

CNUH Regional Cardiovascular Center is established to plan an important role for specialized treatments in the emergency treatment of cardiovascular diseases and early rehabilitation, by preventing death and disability due to cardiovascular diseases, by establishing the systematic treatment system for cardiovascular diseases through improvement of health equity, and by educating and training specialized human resources and residents in the community.

- 23 Doctors (23 Specialists)
- 40 Nurses and 6 Staffs
- 4 Departments
- 62 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedures (EVAR, TEVAR, TAVI)	Angio suite (angiography)
Cardiac catheterization and angiography	Fluoroscopic imaging system
Percutaneous coronary intervention	Intravascular ultrasound
Intravascular imaging	Optical coherence tomography
Invasive physiology study	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	
Percutaneous mitral commissurotomy	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	Organ transplant survival data management
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutritional program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bed sore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication management program for cardiovascular patients
Geriatric program - Elderly cardiac surgery	Pacemaker center program
Cardiac rehabilitation program	

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	2	Y	-	Y	-	-	-
Coordinator	3	Y	-	Y	-	Y	-
Medical form		Y	-	Y	-	-	-
Information (leaflet)		Y	Y	Y	-	Y	-
Signboard		Y	-	-	-	-	-
Facilities for foreign patients		Inpatient ward					

* For inquiries: 82-62-220-6016, 6565 (ykyungy@hanmail.net)

Medical Procedures and Process for treatment

Cardiology

- Percutaneous coronary intervention
- Peripheral angioplasty
- Cell therapy
- Device closure (ASD, VSD, PDA)
- Transcatheter aortic valve implantation
- Endovascular procedures (EVAR, TEVAR)
- Percutaneous mitral valvuloplasty
- Radiofrequency catheter ablation
- ICD & P-M insertion
- ↓ Critical pathways for AMI patients
- ↓ Cardiovascular center
- ↓ Coronary care unit
- ↓ Cardiac rehabilitation program

- Benefit of early statin therapy in patients with acute myocardial infarction who have extremely low low-density lipoprotein cholesterol. Lee KH, Jeong MH, Kim HM, Ahn Y, Kim JH, Chae SC, Kim YJ, Hur SH, Seong IW, Hong TJ, Choi DH, Cho MC, Kim CJ, Seung KB, Chung WS, Jang YS, Rha SW, Bae JH, Cho JG, Park SJ. J Am Coll Cardiol 2011;58:1664-1671.
- The clinical results of a platelet glycoprotein IIb/IIIa receptor blocker (Abciximab: ReoPro)-coated stent in acute myocardial infarction. Weon Kim, Myung Ho Jeong, Kye Hun Kim, Il Suk Sohn, Young Joon Hong, Hyung Wook Park, Ju Han Kim, Young Keun Ahn, Jeong Gwan Cho, Jong Chun Park, Dong Lyun Cho, Jung Chae Kang. J Am Coll Cardiol. 2006; 47 (5):933-938
- Graphene potentiates the myocardial repair efficacy of mesenchymal stem cells by stimulating the expression of angiogenic growth factors and gap junction protein. Park J, Kim YS, Ryu S, Kang WS, Park S, Han J, Jeng HC, Hong BH, Ahn Y, Kim BS. Adv Funct Mater 2015;17:2590-2600.



Chungnam National University Hospital

- Address. (35015) 282, Munhwa-ro, Jung-gu, Daejeon, Korea
- Homepage. <http://www.cnuh.co.kr>
- Telephone. 82-42-280-8429

Chungnam national university hospital opened in 1972, and has daily average 1,100 inpatients, and 4,000 outpatients. We have 31 departments and 1,369 beds. The annual number of operation is more than 22,000 cases. In 2005, we were awarded national 1st place in cardiovascular management and we are the top rated general hospital in Daejeon city. Moreover, in 2013, we were awarded for 1st grade in acute stroke management, and also were awarded the 1st grade in AMI management for the last 3 consecutive years. Furthermore, we manage the latest integrated electronic medical information system. Our specialized fields are : ① Cardiovascular intervention, ② Gamma knife surgery, ③ Breast and thyroid cancer surgery, ④ Infertility clinic, and ⑤ Rehabilitation and Arthritis management

- Tertiary Care Teaching Hospital (Established in 1995)
- Number of Patients (2013). -
- 420 Doctors (238 Specialists)
- 970 Nurses and 1,010 Staffs
- 31 Departments and 6 centers
- 1,368 Beds
- Cardiovascular Center
- International Healthcare Center

We offer a full range of **cardiovascular care** from the latest in diagnostic technologies to the most advanced interventions, and treatments. We do more than 1,200 PCI and 300 peripheral intervention cases in a year. We are famous for the fastest care for AMI in Korea, one-stop one day care for outpatient clinic, and minimally invasive transradial coronary intervention. We are doing complex carotid, aortic and structural heart disease as well as critical limb ischemia.

- 14 Doctors (14 Specialists)
- 32 Nurses and 16 Staffs
- 4 Departments
- 46 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (cardiothoracic surgery) Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound

Technology & Devices	
Invasive physiology study	
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	
Percutaneous mitral commissurotomy	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	Organ transplant survival data management
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bed sore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication management program for cardiovascular patients
Geriatric program - Elderly cardiac surgery	Congenital heart disease center program
Cardiac rehabilitation program	Pacemaker center program

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	1	-	-	1	-	-	-
Coordinator	1	-	-	1	-	-	-
Medical form		Y	-	Y	-	-	-
Information (leaflet)		Y	-	Y	-	-	-
Signboard		Y	-	-	-	-	-
Facilities for foreign patients							

* For inquiries: 82-42-280-8292

Medical Procedures and Process for treatment

Cardiology

- Percutaneous coronary intervention
 - Peripheral intervention
 - EVAR / TEVAR
 - Carotid intervention
 - Structural heart disease intervention
- ↓ One-stop one day service
↓ One day coronary angiogram
↓ Same day discharge after coronary angiogram
↓ Next day discharge after almost all interventional procedure

- Jae-Hwan Lee, Eun-Mi Kim, Kye Taek Ahn, Min Su Kim, Kyu Seop Kim, Il soon Jung, Jae-Hyeong Park, Si Wan Choi, In-Whan Seong, Jin-Ok Jeong. Significant Left Main Coronary Artery Disease from Iatrogenic Dissection During Coronary Angiography. *Int J Cardiol* 2010;138:e35-e37.
- Jae-Hwan Lee, Hyun-Sook Kim, Seung-Whan Lee, Jae-Hyeong Park, Si-Wan Choi, Jin-Ok Jeong, Yoon Haeng Cho, Nae Hee Lee, Kyoung-Suk Rhee, Jae-Ki Ko, In-Whan Seong. Prospective Randomized Comparison of Sirolimus-Versus Paclitaxel-Eluting Stents for the Treatment of Acute ST-Elevation Myocardial Infarction: PROSIT trial. *Cathet Cardiovasc Intervent* 2008;72:25-32.
- Shin JW, Jeong HS, Song HJ, Lee JH, Choi SW, Lee SH, Shin J, Kim J. Intracranial hemodynamic stabilization patterns after stenting of severe stenosis in the proximal internal carotid artery. *J Endovasc Ther.* 2013 Jun;20 (3):398-405.
- Jeong HS, Song HJ, Lee JH, Choi SW, Kim J. Interpretation of TCD spectral patterns detected during carotid artery stent interventions. *J Endovasc Ther.* 2011 Aug;18 (4):518-26



Jeju National University Hospital

- Address. Aran 13-gil 15, Jeju-si, Jeju Special Self-Governing Province, Korea
- Homepage. http://www.jejunuh.co.kr/eng/01_sub01.jsp
- Telephone. 82-64-717-1652

Jeju National University Hospital has been serving the public health needs for people of Jeju Island for the past 100 years, since it opened as Jahye Clinic in 1910. It continued its service under the name of Jeju Medical Clinic and eventually evolved into Jeju National University Hospital. Since its opening as a university hospital in 2001, our hospital has devoted itself to fulfilling our role as the only university hospital of Jeju by providing not only medical services but also education and research. The past ten years, we have been laying the foundations of a National University Hospital. Over next ten years, Jeju National University Hospital will continue to progress and establish itself as a benchmark of the international health care community.

To better meet and fulfill our current and future objectives, in March 2009, we moved into the new facility at Ara-dong, Jeju-city. The new facility includes new specialty centers with state-of-the-art equipments and our highly-trained medical staff. Furthermore, we will also put our efforts to help Jeju, a beautiful and idyllic island with its clean natural environment, be the best place in the competitive market of medical tourism. We will always appreciate your trust and support for the development and growth of Jeju National University Hospital, now and in the future.

- General Hospital (Established in 2001)
- Number of Patients (2013). – (Inpatients 21,154)*
- 218 Doctors (146 Specialists)
- 493 Nurses and 423 Staffs
- 24 Departments and 7 Centers
- 630 Beds
- Cardiovascular Center

* Excluded number of re-visited/re-admitted patients

In the past, in Jeju, there had been difficulties treating patients of cardiovascular diseases because there are lack of specialized facilities and specialists and geographical inconvenience. The Korean Government established “Cardiovascular Disease Measures” in 2006 and as one of the outcomes, “Regional cardiovascular disease center” in Jeju National University Hospital was designated as the first center in November 2008. Now, specialists stay 24 hours in hospital and can treat emergent patients of cardiovascular diseases in 90 minutes. “Regional cardiovascular disease center” in Jeju National University Hospital is going to take the lead in prevention and treatment of cardiovascular diseases.

- 12 Doctors (8 Specialists)
- 7 Nurses and 2 Staffs
- 4 Departments
- 36 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment

IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	Da Vinci robot (robotic surgery system)
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	
Endovascular aneurysm repair	

Medical Support Programs for treatment

Support Programs	
Nurse program – Physician assistant	Organ transplant survival data management
Pain management program after surgery	Cardiovascular patients referral center
Nutrition program for cardiovascular surgery	Outpatient care program for cardiovascular patients
Wound care and bed sore management program	Medication management program for cardiovascular patients
Infection control program	Pacemaker center program
Sub-ICU (intensive care unit) operations	
Cardiac rehabilitation program	

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	4	1	1	1	-	-	1
Coordinator	-	-	-	-	-	-	-
Medical form		Y	-	-	-	-	-
Information (leaflet)		Y	-	-	-	-	-
Signboard		Y	-	-	-	-	-
Facilities for foreign patients							

* For inquiries: 82-64-717-1941 (ynm78@hanmail.net / lovery2314@hanmail.net)

Medical Procedures and Process for treatment

Cardiology

- ↓ Critical Pathway of STEMI (ST elevation myocardial infarction) patients
- ↓ Critical Pathway of NSTEMI (Non-ST elevation myocardial infarction) patients
- ↓ Risk factor management education of AMI (acute myocardial infarction) patients
- ↓ Follow-up monitoring of AMI patients



Kangwon National University Hospital

- Address. (24289) Baengnyeong-ro 156, Chuncheon-Si, Gangwon-Do, Korea
- Homepage. <http://www.knuh.or.kr/eng/>
- Telephone. 82-33-258-9003

In only 15 years since being established in May, 2000, **Kangwon National University Hospital** has grown into a respected university hospital. A university hospital has value for existence in cultivating medical specialists and providing support for creating outstanding research achievements. It is our desire to manage Kangwon National University Hospital in order to fully fulfill such duties of a university hospital.

• General Hospital (Established in 2000)	• 38 Departments and 13 Centers
• Number of Patients (2013). 21,241 (Inpatients -)*	• 676 Beds
• 239 Doctors (125 Specialists)	• Children's Hospital, Cardiovascular Center
• 132 Staffs and 480 Nurses	• International Healthcare Center

* Excluded number of re-visited/re-admitted patients

Kangwon National University Children's Hospital (KNUCH) was established to provide specialized and integrated medical service for children in Kangwon-do province in 2013. We are managing high risk maternal care center for the first time in Korea and performing high quality medical service for children and mothers.

• 21 Doctors (17 Specialists)	• 10 Departments
• 95 Nurses and 12 Staffs	• 132 Beds

Kangwon Regional Cardio-Cerebrovascular Disease Center is providing 24 hours, 365 days immediate response service for cardio-cerebrovascular disease patients. And we are also performing preventive and educative actions with well organized government initiated system.

