



UNIVERSITA' DI GENOVA



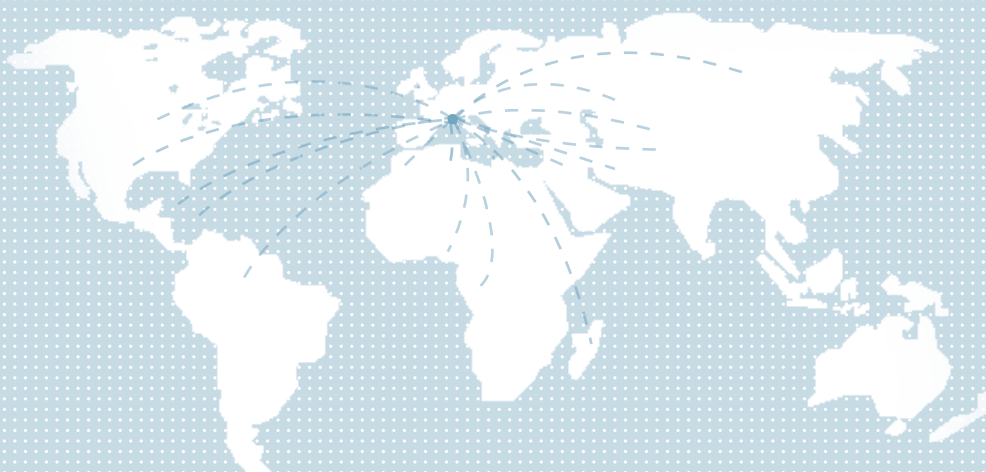
ISTITUTO GIANNINA GASLINI

ISTITUTO PEDIATRICO
DI RICOVERO E CURA
A CARATTERE SCIENTIFICO

Istituto Giannina Gaslini

Genoa-Italy

[I n t e r n a t i o n a l]



Gaslini



National Public Children's Hospital and Research Institute

Giannina Gaslini Children's Hospital is an academic medical Institute specialized in paediatrics, that develops biomedical Research and is recognized by the Italian Ministry of Health as Scientific Institute of excellence.

Since its foundation in 1938, the hospital has been dedicated to children's healthcare and to finding new and better ways to treat childhood illnesses.

Gaslini is the regional reference centre for the care of critically ill newborns and manage the neonatal transport, it is the venue of the regional emergency department and national reference centre for the treatment of complex neonatal, paediatric and adolescent diseases requiring specialized medical and surgical care: more than 45% of patients come from other Italian regions and from abroad.

Integration among healthcare, research, teaching, and continuing education guarantees quality of care and excellence of services from all perspectives, namely: of patient safety, overall management of patient and family, early and effective healthcare services.

The Istituto Gaslini is a multidisciplinary, highly specialized reference centre with national and international catchment area. It is the only hospital in Italy providing specialist and sub-specialist care, both medical and surgical for mothers and children.

Gaslini is a national referral centre for complex diseases affecting newborns, children, and adolescents requiring highly specialized treatment.

It counts over 25 reference and highly specialized centres.

Gaslini is the unique Italian public children's hospital that has all medical and surgical specialties, including obstetrics and rehab.

Health care activity is carried out in compliance with criteria of appropriateness, with continuous review of clinical pathways, in order to guarantee the most appropriate healthcare setting to respond to all patient needs. This activity is implemented according to an organizational model based on intensity of care and healthcare complexity.

Gaslini meets the international excellence standards for safe health care delivery. The Institute has been continuously accredited by Joint Commission International since 2007.



The Institute has 20 interconnected buildings distributed over a 73.000 square meters area (15.000 square meters of green area) on a hill sloping down to the sea.



The hospital staff members are over 1.800, including about 250 physicians and about 850 nurses. Beds available for ward hospitalization, for day hospital admissions, and for day surgery, are 300.



On average, all hospitalizations, including DH, are about 30.000/year, and outpatient admissions about 538.000/year. Emergency Department admissions are about 34.000/year.

About
30.000/years
Hospitalizations

About
34.000/years
Emergency Dept.

About
538.000/years
Outpatient admission



The new Day Hospital and Outpatient Care building has five floors and covers a 6.000 square meters area.

Home care and hospice care represent the point of contact between hospital care and territorial medicine, helping the families to face their problems and improving patients' clinical pathways at Gaslini to support cases with chronic-complex diseases requiring palliative care in dedicated facilities.

Through collaboration agreements with institutions and health care facilities all over the world, the Institute promotes continuing education and training of staff of local children's hospitals and is actively involved in many humanitarian projects, even in post-war areas.

Gaslini has established collaboration agreements with over 250 national and international institutions.

The development of international collaboration programs is a priority of Gaslini's strategic plan.

The projects regard:

1. Strategic partnerships for joint projects in clinical care, research and education to strengthen collaborative relationships with highly specialized children's hospitals;
The main purposes are to engage with leading healthcare facilities, to encourage site visit, training exchanges, to joint research projects.
2. Strengthening health systems in developing countries and post conflict areas
The program in this field includes activities carried out on a voluntary basis by Gaslini's staff (India, Congo...) and humanitarian mission during conflicts (Balkan, Iraq...).
3. Business development projects
We offer: Stages at Gaslini Children's Hospital, Missions to the clients' headquarters, Telemedicine sessions and second opinion consultations, Second/third level outsource diagnosis/treatment in Gaslini for complex/very complex patients.

Patient and family-centered care is the approach adopted by Gaslini. The C.A.B.eF. (Centre for the Reception of Children and their Families) guarantees different types of support, namely: informative, logistic, social, educational, cultural, and religious.

Over 300 beds are made available by Gaslini to patients' families. Sixty-four accredited volunteer organizations collaborate with Gaslini giving support to patients and their families.

Continuing education and training of personnel are an essential commitment to guarantee the promotion of human resources. Gaslini promotes and implements educational and cultural projects, and is an accredited national provider for residential training, on site training, and e-learning for all health care professionals.

The whole hospital staff contributes to the development of research programmes; the annual Impact Factor is over 1.550 with over 300 publications in international journals.

