

# The Discipline of Pediatric Urology: Prerogatives and Necessities

## “Position Paper” written by the Italian Society Urology (Società Italiana Urologia, SIU) and the Italian Society Pediatric Urology (Società Italiana Urologia Pediatrica, SIUP)

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To the Editor,

The aim of this “*position paper*” is to describe the discipline of *Pediatric Urology* with its clinical and cultural competencies, represent the reasons for legitimizing its existence, and reinforce its importance in the “*scenario*” of the *National Italian Healthcare System*. The requisites and the educational requirements were defined by both the *Italian Ministry of Health* with the *State-Regions Conference*, and the *European Union*.

### Definition and requirements

*Pediatric Urology* (Discipline code 48 - Ministerial Decree 05 December 2006) deals with the congenital and acquired diseases and disorders of the urinary and genital systems, at every pediatric age, from the fetal and neonatal age as far as the adolescence. In collaboration and synergy with adult specialties, pediatric urology continues to deal with the assistance of the patients “*becoming adults*”, in their process of “*transitional care*” and thereafter long-life (1).

The national needs for *Pediatric Urology* services in Italy have been defined in the Ministerial Decree of 02 April 2015 (*Italian Official Gazette n. 70 of 04 June 2015*) (2): it was recognized as “*medium*” level of healthcare regarding the allocation of human resources (doctors, nurses), similarly to others surgical specialties. It was also calculated a population basin of 4-6 millions of inhabitants for each pediatric urology unit, therefore a total of 10-15 units nationwide, a parameter that substantially matches the current existing situation (16 units). The same 2015 ministerial document indicates the need for pediatric surgery units, which are currently twice as many as expected.

A further consideration comes from the international definitions of the pediatric Networks, and of the pathways to treat uro-genital malformations by reconstructive/substitution surgery. There is a tendency to refer the complex and “*rare*” conditions to a few “*hub*” Centers, which are able to provide the needed specialized services and reference sub-disciplines. This trend has been acknowledged by the *Italian State-Regions Conference* (Agreement of December 21, 2017 - Guidelines to promote and ameliorate the quality, security, and appropriateness of treatment interventions in the pediatric-adolescent area).

### PEDIATRIC UROLOGY AS A SUB-SPECIALTY

The origin of *Pediatric Urology* is traced back to *Great Britain* during the 1960s, while a more structured development occurred also in *North America* and northern *Europe* during the seventies (3). At that time, the necessities were mainly dictated by the young age of the patients (children and newborns), requiring expertise in working with fragile structures,

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in “small” surgical fields, using “small” instruments; while another limitation was the high risk for general anesthesia. Furthermore, the principle to be followed was the correction of any congenital malformations, at any age, thus falling under the competence of *General Pediatric Surgeons*. They were the experts of embryology (the fetus), of neonatal and pediatric development, of changes at adolescence. Moreover, *Pediatric Surgeons* had also greater support from advanced neonatal/pediatric anesthesia and specialized radiology, and availability of miniaturized instruments. But, newborns and children’s survival was, at that time, the only (or main) objective when correcting congenital anomalies: little consideration was given to the dysfunction of a malformed organ and system, which on the contrary could result in clinical complications, impairments (even fatal in the long-term) and disabilities leading to poor quality of life.

More recently, gradually the various pediatric surgical specialists were able to benefit from more specific training, coupled with the advent of advanced technologies within their “parent” specialties (i.e. *Cardiac Surgery, Neurosurgery, Orthopedics, Plastic Surgery, Urology*, etc.). Regarding Urology, in parallel, some medical pediatric specialties related to Urology (i.e. *Nephrology, Endocrinology*) grew up, and supported pediatric urology itself by their specific competencies, as for renal transplant and the disorders of gender differentiation. Thus, in the end, pediatric urology separated from pediatric surgery, to become a subspecialty in its own right, similarly to the previous development of Urology as a specialty distinct from General Surgery (4).

By this way, most Pediatric Urologists could fully work with pediatric patients, paying attention to the emerging necessities of the affected children and adolescents, who legitimately were looking for a reasonable quality of life. In general, patients with congenital anomalies aspire to achieve a “normal” life, playing sports, having fun with friends and getting a fulfilling job. Conversely those with genito-urinary malformations disabilities, also, wish a reasonable urinary (and fecal) continence, a regular sexual activity, sufficient fertility, and adequate maternity and paternity. For the above reasons, nowadays, the surgical correction of malformations of the genital and urinary systems has to firmly take into account the preservation of affected organs and functions. The initial purpose of saving life has changed into the perspective of the adulthood, in view of lifelong maintenance of the primary functions and continuous management of the condition itself. Clinical pathways and regular follow-up toward adulthood are of paramount importance and should be shared among the different pediatric and adult specialists. This process of moving from pediatric to adult healthcare, known as “transition of care”, is even more compelling, as is the training of general urologists in the reconstructive and corrective surgery of malformations in functional terms (5, 6).