• 13 Doctors (9 Specialists)	• 2 Departments
• 25 Nurses and 9 Staffs	• 30 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (cardiothoracic surgery)
	Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)

Technology & Devices	
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	
Percutaneous mitral commissurotomy	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	Heart transplant patient management team and facilities
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bed sore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication management program for cardiovascular patients
Cardiac rehabilitation program	Pacemaker center program

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	2	1	-	1	-	-	-
Coordinator	2	1	-	1	-	-	-
Medical form		Y	-	Y	-	-	-
Information (leaflet)		-	-	-	-	-	-
Signboard		-	-	-	-	-	-
Facilities for foreign patients							

* For inquiries: 82-33-258-9003

Medical Procedures and Process for treatment

Cardiology

- Percutaneous Coronary Intervention

- Invasive evaluation of patients with angina in the absence of obstructive coronary artery disease. Lee BK, Lim HS, Fearon WF, Yong AS, Yamada R, Tanaka S, Lee DP, Yeung AC, Tremmel JA. *Circulation*. 2015 Mar 24;131 (12):1054-1060.
- Fulminant myocarditis: the role of cardiac magnetic resonance imaging. Ryu DR, Heo JW, Lee SH, Lee W, Choi JW, Kim HY, Lee BK, Cho BR. *Int J Cardiol*. 2013 Sep 30;168 (2):e58-9.
- Left atrial strain assessed by speckle tracking imaging is related to new-onset atrial fibrillation after coronary artery bypass grafting. Her AY, Kim JY, Kim YH, Choi EY, Min PK, Yoon YW, Lee BK, Hong BK, Rim SJ, Kwon HM. *Can J Cardiol*. 2013 Mar;29 (3):377-83.
- Differences in ward-to-cath lab systolic blood pressure predicts long-term adverse outcomes after drug-eluting stent implantation. Her AY, Ann SH, Lee JH, Kim JM, Kim YH, Garg S, Singh GB, Shin ES. *Heart Vessels*. 2014 Jul 26. [Epub ahead of print]



Konkuk University Medical Center

- Address. (05030) 120-1 Neungdong-ro (Hwayang-dong), Gwangjin-gu, Seoul, Korea
- Homepage. <http://www.kuh.ac.kr/english>
- Telephone. 82-2-2030-8361

Konkuk University Medical Center was established by Dr. YOO, Suk-chang for impoverished civilians in 1931. The hospital was founded with his devotion to the provision of unreserved medical service to help people. Konkuk University Medical Center endeavors to carry on his will of providing sheer dedication in medical practice.

Konkuk University Medical Center was reborn in the year of 2005 as a response to the rapid changes in medical environments and in order to provide high-quality medical service. The new hospital provides 870 sickbeds and occupies 83,000 square meters in total space. The new structure consists of 13 floors above ground and 4 floors underground. Moreover, the hospital has adopted a fully-digitalized medical chart system, paired with state of the art medical equipments. Our medical professionals and staff are united to provide the patients with medical care of the highest quality. Under these high standards, Konkuk University Medical Center strives to provide you the most pleasant experience in receiving medical treatment. Konkuk University Medical Center will continue to grow with a goal to emerge as a true global medical center.

Furthermore, we will humbly take your valuable opinions into account and dutifully reflect on them with respect to the various operations of the hospital. We will try to make significant contributions to fulfill personal needs and care with an openness that affirms life and healing.

- | | |
|--|-----------------------------------|
| • Tertiary Care Teaching Hospital (Established in 1982) | • 33 Departments and 15 Centers |
| • Number of Patients (2013). 740,000 (Inpatients 260,000)* | • 879 Beds |
| • 452 Doctors (230 Specialists) | • Cardiovascular Center |
| • 829 Nurses and 806 Staffs | • International Healthcare Center |

* Included number of re-visited/re-admitted patients

Cardiovascular center consists of the world best heart surgery team. We have the best medical doctors from Departments of Cardiology, internal medicine, Thoracic and Cardiovascular Surgery, Paediatric Cardiac Surgery. Using state-of-the-art medical equipment such as Dual Source CT only for heart examination, we treat the patients who have a massive cardiovascular disease with speed and accuracy.

- | | |
|-------------------------------|-----------------|
| • 15 Doctors (13 Specialists) | • 4 Departments |
| • 48 Nurses and 8 Staffs | • 103 Beds |

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)

Endovascular procedure	Angio suite (angiography)
Heart and lung transplant	Transplant team Separate aseptic room
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Percutaneous coronary intervention	Optical coherence tomography
Peripheral vascular intervention	Coronary care unit
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	
Renal Denervation	

Medical Support Programs for treatment

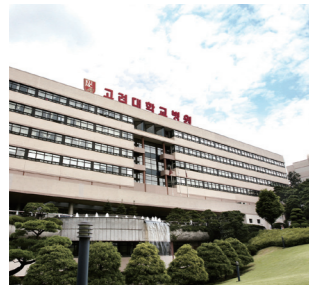
Support Programs	
Nurse program - Physician assistant	Heart transplant patient management team and facilities
Pain management program after surgery	Organ transplant survival data management
Nutrition program for cardiovascular surgery	One-stop service program for cardiovascular patients
Wound care and bed sore management program	Surgery and anesthesia control program for cardiovascular patients
Infection control program	Cardiovascular patients referral center
Sub-ICU (intensive care unit) operations	Outpatient care program for cardiovascular patients
Geriatric program - Elderly cardiac surgery	Medication Management program for cardiovascular patients
Cardiac rehabilitation program	Congenital heart disease center program

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	2	1	1	-	-	-	-
Coordinator	4	1	1	2	-	-	-
Medical form		Y	-	-	-	-	-
Information (leaflet)		Y	Y	Y	-	Y	Y
Signboard		Y	Y	-	-	-	-
Facilities for foreign patients	Facilities for religion						

* For inquiries: 82-2-2030-8361





Korea University Anam Hospital

- Address. (02841) 73, Incheon-ro, Seongbuk-gu, Seoul, Korea
- Homepage. <http://anam.kumc.or.kr/language/ENG/main/index.do>
- Telephone. 82-2-920-5677

Korea University Anam Hospital has grown to be the leading medical center in South Korea by providing the most advanced medical technology and excellence in patient-center care. We are committed to offer the most personalized and safe treatment plans for our patients, therefore, receiving accreditation by the International Joint Commission JCI certification and FERCAP which are the international certifications in the field of medical research.

• Tertiary Care Teaching Hospital (Established in 1938)	• 40 Departments and 22 Centers
• Number of Patients (2013). 90,388 (Inpatients 42,119)*	• 1,051 Beds
• 605 Doctors (258 Specialists)	• Cardiovascular Center
• 832 Nurses and 738 Staffs	• International Healthcare Center

* Excluded number of re-visited/re-admitted patients

Cardiovascular center has the highest level in Asia. We introduced radiofrequency catheter ablation for chronic atrial fibrillation therapy for the first time in Korea and do the most angiography. The best specialized radiologists are in charge of the diagnosis and treatment. In addition, we are leading the world research and therapy of cardiovascular disease.

• 27 Doctors (13 Specialists)	• 2 Departments
• 26 Nurses and 19 Staffs	• 20 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (cardiothoracic surgery) Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	X-ray unit Angiographic system

Technology & Devices	
Percutaneous mitral commissurotomy	
Transcatheter aortic valve implantation	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	
Catheter ablation of cardiac arrhythmia	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bedsore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Heart transplant patient management team and facilities	Medication management program for cardiovascular patients
Organ transplant survival sata management	Pacemaker center program

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	2	-	1	1	-	-	-
Coordinator	3	1	-	1	-	1	-
Medical form		Y	-	Y	-	Y	-
Information (leaflet)		Y	Y	Y	-	Y	-
Signboard		Y	-	-	-	-	-
Facilities for foreign patients	Treatment room, Rest area						

* For inquiries: 82-2-920- (English 5677, Mongolian 6795, Russian 6960, Chinese 6920)

Medical Procedures and Process for treatment

Cardiac Surgery

- Ventricular assist device
 - Heart transplantation
- ↓ Evaluation of pre- cardiac surgery
 - ↓ Post operative ICU care
 - ↓ Post operative general ward care
 - ↓ Long term follow up

• Short-term mechanical unloading with left ventricular assist devices after acute myocardial infarction conserves calcium cycling and improves heart function, Wei X, Li T, Hagen B, Zhang P, Sanchez PG, Williams K, Li S, Bianchi G, Son HS, Wu C, DeFilippi C, Xu K, Lederer WJ, Wu ZJ, Griffith BP., JACC Cardiovasc Interv. 2013 Apr;6 (4):406-15

• Pre-clinical evaluation of the infant Jarvik 2000 heart in a neonate piglet model. Wei X, Li T, Li S, Son HS, Sanchez PG, Niu S, Watkins AC, DeFilippi C, Jarvik R, Wu ZJ, Griffith BP. J Heart Lung Transplant. 2013 Jan;32 (1):112-9



Cardiology

- Coronary angiography
- Percutaneous coronary intervention
- Transcatheter aortic valve replacement
- Balloon valvuloplasty
- Thoracic endovascular aneurysm repair & Endovascular aneurysm repair
- Percutaneous transluminal angioplasty
- Left atrial appendage occlusion
- Percutaneous intracoronary mesenchymal stem cell transplantation
- Atrial septal defect device closure
- Device closure of patent foramen ovale
- Percutaneous mitral balloon valvuloplasty

- ↓ Chest pain clinic
- ↓ Preliminary basic exam
- ↓ Admission to 1-day care unit
- ↓ Coronary angiography
- ↓ Discharge from 1-day care unit

• A case of fistulous tracts from all coronary arteries to pulmonary trunk, right ventricle, left atrium, bronchial arteries and aorta, co-existing fistulas between bronchial arteries and pulmonary arteries. Jeong HS, Hong SJ, Park JH, Ahn CM, Yu CW, Lim DS. Int J Cardiol. 2014 Mar 1;172 (1):e62-5

• Telmisartan reduces neointima volume and pulse wave velocity 8 months after zotarolimus-eluting stent implantation in hypertensive type 2 diabetic patients. Hong SJ, Choi SC, Ahn CM, Park JH, Kim JS, Lim DS. Heart. 2011 Sep;97 (17):1425-32

• Cellular and molecular changes associated with inhibitory effect of pioglitazone on neointimal growth in patients with type 2 diabetes after zotarolimus-eluting stent implantation. Hong SJ, Kim ST, Kim TJ, Kim EO, Ahn CM, Park JH, Kim JS, Lee KM, Lim DS. Arterioscler Thromb Vasc Biol. 2010 Dec;30 (12):2655-65

• A case of fistulous tracts from all coronary arteries to pulmonary trunk, right ventricle, left atrium, bronchial arteries and aorta, co-existing fistulas between bronchial arteries and pulmonary arteries. Jeong HS, Hong SJ, Park JH, Ahn CM, Yu CW, Lim DS. Int J Cardiol. 2014 Mar 1;172 (1):e62-5

• Telmisartan reduces neointima volume and pulse wave velocity 8 months after zotarolimus-eluting stent implantation in hypertensive type 2 diabetic patients. Hong SJ, Choi SC, Ahn CM, Park JH, Kim JS, Lim DS. Heart. 2011 Sep;97 (17):1425-32

• Cellular and molecular changes associated with inhibitory effect of pioglitazone on neointimal growth in patients with type 2 diabetes after zotarolimus-eluting stent implantation. Hong SJ, Kim ST, Kim TJ, Kim EO, Ahn CM, Park JH, Kim JS, Lee KM, Lim DS. Arterioscler Thromb Vasc Biol. 2010 Dec;30 (12):2655-65

• Cardiovascular event rates in patients with ST-elevation myocardial infarction were lower with early increases in mobilization of Oct4 (high)Nanog (high) stem cells into the peripheral circulation during a 4-year follow-up. Yu CW, Choi SC, Hong SJ, Choi JH, Park CY, Kim JH, Park JH, Ahn CM, Lim DS. Int J Cardiol. 2013 Oct 3;168 (3):2533-9



Korea University Guro Hospital

- Address. (08308) 148, Gurodong-ro, Guro-gu, Seoul, Korea
- Homepage. <http://guro.kumc.or.kr/language/ENG>
- Telephone. 82-2-1577-9966

Since its opening in 1983, **Korea University Guro Hospital** has played a central role in the Korean medicine. Now it is trying to take off toward a medical institution with global competitiveness. The Hospital provides the best quality medical service through specialized centers. Guro Hospital will make utmost efforts to be a medical hub in Northeast Asia by implementing its master plan which includes the stronger industrial-academic cooperation network, connection with knowledge-based industry, addition of medical science research center and outpatient center, establishment of specialized international hospital, and creation of global medical network.