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BONE MARROW TRANSPLANT CENTER

Clinical activities

Hematopoietic Stem Cell Transplantation (HSCT) represents the only chance of cure for a variety of pediatric diseases, including high-risk leukemias, lymphomas, selected solid tumors as well as for non-neoplastic diseases, either congenital and acquired, such as haemoglobinopathies, bone marrow failures, immunodeficiencies, inborn error of metabolism, etc.

HSCT is an extremely complicated and expensive procedure, requiring multidisciplinary specialist skills that are organized in a "Transplant Program", able to assist the patient throughout the whole treatment process, from donor search in the family context and in worldwide registries of voluntary donors/cord blood banks, to long-term follow-up.

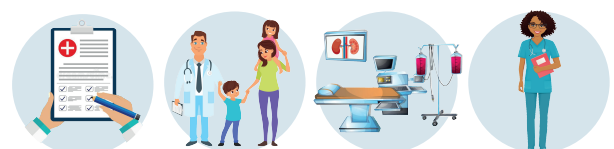
The transplant activity takes place in a dedicated inpatient ward with 6 single-bed HEPA filtered rooms, with 24h parent's assistance; all pediatric specialists and services are available on site. In the pre-post HSCT phase patients are nursed in the Day Hospital of the Dept. of Pediatric Hematology-oncology and, whenever possible, at home in collaboration with the Home Care Unit. The long-term follow-up is ensured in the framework of the "program for Recovered patients" of the Department of Pediatric Sciences and Hematology-oncology.

The Bone Marrow Transplantation Centre began its activity in 1984, and since then more than 1600 transplants have been performed, with an average of 45 procedures/year. In 80% of the cases, the patients come from outside the Ligurian Region and, in the last decade, 30% of them came from abroad Italy, in the context of institutional cooperative programs.

The Bone Marrow Transplantation Program is accredited by the national organisms GITMO/CNT to provide any type of transplantation procedure (autologous, allogeneic from HLA-identical or haploidentical related, allogeneic from unrelated adult volunteers or umbilical cord units).

Areas of excellence/research

- ■ ■ Allogeneic transplantation from haploidentical related donors, with the option of 2 different platforms in patients suffering from neoplastic and non-neoplastic diseases (post-transplant cyclophosphamide, negative selection of TCR $\alpha\beta$ /CD19 positive cells from the apheretic product) in children lacking an HLA-identical relative or a 10/10 compatible unrelated donor.
- ■ ■ Use of repeated high-dose chemotherapy cycles followed by autologous HSCT in neoplasms of the central nervous system and other poor-prognosis solid tumors.
- ■ ■ Use of pathogen-specific CTLs (CMV- EBV- Adenovirus) in patients who developed viral diseases resistant or refractory to conventional therapeutic approaches
- ■ ■ Prospective study to evaluate the efficacy of haploidentical HSCT in patients with refractory or relapsed neuroblastoma



BONE MARROW TRANSPLANT CENTER

- ■ ■ Study of fertility and reproductive function in pre- and post-pubic patients undergoing different transplant preparation regimes.
- ■ ■ Prospective phase I-II-III studies on the treatment of acute and Chronic graft-versus-host disease (GVHD) refractory to first-line treatment (monoclonal antibodies; extracorporeal lymphofotapheresis; TKI; JAK inhibitors)
- ■ ■ Prospective study on oral and fecal microbioma in HSCT recipients and its impact on acute and chronic complications

Directors

- **HSCT Unit** Edoardo Lanino, MD
- **Transplant Program** Maura Faraci, MD

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CARDIAC SURGERY

Our activities

- Cardiac surgery in neonates and premature babies.
- Surgery for all congenital and acquired heart diseases in infants and children.
- Surgery for valvular heart diseases: repairs and replacements (including Ross procedure)
- Surgery in adults with congenital heart diseases (GUCH program)
- Fetal counseling in collaboration with fetal and perinatal medicine unit
- Vascular rings and airway surgeries in collaboration with the tracheal team
- Hybrid procedures in collaboration with interventional cardiology team
- ECMO program in collaboration with pediatric intensive care unit
- International cooperation program: treating international patients, surgical missions abroad, training and education programs for international medical professionals.



Director

Giuseppe Pomè, MD

Specialities: Cardiosurgery

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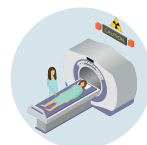
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CARDIOLOGY

In this Unit we carry out the most modern activities for the diagnosis and the non-surgical therapies within the prenatal, neonatal and paediatric fields. Moreover we treat children with acquired heart diseases and systemic diseases with cardiac involvement. We manage patients with grown-up congenital heart (GUCH) diseases that may or may not have been operated during infancy.

These activities include:

- Prenatal Cardiology: early prenatal diagnosis (starting from the 16/17 week of gestational age or even earlier in specific cases) of congenital heart diseases or anomalies of the heart rhythm with foetal echocardiography and counselling about treatment options. Ongoing screening and care for mothers carrying babies with a confirmed or suspected congenital cardiac anomaly. Foetal MRI application for specific cardiac diseases. Prenatal discussion in a multidisciplinary team of Fetal and Perinatal Medicine (OB/Gyn, Neonatal and Pediatric ICU, Neonatology, Cardiology, Cardiac Surgery, Fetal and Perinatal Pathology, Genetics) to define successful perinatal care pathways of every complex case of CHD. Fetal interventional procedures for selected CHDs (aortic or pulmonary stenosis, hypoplastic left heart syndrome with restrictive or intact interatrial septum).
- Global Clinical evaluation of the needs of the new-born, the child and the young adult that suffer from both cardiac and cardiovascular pathology. We include psychological consulting to the patient and his/her family
- Functional cardiology of the premature newborn
- Paediatric consulting activities that include instrumental tests for patients with haematological, oncological, nephrological, metabolic, orthopaedic, surgical, pneumological, infectious, neurological (including ischemic cerebrovascular disease due to paradoxical embolism) and neurosurgical diseases...
- GUCH (Grown-up Congenital Heart Disease) Unit: regional reference centre for diagnostic evaluation, treatment and follow-up of adult patients with congenital heart disease; the GUCH Unit is integrated in a multicentre network for GUCH patients care, including ASL3 and ICLAS in order to provide the best available solution for each single patient
- Echocardiography: mono and bidimensional echocardiography, Color Doppler, tissue Color Doppler, eco-stress, advanced functional echocardiographic assessment (including speckle-tracking and strain analysis), transoesophageal echocardiography, three-dimensional echocardiography
- Advanced Cardiovascular Imaging: Cardiac Magnetic Resonance Imaging (CMR), stress-CMR, and cardiac Computed Tomography, in collaboration with the Radiology Unit
- Cardiac Arrhythmias and syncope ambulatory: diagnosis, treatment and follow-up. Electrocardiogram (EKG), Holter EKG, Remote EKG Recording and remote pace-maker (PM) interrogation, transesophageal electrophysiologic studies, Tilt Test.
- Invasive Electrophysiology: diagnostic and therapeutic invasive studies with radiofrequency ablation of accessory pathways and ectopic focus; implantation, replacement and check of PM, implantable cardioverter Defibrillator (ICD) and cardiac resynchronisation therapy device (CRT)