### **Related disciplines**

The principal relationship of *Pediatric Urology* is with *Urology*, due to technological innovations and for the competence in adults looking at the transitional care; while the collaboration with *Pediatric Surgery* relates to the association between genito-urinary and other apparatus malformations, such as anorectal anomalies.

Furthermore, clinical relationships with the following medical sub-specialties are required, to obtain a complete and first-class assistance:

- *Pediatric Nephrology*, for renal function aspects and kidney replacement therapy (transplant)
- *Neonatology*, for specific neonatal assistance of patients with complex anomalies
- *Fetal Medicine*, for antenatal diagnosis/counselling and selective fetal interventions
- *Pediatric Endocrinology*, for genital diseases in general, and especially for *differences of sex development (DSD)*

The advanced center of *Pediatric Urology* should also offer availability for some specialized activities and procedures which are very common for adults but rarely used for children: they should have easy and structured access to endourology (stone centers), neuro-urology (spinal units, incontinence referral centers), robotic surgery, interventional radiology.

### **Uro-genital diseases and malformations**

The urinary and genital malformations are the most frequent (3.1 0/00 live births), following cardiac (6.5 0/00) and limbs (3.8 0/00) defects [data from the Eurocat 2010 study, conducted on 1.5 million of births in 22 European countries]. They may affect continence and fertility. The most complex anomalies are exstrophy-epispadias, posterior urethral valves, neurogenic bladder, ano-rectal malformations, all affecting continence; while the most frequent are hypospadias and cryptorchidism, potentially affecting fertility. Surgical correction should save functions of the patient becoming adult, who has the hope to enjoy his/her own social, sportive, working, procreative and emotional life.

Other fields of interest are the not-malformative urinary and genital diseases: neuropathic bladder and neurogenic dysfunction, urinary calculi, tumors of urogenital tracts, vesicoureteral reflux, vesical and perineal dysfunctions, urinary incontinence, nocturnal enuresis.

Guidelines for principal and more frequent diseases pertinent to pediatric urology are jointly elaborated by the *European Association of Urology (EAU)* and the *European Society for Pediatric Urology (ESPU)*, and are published on the website of both SIU e SIUP.

## **PEDIATRIC UROLOGY IN ITALY**

In *Italy*, the development of pediatric urology began in the 1980s within the fields of general urology (i.e. *Padua, Florence, Varese*) and pediatric surgery (i.e. *Vicenza, Bologna, Rome*), and this led to the subsequent establishment of the first autonomous pediatric urology departments in *Children’s Hospitals*, and also in general and teaching *Hospitals*.

**Table 1.**  
Formalized Units of Pediatric Urology in Italy - January 2022.

City	Institution	Unit	Department/Division	Name of the Unit	Hosp	Head
Padova	University Hospital *	UOC	Dep Surgery	Pediatric Urology	Gen	Prof F. Del Moro (int)
Torino	"Regina Margherita" Hospital *	UOC	Dep Pediatrics	Pediatric Urology	Ped	Drsa S. Gerocami Nappo
Milano	Foundation "Cà Granda Maggiore" Hospital *	UOC	Maternal Pediatric Dep	Pediatric Urology	Gen	Dr G.A. Manzoni
Firenze	"Meyer" Pediatric Hospital	UOC	Multidisciplinary Dep	Pediatric Urology	Ped	Prof L. Masieri
Roma	"Bambino Gesù" Children Hospital *	UOC	Dep Surgery	Pediatric Urology	Ped	Prof M. Castagnetti
Roma-Palidoro	"Bambino Gesù" Children Hospital *	UOC	Dep Surgery	Continence Surgery and Neurourology	Ped	Dr G. Mosiello
Napoli	"Santobono" Hospital	UOC	Dep Surgery	Pediatric Urology	Ped	Dr G. Di Iorio
Bari	"Papa Giovanni XXIII" Pediatric Hospital	UOC	Pediatric Surgical Sciences Dep	Pediatric Surgery Urological	Ped	Dr N. Laricchiuta
Trieste	"Burlo Garofalo" Pediatric Hospital	UOSD	Maternal Pediatric Dep	Pediatric Surgery and Urology	Ped	Dr J. Schleeef (int)
Bolzano	"Centrale" Hospital	UOS	Urology Division	Pediatric Urology	Gen	Drsa E. Comploj
Varese	"Del Ponte" Hospital	UOSD	Maternal Pediatric Dep	Pediatric Urology	Gen	Drsa L. Reali
Vicenza	"San Bortolo" Hospital	UOS	Pediatric Surgery Div	Pediatric mini-invasive Urology	Gen	Dr F. Chiarenza (int)
Alessandria	"Arigo" Pediatric Hospital	UOS	Pediatric Surgery Div	Pediatric Urology	Ped	Dr L. Sangiorgio
Milano	"Buzzi" Pediatric Hospital	UOS	Pediatric Surgery Div	Pediatric Urology	Ped	Dr G. Selvaggio
Milano	"San Raffaele" Hospital	UOS	Urology Division	Pediatric Urology	Gen	Drsa A. Lesma
S. Giovanni Rotondo (FG)	"Casa Sollievo Sofferenza" Hospital	UOSD	Dep Surgery	Pediatric Urology	Gen	Dr G. Creti