- Tertiary Care Teaching Hospital (Established in 1983)
- Number of Patients (2013). (Inpatients -)
- 423 Doctors (234 Specialists)
- 865 Nurses and 742 Staffs
- 24 Departments and 19 Centers
- 1,057 Beds
- Cardiovascular Center

Cardiovascular Center is devoted to patient care and treatment in collaboration with various departments such as Cardiology, Thoracic & Cardiovascular Surgery, Pediatric Cardiology, Cardioanesthesia and Cardioradiology. Since cardiologicallabs are equipped with the latest equipments, it aims to provide world-class medical service. It also invested heavily in research and education in order to foster competitive, talented medical professionals. The Center makes every effort to accurately diagnose cardiovascular diseases and accordingly perform interventional treatment using the state-of-the-art angiography to provide specialized and systemic treatment for patients with non-vascular diseases, heart problems and vascular diseases. When the interventional surgery is not adopted, the state-of-the-art surgical techniques are used even when conventional surgery cannot be applied, since they reduce cost and shorten time to recover. In the case of children with heart problems, the experienced medical professionals provide an accurate and early diagnosis and treatments using sophisticated equipments. The Cardiovascular Center allows us to promptly respond to patients and provide emergency treatment. The center aims to create a hospital that serves the local community and places the national health first.

- 17 Doctors (12 Specialists)
- 33 Nurses and Staffs
- 7 Departments
- 38 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	
Separate ECMO room	
Bloodless surgery	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)



Cardiac catheterization and angiography	CINE angio imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program – Physician assistant	Organ transplant survival data management
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bed sore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication management program for cardiovascular patients
Geriatric program – Elderly cardiac surgery	Congenital heart disease center program
Cardiac rehabilitation program	Pacemaker center program
Heart transplant patient management team and facilities	

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	-	-	-	-	-	-	-
Coordinator	-	-	-	-	-	-	-
Medical form	-	-	-	-	-	-	-
Information (leaflet)	-	-	-	-	-	-	-
Signboard	-	-	-	-	-	-	-
Facilities for foreign patients							

* For inquiries: 82-2-1577-9966

Medical Procedures and Process for treatment

Pediatric Cardiac Surgery and Cardiology

- Cardiac catheterization
- Transcatheter closure of congenital heart disease

Cardiology

- Coronary Artery Intervention
- Peripheral Artery Intervention
- Aortic Intervention



Kyungpook National University Hospital

- Address. (41944) 130, Dongdeok-ro, Jung-gu, Daegu, Korea
- Homepage. <http://eng.knuh.kr/main/>
- Telephone. 82-53-200-5053

Kyungpook National University Hospital opened as Daegu Dong-in medical center in 1907 when the modernization of our country begun, and has a history of over 100 years. Since it started as a corporation in 1993, the hospital endeavors to build the optimal hospital environment through the hospital environment modification business (remodeling), Chil-gok Kyungpook National University Hospital, establishment of children's hospital, Kyung-buk National University Dental Hospital transfer and reconstruction, and introduction of the newest medical equipments in an effort to be reborn as a world-wide superb hospital on the basis of the past 100 years' history. In addition, it offers the medical service since it was appointed as the cancer center in Daegu-Kyungbuk area and health medical center for the elderly from the Ministry of Health & Welfare in 2005. In 2006, the hospital was selected as the regional clinical test center and medical equipment clinical test center appointed by the Ministry of Health to upgrade the quality of medical service in order for the patients to get high-quality medical service. Now in 2010, the average number of out-patients are about 4,000 and daily average number of hospital staffs reach to about 900 (including the emergency room), making it as the foothold among our regional medical facilities.

- Tertiary Care Teaching Hospital (Established in 1910)
- Number of Patients (2013) 941,983 (Inpatients 30,582)*
- 674 Doctors (320 Specialists)
- 660 Nurses and 743 Staffs
- 25 Departments
- 934 Beds
- Children's Hospital, Cardiovascular Center

* Excluded number of re-visited/re-admitted patients

Assigned as a **children's hospital** business organization by the Ministry of health and welfare, it was constructed for severe rare diseases, handicapped children, extensive research on children's disease and health promotion.

- 27 Doctors (11 Specialists)
- 68 Nurses and 7 Staffs
- 7 Departments
- 91 Beds

Since it was appointed as a community based **cardiovascular center** from the Ministry of Health & Welfare and Korea center for Disease Control and Prevention in 2008, Daegu-Kyungbuk community based cardiovascular center which is composed of the cardiovascular center in charge of the treatment, rehabilitation, and prevention of cardiovascular diseases such as acute myocardial infarction and stroke, cerebrovascular center, cardiac cerebrovascular rehabilitation center, and preventive care center is opened as of December, 2009.

- 23 Doctors (15 Specialists)
- 42 Nurses and 11 Staffs
- 3 Departments
- 42 Beds



Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (cardiothoracic surgery) Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	Da Vinci robot (robotic surgery system)
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	
Percutaneous coronary intervention	Pressure wire monitor
Peripheral vascular intervention	Coronary care unit
Percutaneous mitral commissurotomy	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program – Physician assistant	Organ transplant survival data management
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bedsore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication management program for cardiovascular patients
Cardiac rehabilitation program	

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	5	2	1	-	-	-	2
Coordinator	-	-	-	-	-	-	-
Medical form		-	-	-	-	-	-
Information (leaflet)		-	-	-	-	-	-
Signboard		-	-	-	-	-	-
Facilities for foreign patients							

* For inquiries: 82-53-200-5053

Medical Procedures and Process for treatment

Cardiology

Cardiology

- Percutaneous coronary intervention
 - ↓ Critical pathway
 - ↓ Rapid team approach process for patients with cardiac arrest
 - ↓ Group education
 - ↓ Man-to-man education program
 - ↓ Cardiac rehabilitation program
 - ↓ Telephone-contact program

- Intravascular ultrasound guided recanalization of stumpless chronic total occlusion. Park Y, Park HS, Jang GL, Lee DY, Lee H, Lee JH, Kang HJ, Yang DH, Cho Y, Chae SC, Jun JE, Park WH. Int J Cardiol. 2011 Apr 14;148 (2):174-8.
- Suboptimal use of evidence-based medical therapy in patients with acute myocardial infarction from the Korea Acute Myocardial Infarction Registry: prescription rate, predictors, and prognostic value. Lee JH, Yang DH, Park HS, Cho Y, Jeong MH, Kim YJ, Kim KS, Hur SH, Seong IW, Hong TJ, Cho MC, Kim CJ, Jun JE, Park WH, Chae SC; Korea Acute Myocardial Infarction Registry Investigators. Am Heart J. 2010 Jun;159 (6):1012-9.
- Prognostic Value of Early Acute Kidney Injury After Primary Percutaneous Coronary Intervention in Patients With ST-Segment Elevation Myocardial Infarction. Kim JH, Lee JH, Jang SY, Park SH, Bae MH, Yang DH, Park HS, Cho Y, Chae SC. Am J Cardiol. 2014 Oct 15;114 (8):1174-8.
- Predictors of six-month major adverse cardiac events in 30-day survivors after acute myocardial infarction (from the Korea Acute Myocardial Infarction Registry). Lee JH, Park HS, Chae SC, Cho Y, Yang DH, Jeong MH, Kim YJ, Kim KS, Hur SH, Seong IW, Hong TJ, Cho MC, Kim CJ, Jun JE, Park WH; Korea Acute Myocardial Infarction Registry Investigators. Am J Cardiol. 2009 Jul 15;104 (2):182-9.



WHY?

WHAT?

HOW?

WHERE?



Pusan National University Yangsan Hospital

- Address. (50612) 20, Geumo-ro, Mulgeum-eup, Yangsan-si, Gyeongsangnam-do, Korea
- Homepage. <http://www.pnuyh.co.kr>
- Telephone. 82-55-360-2011

Pusan National University Yangsan Hospital is the largest nation's medical complex consisting of University Hospital, Children's Hospital, Rehabilitation Hospital, Neurology Center Korean Medicine Hospital, and Dental Hospital which were established as each specialized hospital in independent type in 2008. The hospital provides the best medical service with the infrastructure for treatment such as excellent medical staff and Electronic System for Total Care (YES), PACS, logistics automation system, etc. It has been acknowledged as "the most safest hospital in the world" through the JCI (Joint Commission International) accreditation in 2010 and reaccreditation in 2013 and operated with 11 specialized centers like Cardiovascular Center, Transplantation Center, International Health Care Center, and 23 specialized clinics.

In addition, systemic and effective infrastructure for research and research support have been built through the cooperation with Pusan National University Yangsan Campus, H.W Biomedical Research Institute and a venture company. Therefore, the hospital has been recognized as a leader in the areas of medical education and research.

Public welfare is also increased by expanded medical supports for undeserved population through the medical service for doctorless village and for patients in developing countries.

- Tertiary Care Teaching Hospital (Established in 2008)
- Number of Patients (2013).564,199 (Inpatients 304,568)*
- 226 Doctors (223 Specialists)
- 1,056 Nurses and 486 Staffs
- 25 Departments and 11 Centers
- 1,238 Beds
- Children's Hospital, Cardiovascular Center
- International Healthcare Center

* Included number of re-visited/re-admitted patients

Children's Hospital, which was built as the second Children's hospital in Yeongnam region and a specialized hospital for Pediatric diseases, provides systematic and high-quality medical service by Total Care-System which can perform all consultations and treatment for children. It is made up of Pediatric Cardiac Center and 20 specialized clinics such as Pediatric Gastroenterology Clinic and improves the synergic effect through psychological and emotional stability by operating "hospital school" for students who can not keep school education due to long hospitalization.

- 22 Doctors (22 Specialists)
- 173 Nurses and 15 Staffs
- 12 Departments
- 219 Beds

Cardiovascular center is a Korea's representative center which leads cardiovascular medical treatment and research in Korea. We have professional skills and knowledge of cardiovascular disease and the latest medical facilities as well. We do our utmost to provide the best medical service by choosing the most effective way of medical care according to professional collaboration of cardiology, thoracic surgery and radiology departments.

- 11 Doctors (11 Specialists)
- 13 Nurses and 8 Staffs
- 2 Departments
- 5 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (cardiothoracic surgery) Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Hybrid	Angio suite (angiography)
Heart and lung transplant	Transplant team Separate aseptic room
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	
Peripheral vascular intervention	
Percutaneous mitral commissurotomy	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	
Renal denervation	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	One-stop service program for cardiovascular patients
Wound care and bedsore management program	Surgery and anesthesia control program for cardiovascular patients
Infection control program	Cardiovascular patients referral center
Sub-ICU (intensive care unit) operations	Outpatient care program for cardiovascular patients
Cardiac rehabilitation program	Medication Management program for cardiovascular patients
Heart transplant patient management team and facilities	Congenital heart disease center program

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	13	2	1	9	-	1	-
Coordinator	5	2	-	3	-	-	-
Medical form		-	-	-	-	-	-
Information (leaflet)		Y	Y	Y	-	-	-
Signboard		Y	Y	Y	-	-	-
Facilities for foreign patients	Treatment rooms (2 rooms), Rest area						

* For inquiries: 82-55-360-2010~2017 (hyeyoung@pnuyh.co.kr)



Medical Procedures and Process for treatment

Pediatric Cardiac Surgery and Cardiology

- Operation for HLHS or variants
- TOF and RVOTO repair
- Aortic arch repair
- Diagnostic radiology and other cases

- Temporary fenestration using venoatrial extracorporeal membrane oxygenation after the Fontan operation. Chang YH, Kim H, Sung SC, Lee HD. Ann Thorac Surg. 2012 Jun;93 (6):2068-9. doi: 10.1016/j.athoracsur.2011.11.020.
- A new simplified technique for making tricuspid expanded polytetrafluoroethylene valved conduit for right ventricular outflow reconstruction. Kim H, Sung SC, Chang YH, Lee HD, Park JA. Ann Thorac Surg. 2013 May;95 (5):e131-3. doi: 10.1016/j.athoracsur.2012.12.047.
- Early and midterm outcomes of left pulmonary artery angioplasty using an anterior wall flap of the main pulmonary artery in tetralogy of Fallot repair. Kim H, Sung SC, Chang YH, Lee HD, Park JA. J Thorac Cardiovasc Surg. 2013 Dec 9. pii: S0022-5223 (13)01290-7. doi: 10.1016/j.jtcvs.2013.10.060
- Anterior translocation of the right pulmonary artery for relief of airway compression in the repair of distal aortopulmonary window and interrupted aortic arch. Chang YH, Sung SC, Kim H, Lee HD. Ann Thorac Surg. 2012 Jun;93 (6):e159-61. doi: 10.1016/j.athoracsur.2011.12.027.
- Anterior translocation of the right pulmonary artery to avoid airway compression in aortic arch repair. Chang YH, Sung SC, Kim H, Choo KS, Lee HD, Park JA. Ann Thorac Surg. 2013 Dec;96 (6):2198-202. doi: 10.1016/j.athoracsur.2013.06.079. Epub 2013 Sep 10.