CARDIOLOGY

- Exercise and Sport Cardiology: cardiopulmonary exercise test, pulmonary function test, diffusing capacity of lung for carbon monoxide (DLCO), comprehensive functional evaluation of patients with congenital and acquired heart diseases.
- Invasive Cardiology: diagnostic cardiac catheterization with full morphologic and hemodynamic assessment, and pharmacologic test to evaluate therapeutic efficacy in particular pathological conditions such as pulmonary hypertension. Interventional cardiac catheterization, including pulmonary and aortic valvuloplasty and angioplasty; revascularization of occluded vessels and radiofrequency perforation of atretic pulmonary valves; stent implantation; abnormal vessels embolization by coils or devices and closure of atrial septal defects, ventricular septal defects, patent ductus arteriosus, arterio-venous fistulae, coronary fistulae, transcatheter pulmonary valve implantation or replacement.
- Educational activities in the framework of the Degree in Medicine and Surgery, the School of specialization in Paediatrics, the School of specialization in Cardiology and the School of Nursing Sciences of the University of Genoa.

Director

Maurizio Marasini, MD

Specialities: Cardiology

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CRITICAL AREA UNIT

Clinical activities

The Critical Area Unit is an area of Paediatric Emergency (n° 4 beds) dedicated to the semi-intensive therapy supported by patient monitoring 24 hours per day, continuous and intensive therapeutic treatment and non-invasive ventilation techniques. Patients are clinically unstable or at high risk of instability and are expected to have a low risk of adverse development. Patients need, therefore, a more qualitative-quantitative assistance than what they would get in an ordinary ward. The priority is given to patients coming from the E.R., but patients with an acute deterioration in other Units of the Hospital are treated here. The patient with stroke is treated in the critical area (dedicated assistance path).

When possible, the management mode of the backtransport is implemented for both Ligurian and extra-regional patients. Permanent mentoring for doctors of the Schools of Specialization in Paediatrics, Child Neuropsychiatry and periodic mentoring for doctors of General Medicine, doctors and nurses from other national hospitals.

Projects and main collaborations

- Observational/biological study "Safety monitoring of medicines and vaccines and evaluation of the effectiveness of flu vaccination in paediatrics"
- Multicentre and multidisciplinary study "epilepsy and Brugada syndrome: clinical and genetic correlation and prevention of SUDEP (Sudden Unexpected Death in Epilepsy)"
- Participation in the Multidisciplinary Working Group on Non-Invasive Ventilation
- Collaboration with the Istituto Superiore della Sanità (Italian National Health Institute) on the Safe Use of Drugs in Paediatrics and Adverse Reactions (Multicentre Study)
- International Multicentre Study on Injections (PERN)



Director

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FIRST AID AND OBI

Clinical activities

The Institute's Emergency Room provides assistance to all patients who access the service in emergency conditions. As a rule, access is reserved to traumalogical patients within 14 years of age and to patients over 18 already in follow-up in the Institute.

Number of accesses approximately 36.000 per year.

Each patient is taken care through:

- reception and nurse triage
- medical / surgical evaluation
- case management with customized diagnostic-therapeutic plan preparation
- clinical report with results of the performed treatments

Monitoring activities on the appropriateness of the treatments are carried out, moreover development of coordination and update of guidelines and clinical paths in emergency.

The following is active:

- Collaborations with the major National Pediatric Centers for the formulation and the update of the diagnostic-therapeutic paths and shared protocols for the emergency patient.
- Collaboration with the Emergency Room, the paediatric wards of provincial hospitals, 112 service for shared protocols on the emergency patient, transfer management and transport.
- Permanent tutoring for the training of doctors of the Schools of Specialization in Paediatrics; theoretical lectures and theoretical-practical training in the field of emergency and paediatric cardiopulmonary resuscitation
- Periodic tutoring in the training sessions of general practitioners, 112 physicians, medical doctors and nurses from other national hospitals
- The Intensive Short Observation (OBI) is closely related to the Emergency Room activity. The OBI in the paediatric field was tested at the beginning of the nineties. Later it developed with the spread of the Pediatric First Aid (PSP) activity, both in the DEA and Pediatric Hospitals and in the General Paediatric Units, with the availability of dedicated beds.

At the same time, it has developed from a tool for assessing the need for hospitalization, in doubtful cases, to a specific methodology for managing patients with rapid reversible acute diseases of medium severity.

It has many advantages:

- the observation reduces the number of hospitalizations, in particular of the inappropriate ones, and also avoids improper discharge from the E.R.;
- the short stay in hospital, through a rapid diagnostic-therapeutic path, alleviates the discomfort for the child and his family and helps to reduce the costs of assistance;
- improves the quality of care, which is based on codified criteria and guidelines;
- ensures continuity of care.



FIRST AID AND OBI

Each patient is guaranteed:

- case management with customized diagnostic-therapeutic plan;
- at least 2 medical examinations recorded in the medical record;
- at least 4 nursing evaluations or, according to expected monitoring, noted in the medical record;
- clinical report with the performance results.

