CARDIOVASCULAR INSTITUTE
AT THE HEART OF BARCELONA
Summary

3 Who we are

5 Our Institute / Teaching & Research

6 Our Facilities & Technology

11 Activity

14 Leading services

22 Annexed

Minimally invasive cardiac surgery / Interventional Cardiology / Sports Cardiology
“We offer you the best and fast resolution option for your cardiovascular disorder”

“Comprehensive approach to all cardiovascular disease”

“State-of-the-art in cardiovascular therapies, technology and procedures”

“Best scientific evidence-based Medicine”

“Precision Medicine, personalized and patient centered care”

“Team Work at Institutional level”
The Cardiovascular Institute of barnaclinic+ was created by a group of professionals involved in Cardiovascular Medicine and Surgery to give a service of excellence to patients with heart and vascular disorders requiring a very personalized way of care and in the shortest time possible with a comprehensive and multidisciplinary approach using state of the art and most developed equipments.

One of the largest, most experienced cardiovascular groups in Spain, and one of the best well-known in Europe, cares for patients from all our Country and many different areas around the world.
Our depth and breadth of experience allows us to perform high complex surgeries and treatments, with success rates above the national average. Our staff works with the newest surgical and interventional techniques, equipment and devices, including most recently developed strategies. We are one of the largest and best equipped University Medical Center in Europe, due to the prestigious and devoted professionals, researchers and teacher in the Cardiovascular field.

For nation-wide scores, it has been established a comprehensive rating system to compare the quality of cardiac surgery among hospitals across the country. Most years the Hospital and our Institute have been awarded with the highest positions at the Top ten which is based on Aortic Valve Replacement, combined Aortic Valve Replacement and Coronary Artery Bypass Graft (CABG) Surgery, and CABG or PCI.
Our Institute

44 Doctors
168 Nurses

4.576 Admissions
22.270 Outpatient visits
1.308 Emergencies
1.959 Surgeries

*ONE-YEAR RESULTS
Our facilities and Technology

8 BEDS
Coronary Care Unit

18 BEDS
Medial Intermediate care

46 BEDS
Hospitalization

8 BEDS
Short stay

8 BEDS
Surgical ICU

8 BEDS
Surgical Step-down unit

5
Angio Hemodinamic rooms

2 cardiac
Operating Rooms (24/365 availability)

2 vascular

2 LABS.
Cath. Labs.

3 LABS.
EPS Labs.

7
Echo machines

2
OR Echo machines
Teaching

University of Barcelona.
Master degrees

Advanced Medical Skills. Specialization in:
- Acute Cardiac Care and Perioperative Intensive Care
- Diagnosis and Interventional Treatment in Coronary Heart Disease
- Clinical Electrophysiology and Rhythm Management Devices
- Non-Invasive Cardiac Imaging
- Endovascular and Cardiac Treatments

Advanced cardiovascular surgery and specialized intensive care

Techniques of extracorporeal perfusion and oxygenation

Collaboration in International Master of Valve Repair
FELLOWSHIP PROGRAMS

- Cardiac Insufficiency and transplantation
- Interventional cardiology
- Acute cardiac care
- Non invasive imagining
- Sports cardiology
- Cardiac surgery
- Electrophysiology and Arrhytmias
- Vascular surgery
The Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS) is a biomedical research institute of excellence. It combines clinical and basic research in order to accelerate the translation of the knowledge to the benefit of the patients.

The research activity of Cardiology is primarily involved in two main lines of research:

- Atherosclerosis, coronary disease and cardiac insufficiency
- Arrhythmias, resynchronization and cardiac imaging
OUR RESULTS

Published originals: 81
Impact factor: Mean 5.13, Total 413
Competitive national projects: 19
Competitive international projects: 2

*ONE-YEAR RESULTS
Activity

RAMI - Risk-adjusted Mortality Rate
RACI - Risk-adjusted Complication Index
RARI - Risk-adjusted Readmissions Index

ONE-YEAR RESULTS

0.83
RAMI

0.94
RACI

0.84
RARI

3,650
Admissions

2.19
Complexity

6
Length of stay
Our results

50
Percutaneous heart valve interventions

800
Device implantation (pacemaker ICD)

900
Cardiac surgeries Including MICS

3,000
Catheterization

1,200
Arrhythmia ablation (Including atrial fibrillation and ventricle tachycardia)

100
Aortic aneurism (Including endovascular treatment)

300
Vascular surgery (carotid artery, AV fistula)

12,000
Echocardiograms

700
Cardiac MRI

1,700
Stress test
Professionals

Our core values are the vocation of patient service and respect for people and rely on the intense teamwork of our group and the ambition for excellence and excellence. The department comprises a strong team of professionals from various cardiac subspecialties, (cardiovascular surgeons, interventional cardiologists, non-interventional cardiologists, cardiovascular intensive care professionals), and specialized nurses, among others, capable to treat all types of heart diseases.