Cardiac Surgery

- Minimally invasive cardiac surgical procedure

- Minimally invasive cardiac surgical procedure in a patient with breast implants by use of a fibrous capsule preservation method Je HG, Kang PJ, Lee SK. Ann Thorac Surg. 2014 May;97 (5):e143-4.

Cardiology

- Percutaneous transcatheter intervention
- Endovascular aortic aneurysm repair
- Atrial septal defect closure
- Percutaneous mitral valvuloplasty

- Characteristic Findings of Coronary Artery Disease in Kawasaki Disease, KIM, Jeong Su, et al., Journal of the American College of Cardiology, 2011, 57.7: 884-884.
- Pressure-wire based assessment of microvascular resistance using calibrated upstream balloon obstruction, KIM, June-Hong, et al., Catheterization and Cardiovascular Interventions, 2012, 80.4: 581-589.
- Effects of trimetazidine in patients with acute myocardial infarction: data from the Korean Acute Myocardial Infarction Registry, KIM, Jeong Su, et al., Clinical Research in Cardiology, 2013, 102.12: 915-922.



Samsung Medical Center

- Address. (06315) 81, Irwon-Ro, Gangnam-Gu, Seoul, Korea
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- Telephone. 82-2-3410-0200

Samsung Medical Center was built on 148,500m plot of land in iron-dong, Gangnam-gu, Seoul in 1994; consists of the main building (20 stories above ground and 5 basements), the wing (8 stories above ground and 4 basements), and Samsung Comprehensive Cancer Center (11 stories above ground and 8 basements). SMC is equipped with a total of 1979 beds, 24 departments, 31 specialized centers, and 120 specialized clinics. It is an advanced general hospital with 7,500 staff members, including 1,371 doctors and 2,581 nurses. Since SMC was opened in 1994, SMC has become a Korea's representative medical institution. It has provided medical treatments for 16million outpatients, and 800 thousand inpatients, and SMC is giving treatments to an average of 8,000 patients daily.

- Tertiary Care Teaching Hospital (Established in 1994)
- Number of Patients (2013). 579,511 (Inpatients 79,511)*
- 1,371 Doctors (779 Specialists)
- 2,581 Nurses and 3,948 Staffs
- 24 Departments and 31 Centers
- 1,979 Beds and 19 Beds for only foreign patients
- Cardiovascular Center
- International Healthcare Center

* Excluded number of re-visited/re-admitted patients

Heart Vascular Stroke Institue (HVSI) is organized into the Cardiac Center, Stroke Center, Vascular Center, Imaging Center, Prevention and Rehabilitation Center, Management Support Office, Synergic Strategy Office, and External Cooperation Office. In creating the HVSI, we moved away from the traditional department model, instead we created an integrated system that brings together internal medicine, general surgery, radiology, intensive care, and pediatrics.

The goal of the HVSI is to ensure our patients have strong hearts, clean vessels, and happy brains for as long as possible. We are also dedicated to create a world-class hospital by focusing on patient satisfaction and medical innovation through cutting-edge integrated treatment and convergence research in the future.

We are moving forward on four strategic goals : aiming for top-class standardized treatment while making a patient-centric system, treating severe diseases in an integrated way, introducing up-to-date techniques and treatment methods, and training cardiac and cerebrovascular experts while reinforcing domestic partnerships. We are also working hard to reinforce our partnership with the Mayo Clinic in the United States, which has been working on this process for a long time.

- 100 Doctors (51 Specialists)
- 220 Nurses and 66 Staffs
- 5 Departments
- 209 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment



Chest pain unit in ER	
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	
Heart and lung transplant	Transplant team Separate aseptic room
Cardiac catheterization and angiography	
Intravascular imaging	
Percutaneous coronary intervention	
Peripheral vascular intervention	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program – Physician assistant	Surgery and anesthesia control program for cardiovascular patients
Pain management program after surgery	Cardiovascular patients referral center
Nutrition program for cardiovascular surgery	Outpatient care program for cardiovascular patients
Wound care and bed sore management program	Medication management program for cardiovascular patients
Infection control program	Congenital heart disease center program
Sub-ICU (intensive care unit) operations	Pacemaker center program
Cardiac rehabilitation program	One-call system of cardiac centers
Heart transplant patient management team and facilities	24 hours hot line in aortic team
One-stop service program for cardiovascular patients	One-day treatment system of cardiovascular imaging center

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator/Coordinator	15	8	1	2	2	1	1
Medical form		Y	-	-	-	-	-
Information (leaflet)		Y	Y	Y	Y	Y	Y
Signboard		Y	-	-	-	-	-
Facilities for foreign patients	Inpatient ward (19 rooms), Treatment rooms (4 rooms), Rest area, Prayer rooms						

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Medical Procedures and Process for treatment

Pediatric Cardiac Surgery and Cardiology

- VSD repair
- ASD repair
- TOF repair
- Complete AVSD repair
- Arterial switch operation
- Fontan operation
- Coa/iaa repair
- Congenital heart intervention (Device closure, Balloon valvuloplasty, Stent)

- Clinical implications of serial serum N-terminal prohormone brain natriuretic peptide levels in the prediction of outcome in children with dilated cardiomyopathy, American Journal of Cardiology, 2013, 112 (9):1455-1460
- The use of a self-expandable stent with a self-expandable stent graft in a Fontan baffle, CARDIOLOGY IN THE YOUNG, 2013, 23 (1):125-128
- Interstage mortality for functional single ventricle with heterotaxy syndrome: a retrospective study of the clinical experience of a single tertiary center, JOURNAL OF CARDIOTHORACIC SURGERY, 2013, 8:93-100
- Outcome of transcatheter closure of oval shaped atrial septal defect with amplatzer septal occluder, Yonsei University College of Medicine, 2013, 54 (5):1104-1109
- Device size for transcatheter closure of ovoid interatrial septal defect, Forum Multimedia Pub, 2013, 16 (4):E193-E197
- Fragmented QRS Complex in Adult Patients With Ebstein Anomaly and Its Association With Arrhythmic Risk and the Severity of the Anomaly 허준, CIRCULATION-ARRHYTHMIA AND ELECTROPHYSIOLOGY, 2013, 6 (6):1148-1155
- Predictors and clinical impact of inappropriate implantable cardioverter-defibrillator shocks in Korean patients, JOURNAL OF KOREAN MEDICAL SCIENCE, 2012, 27 (6):619-624

Cardiac Surgery

- Coronary artery bypass graft
- Tricuspid valve operation
- Mitral valve operation
- Aortic valve operation
- Ascending aorta aneurysm operation
- Aorta arch aneurysm operation
- Descending thoracic aorta aneurysm operation
- Abdominal aortic aneurysm operation
- Thoracoabdominal aortic aneurysm operation

- Long-term hemodynamic performance of ATS valves in the aortic position-impact on the progression of late tricuspid regurgitation. J Heart Valve Dis, 2013, Vol.22, No.6
- Tricuspid Reoperation After Left-Sided Rheumatic Valve Operations. Ann Thorac Surg., 2013, Vol.95, No6
- Revascularization in left main coronary artery disease: comparison of off-pump coronary artery bypass grafting vs percutaneous coronary, Eur J Cardiothorac Surg, 2013, Vol.44, No. 4
- Revascularization for the right coronary artery territory in off-pump coronary artery bypass surgery. Ann Thorac Surg., 2013, Vol.96, No.3
- Long-term outcomes of drug-eluting stent implantation versus coronary artery bypass grafting for patients with coronary artery disease and chronic left ventricular systolic dysfunction. Am J Cardiol., 2013, Vol.112, No.5
- Long-term hemodynamic performance of bileaflet prostheses versus tilting-disc prostheses in the aortic position, International journal of cardiology, 2013, Vol.166, No. 3
- Graft Selection for the Right Coronary Artery Territory in Off Pump Coronary Artery Bypass, Thoracic and Cardiovascular Surgeon, 2012, Vol.60/No7

Cardiology

- Acute myocardial infarction
- Angina pectoris
- Aortic disease
- Carotid disease
- Peripheral arterial disease

- Frequency of Myocardial Infarction and Its Relationship to Angiographic Collateral Flow in Territories Supplied by Chronically Occluded Coronary Arteries, Circulation, 2013, 127 (6):703-9
- Ischemic Postconditioning During Primary Percutaneous Coronary Intervention: The Effects of Postconditioning on Myocardial, Circulation, 2013, 128 (17):1889-96
- Predictors and Outcomes of Side Branch Occlusion After Main Vessel Stenting in Coronary Bifurcation Lesions: Results From the COBIS II Registry (COronary BIfurcation Stenting). J Am Coll Cardiol., 2013.62 (18):1654-9
- Takayasu Arteritis: Assessment of Coronary Arterial Abnormalities with 128-Section Dual-Source CT Angiography of the Coronary Arteries and Aorta. Radiology., 2013, 270 (1):74-81
- Hemodynamic patterns for symptomatic presentations of severe aortic stenosis. JACC Cardiovasc Imaging., 2013, 6 (2):137-46
- Percutaneous Coronary Intervention for Nonculprit Vessels in Cardiogenic Shock Complicating ST-Segment Elevation Acute Myocardial Infarction, Crit Care Med., 2013, 42 (1):17-25
- Fragmented QRS Complex in Adult Patients With Ebstein Anomaly and Its Association With Arrhythmic Risk and the Severity of the Anomaly. Circ Arrhythm Electrophysiol., 2013, 6 (6):1148-55



Sejong General Hospital

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- Homepage. <http://en.sejongh.co.kr>
- Telephone. 82-32-340-1468

Sejong General Hospital was founded in 1982 as a Heart Hospital with the state-of-the-art equipments and facilities and has focused on heart disease more than 32 years. As a result, Sejong General Hospital was authorized as a heart disease specialty hospital in 1989 by the Ministry of Health and Welfare, and was nominated as a cardiovascular hospital in Korea in 2005, 2008, 2011. Until 2015 Oct, We have achieved a Coronaryangiography 64,000th cases and a open heart surgery 32,000th cases. Since 1989 children with congenital heart disease from China, Vietnam, Russia, Papua New Guinea, Mongol, Uzbekistan, and Nepal have been successfully treated surgically and have been giving them new lives. (1,210th cases until 2015 Oct.) Also quite a few medical doctors from abroad China and Russia and etc., have received training at Sejong General Hospital. Sejong General Hospital, now a JCI accredited hospital, is recognized as heart specialty hospital with international standards. With 2 years of preparation, Sejong General Hospital has achieved JCI. Accreditation without any delay in Nov 2011 and Nov 2014. With our world-class medical technology and efforts in research and clinical activities, we would like to repeat our commitment to contribute to the improvement of the medical communities in Asia as well as in Korea.

- * More than 1,300 cases of heart disease surgeries every year
- * More than 4,400 cases of interventions and angiographies every year
- * Patients from world wide (more than 24 countries)

- | | |
|--|--|
| • General Hospital (Established in 1981) | • 25 Departments and 8 Centers |
| • Number of Patients (2013) (Inpatients) | • 328 Beds and 15 Beds for only foreign patients |
| • 101 Doctors (66 Specialists) | • Children's Hospital, Cardiovascular Center |
| • 404 Nurses and 219 Staffs | • International Healthcare Center |

The Pediatric Cardiology Department of Sejong General Hospital diagnoses and treats various diseases of newborn infants to adolescents, providing consultation, vaccination, physical examination, etc. The department covers not just all types of congenital and acquired heart diseases, such as Kawasaki disease, valvular disease and myocarditis, but also juvenile arrhythmia, swooning, dizziness and chest pains.

- | | |
|-----------------------------|----------------|
| • 9 Doctors (6 Specialists) | • 1 Department |
| • 35 Nurses and 21 Staffs | • 24 Beds |

Cardiovascular Center of Sejong General Hospital is comprised of Cardiology Division, Pediatrics Division, Thoracic Surgery Division, Radiology Division, and Anesthesiology Division, and we have a prompt treatment system capable of conducting emergency treatment with professional medical staff through the organic and joint treatment in case we have heart patients. We are boastful of the best capacity as the exclusive hospital for cardiovascular disease. We are putting all-out efforts to achieve the best results through advanced medical equipment, and the team based patient management of the diagnose division and treatment division. We have intensive care units equipped with the latest medical equipment for patients that receive heart operation and where specialists stand by for 24 hours, devoting themselves to the treatment of patients, and we cure congenital heart disease and myocardial infarction, valve disease, and aneurysm of the aorta.