Projects in progress

- Evaluation of pain management in the E.R. in collaboration with the "Pain-free Hospital Team" of the Institute.
- Child Protection through collaboration with the Multidisciplinary Working Group on Mistreatment and Abuse.
- Accident prevention monitoring in collaboration with Higher Institute of Health.

Directors

Emanuela Piccotti, MD

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GASTROENTEROLOGY

Clinical activity and areas of excellence

The unit is organized as follows: hospitalization, day-hospital, outpatient care, consultation, digestive endoscopy

Clinical activity is focused on the following:

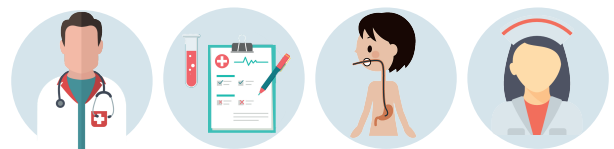
- Benign chronic intestinal insufficiency due to intractable chronic diarrhoea of childhood, short bowel, and chronic intestinal pseudo-obstruction
- Clinical nutrition (enteral and parenteral, at hospital and at home)
- Diagnostic and therapeutic digestive endoscopy (gastroscopy and pancolonoscopy with retrograde ileoscopy, dilatation of esophageal and colonic stenoses with possible stent application, polypectomy, plugging of hemorrhage, removal of foreign bodies, ligature and sclerosis of esophageal varices, percutaneous endoscopic gastrostomy)
- Management of clinical nutrition in patients with neurological lesions (in collaboration with the Pediatric Surgery unit)
- Management of intestinal pre-transplant
- Chronic inflammatory bowel diseases (CIBD)
- Celiac disease (the unit is regional reference center)
- Intestinal bowel movement disorders
- Intolerance to carbohydrates
- Gastrointestinal disease due to food allergy
- Peptic disease
- Malformative and autoimmune hepatology
- Management of pre- and post-liver transplant

Diagnostic procedures include:

- esophageal and gastric pH-metry/impedance measurement;
- breath test (labeled urea for Helicobacter pylori infection and H2 for intolerance to carbohydrates);
- intestinal functional absorptive tests;
- imaging diagnosis (traditional, US, spiral CT, MR examinations performed by the Radiology unit);
- scintigraphy (performed by Nuclear Medicine units of Galliera hospital and Villa Scassi hospital);
- video capsule enteroscopy;
- manometry.

Therapeutic procedures include:

- medical therapy;
- artificial clinical nutrition;
- selective diet;
- digestive tract surgery in selected cases (performed by the Pediatric Surgery unit).



GASTROENTEROLOGY

MAJOR COLLABORATIONS

- ■ ■ Transplant Center of "S. Martino" Hospital, Genoa, Italy
- ■ ■ Transplant Center, Bergamo, Italy
- ■ ■ Gastroenterology and Digestive Endoscopy Unit, Galliera Hospital, Genoa, Italy
- ■ ■ Gastroenterology and Digestive Endoscopy unit, Imperia Hospital, Imperia, Italy
- ■ ■ Hôpital des Enfants Malades Necker, Paris, France
- ■ ■ Institute of Child Health, London, UK
- ■ ■ Jackson Memorial Hospital, Miami, USA
- ■ ■ ISMETT, Palermo, Italy

Head

Paolo Gandullia, MD

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HEMATOLOGY UNIT

Clinical activities

The Unit is an advisor, a reference centre and a coordinator for the studies and the treatments of Marrow failures diseases for AIEOP (Italian Association of Pediatric Hemato–Oncology).

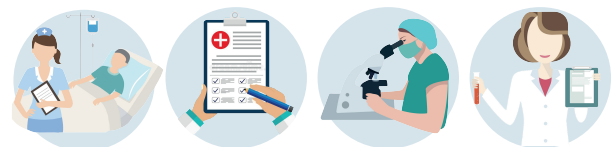
This activity is expressed through the provision of the following services to other Italian Centres:

- Formal clinical advice.
- Implementation of the ELA 2 mutation study.
- Implementation of the HAX 1 mutation study.
- Implementation of the TERC and TERT and other telomere biology disease mutation analysis.
- Large NGS panel for bone marrow failure disease, neutropenias (acquired and constitutional), immune cytopenias, immunodysregulations.
- Possibility of WES/WGS analyses within research programs.
- Functional studies aimed to confirm the effect of new variants/ VUS.
- Haematopoietic progenitor cell cultures.
- Performance of neutrophil antibody detection by indirect and methodical tests and cytofluorimetric systems.
- Execution in Italy of complementation analysis with retroviral vectors for Fanconi Anaemia.

Every year about 150 new patients are supervised and treated, whereas 420 overall patients with Hematologic diagnoses (acquired aplastic anemia, leukaemia, neutropenia, Fanconi Anaemia, Blackfan-Diamond anaemia, thrombocytopenia and other constitutional marrow failure diseases, immune cytopenias, thalassemia, sickle cell disease) are in charge.

Experimental Clinical Trials on new drugs in Leukemias and Sickle cell are conducted in the Unit.

Nation Registry of Fanconi Anemia, Neutropenia and ALPS have seat in the Unit.



Director

Carlo Dufour, MD

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INTENSIVE CARE

Clinical activities and areas of excellence

■ ■ ■ **22 beds - 800 admissions/year**

■ ■ ■ **Surgical and Cardiovascular Neonatal Intensive Care**

Surgical (all surgical subspecialties) and cardiovascular (congenital heart disease, severe hemodynamic decompensation, pulmonary hypertension) pathology and extracorporeal life support (ECMO-Extracorporeal Membrane Oxygenation), CRRT-Continuous Renal Replacement Therapy, blood purification), including surgical complications in premature babies.

Medical-Surgical Pediatric Intensive Care

0 to 16 years (medical and surgical conditions - all surgical sub-specialties), up to adult patients with congenital pathologies.