Our prestigious and devoted professionals, researchers and teachers in the Cardiovascular field are international opinion leaders in all the subspecialties.

Our multidisciplinary team has extensive experience in the patient centered care and is completely committed to the patient process during the treatment but also to the post-procedural care. We are known to deliver a professional, individualized and compassionate care to all patients.
Leading services

HEART VALVE DISEASE

- Aortic Stenosis
- Aortic Insufficiency
- Mitral Insufficiency
- Mitral Stenosis
- Tricuspid Valve Disease

SERVICES

- Imaging diagnostics: ultrasound, stress tests, CT scan, cardiac MR, hemodynamics (cath lab)
- Medical treatment: follow ups
- Minimal invasive Cardiac surgery targeted at repair and substitution in mitral disease
- Open heart surgery targeted at the substitution with valvar prosthesis or homograft valves transplant (valvar transplant) in valve disease
- Second opinion
- Pre- and post-operative rehabilitation
HEART RHYTHM DISEASE

• Atrial fibrillation
• Other supraventricular tachycardias
• Ventricular tachycardia
• Artificial cardiac pace makers and defibrillators
• Pace-makers and desfibrilators (ICD)
• Bradicardia

SERVICES

🔍 Imaging diagnostics: monitoring of ambulatory ECG, echocardiography, stress tests, CT scan, cardiac MR, electrophysiological studies
ញ Medical treatment with medication
🔥 Percutaneous intervention treatment: ablation of arrhythmias
💧 Prevention of embolism in patients with atrial fibrillation: treatment with anticoagulants and percutaneous closure of left atria
'https://www.ncbi.nlm.nih.gov/pubmed/33529457' Surgical treatment: Minimal invasive surgery targeted at atrial fibrillation and combined treatment for valve disease (valve repair and substitution)
✏️ Implanting and follow up with artificial cardiac pace makers and defibrillators
❓ Second opinion
🔍 Evaluation of sudden cardiac death
🔍 Familiar Arrythmic diseases
Leading services

CORONARY ARTERY DISEASES

• Myocardial infarction and acute coronary syndrome
• Chronic ischemic cardiopathy
• Angina pectoris
• Coronary bypass
• Coronary stenting
• Total coronary chronic occlusion

SERVICES

🔍 Imaging diagnostics: echocardiography, stress tests, CT scan, cardiac MR, catheterization
💉 Medical treatment with medication
💰 Percutaneous intervention treatment: angioplasty and coronary stenting
.getLogosurgery-logosurgery
✨ Surgical treatment: surgery of coronary artery bypass grafting (CABG)
❓ Second opinion
🔗 Pre- and post-operative rehabilitation
Leading services

HEART FAILURE

- Hypertrophic cardiomyopathy
- Amyloidosis and other forms of cardiomyopathy
- Dilated cardiomyopathy
- Ischemic cardiomyopathy
- Familiar cardiomyopathies

SERVICES

- Image diagnostics: echocardiography, stress tests, CT scan, cardiac MR, catheterization, electrophysiological studies
- Medical treatment: follow ups
- Percutaneous intervention treatment: angioplasty and coronary stenting, alcohol septal ablation in hypertrophic cardiomyopathy (myectomy)
- Surgical Treatment: Minimal invasive surgery targeted at repair and substitution with valve in secondary mitral disease
- Surgical treatment: surgery of coronary artery bypass grafting (CABG), surgery of ventricular remodeling, surgery for hypertrophic cardiomyopathy (myectomy), cardiac transplant
- Second opinion
- Pre- and post-operative rehabilitation
- Treatment with devices: Left ventricular assist device (artificial heart), Pacing in hypertrophic cardiomyopathy, Resynchronization therapy (CRT) in dilated cardiomyopathy
Leading services

AORTIC DISEASES

- Aneurysm and dilation of thoracic and abdominal aorta
- Dissection of aorta
- Intramural hematoma

SERVICES

- Imaging diagnostics: echocardiography, CT scan, cardiac MR, vascular MR (angiography), catheterization
- Medical treatment with medication
- Percutaneous intervention treatment: endovascular therapy for abdominal and thoracic aortic aneurysms
- Surgical treatment: Open surgery for thoracic and abdominal aortic aneurysm
- Second opinion
- Pre- and post-operative rehabilitation
Leading services