- | | |
|-------------------------------|-----------------|
| • 59 Doctors (25 Specialists) | • 5 Departments |
| • 84 Nurses and 38 Staffs | • 172 Beds |

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (cardiothoracic surgery) IABP Support
ECMO Support	IABP (balloon pump)
Endovascular procedure	EBS or PLS (ECMO equipment)
Robotic cardiac surgery	
Hybrid	Angio suite (angiography)
Heart and lung transplant	Transplant team
Heart and lung transplant	Separate aseptic room
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Pressure wire monitor
Percutaneous coronary intervention	Coronary care unit
Rotational atherectomy	
Peripheral vascular intervention	
Percutaneous mitral commissurotomy	
Transcatheter aortic valve implantation	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	Heart transplant patient management team and facilities
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bed sore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication management program for cardiovascular patients
Geriatric program - Elderly cardiac surgery	Congenital heart disease center program
Cardiac rehabilitation program	Pacemaker center program

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	11	3	-	6	-	3	-
Coordinator	8	2	-	5	-	1	-
Medical form		Y	Y	Y	-	Y	-
Information (leaflet)		Y	Y	Y	Y	Y	-
Signboard		Y	Y	Y	-	Y	-
Facilities for foreign patients	Inpatient ward, Treatment rooms, Rest area, Facilities for religion						

* For inquiries: 82-32-340-1468, 1469



Medical Procedures and Process for treatment

Pediatric Cardiac Surgery and Cardiology

- VSD repair
 - Atrial septal defect (ASD)
 - TOF repair
 - Complete AVSD repair
 - Arterial switch operation
 - Fontan operation
 - CoA/IAA repair
 - Device closure
 - Percutaneous transluminal angioplasty
 - Stent
- ↓ Out patient clinic
 - ↓ Medical treatment
 - ↓ Echocardiography
 - ↓ Bone scan or CT
 - ↓ Procedures for hospitalization
 - ↓ NPO
 - ↓ Blood test
 - ↓ OP
 - ↓ Observation
 - ↓ Echocardiography
 - ↓ Discharge
 - ↓ F/U
 - ↓ Echocardiography after 6 month OP
 - ↓ Echocardiography after 2 year OP

- Surgical management of pulmonary atresia with ventricular septal defect: early total correction versus shunt, Ann Thorac Surg, 2011, 1928
- Does limited right ventriculotomy prevent right ventricular dilatation and dysfunction in patients who undergo transannular repair of tetralogy of Fallot? Matched comparison of magnetic resonance imaging parameters with conventional right ventriculotomy long-term after repair, J Thorac Cardiovasc Surg, 2014, 889
- Aortic root translocation with atrial switch: another surgical option for congenitally corrected transposition of the great arteries with isolated pulmonary stenosis, J Thorac Cardiovasc Surg, 2010, 1652

Cardiac Surgery

- Coronary artery bypass surgery
 - Coronary artery bypass surgery on pump
 - Tricuspid valve repair
 - Mitral valve operation
 - Aortic valve operation
 - Ascending aortic aneurysm
 - Thoracic aortic aneurysm
- ↓ Out patient clinic
 - ↓ Medical treatment
 - ↓ Echo, TMT, CT, Lab, Bone scan, Cardiac MRI, Brain MRI Ect.
 - ↓ Procedures for hospitalization
 - ↓ Transfer to CS
 - ↓ NPO
 - ↓ Blood test
 - ↓ OP
 - ↓ Observation
 - ↓ Echocardiography
 - ↓ Discharge
 - ↓ F/U
 - ↓ Echocardiography after 6 month OP
 - ↓ Echocardiography after 2 year OP

- The detection of pulmonary embolisms after a coronary artery bypass graft surgery by the use of 64-slice multidetector CT, Int J Cardiovasc Imaging, 2011, 639
- Long-term results after mitral valve repair in children, Eur J Cardiothorac Surg, 2010, 267
- Histopathologic analysis of atrial tissue in patients with atrial fibrillation: comparison between patients with atrial septal defect and patients with mitral valvular heart disease, Cardiovasc Pathol, 2014, 185

Cardiology

- Percutaneous coronary intervention
 - Mitral valve repair
 - PDA closure
 - ASD closure
- ↓ Out patient clinic
 - ↓ Medical treatment
 - ↓ Echo, TMT, CT, Lab, Bone scan, Cardiac MRI, Brain MRI Ect.
 - ↓ Procedures for hospitalization
 - ↓ NPO
 - ↓ Blood test
 - ↓ Procedure
 - ↓ Observation
 - ↓ Discharge
 - ↓ F/U
 - ↓ CT or Echo

- Long-term safety and efficacy of sirolimus-vs. paclitaxel-eluting stent implantation for acute ST-elevation myocardial infarction: 3-year follow-up of the PROSIT trial, Int J Cardiol, 2011, 253
- Large false lumen area is a predictor of failed false lumen volume reduction after stent-graft repair in type B aortic dissection, J Endovasc Ther 2014, 697
- Postclose technique for large sheath arterial access using perclose (TM) in emergency endovascular repair, Cathet Cardiovasc Interven 2014, 1176





Seoul National University Bundang Hospital

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- Homepage. <http://www.snubh.org/dh/en>
- Telephone. 82-31-787-2034

Seoul National University Bundang Hospital, which opened in 2003 as the most modern digitalized-health care institution of 21st century in Korea, succeeded the legacy and the 130 years' tradition of prestige and obligation of the Seoul National University Medical school as the central figure in the health care in Korea. Since its opening, Seoul National University Bundang Hospital has established itself as a national and international leader by providing top class medical care in virtually every area of medicine and has been the site of breakthrough research and education.

- Tertiary Care Teaching Hospital (Established in 2003)
- Number of Patients (2013). 332,050 (Inpatients 55,032)*
- 752 Doctors (430 Specialists)
- 1,320 Nurses and 2,275 Staffs
- 33 Departments and 9 Centers
- 1,134 Beds and 5 Beds for only foreign patients
- Heart Institute
- International Healthcare Center

* Excluded number of re-visited/re-admitted patients

Cardiovascular Center at Seoul National University offers top quality medical service to patients and effectively treat heart and vascular diseases that has been brought on by westernized lifestyle patterns. The cardiovascular center brings together physicians from department of cardiology, thoracic and cardiovascular surgery and specialists from other departments of medicine to deliver one-stop medical service to the patients.

- 31 Doctors (9 Specialists)
- 199 Nurses and 55 Staffs
- 4 Departments
- 84 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (cardiothoracic surgery)
	Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	Da Vinci robot (robotic surgery system)
Hybrid OR	Angio suite (angiography)

Technology & Devices	
Heart and lung transplant	Transplant team
	Separate aseptic room
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	Rotablator
Percutaneous mitral commissurotomy	
Transcatheter aortic valve implantation	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	Organ transplant survival data management
Nutrition program for cardiovascular surgery	One-stop service program for cardiovascular patients
Wound care and bed sore management program	Surgery and anesthesia control program for cardiovascular patients
Infection control program	Cardiovascular patients referral center
Sub-ICU (intensive care unit) operations	Outpatient care program for cardiovascular patients
Geriatric program - Elderly cardiac surgery	Medication Management program for cardiovascular patients
Cardiac rehabilitation program	Congenital heart disease center program
Heart transplant patient management team and facilities	Pacemaker center program

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	1	1	-	-	-	-	-
Coordinator	9	3	-	3	2	1	-
Medical form		Y	-	Y	Y	-	-
Information (leaflet)		Y	Y	Y	Y	Y	Y
Signboard		Y	-	-	-	-	-
Facilities for foreign patients	Inpatient ward (5 rooms), Treatment room (3 rooms), Rest area, Facilities for religion						

* For inquiries: 82-31-787-2034 (ihsi@snubh.org)

Medical Procedures and Process for treatment

Cardiac Surgery

- Coronary Artery Bypass Surgery (CABG) ↓ Out-Patient Clinic interview
- OPCAB (Off-Pump CABG) ↓ In-Patient consultation
- Ascending aorta replacement ↓ Admission or Transfer
- Total or Partial arch replacement ↓ Preoperative work-up
- Descending thoracic aortic replacement ↓ Consultation of surgery
- Abdominal aortic replacement ↓ Emergency surgery
- Thoracoabdominal aortic replacement ↓ Cardiovascular anesthesia
- ↓ Cardiovascular surgery
- ↓ Cardiac intensive care
- ↓ Sub-ICU care
- ↓ Cardiac rehabilitation
- ↓ Discharge education
- ↓ OPD Follow up

- Intramyocardial transfer of hepatocyte growth factor as an adjunct to CABG: phase I clinical study. Kim JS, Hwang HY, Cho KR, Park EA, Lee W, Paeng JC, et al. Gene therapy. 2012 ; P:5
- Coronary artery bypass grafting versus drug-eluting stent implantation for left main coronary artery disease (from a two-center registry). Kang SH, Park KH, Choi DJ, Park KW, Chung WY, Lim C, et al. The American journal of cardiology. 2010 ; P:8
- Subclinical Hypothyroidism Might Increase the Risk of Transient Atrial Fibrillation After Coronary Artery Bypass Grafting. Park YJ, Yoon JW, Kim KI, et al. Ann Thorac Surg. 2009;P:6
- Midterm Change of Descending Aortic False Lumen After Repair of Acute Type I Dissection. Park KH, Lim C, Choi JH, Chung E, Choi SI, Chun EJ, et al. The Annals of thoracic surgery. 2009; P:5

Cardiology

- Percutaneous coronary intervention ↓ CAG – 2 night 3 days (Coronary Angiography)
- PMV (Percutaneous Mitral Valvuloplasty) ↓ CAG – 1 night 2 days (Coronary Angiography)
- TEVAR (Thoracic Endovascular Aortic Repair) ↓ CAG – 1 day (Coronary Angiography)

- A randomized comparison of platinum chromium-based everolimus-eluting stents versus cobalt chromium-based Zotarolimus-Eluting stents in all-comers receiving percutaneous coronary intervention: HOST-ASSURE (harmonizing optimal strategy for treatment of coronary artery stenosis-safety & effectiveness of drug-eluting stents & anti-platelet regimen), a randomized, controlled, noninferiority trial. Park KW, Kang SH, Kang HJ, Koo BK, Park BE, Cha KS, Rhew JY, Jeon HK, Shin ES, Oh JH, Jeong MH, Kim S, Hwang KK, Yoon JH, Lee SY, Park TH, Moon KW, Kwon HM, Hur SH, Ryu JK, Lee BR, Park YW, Chae IH, Kim HS; HOST-ASSURE Investigators. J Am Coll Cardiol. 2014 Jul 1;63 (25 Pt A):2805-16. doi: 10.1016/j.jacc.2014.04.013. Epub 2014 May 7.
- Coronary artery stenosis in moyamoya disease: tissue characterization by 256-slice multi-detector CT and virtual histology. Lee JH, Youn TJ, Yoon YE, Park JJ, Hong SJ, Chun EJ, Choi SI, Cho YS, Cho GY, Chae IH, Choi DJ. Circulation. 2013 May 21;127 (20):2063-5. doi: 10.1161/CIRCULATIONAHA.112.136473
- Clinical and physiological outcomes of fractional flow reserve-guided percutaneous coronary intervention in patients with serial stenoses within one coronary artery. Kim HL, Koo BK, Nam CW, Doh JH, Kim JH, Yang HM, Park KW, Lee HY, Kang HJ, Cho YS, Youn TJ, Kim SH, Chae IH, Choi DJ, Kim HS, Oh BH, Park YB. JACC Cardiovasc Interv. 2012 Oct;5 (10):1013-8. doi: 10.1016/j.jcin.2012.06.017.
- Percutaneous intervention for ST-elevation myocardial infarction. Yoon CH, Chung WY, Suh JW, Cho YS, Youn TJ, Chun EJ, Choi SI, Chae IH, Choi DJ. Int J Cardiol. 2013 Sep 1;167 (5):2002-7. doi: 10.1016/j.ijcard.2012.05.029. Epub 2012 May 26.
- Potential predictors of side-branch occlusion in bifurcation lesions after percutaneous coronary intervention: a coronary CT angiography study. Park JJ, Chun EJ, Cho YS, Oh IY, Yoon CH, Suh JW, Choi SI, Youn TJ, Koo BK, Chae IH, Choi DJ. Radiology. 2014 Jun;271 (3):711-20. doi: 10.1148/radiol.14131959. Epub 2014 Feb 27.



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- Homepage. <http://snuh.org/english>
- Telephone. 82-2-2072-0505

Seoul National University Hospital (SNUH), as the founder of modern medicine and a nationally recognized hospital, has been the leader in comprehensive healthcare development in Korea over the past century.