Advanced assistance in surgical and medical conditions:

- Neurosurgery - Neurointensive Care (advanced neurologic integrated monitoring, ICP, CPP, SvJO2, ICM+, Transcranial Doppler, non-invasive ICP monitoring);
- Status epilepticus, refractory epilepsy, encephalitis (immune and infectious);
- Post-resuscitation care (therapeutic hypothermia, targeted temperature management);
- Cardiac surgery (140 cases on bypass/year, 300 total cases/year) - Cardiovascular Intensive Care (medical and perioperative care of children with cardiovascular diseases);
- Extracorporeal mechanical circulatory support (veno-arterial ECMO);
- Acute lung injury team (advanced respiratory support for patients with ARDS: high frequency oscillatory and percussive ventilation, inhaled nitric oxide, ECMO);
- ECMO Program, percutaneous cannulation in neonates and children, ECPR - Extracorporeal Cardio-Pulmonary Resuscitation;
- Critical Care Transport Service (ECMO and international retrievals, ground, rotor and fixed wing) - Gaslini Critical Care ECMO and Transport Team (CCETT) - +39 010 5636.2440-2442-2443 - +39 335 7593974 (contact numbers for retrievals and teleconsultation);
- Postoperative Intensive Care (care for children undergoing major surgery: neurosurgery, chest surgery, major abdominal surgery, airway surgery, orthopedic surgery, etc.);
- Nephrology (CRRT, blood purification techniques - plasma exchange);
- Hematology-Oncology, Immunology, Rheumatology (intensive care of the immunocompromised host);
- Infectious diseases (isolation section);
- Tracheal Team;
- Difficult airway management (flexible and rigid diagnostic and operative endoscopy);
- Trauma, Trauma Team coordination and lead;
- Intensive care treatment of severe burns;
- Rapid Response Team for intra hospital emergencies and blue codes in Emergency Dept. - ED (intensive care in the ED);
- Delivery Room Intensive Care Unit (DRICU) for the peripartum management and delivery room resuscitation in surgical and cardiovascular congenital conditions (delivery facility adjacent to the Intensive Care Unit - ICU);



INTENSIVE CARE

- Ex-Utero Intrapartum Treatment (EXIT);
- Congenital Diaphragmatic Hernia program (plug, unplug, advanced respiratory support, ECMO, surgery at the bedside);
- Percutaneous tracheostomy in children;
- Care of patients with chronic respiratory diseases and home mechanical ventilation program;
- Dedicated team for the education of parents to home mechanical ventilation and tracheostomy care;
- Metabolic intensive care (inborn errors of metabolism, diabetic ketoacidosis, etc.);
- Nutritional support of the critically ill newborn and child (parenteral nutrition, enteral nutrition);
- Dedicated nurse teams for nursing education, transport and pressure wounds prevention;
- Continuing education of the nursing and medical staff according to the latest guidelines;
- European Pediatric Advanced Life Support, Neonatal Life Support (Italian Resuscitation Council) staff certification;
- Clinic for the post-discharge follow-up of critically ill newborns and children.

A psychologist is available to support patients and their families. The presence of parents in the ICU is encouraged, possible limitations of access can be due to emergencies or the clinical needs of the patients. A dedicated physical therapist takes care of patients daily.

MAIN COLLABORATIONS

- Division of Critical Care, Boston Children's Hospital, Boston, MA, USA;
- Division of Critical Care, Sickkids Children's Hospital, Toronto, Canada;
- Division of Critical Care, Pittsburgh Children's Hospital, Pittsburgh, PA, USA;
- Primary Care Children's Hospital, Salt Lake City, UT, USA;
- Pediatric Intensive Care Unit, Rady Children's Hospital, San Diego, CA-USA;
- Department of Clinical Neurosciences, Cambridge University, UK;
- Neonatal Intensive Care Unit, Royal Prince Alfred Hospital Sydney, Australia;
- Neonatal Intensive Care Unit, Columbia University, New York, USA;
- Division of Cardiology, Keck School of Medicine, University of Southern California Los Angeles, USA;
- University Medical Center, National Research Center for Maternal and Child Health, Nazarbayev University, Astana, Kazakhstan

PROJECTS

- ICM+ and multimodality monitoring in Neurointensive Care;
- Extracorporeal Cardiopulmonary Resuscitation;
- ECMO for cardiovascular and respiratory support;
- Percutaneous ECMO cannulation;
- Patent Ductus Arteriosus management in ECMO patients;
- Treatment of infectious and immune encephalitis;
- Regional Pediatric Trauma Network development;
- Intensive care of children undergoing tracheal surgery.

Director

Andrea Moscatelli, MD

Specialties:

Anesthesia and Intensive Care Pediatrics

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NEPHROLOGY AND KIDNEY TRANSPLANT

Clinical activities

Diagnosis and therapy of acquired and congenital nephropathies of the paediatric age:

- primitive and secondary glomerulopathies (nephrotic syndrome, glomerulonephritis at iga deposits, focal and segmental sclerosis, LES, Schoenlein-Henoch syndrome, etc.);
- primitive tubulopathy (Fanconi Syndrome, Bartter Syndrome, Dent Syndrome, renal tubular acidosis, Lowe's disease, etc.);
- nephrophenosis - cystic cord disease - family fibrosis;
- nephrolithiasis or nephrolithiasis;
- malformations of the kidney and of the urinary tract;
- among the aspects that characterise the clinical activity of the Unit, there's the conservative treatment of chronic renal insufficiency through dietary therapy, pharmacological and hormone replacement;
- Innovative treatments of nephrotic syndrome.

Diagnosis uses advanced molecular tests and pathological analysis:

- renal function tests, tests for tubular function, etc.;
- clinical and molecular diagnosis of genetic nephropathies;
- immunological, histological and immunohistological evaluation of primitive and secondary glomerular diseases by performing ecoguided renal biopsy;
- ultrasound examinations of the urinary tract and cysteanography

Dialysis section:

- treatment of the different forms of acute renal insufficiency both primitive and secondary to neoplastic or postsurgical pathologies with also the adoption of continuous filtration techniques;
- Replacement treatment of the child's end-stage renal failure using different techniques of extracorporeal dialysis (bicarbonate dialysis, haemodialysis, etc.) and automated home-based chronic peritoneal dialysis techniques using different personalised patterns; dialysis efficiency study using peritoneal balancing tests.