CONGENITAL CARDIOPATHY IN ADULTS

SERVICES

Image diagnostics: echocardiography, stress tests, CT scan, cardiac MR, catheterization, electrophysiological studies

Medical treatment with medication

Percutaneous intervention treatment: implantation of occludes for atrial septal defect, ventricular septal defect, alcohol septal ablation in hypertrophic cardiomyopathy (myectomy), trans catheter pulmonary valve implantation

Surgical treatment: Repair and palliative surgery for congenital heart disease, valve surgery, surgery for hypertrophic cardiomyopathy (myectomy)

Second opinion

Pre- and post-operative rehabilitation
Leading services

SPORTS CARDIOLOGY

SERVICES

- Imaging diagnostics: echocardiography, stress test, CT scan, cardiac MR, catheterization, electrophysiological studies
- Pre-participation screening
- Evaluation of exercise capacity in athletes with heart disease (assessment and counselling)
- Specific care and treatment of cardiovascular disease in professional and amateur athletes
- Second opinion
MEDICAL EXCELLENCE AND INNOVATION

IF YOU WANT TO KNOW MORE ABOUT US, SCAN THE QR CODE...
The Hospital Clinic of Barcelona was one of the first centers in Europe to initiate a program of minimally invasive mitral valve surgery back in 1997. Since 2012 we started the program of advanced minimally invasive mitral repair and currently we are able to offer a minimally invasive repair to the vast majority of patients requiring a surgical intervention on their mitral valve with state-of-the-art technology and results. We are able to perform this type of repair even in the most difficult subsets of indications such as elderly patients, reoperations, endocarditis and Barlow's disease.
Activity

Our Hospital is a leading institution in mitral valve repair, both nationally and internationally, and has been appointed by the Spanish Ministry of Health as a nationwide center of reference for complex mitral repair uninterruptedly since 2010 when this recognition was first created, with our results being audited yearly to renew this certification. (https://www.msssi.gob.es/profesionales/CentrosDeReferencia/CentrosCSUR.htm).
Minimally Invasive Mitral Repair

INDICATIONS

DEGENERATIVE MITRAL REGURGITATION OR MITRAL PROLAPSE
• Includes fibroelastic deficiency, mitral prolapse and Barlow’s disease
• It’s the most common valve disease and the nº1 indication for mitral repair in Europe
• Near 100% repair chance in our institution.

RHEUMATIC MITRAL DISEASE
• As a consequence on rheumatic fever many years before mitral dysfunction appears
• May cause mitral stenosis (narrowing), regurgitation or both
• Most frequently requires valve replacement with a prosthesis: mechanical or biological

FUNCTIONAL AND ISCHEMIC MITRAL REGURGITATION
• As a consequence of a diseased cardiac muscle, most commonly after a myocardial infarction
• In most cases the valve can be repaired
Personnel

Our strategy involves a multidisciplinary team approach focused in treating this pathology to assure we achieve the best possible individual outcomes. All patients are treated by a multidisciplinary team including surgeons, anesthesiologists, cardiologists, physiotherapists and nurses, combining their knowledge and skills to provide the best possible care.
Mitral repair is an open-heart operation performed under cardiopulmonary bypass (with a heart-lung machine) and the heart arrested. The cardiac surgery department has its own postoperative intensive care unit exclusive for cardiac surgery patients and run by our cardiac surgery staff. This way we can provide continuous surgical care 24/7 to all of our patients, including emergency establishment of extracorporeal life support.
Minimally Invasive Mitral Repair

OUR BASIC APPROACH

- 3-4cm incision between ribs / periareolar
- No rib retraction needed (less postoperative pain)
- High-Definition thoracoscopic video assistance
- Cardiopulmonary bypass established through the femoral vessels using a 2-3cm incision in the groin
- Continuous intraoperative transesophageal 3D echocardiography
- Patients are extubated in the OR immediately after the operation

THORACOSCOPY VISUALIZATION

- High definition intracardiac imaging (3D)
- Provides the greatest anatomical detail
- Greater surgical precision
Minimally Invasive Mitral Repair

**BENEFITS**

- Better cosmesis (nearly invisible in women, below breast incision)
- Shorter mechanical ventilation and better respiratory function
- Less pain
- Faster return to normal activities and work
- Less blood loss and transfusions
- Lesser incidence of wound infection
- No mediastinitis or sternal dehiscence
Estimated time frame