Currently over 1,700 beds, SNUH includes the Main Hospital, Children's Hospital, Cancer Hospital, and Biomedical Research Institute. SNUH takes care of more than 8,600 outpatients per day and 1,700 hospitalized patients with the best medical care. In addition, SNUH is the most technologically advanced hospital and was the first in the nation to develop an electronic medical records system accredited by the Ministry of Health and Welfare. We offer One-Stop healthcare service for our patients and visitors to receive quality care in a safe and comfortable environment.

Above all, SNUH is an educational hospital that has been training medical doctors annually to become professionals in various fields of medicine. Hence, we focus on medical research and every year approximately 2,400 papers are published in the Science Citation Index (SCI) Journal, which is the one of the most authoritative journals in the world.

All 6,000 staff members at SNUH work tirelessly to treat each of our patients with high quality care and respect to promote healthy life styles.

- Tertiary Care Teaching Hospital (Established in 1978)
- Number of patients (2014). 2,829,865 (Inpatients 621,635)*
- 1,307 Doctors (798 Specialists)
- 1,837 Nurses and 2,805 Staffs
- 41 Departments and 35 Centers
- 1,782 Beds
- Children's Hospital, Cardiovascular Center
- International Healthcare Center

* Included number of re-visited/re-admitted patients

Seoul National University Children's Hospital (SNUCH) was opened as the only national pediatric hospital in Korea, focusing on special treatment for children's diseases. In 1985, SNUCH inaugurated as the first children's hospital in Korea. Now, SNUCH is the best and largest children's hospital in Korea.

SNUCH provides safe, bright, children friendly atmosphere which is equipped with brand new with state of the art facilities such as Pediatric Operating Theater, In-Hospital School. also, it has MRI and CT only for pediatric use.

Currently over 311 Beds, SNUCH includes Clinical Specialties of SNUCH such as Neonatal ICU, Pediatric Cancer Center, Pediatric Heart Center, Pediatric Neuroscience Center, Pediatric Orthopaedics, Pediatric Plastic Surgery, and Pediatric Ophthalmology.

SNUCH has educated and trained majority of professors in university hospitals of Korea.

Ninety-one residents of other institutes (2014) are visiting SNUCH as part of their training. also SNUCH has educated for students of medical, nursing and pharmacy schools of Seoul National University.

SNUCH is the first, best and largest children's hospital in Korea, providing world-class patient care, research, education, and services.

- 182 Doctors (79 Specialists)
- 382 Nurses and 250 Staffs
- 26 Departments
- 311 Beds including 60 ICU beds (PICU 20, NICU 40)

Experienced interventionists perform over 140,000 diagnostic procedures (including cardiac evaluation) and over 1,300 therapeutic procedures each year at the **CV (Cardiovascular) center**, including the use of intravascular ultrasound and pressure wires. The one-year mortality in our institution is less than 1% and the rate of target lesion failure (defined as cardiac death, myocardial infarction, and target lesion repeat procedure) is less than 5%, which is one of the best in the world.



- 41 Doctors (32 Specialists)
- 52 Nurses and 36 Staffs
- 5 Departments (Adult CV, Pediatric CV, CCU, 2 Heart wards)
- 56 Beds (8 CCU Beds, 36 Adult beds, 12 Pediatric beds)

One-stop Service

- Patient friendly reservation by telephone or e-mail
- Collaborative medical treatment by specialists
- Separate inpatient wards based on severity of medical condition (cardiovascular care unit, general cardiology ward)
- Continuous medication education during hospitalization and upon discharge
- Regular follow-up

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER (Adult)	Resident specialist (cardiothoracic surgery), Resident specialist (emergency medicine), Resident specialist (cardiology)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	Da Vinci robot (robotic surgery system)
Heart and lung transplant	Angio suite (angiography) Transplant team
Cardiac catheterization and angiography	Separate aseptic room
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	
Percutaneous mitral commissurotomy	
Transcatheter aortic valve implantation	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse program - Physician assistant	One-stop service program for cardiovascular patients
Pain management program after surgery	Surgery and anesthesia control program for cardiovascular patients
Nutrition program for cardiovascular surgery	Cardiovascular patients referral center
Wound care and bedsores management program	Outpatient care program for cardiovascular patients
Infection control program	Medication management program for cardiovascular patients
Sub-ICU (Intensive Care Unit) operations	Congenital heart disease center program
Cardiac rehabilitation program	Pacemaker center program
Heart transplant patient management team and facilities	Fetal cardiac program
Organ transplant survival data management	Adult cardiac clinic

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	others
Medical translator	-	-	-	-	-	-	-
Coordinator	14	6	1	2	1	2	Spanish 1 / French 1
Medical form		Y	-	-	-	-	-
Information (leaflet)		Y	Y	Y	Y	Y	-
Signboard		Y	Y	-	-	-	-
Facilities for foreign patients	Consultation rooms (2), Examination room (1), Lounge						

* For inquiries: 82-2-2072-0505 (international@snuh.org)

Medical Procedures and Process for treatment

Pediatric Cardiac Surgery and Cardiology

- Mini-volume priming in infants ≤ 5kg
 - Modified lecompte procedure
 - Total repair for tetralogy of fallot
 - Regional cerebral perfusion
 - Fontan conversion
 - Treatment for heart arrhythmia
 - Transcatheter heart defect treatment
- ↓ Echocardiography
 - ↓ Cardiac CT or MRI or Catherization
 - ↓ Cardiac operation or catheter intervention
 - ↓ Counseling after cardiac operation or catheter intervention
 - ↓ Outpatient follow-up

• Twenty-five years' experience of modified Lecompte procedure for the anomalies of ventriculoarterial connection with ventricular septal defect and pulmonary stenosis Hong-Gook Lim, Woong-Han Kim, Jeong Ryul Lee, and Yong Jin Kim Journal of Thoracic and Cardiovascular Surgery 2014;148:825-31

• Usefulness of Regional Cerebral Perfusion Combined With Coronary Perfusion During One-Stage Total Repair of Aortic Arch anomaly Hong-Gook Lim, Woong-Han Kim, Chun-Soo Park, Eui-Suk Chung, Chang-Ha Lee, Jeong Ryul Lee, Yong Jin Kim Annals of Thoracic Surgery 2010;90:50-7

• Changes of Brain Magnetic Resonance Imaging Findings After Congenital Aortic Arch Anomaly Repair Using Regional Cerebral Perfusion in Neonates and Young Infants Jae Gun Kwak, Woong-Han Kim, Jin Tae Kim, In-One Kim, Jong-Hee Chae annals of thoracic surgery 2010;90:1996-2000

• Clinical Spectrum and Prognostic Factors of Pediatric Ventricular Tachycardia. Song MK, Baek JS, Kwon BS, Kim GB, Bae EJ, Noh CI, Choi JY. . Circ J. 2010 Sep;74 (9):1951-8

• Septal Dyskinesia and Global Left Ventricular Dysfunction in Pediatric Wolff-Parkinson-White Syndrome with Septal Accessory Pathway. Kwon BS, Bae EJ, Kim GB, Noh CI, Choi JY, Yun YS. J Cardiovasc Electrophysiol. 2010;21 (3):290-5

Cardiac Surgery

- Off-pump coronary artery bypass grafting
- Valvular heart surgery
- Aortic surgery
- Arrhythmia surgery
- Heart failure surgery/transplantation
- Robot-assisted cardiac surgery

• Complete revascularization of the three-vessel territories using a left internal thoracic artery composite graft. Ann Thorac Surg. Hwang HY, Oh HC, Kim YH, Kim KB. 2015;100:59-66.

• Paravalvular leak after mitral valve replacement; 20-year follow-up. Hwang HY, Choi JW, Kim HK, Kim KH, Kim KB, Ahn H. Ann Thorac Surg. 2015;100:1347-52.

• Morphologic changes of the saphenous vein Y-composite graft based on the left internal thoracic artery: 1-year intravascular ultrasound study. Hwang HY, Koo BK, Oh SJ, Kim KB. J Thorac Cardiovasc Surg. 2015;149:487-93.

• A randomized comparison of the Saphenous Vein Versus Right Internal Thoracic Artery as a Y-Composite Graft (SAVE RITA) trial: One-year angiographic results and mid-term clinical outcomes. Kim KB, Hwang HY, Hahn S, Kim JS, Oh SJ. J Thorac Cardiovasc Surg. 2014;148:901-7.

• Treatment for severe functional tricuspid regurgitation: annuloplasty versus valve replacement. Hwang HY, Kim KH, Kim KB, Ahn H. Eur J Cardiothorac Surg. 2014;46:e21-7.

• Propensity score matching analysis of mechanical versus bioprosthetic tricuspid valve replacements. Hwang HY, Kim KH, Kim KB, Ahn H. Ann Thorac Surg. 2014;97:1294-9.

• Surgical anterior ventricular endocardial restoration performed with total arterial revascularization: Serial 5-year follow-up. Hwang HY, Kim JS, Cho KR, Kim KB. J Thorac Cardiovasc Surg. 2014;148:529-35.

Cardiology

- Percutaneous coronary intervention
- Electrophysiologic study / Arrhythmia clinic
- Echocardiography / Cardiac imaging
- Transcatheter aortic valve implantation (TAVI)
- Endovascular aneurysm repair (EVAR)
- Peripheral artery intervention
- Cell therapy

- A Randomized Comparison of Platinum Chromium-Based Everolimus-Eluting Stents Versus Cobalt Chromium-Based Zotarolimus-Eluting Stents in All-Comers Receiving Percutaneous Coronary Intervention HOST-ASSURE, a Randomized, Controlled, Noninferiority Trial. Park KW, Kang SH, Kang HJ, Koo BK, Park BE, Cha KS, Rhew JY, Jeon HK, Shin ES, Oh JH, Jeong MH, Kim SH, Hwang KK, Yoon JH, Lee SY, Park TH, Moon KW, Kwon HM, Hur SH, Ryu JK, Lee BR, Park YW, Chae IH, Kim HS, J Am Coll Cardiol. 2014 Jul 1;63 (25 Pt A):2805-16.
- Biodegradable-Polymer Drug-Eluting Stents versus Bare Metal Stents versus Durable-Polymer Drug-Eluting Stents : A Systematic Review and Bayesian Approach Network Meta-Analysis. Kang SH, Park KW, Kang DY, Lim WH, Park KT, Han JK, Kang HJ, Koo BK, Oh BH, Park YB, Kandzari DE, Cohen DJ, Hwang SS, Kim HS. Eur Heart J. 2014 May;35 (17):1147-58.
- Direct Conversion of Adult Skin Fibroblasts to Endothelial Cells by Defined Factors. Han JK, Chang SH, Cho HJ, Choi SB, Ahn HS, Lee J, Jeong H, Youn SW, Lee HJ, Kwon YW, Cho HJ, Oh BH, Oettgen P, Park YB, Kim HS. Circulation. 2014 Sep 30;130 (14):1168-78.
- Adenylyl Cyclase-Associated Protein 1 (CAP1) is a Receptor for Human Resistin and Mediates Inflammatory Actions of Human Monocytes Lee S, Lee HC, Kwon YW, Lee SE, Cho Y, Kim J, Lee S, Kim JY, Lee J, Yang HM, Mook-Jung I, Nam KY, Chung J, Lazar MA, Kim HS. Cell Metab. 2014 Mar 4;19 (3):484-97.
- Effects of carvedilol on cardiac autonomic nerve activities during sinus rhythm and atrial fibrillation in ambulatory dogs. Choi EK, Shen MJ, Lin SF, Chen PS, Oh S. Europace. 2014 Jul;16 (7):1083-91.
- 11C-Pittsburgh B PET imaging in cardiac amyloidosis. Lee SP, Lee ES, Choi H, Im HJ, Koh Y, Lee MH, Kwon JH, Paeng JC, Kim HK, Cheon GJ, Kim YJ, Kim I, Yoon SS, Seo JW, Sohn DW. JACC Cardiovasc Imaging. 2015 Jan;8 (1):50-9.



Seoul St. Mary's Hospital, The Catholic University of Korea

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Under the Catholic Medical Center which has led the history of Korean medicine based on the philosophy of “respect for life” accumulated over the past 80 years, **Seoul St. Mary's Hospital**, Catholic University of Korea, is providing quality medical services with state-of-the-art infrastructure and is leading the medical field in the Republic of Korea.

Seoul St. Mary's Hospital, which is located in 222 Banpo-daero, Seocho-gu, Seoul is the largest single hospital building in Korea which has 22 floors above ground, 6 floors underground, 1339 hospital beds and a land area of 190,000m², and it boasts the largest scale among the Catholic institutes in not only the Republic of Korea but also in the entire world. Seoul St. Mary's hospital resembles a five star hotel, eco-friendly interior design through which natural lighting shines, world's first conveyor system dedicated to waste disposal, enhanced patient safety through perfect infection control system, mega-scale comprehensive medical information system (CMC nU), integration of advanced medical equipment, operation of special care centers for various fields such as cancer, cerebro-cardio-vascular, organ transplant, eye, etc., and maximized patient convenience through patient-centered one-stop system. Based on these infrastructures, Seoul St. Mary's Hospital firmly established itself as Korea's largest medical institute with 1,560,000 patients being successfully treated at the outpatient care in 2013, 426,000 patients at the inpatient care and approximately 33,000 surgeries being performed.