Pre and post-transplant assistance section:

- preparation of recipients for kidney transplantation from cadaver donors;
- preparation of recipients and donors in case of kidney donation from an alive donor;
- assistance in post-transplantation in early stages and long-term follow-up;
- the application of new immunosuppressive therapy schemes;
- study and treatment of post-transplant viral complications related to immunosuppressive therapy, (EBV, CMV, BKV).

Director

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ONCOLOGY

Clinical activity

For more than 40 years our Centre has been involved in the assistance and the research in paediatric oncology. Every year, approximately 90 children and adolescents with solid tumours, lymphomas and histiocytosis are diagnosed/treated in our Centre. Specifically, the diseases treated are:

- Neuroblastoma
- Soft tissue sarcomas (rhabdomyosarcomas and other soft sarcomas)
- Kidney tumours
- Liver Tumours
- Germ cell tumours
- Bone tumours
- Rare tumours (e.g. carcinomas, carcinoids, melanoma, gonadal tumours, pheochromocytoma, pleuropulmonary blastoma ...)
- Non-Hodgkin lymphoma
- Hodgkin lymphoma
- Histiocytosis

Since several years and in selected patients we have been using high doses treatments followed by autologous haematopoietic stem cell transplantation. More importantly, we have obtained special experience in the use of experimental and/or innovative treatments for patients with relapsing or resistant tumours. .

Thanks to the multidisciplinary structure completely dedicated to children as the Giannina Gaslini Institute, we can guarantee a “global care” to our patients. In fact, our multidisciplinary team can benefit of several professionals experienced in the field of paediatric oncology such as radiologist, pathologist, surgeon, radiotherapist, nuclear physician, infectivologist as well advanced research laboratories addressing biochemical, genetic and molecular aspects of childhood cancer. An area of recent development is the study of predisposing syndromes to paediatric cancer. Clinical activities are carried out by paediatric nurses experienced in oncology, supported by a staff including a psychologist, social workers, nursery, primary and secondary school teachers, educators, entertainers, volunteers.

Special attention is given to supportive care, prevention and treatment of infectious complications, as well to palliative care for the unfortunate ones with aggressive and resistant disease. Besides supporting families in general, we also pay particular attention to adolescents fighting they battle against cancer. We are also very active in the study and possible prevention of the early and late effects of cancer treatments. At our late effects clinic we follow-up of more than 1000 long term survivors after a solid tumour during childhood. Follow-up is organized in the so called DOPO clinic (acronym for Diagnosis, Observation, Prevention after (dopo) Oncologic treatment). The follow-up continues well into adulthood with about 50% of our survivors having already entered or entering adulthood. Our survivors receive the Survivorship Passport with a complete treatment summary and personalized recommendations for follow-up. Among several international projects in which we are involved, we are also addressing the issue of the treatment of lymphoproliferative syndromes after organ transplantation.



The area of excellence are:

- Diagnosis and therapy of neuroblastoma.
- Testing of new and innovative drugs.
- Support therapy, palliative care and home care.
- Prevention and screening for long-term complications in childhood cancer survivors.

Research Lines

The scientific research, carried out at our Unit is made possible thanks to the close cooperation with several research laboratories of our Institute like Experimental Oncology, Molecular Biology, Immunology and Pathology. Main focus is a better understanding of biological and molecular characteristics of paediatric malignancies and in particular of neuroblastoma. This allows the identification of increasingly precise prognostic factors and the development of new drugs or therapeutic strategies for solid tumours in children.

NATIONAL AND INTERNATIONAL COLLABORATIONS

The Oncology Unit is part of the network of European Reference Centres (ERN) and actively collaborates with:

- ITTC: Innovative therapy children with cancer. It is an international consortium that aims to identify and test, in certified structures, new drugs for the treatment of paediatric oncological diseases.
- SIOPEN: European neuroblastoma group. In 1994 Gaslini Institute was one of the promoters of the establishment of the European Clinical and Biological Group, which promotes research and treatment protocols for neuroblastoma in major European centres.
- AIEOP: Italian Association of Haematology and Paediatric Oncology with its 51 centres of onco-haematology scattered throughout the national territory. Since 1979, Gaslini Institute's Oncology Unit has established itself as a reference centre in Italy for the treatment of neuroblastoma by developing therapeutic and clinical and biological research programmes for this disease.
- Oncological and reconstructive orthopaedic surgery, University of Pisa.
- Pausilipon Hospital, Naples - Department of Haematology and Paediatric Oncology.
- Neuroblastoma Foundation Laboratory.
- Galliera Hospital of Genoa - Nuclear Medicine: diagnostic and therapy centre.
- USMI, Genoa - Paediatric Radiotherapy Unit.

Director

Alberto Garaventa, MD

Specialities: Oncology

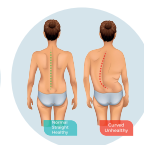
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ORTHOPEDICS