PREOPERATIVE EVALUATION
- Interview with cardiologist, anesthesiologist and the surgeon.
- Transthoracic or transesophageal echocardiography
- Coronary angiogram (cardiac catheterization or CT-angiography)
- Thoraco-abdominal multi-slice CT

ICU STAY
2 days

HOSPITAL STAY
5 days

IN BARCELONA
10 days
Process

1. Preoperative evaluation
2. Surgical Consultation
3. Interview with a cardiac anesthesiologist specialized in these procedures before the operation
4. Specifically designed and equipped operating theater
5. Strict postoperative follow-up at ICU and ward
6. Postoperative long-term follow-up of the patients in communication with the patient’s local cardiologist
Our results

>30% of our patients are complex (with anterior or bileaflet prolapse)

100% repair success rate

0% in-hospital mortality

Cases with mitral prolapse

>90% freedom of recurrence

20 years after the surgery
INTERVENTIONAL CARDIOLOGY
Activity

- The treatment of cardiac structures other than coronary arteries has experienced a major development within the last 10 years. Transcatheter aortic valve implantation (TAVI), Mitral repair (Mitraclip), closure of residual para-valvular leaks after cardiac surgery and other interventions can be currently performed through catheters. Once again, our institution has led this field in Europe and offers all available techniques with a highly experience medical team.
- The experience of one of the largest and best equipped University Medical Centres in Europe
The department comprises a strong team of professionals from various cardiac subspecialties to treat all types of heart disease. The medical team is 100% dedicated to Hospital and patient care. Our doctors are international opinion leaders in percutaneous cardiology interventional. The medical team have extensive experience in the care of cardiac patients and committed to the intervention process but also to the post-procedural care. The most prestigious and devoted professionals, researchers and teachers in the Cardiovascular field. Known to deliver a very professional, individualized and friendly nursing care to all patients.
Lines of care

CORONARY ARTERY DISEASE
Cardiac ischemic disease is one of the leading causes of death in developed countries. The treatment of coronary narrowing/occlusions with catheters has become a first-line treatment in several situations. Our center has pioneered and led this field during the last 30 years offering last generation treatments for ischemic disease.

VALVE DISEASE (TAVI, MITRACLIP...)
The treatment of cardiac structures other than coronary arteries has experienced a major development within the last 10 years. Transcatheter aortic valve implantation (TAVI), Mitral repair (Mitraclip), closure of residual para-valvular leaks after cardiac surgery and other interventions can be currently performed through catheters. Once again, our institution has led this field in Europe and offers all available techniques with a highly experience medical team.

LEFT ATRIAL APPENDAGE OCCLUSION
Left atrial appendage occlusion is probably one of the interventional techniques with a higher expansion worldwide. This technique is mostly oriented to patients with atrial fibrillation in whom oral anticoagulation might produce or has already produced a health problem (mostly bleedings).

ADULT CONGENITAL DISORDERS
Our hospital has created a strategic alliance with the reference kids hospital Sant Joan de Déu. All congenital patients over 18 years are followed and treated in our institution. Medical cooperation between adult and pediatric interventionalists is a pivotal factor to achieve the excellence in this kind of procedures.

TEACHING /RESEARCH
• Course organization, International fellowship, Invited lectures.
• The Hospital Clinic of Barcelona has always shown by a major interest in research projects. Our medical staff has contributed and published in several national and international medical journals in all aforementioned fields.
• >100 research manuscripts published in national/international journals per year.
Equipment

HOSPITAL ROOMS

DAY HOSPITAL

SPECIFICALLY ORIENTED INTENSIVE CARE UNIT

HIGHLY TRAINED INTERVENTIONAL CARDIOLOGY TEAM

LAST GENERATION CATHETERIZATION LABS

STATE OF THE ART IMAGING MODALITIES:
3D echocardiography, cardiac tomography and magnetic resonance.

24 HOURS HEART TEAM:
Surgeons, anesthesiologists, imaging experts and clinical cardiologists.
Process

A Clinical Evaluation

B Complete pre-procedural test/ imaging

C Non-invasive cardiac intervention

D Strict post-operative follow-up with the safest surveillance protocols depending on the type of intervention
Outcomes/ Our results

Coronary Artery Disease:

- **3,500** Diagnostic catheterizations
- **1,500** percutaneous coronary interventions
- **550** primary angioplasties in acute myocardial infarction

*The results are "yearly"*
Outcomes/ Our results

Structural Heart Disease:

More than 200 procedures in structural heart disease

* The results are from 2016

1st Percutaneous tricuspid valve repair in Spain

1st Mitraclip implantation in Catalonia

Leading structural program in Spain
Outcomes/ Our results

Left atrial appendage occlusion:

More than 100 procedures, including international proctorship

- 100% of procedural success
- <1% pericardial effusion
- 0% in-hospital mortality
Outcomes/ Our results

Adult Congenital Disorders

More than 50 procedures last year

- 0% in-hospital mortality
- 0% complications

Reference center for adult congenital disorders for all Spain (CSUR)

Enhanced safety Combined staff of adult and pediatric interventional cardiologists

* The results are "yearly"
SPORTS CARDIOLOGY

Since the creation of the Group of sports cardiology at the Hospital Clinic in 2009 to present, its clinical, teaching and research activity has become one of the European references and opinion leader in this area. The approach of a joint evaluation by a multidisciplinary team makes our experience unique. The multidisciplinary team include sports physicians, non-invasive cardiologists mastering the area of cardiac imaging and invasive cardiologists with internationally renown expertise in the field of arrhythmia. Additionally, the back of the whole team at the Cardiovascular Institute provides all the potential therapies currently available such as percutaneous or minimally invasive surgery for congenital heart disease, arrhythmia ablation or valve disease treatment.

Our team addresses not only the prevention of heart disease in athletes by our preparticipative screening programmes but also, the personalized treatment of cardiac disease in athletes, a subset of subject who deserve and specific and tailores approach adapted to their needs.
Activity

Our group has evaluated more than 6,000 competitive and amateur athletes during the last 6 years, from all nationalities and ethnicities. Our partnership with the Catalan Council for Sports (Catalan Government) and FC Barcelona has provided the opportunity to quickly be embedded in the world of high performance sport.

A regular and routine screening is performed at the corresponding sportive centers and whenever an abnormality is detected, the subject is transferred to our Cardiobvascular Institute where a second line of tests and specific treatments can be provided.
Personnel

The medical team is 100% dedicated to the hospital. Athletes are always evaluated by the same team of doctors, all members of the Group of Sports Cardiology are sub-specialized and have extensive experience in alterations that are associated with high-level athletes.
Lines of care

PRE-PARTICIPATION SCREENING
The assessment of each athlete by a cardiac evaluation including interview, physical exam, 12-lead ECG, echocardiogram and stress test; this comprehensive evaluation rules out most of the diseases that cause sudden death in athletes. Our group has extensive experience in this area.

TREATMENT OF HEART DISEASE IN ATHLETES
Our Unit has extensive experience in the treatment of heart diseases in athletes taking into account the special characteristics of this group and always considering the equilibrium between willingness of continuing sport practice and the safety of the athlete:

- Arrhythmias
- Valve Disease
- Congenital heart Disease
- Cardiomyopathy

TEACHING
- Course organization
- Fellowship
- Dissemination activities among sports physician and exercise physicist

RESEARCH
- Adaptation of the heart to exercise
- Pre-participation screening; utility, teaching and safety
- Potential harm on the heart:
  - Atrial fibrillation pathogenesis; research in animal model (marathon rat) and athletes
  - Ventricular fibrosis
Equipment

ECHOCARDIOGRAPHY WITH STATE OF THE ART MODALITIES: 3D, strain imaging, Tissue Doppler Imaging

EXERCISE ECHOCARDIOGRAPHY

TREADMILL STRESS TEST CARDIAC MAGNETIC RESONANCE

CARDIAC TOMOGRAPHY Non invasive coronariography

ELECTROPHYSIOLOGICAL STUDY Diagnosis & treatment arrhythmias

AMBULATORY CONTINUOUS ECG MONITORING

CORONARY ANGIOGRAPHY

CARDIAC SURGERY AND PERCUTANEOUS THERAPY OR
Process

A  ONE STOP CLINIC FOR PRE-PARTICIPATIVE SCREENING - 1 HOUR EVALUATION

- Focused clinical interview and physical examination
- 12-lead ECG
- Echocardiography
- Stress test

B  2ND LINE (WHENEVER ABNORMALITIES ARE FOUND IN STEP 1) - 1 WEEK

- Cardiac magnetic resonance
- Cardiac Tomography
- Electrophysiological study
- Ambulatory continuous ECG monitoring

C  EXPERT OPINION
Our results

Screening in +6.000 Athletes
10 % International elite

ABNORMAL FINDINGS
10% athletes

GLOBALLY
1 of 40 Requires 2º line of investigation
1 of 160 Requires specific treatment for continuing sport practice
1 of 350 Had a severe heart disease and was disqualified for sport practice