Seoul St. Mary's hospital has strengthened its global competitiveness in terms of world-class treatment and research capability through the JCI accreditation, which proves how internationally qualified a medical institute is in terms of patient safety, and AHRPP accreditation, which is an international certification on clinical researches. With the globalization of the medical industry, the hospital is engaging in securing new overseas businesses and patients through active marketing activities across various countries such as the United States, Russia, China and major countries in the Middle East. The hospital is also actively carrying out joint researches, academic exchanges and fellowship programs for medical professionals by signing MOUs with more than 130 prestigious universities and research centers in the world. In the recent three years, the number of foreign patients coming to Seoul St. Mary's Hospital increased rapidly by almost threefold. In 2013 alone, the number of foreign patients who visited Seoul St. Mary's Hospital was over 20,000.

- Tertiary care teaching hospital (established in 1980)
- Number of patients (2013). 1,988,565 (inpatients 426,682)*
- 827 Doctors (466 specialists)
- 1,797 Nurses and 1,362 staff
- 25 Departments and 15 centers
- 1,339 Beds and 31 beds for foreign patients only
- Cardiovascular center
- International healthcare center

* Included number of re-visited/re-admitted patients

Cardio-Cerebro-Vascular Center at Seoul St. Mary's Hospital is the best patient-oriented specialized center in Korea for the treatment of cardiac, cerebro-vascular, aorta, and peripheral vascular diseases. Medical professionals from different departments join to provide comprehensive care to patients with vascular diseases which are interconnected with other diseases using their profound medical knowledge and technologies to provide optimum care, and play leading roles in the field of research through various studies and activities for the development of hybrid treatment. The center provides comprehensive one-stop treatment to patients with not only mild but also severe diseases such as aortic stenosis, cerebrovascular malformation and diabetic foot. Integrated consultation care conducted by cardiologist, heart surgeon, vascular surgeon, radiation interventionist, neuro-surgeon and neurologist is performed to patients with polyvascular disease, aortic disease, stroke combined with atrial fibrillation and multiorgan transplant included in heart transplant. Furthermore, hybrid operation room is going to open at October, so that hybrid CABG, hybrid treatment of aortic aneurysm and dissection, hybrid treatment of cerebrovascular disease and hybrid treatment of peripheral arterial disease is performed by the highest quality and the safest care for patients.

- 36 Doctors (above doctor specialist)
- 250 Nurses (including 7 NA and PN)
- 7 Departments
- 233 Beds (including 60 beds in the ICU)

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT equipment
Cardiac MRI	MRI equipment
Chest pain unit in the ER	Resident specialist (cardiothoracic surgery)
	Resident specialist (emergency medicine)
	Resident specialist (cardiology)
IABP Support	IABP (balloon pump)
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	Da Vinci robot (robotic surgery system)
Hybrid OR * only installed in the OR	Angio suite (angiography)
Heart and lung transplant	Transplant team
	Separate aseptic room
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	
Percutaneous mitral commissurotomy	
Transcatheter aortic valve implantation	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	

Medical Support Programs for treatment

Support Programs	
Nurse specialist programs according to diseases (PA, NP, Nurse specialist)	Operation of sub-ICUs
Post-operative pain management program	Collaborative system for inpatient, outpatient, and surgical care
Cardiovascular surgery patient's nutrition management program	One-stop service program for patients with cardiovascular diseases
Wound and bedsore management program	Comprehensive valve program (cardiothoracic surgery, cardiology, patient)
Patient safety and infection control program	Comprehensive treatment for brain-arrhythmia (neurology, cardiology, patient)
Drug administration management program	Heart transplant patient management (by heart transplant team)
CQI between multidisciplinary team for quality improvement of treatment and patient satisfaction	Program for cardiac surgery in children and elderly patients
Surgery, operation and index management program (survival data ect.)	
Cardiac rehabilitation program	

Services of International Healthcare Center

	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	3	-	-	-	3	-	-
Coordinator	9	6	-	2	-	-	1
Medical form		Y	-	Y	Y	-	Y
Information (leaflet)		Y	-	Y	Y	-	Y
Signboard		Y	-	-	-	-	-
Facilities for foreign patients	Treatment room (3 rooms), Rest area, facilities for religious activities						

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Medical Procedures and Process for treatment

Pediatric Cardiac Surgery and Cardiology

- Pulmonary valve replacement
 - Repair of tetralogy of fallot
 - Mitral valve repair
 - Surgery of patent ductus arteriosus in very low birth weight infants
 - CoA (coarction of aorta) correction
 - ASD (atrial septal defect) closure
 - VSD (ventricular septal defect) closure
 - DORV (doubly-committed subarterial VSD)
 - TGA (transposition of the great arteries)
- ↓ Conference on congenital metabolic diseases research (Multi-disciplinary treatment involving Dept. of Ob&Gyn, Pediatrics & Adolescents, Chest surgery, Radiology, Rheumatism)
- ↓ Multi-disciplinary treatment between Dept. of Chest surgery and Dept. of Pediatrics & Adolescents (conduct echocardiogram)
- ↓ Multi-disciplinary treatment between Dept. of Chest surgery and Dept. of Pediatrics & Adolescents (outpatient f/u)
- ↓ Gradual performance of surgery through ultrasound under multi-disciplinary treatment between Dept. of Chest surgery and Dept. of Pediatrics & Adolescents (1st stage → 2nd stage → 3rd stage in accordance with the growth of the pediatric patient)

- Outcomes of pulmonary valve replacement in 170 patients with chronic pulmonary regurgitation after relief of right ventricular outflow tract obstruction: implications for optimal timing of pulmonary valve replacement. Lee C, Kim YM, Lee CH, Kwak JG, Park CS, Song JY, Shim WS, Choi EY, Lee SY, Baek JS. J Am Coll Cardiol 2012;60:1005-14.
- The Aristotle score predicts mortality after surgery of patent ductus arteriosus in preterm infants. Chang YH, Lee JY, Kim JE, Kim JY, Youn Y, Lee EJ, Moon S, Lee JY, Sung IK. Ann Thorac Surg. 2013;96:879-84.
- Factors associated with right ventricular dilatation and dysfunction in patients with chronic pulmonary regurgitation after repair of tetralogy of Fallot: analysis of magnetic resonance imaging data in 218 patients. Lee C, Lee CH, Kwak JG, Kim SH, Shim WS, Lee SY, Jang SI, Park SJ, Kim YM. J Thorac Cardiovasc Surg. August 1, 2014 [Epub ahead of print].
- Does limited right ventriculotomy prevent right ventricular dilation and dysfunction in patients who undergo transannular repair of tetralogy of Fallot? Matched comparison of magnetic resonance imaging parameters with conventional right ventriculotomy long-term after repair. Lee C, Lee CH, Kwak JG, Kim SH, Shim WS, Lee SY, Baek JS, Jang SI, Kim YM. J Thorac Cardiovasc Surg 2014;147:889-96.
- Durability of bioprosthetic valves in the pulmonary position: long-term follow-up of 181 implants in patients with congenital heart disease. Lee C, Park CS, Lee CH, Kwak JG, Kim SJ, Shim WS, Song JY, Choi EY, Lee SY. J Thorac Cardiovasc Surg 2011;142:351-8.

Cardiac Surgery

- Coronary artery bypass surgery
 - Thoracoscopic maze operation
 - Minimal incision sternotomy coronary artery bypass graft
 - Hybrid coronary artery bypass graft
 - Hybrid thoracic endovascular artery repair
- ↓ Limited incisional full sternotomy coronary artery bypass surgery
- ↓ Hybrid coronary revascularization
- ↓ Dept. of cardiology, Chest surgery, Anesthesiology, Pulmonology, Dentistry and Otolaryngology practice multidisciplinary treatment approach to determine the indication of a surgery and make preparation.
- ↓ 1) Establish a protocol for different types of surgery so that post-operative treatment and nursing care can be provided effectively.
- 2) Through earlier ambulation, reduce the length of hospital stay
- ↓ In cooperation with Dept. of cardiology, provide outpatient f/u
- ↓ Can provide f/u by patient referral to cooperative hospitals depending on situations, and some of them are receiving outpatient care from this hospital for more than 10 years.



- Assessment of stroke and concomitant cerebrovascular disease with heart disease requires invasive treatment: Analysis of 249 Consecutive Patients with Heart Disease. Myeong Jin Kim¹ Hyun Song² Se-yang Oh³ Jai Ho Choi³ Bum-soo Kim⁴ Joonkyu Kang² Yong Sam Shin³. Thoracic and Cardiovascular Surgeon Vol. 62 No. 4/2014
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- Hybrid Coronary Revascularization Using Limited Incisional Full Sternotomy Coronary Artery Bypass Surgery in Multivessel Disease: Early Results. Joonkyu Kang, M.D., Hyun Song, M.D., Ph.D., Seok In Lee, M.D., Mi Hyoung Moon, M.D., Ph.D., Hwan Wook Kim, M.D., Ph.D., Gyun Hyun Jo, M.D., Ph.D. Korean J Thorac Cardiovasc Surg 2014;47:106-110
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Cardiology

- Percutaneous coronary intervention
 - Antiplatelet therapy
 - Percutaneous coronary intervention for chronic total occlusion of coronary artery
 - Transcatheter aortic valve implantation
 - Percutaneous mitral commissurotomy
 - Endovascular aortic aneurysm repair
 - Percutaneous transcatheter angioplasty for peripheral arterial disease
 - Transcatheter intervention for congenital heart disease
- ↓ One-stop and comprehensive care for coronary artery, cerebral artery, aorta and peripheral artery

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Severance Hospital, Yonsei University College of Medicine

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- Homepage. <http://www.yuhs.or.kr/en/>
- Telephone. 82-2-2228-5800

Established in 1885 as Korea's first institution to practice and teach western medicine, **Severance Hospital, Yonsei University College of Medicine** has led many of those developments. Severance Hospital operated its International Health Care Center since 1962. Also it was the hospital to be first accredited in Korea by Joint Commission International (JCI) in 2007. Based on more 120 years of experience in medicine, Severance Hospital will strive to be a leader in the industrialization and globalization of medicine, thus helping it to achieve its goal of becoming the medical hub of Northeast Asia.

- Tertiary Care Teaching Hospital (Established in 1885)
- Number of Patients (2013). (Inpatients -)
- 6,297 Doctors (765 Specialists)
- 2,740 Nurses and 1,977 Staffs
- 51 Departments and 25 Centers
- 2,471 Beds
- Children's Hospital, Cardiovascular Center
- International Healthcare Center

Severance Children's Hospital was founded based on its vision to heal children in order to be the hospital children want to go to. It is armed with professors who are specialized in more detailed fields of expertise for children and youth. Also It runs some clinics where specialists from at least 3 departments are simultaneously working together in order to assure multilateral and multidimensional treatments for children and youth.

- 81 Doctors (46 Specialists)
- 260 Nurses and 76 Staffs
- 10 Departments
- 221 Beds

For the past 20 years, the **Severance Cardiovascular Hospital** has gained vast experiences and know-how regarding patient-oriented multidisciplinary team-approach. Based on these accumulations, this cardiovascular hospital took one step further to elevate itself to the world's best specialized cardiovascular hospital by expanding its facility in 2011. Now the hospital offers comprehensive management of prevention, early diagnosis and treatment of cardiovascular diseases and rehabilitation.

- 64 Doctors (64 Specialists)
- 329 Nurses and 141 Staffs
- 5 Departments
- 217 Beds

Medical Technology and Devices for treatment

Technology & Devices	
Cardiopulmonary bypass	Artificial heart lung apparatus
Separate ECMO room	Perfusionist
Bloodless surgery	Cell saver (autotransfusion system)
Heart ultrasound	Echocardiography
Cardiac CT	CT Equipment
Cardiac MRI	MRI Equipment
Chest pain unit in ER	Resident specialist (emergency medicine)
IABP Support	IABP (balloon pump)

POP WHY?

WHAT?

HOW?

WHERE?