UOC = Complex Operative Unit; UOS = Simple Operative Unit; UOSD = Simple Departmental Unit; Dep = Department; Div = Division; Hosp = Hospital; Gen = General Hospital; Ped = Pediatric hospital; (int) = ad interim.  
\* Neonatology, Pediatric nephrology and renal transplant available at the Institution.

## RESULTS OF THE SIU/SIUP CENSUS (2021)

The Italian Society of Urology, in collaboration with the Italian Society of Pediatric Urology in 2020 and 2021 conducted a census of the pediatric urology units in the nation, taking into consideration their assignment to general urology and/or pediatric surgery divisions, or if they were independent and affiliated to general departments, as surgery or pediatrics. The results showed a sufficient yet in-homogeneous distribution across Italy. Of the 16 formal departments, 10 are located in the North of the country, while 11 Regions are totally devoid of a service. The majority of the pediatric Hospitals have a department of pediatric urology, specifically eight out of the eleven ones nationwide (Turin, Milan, Alessandria, Trieste, Florence, Rome, Naples, Bari), with the exclusion of Genoa, one of the largest pediatric Institutions. Of the aforementioned 16 pediatric urology departments, 11 are autonomous and 5 are divisions of pediatric surgery (3) or general urology (2) departments. There are only 4 units (Milan, Padua, Turin, Rome) offering renal transplantation within a context of tertiary care (Table 1).

## Organization and education in Italy and European Union

### Organization

Since 2013, with the objective of reducing healthcare inequalities for everyone with rare and complex diseases, the European Reference Networks of Centers of Expertise (ERN) has been identifying Centers of excellence (HCP), primarily those with larger case-loads including the more complex cases. The ERN on uro-recto-genital diseases and conditions, eUROGEN, comprises three workstreams with their own disease areas (malformative, reconstructive/functional, oncological) and provides pathways of clinical care from birth to adulthood; Workstream 1 focuses on rare congenital urogenital anomalies.

These Centers of excellence have been recognized due to their experience, expertise, and volume of activity within the urological area, and area quite distinct from pediatric surgery.

### Education

The European Union of Medical Specialists (UEMS), jointly with urologists and pediatric surgeons, has established a qualification in pediatric urology, which involves a biennial period of training in European Board Pediatric Urology (EBPU) Accredited Training Centers, and Fellowships in European Pediatric Urology Academy (FEAPU).

In Italy, we have 2 of the above accredited Centres: the Bambino Gesù Children Hospital in Rome and the Foundation IRCCS Cà Granda Policlinico Maggiore Hospital in Milan. In addition, several academic Schools of Urology provide brief educational programs in pediatric urology inside the entire general urology program, involving periods of active training in pediatric urology departments. And the Universities of Milan and Florence provided a professional Master's course in pediatric nephron-urology. It would be desirable that the Urological Society contributes to the development of the international fellowship EBPU and FEAPU programs. The desire is to reinforce the educational academic offer in general, in order to ensure that in Italy, as in other European countries, will be possible to obtain a more structured educational program in the field of pediatric urology and transitional urological care.

## CONCLUSIONS

This document was designed looking at the following objectives:

- maintain and sustain the Italian pediatric urology credit, on a national and international level
- clarify the affinity of the sub-specialty *Pediatric Urology* with the discipline general urology and also its proximity to the pediatric surgery discipline, even emphasizing its own autonomy
- defend the existence and operativity of the already formalized *Pediatric Urology Units*, its diffusion nationwide, and natural placement in *Children's Hospitals*; and promote the institution of other units where required, on a regional and national basis
- implement the educational offer, according to European standards, and encourage and help international attendance at accredited training centers in *Italy*
- promote a culture of the "referral center" for rare pathologies (e.g. bladder exstrophy) and for advanced technologies (robotic surgery, neuromodulations)
- contribute to the identification of "hubs" to refer for more complex pathologies (e.g. *North, Centre, South*), with their requirements.

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