Clinical and surgical activity

- Surgical and conservative management of musculoskeletal diseases and disabilities requiring a multidisciplinary approach (severe idiopathic deformities in muscular diseases, brain diseases, bone dysplasias, complex dysmorphic syndromes, rare diseases, etc.)
- Treatment of congenital deformities (e.g. hip dysplasia, clubfoot, syndactyly, clubhand, bifid thumb, Poland syndrome, Apert syndrome, congenital pseudoarthrosis of the tibia, pubic diastasis due to vesical extrophy, congenital kyphosis and scoliosis, etc.)
- Spinal surgery for complex deformities: idiopathic (scoliosis, kyphosis, spondylolisthesis, etc.), congenital spinal deformities, neuromuscular scoliosis (child cerebral palsy, spinal muscular atrophy, spina bifida, etc.), other. Anterior, posterior or combined approaches for surgical treatment of severe scoliosis and kyphosis; growth friendly surgical techniques for early onset idiopathic and neuropathic infantile scoliosis (temporary vertebral implants); early surgery of congenital scoliosis and kyphosis
- Surgical limb lengthening in congenital and acquired limb length discrepancies and in disharmonic short stature; surgical treatment of complex axial deviations (osteochondrodysplasia, bone arthritis sequelae, post-traumatic deformities, congenital deformities, etc.)
- Hand surgery and orthopedic microsurgery (surgery of complex hand malformations, pollicization, brachial plexus repair in obstetric palsies, nerve grafts, vascularized fibular graft, reimplantations, vascular and nerve flaps, etc.) and post-traumatic reconstructive surgery
- Surgical and conservative treatment in neuro-orthopedics (infantile cerebral palsies, neuromuscular diseases, multiple arthrogryposis, spina bifida, post-traumatic palsies, etc.); treatment of spastic palsies with botulin toxin
- Foot surgery (conservative and surgical treatment of clubfoot and flatfoot, treatment of hallux valgus in adolescence, etc.)
- Orthopaedic care for rheumatologic conditions of the musculoskeletal system and endocrine-metabolic diseases (rheumatoid arthritis, mucopolysaccharidosis, osteochondromatosis, Marfan syndrome, Larsen syndrome, neurofibromatosis, etc.)
- Conservative and surgical treatment of growth disorders (vertebral osteochondrosis, Perthes disease and other osteochondronecroses, femur head epiphysiolysis, functional over-weight bearing syndromes, etc.)
- Minimally-invasive surgery and open surgery for fractures and dislocations (diagnostic and therapeutic arthroscopy, fracture percutaneous treatment, etc.)
- Radiofrequency thermoablation in benign bone tumors
- Prevention and treatment of sports-related orthopedic lesions (the unit is member of the multidisciplinary group "Sport in the child: how orthopedics can nurture psychophysical health – International Working Group")
- Conservative treatment of vertebral deformities (use of Maguelone, MMG and EDF-Lyonnaise techniques; treatment of malignant scolioses in the first years of life with casts under general anesthesia, etc.)



MAIN COLLABORATIONS

- ■ ■ Service de Chirurgie Infantile et Orthopédie, Hôpital d'Enfants de la Timone, Marseille
- ■ ■ Laboratoire de Biomécanique-Centre National de la Recherche Scientifique, Paris (scoliosis, sports orthopedics)
- ■ ■ Orthopedic Clinic, University of Genoa (prosthetic surgery)
- ■ ■ Orthopedic Clinic, Biomedical Campus University of Rome
- ■ ■ Department of Mechanics and Machine Construction, Faculty of Engineering, University of Genoa

PROJECTS

- Development of minimally invasive approaches for anterior spinal surgery in pediatric patients (thoracoscopic procedures to thoracic spine anterior release, minimally invasive approached to the lumbar spine, etc.)
- 3D model printing for pre-operative planning in complex lower limb deformities and tumor surgery
- Bisphosphonate adjuvant therapy for congenital tibial pseudoarthrosis (CPT)
- Prospective database to assess and monitor quality of life changes in patients with severe neuromuscular scoliosis / spinal deformities

Director

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PEDIATRIC EMERGENCY DEPARTMENT AND FIRST AID

Clinical activity

The Paediatric Emergency Department (DEA) is the second level paediatric reference centre for the Ligurian Region and carries out functions of first Level for the metropolitan area. It's a mixed department made up of the of Paediatric E.R. Unit and its two areas: Critical Medical Area and E.R and Intensive Short Observation. The DEA, as per regional decision, is the home to the Paediatric Trauma Centre and the Regional Centre SIDS ALTE.

The main activities are:

- Paediatric E.R.: ensures the functions of the Emergency Room, emergency medical and surgical interventions, ensures Intensive Short Observation (8 beds), ensures ward to patients up to 14 years of age; however, it takes care of all patients already hospitalized and suffering from chronic diseases with a worsening condition.
- Paediatrics of Urgency: short hospitalization (8 beds) and paediatric semi intensive therapy (4 beds). Activity aimed to both patients accessing through the E.R. and patients in other units of our Institute.
- Ambulatory: in-depth clinical examination of patients from the Emergency Room, Territorial Paediatrics and post-hospitalization controls of Pediatrics of Urgency.
- Regional Centre SIDS -ALTE: multidisciplinary and inter-institutional activities for the management of infants with life-threatening events and management of events of unexpected death of the infant and the foetus.
- Multidisciplinary Centre for Combating Child Abuse and Ill-treatment called 'The Tree House' Multidisciplinary Working Group on Child Abuse and Ill-treatment coordinated by the E.R.-DEA that operates at internal and external level both in terms of the definition of paths, both on organizational / management aspects and training.
- Reference Centre for Accident Prevention in collaboration with the Higher Health Institute.
- Paediatric First Aid Reference Centre for the Ministry of Health and the European Injuries data base system (IDB-Eu).
- Paediatric Toxicology Centre, in collaboration with the Higher Health Institute, Ministry of Health and CAV-CNIT IRCCS Maugeri, Pavia.
- Pharmacovigilance activities in collaboration with the Higher Health Institute.
- National reference centre for drawing up emergency guidelines.
- Pain management in E.R.
- Tutoring activities for Doctors of the School of Specialty in Paediatrics and Neuropsychiatry Children University of Genoa.
- Internships for Interns from other National Specialty Schools, General Medicine Doctors, and E.R. Medicine.

Director

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PEDIATRICS SURGERY

Clinical activity and areas of excellence

- General surgery
- Miniinvasive surgery (laparoscopy, thoracoscopy, etc.)
- Thoracic and Airway surgery (Chest wall anomalies, laryngotracheal and lung anomalies),
- Oncologic surgery
- Neonatal surgery
- Urology
- Trauma centre and urgency surgery
- Clinical and basic research on digestive tract malformations (gastroesophageal reflux, atresia, Hirschsprung disease, anorectal malformations, etc.), urological conditions, airway and thoracic anomalies

MAJOR INTERNATIONAL COLLABORATIONS

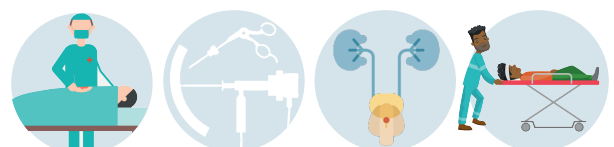
- UMC (University Medical Center), Nur Sultan, Kazakhstan
- St. Damien's Pediatric Hospital, Haiti
- INPAT (International Network of Pediatric Airway Teams)
- AeroDigestive Team (Russel Jennings, Reza Rahbar), Boston Children Hospital, USA
- Sabine Sarnacki, Hopital des Enfants Malades, Paris
- Paul Tam, University of Hong Kong, China
- Patricio Varela, Calvo McKenna Hospital, Santiago, Chile
- Marcelo Martinez Ferro, Fundacion Hospitalaria, Buenos Aires, Argentina
- Manuel Lopez, University Hospital Vall d'Hebron, Barcelona, Spain
- Dick Tibboel, University of Rotterdam, The Netherlands