Technology & Devices	
ECMO Support	EBS or PLS (ECMO equipment)
Endovascular procedure	Angio suite (angiography)
Robotic cardiac surgery	Da Vinci robot (robotic surgery system)
Hybrid	Angio suite (angiography)
Heart and lung transplant	Transplant team Separate aseptic room
Cardiac catheterization and angiography	Fluoroscopic imaging system
Intravascular imaging	Intravascular ultrasound
Invasive physiology study	Optical coherence tomography
Percutaneous coronary intervention	Pressure wire monitor
Rotational atherectomy	Coronary care unit
Peripheral vascular intervention	CGCI (Catheter Guided Control Imaging)
Percutaneous mitral commissurotomy	Biplane Angiography
Transcatheter aortic valve implantation	
Endovascular aneurysm repair	
Transcatheter closure of congenital heart disease (PDA, ASD, etc.)	
LAA Occlusion (left atrial appendage Occlusion)	
VAD (ventricular assist device)	

Medical Support Programs for treatment

Support Programs	
Nurse program – Physician assistant	Organ transplant survival data management
Pain management program after surgery	One-stop service program for cardiovascular patients
Nutrition program for cardiovascular surgery	Surgery and anesthesia control program for cardiovascular patients
Wound care and bedsore management program	Cardiovascular patients referral center
Infection control program	Outpatient care program for cardiovascular patients
Sub-ICU (intensive care unit) operations	Medication Management program for cardiovascular patients
Geriatric program – Elderly cardiac surgery	Congenital heart disease center program
Cardiac rehabilitation program	Pacemaker center program
Heart Transplant patient Management team and facilities	

Services of International Healthcare Center

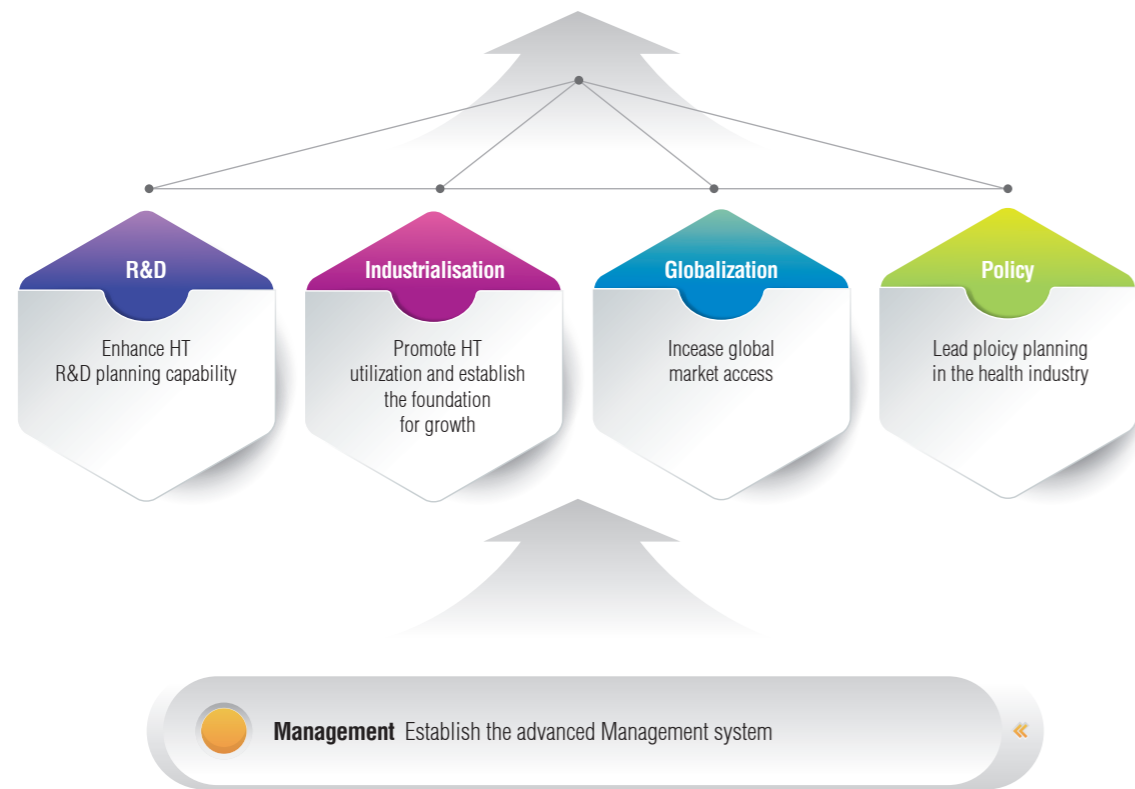
	total	English	Chinese	Russian	Arabic	Mongolian	Japanese
Medical translator	2	-	-	2	-	-	-
Coordinator	5	1	1	2	1	-	-
Medical form		Y	Y	Y	-	-	Y
Information (leaflet)		Y	Y	Y	-	-	Y
Signboard		Y	Y	Y	-	-	-
Facilities for foreign patients		Treatment room					

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Above Medical Korea, there is KHIDI

Mission Developing health industry and improving health service in Korea

Vision To be a professional institution that leads our nation into the Health care Technology(HT) powerhouse by 2020



The Korea Health Industry Development Institute was established pursuant to the Korea Health Industry Development Institute Act. It is a government-funded agency, which aims to contribute to the improvement of the national health care system. Korea Health Industry Development Institute is a public company that was established to nurture and develop public health industry and to improve public health service. Since its establishment in 1999, KHIDI has contributed to strengthen the public health industry, by providing timely support in medical service, pharmaceuticals, medical equipment, beauty products, and products for seniors, coupled with increased R&D investment in public health technology. Also, we are focused on expanding the market and attracting foreign patients to have medical services in Korea, not to mention exporting our own medical system to overseas markets.

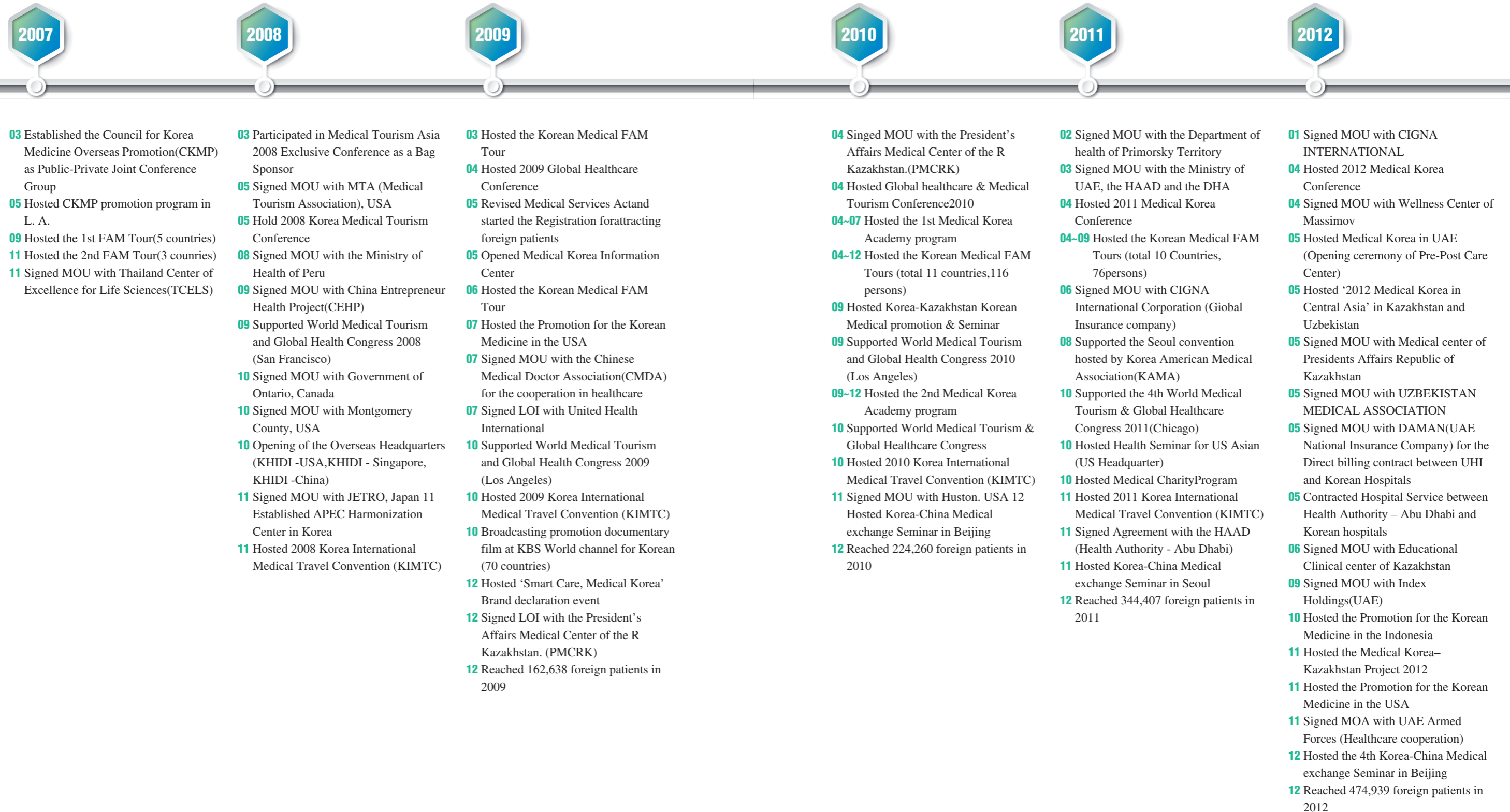
KHIDI Overseas Headquarters

Korea Health Industry Development Institute (KHIDI) has established six Global Business Offices in order to facilitate the overseas expansion of Korea Health Industry and to acquire their overseas authorization. Three new KHIDI global business offices have instituted in England, UAE, and Kazakhstan in 2012.

The KHIDI Global Business Offices have made continuous efforts to promote export marketing of Korea health industry by consulting on overseas licensing and supporting export contracts. Additionally, KHIDI supports projects that strive to enhance Korean healthcare services toward foreign patients as well as the overseas expansion of healthcare service institutions.



History and Major Activities of Medical Korea



2013

2014

2015

- 01 Signed MOU with United Healthcare International for the Direct billing contract between UHI and Korean Hospitals
- 02 Signed MOU with World Vision for the Korean Medical Charity Program
- 03 Hosted Medical Korea and Cultural Event in Qatar and UAE
- 04 Hosted 2013 Medical Korea Conference
- 04 Signed MOU with UAE Armed Forces for the Healthcare cooperation
- 04 Signed MOU with Saudi Ministry of Health
- 07 Signed MOU with Aetna for the Direct billing contract between UHI and Korean Hospitals
- 09 Singed Implementation Plan on Medical Training Program with Saudi Ministry of Health
- 09 Hosted '2013 Medical Korea in Kyrgyzstan' in Kyrgyzstan
- 09 Signed MOU with CIGNA Corporation
- 10 Signed MOU with Republic of Buryatia, Russia
- 11 Hosted 'Korea-Kazakhstan Healthcare Investment Forum' in Kazakhstan
- 11 Signed MOU with Health Centre of the President of the Kyrgyz Republic
- 11 Signed MOU with Republican Center for Health Development of Kazakhstan
- 11 Hosted 'Korea Week 2013 in UAE' in UAE
- 12 Hosted the 5th Korea-China Medical exchange Seminar in Qingdao
- 12 D eveloped the Foreigner's Medical Exam Safety Insurance
- 12 Reached 650,411 foreign patients in 2013

- 02 Singed MOU with Sharjah Health Authority(UAE)
- 03 Singed MOU with AstraZeneca (Oncology Research Program)
- 04 Hosted 'Korea-China Healthcare cooperation Forum' in Shaanxi Province
- 05 Hosted 2014 Bio & Medical Korea Conference
- 05 Singed Implementation Plan on Dentist Training Program with Saudi Ministry of Health
- 05 Signed MOU with VPS Healthcare Group(UAE)
- 07 Hosted 'Korea-China Healthcare cooperation Forum' (East-North Three in North-East China Province)
- 07 Singed MOU with Heilongjiang province(National Health and Family Planning Commission) of China
- 09 Singed MOU with UK Medical Research Council
- 09 Singed Agreed Minutes with Health Authority - Abu Dhabi
- 09 Singed MOU with Sichuan province(National Health and Family Planning Commission) of China
- 12 Signed MOU with China National Travel Service(HK) Group Corporation
- 12 Reached 816,691 foreign patients in 2014

- 04 Hosted 2015 Bio & Medical Korea Conference
- 05 Signed MOU with UAE ADNOC for the Healthcare cooperation
- 07 Signed MOU with SAST, SITI of China
- 09 Signed MOU with Health and Family Planning Commission of Zhejiang Province (China)
- 12 (Estimated) Reached 1,000,000 foreign patients in 2015

Korea, Global Leader in Cardiovascular Disease Treatment