MAJOR INTERNATIONAL COLLABORATIONS

- Nephrology, pneumology, neurosurgery, cardiac surgery, gastroenterology, oncology, pediatrics, intensive care, emergency

MAJOR INTERDISCIPLINARY COLLABORATIONS

- Nephrology (urinary tract infections, obstructive uropathies, complex malformations)
- Pneumology: airway and lung malformation (tracheomalacia, tracheal stenosis, cystic adenomatoid disease, pulmonary sequestration, lobar emphysema, pleural empyema, pectus excavatum, pectus carinatum, Poland syndrome, Jeune syndrome)
- Pediatric clinic (hypospadias, cryptorchidism, varicocele, inguinal hernia, phimosis)
- Spina Bifida Centre (urinary incontinence, neurogenic bladder, caudal regression, tethered cord)
- ENT: laryngotracheal malformations (laryngotracheal stenosis, web, cleft, vocal cord paresis) Collaboration with ENT of University of Genova, Prof. Giorgio Peretti
- Hematology/Oncology (neuroblastoma, Wilms tumor, hepatoblastoma, sarcomas, lymphomas)



PEDIATRICS SURGERY

- ■ ■ Pediatrics-Gastroenterology (artificial nutrition, intestinal dysganglionosis, chronic inflammatory diseases, gastroesophageal reflux)
- ■ ■ Gynecology and Obstetrics (prenatal diagnosis and counselling for congenital malformations)
- ■ ■ Cardiac surgery (ECMO, cardiopulmonary bypass for complex airway and thoracic anomalies)

PROJECTS

- Robotic surgery in pediatrics and development of new approaches (trachea and esophagus reconstruction)
- Cryoanalgesia for thoracic surgery
- Custom made prosthetic material for the treatment of complex anomalies
- Renal transplant

Director

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PHYSICAL MEDICINE AND REHABILITATION

Clinical activity

- Multidisciplinary spasticity clinic
- Orthopedic and rheumatologic rehabilitation
- Respiratory rehabilitation
- Habilitative treatment in neonatal pathology
- Feeding problems rehabilitation
- Physiotherapy
- Speech therapy
- Occupational therapy
- Neuro cognitive rehabilitation
- Motion Analysis Lab

MAJOR COLLABORATIONS

- Division of Critical Care, Boston Children's Hospital, Boston, MA, USA;
- Division of Critical Care, Sickkids Children's Hospital, Toronto, Canada;
- Division of Critical Care, Pittsburgh Children's Hospital, Pittsburgh, PA, USA.

RESEARCH ACTIVITY

- ICM+ and multimodality monitoring in Neurointensive Care;
- Extracorporeal Cardiopulmonary Resuscitation;
- ECMO for cardiovascular and respiratory support.

Director

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PEDIATRICS RHEUMATOLOGY

Clinical activity and areas of excellence

The Pediatrics and Rheumatology Division has been accredited as Centre of Excellence in Rheumatology (years 2008-2013) by the EULAR (European League Against Rheumatism). The unit is the sole centre of excellence in rheumatology recognized by EULAR in Italy.

Clinical activity is focused on the diagnosis and treatment of rheumatic diseases (juvenile idiopathic arthritis, systemic lupus erythematosus, dermatomyositis, scleroderma, vasculitis, etc.), recurrent fever of genetic origin and other autoinflammatory diseases (familial Mediterranean fever, HyperIgD syndrome, TRAPS, CINCA, etc., in collaboration with the Molecular Genetics unit). Intense research activity is carried out in association with clinical activity which positions the Rheumatology unit among the major pediatric rheumatology centres worldwide.

The unit hosts the Direction of PRINTO (Pediatric Rheumatology International Trial Organization), the largest international network for the experimentation of new therapies in pediatric rheumatic diseases.

The network links all European pediatric rheumatology centers as well as many centers from other nations (overall 91 countries). PRINTO has also developed an informative website for families of children with rheumatic diseases (www.printo.it/pediatric-rheumatology).

The Laboratory of Immunology of Rheumatic Diseases of the unit studies the causes of rheumatic and autoinflammatory diseases in the child. The unit hosts the Association for Child Rheumatic Diseases (www.amri.it), a volunteering association helping affected children and their families.

To the Rare Diseases section are admitted patients with metabolic diseases, in particular lysosomal diseases and defects of carbohydrate metabolism (glycogenosis, defects of fructose and galactose metabolism). These diseases are diagnosed and treated (enzyme substitution therapy, therapy with substrate inhibitors).

The section is also involved in national and international experimental therapeutic trials concerning new therapies for lysosomal diseases and in research projects on metabolic diseases.

Other rare genetic diseases are followed (mental retardation of genetic origin, other neurogenetic diseases, skeletal dysplasias). The section collaborates with the Medical Direction in the coordination of the rare diseases multidisciplinary group of the Gaslini Institute for a coordinated approach to patients with rare diseases and multiple organ damage, and with the Regional Public Health Agency in the Ligurian rare diseases network.

MAJOR COLLABORATIONS

- ■ ■ Children's Hospital, Cincinnati, Ohio, USA
- ■ ■ Children's Hospital, Utrecht, The Netherlands
- ■ ■ National Institute of Arthritis and Musculoskeletal and Skin Disease, NIH, Bethesda, USA
- ■ ■ Over 661 centres in 91 countries belonging to PRINTO



PROJECTS

- The PRINTO Evidence-based Revision of the International League Against Rheumatism (ILAR) Classification criteria for juvenile idiopathic Arthritis.
- Comparison of STep-up and step-down therapeutic strategies in childhood ARthritis (The STARS Trial).
- Applicability of standardized ultrasound examination to estimate disease activity in combination with JADAS and inflammation markers in JIA patients (The DAISY study).

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