

## Pediatric Nephrology in France

The management of renal pathologies during childhood is carried out exclusively in academic and public health institutions. The teams involved in this discipline follows exactly this territorial distribution. The accurate distribution and volume of activity by region is imperfectly known, so that the comparison of these data with those in other European Union countries is not possible at the time we publish this paper.

Even if the demographic changes faced by pediatric nephrologists have not been studied precisely, they are recorded in the context of pediatrics, which includes the practice of several pediatric disciplines. Pediatric nephrology is present in all the 32 academic university hospitals (CHU), but all activities are not equally distributed as for example, renal transplantation in children requires the existence of a suitable technical platform, in particular with pediatric anesthesia and pediatric surgeons. A limited number of centers have organized the pediatric renal transplant activity with adult urology surgeons.

Thus, the organization responds to specific requirements depending on the regional needs. Indeed, two types of organizations can be observed. The departments dedicated exclusively to pediatric nephrology which are all in Paris. All the resources are allocated to pediatric nephrology, and all practitioners exercise exclusively this discipline. It is possible that these centers occasionally receive patients suffering from other pathologies than renal pathologies, but this is an exception. Medical density is strong, attractiveness for fellows and interns is also strong, probably because they can devote themselves fully to the specialty they have chosen. On the other hand, multidisciplinary pediatric services accommodate children suffering from kidney diseases in shared structures. To a large extent, the staff assigned to take care of them has to take care of children suffering from other diseases as well.

The special case of pediatric dialysis should be highlighted because the regulatory texts specify that staff should be assigned to teams using this technique. Most often, medical teams are organized around the pediatric dialysis unit with dedicated staff (nurses, dieticians, psychologists ...). However, when the workload allows it, this staff may also be involved in other activities (consultations, day-care hospitals, post-transplant follow-up). For these reasons, the number of medical staff may vary and depends on the type of organization used by the institution to meet the needs in terms of pediatric nephrology.

As it might be expected, the medical density in pediatric nephrology services is roughly proportional to activity, without a threshold effect being demonstrated. There is no level of activity from which the number of practitioners is stable. It appears, however, that centers declaring an exclusive exercise in pediatric nephrology have greater ease in attracting their collaborators. Overall, activities reported by pediatric nephrologists show annual growth of about 10-12% of outpatient visits, 20% of day-care hospital admissions, and a stable number of hemodialysis patients (In 2014, prevalence 145 patients), as well as number of dialysis and peritoneal dialysis sessions (In 2014, prevalence 46 patients).

Altogether, Pediatric nephrology departments are in charge of regions ranging from 0.5 to 11 million inhabitants (ie 0.128 to 3 million children), while the total population covered corresponds to 67 million inhabitants, of which 11.6 million are children under 15 years of age. It is therefore a comprehensive coverage on the territory to ensure the needs in pediatric nephrology. Some 200 beds and places are reported for the whole country with very probably large variations if some of these beds are counted within non-specific pediatric hospital beds. The number of chronic hemodialysis stations reported is 65, while there are also 16 acute hemodialysis stations. All centers have a water treatment system that meets current standards for this type of facility, and provide care in peritoneal dialysis, sometimes in partnership with an adult nephrology area. All Pediatric Nephrology departments allow their patients to attend school during their hemodialysis sessions within the hospital.

The cohort of transplant patients increases moderately, probably due to transition in adulthood, through transition care procedures. The prevalence of transplanted pediatric patients was 665 in 2014. Most centers report specific pediatric renal transplantation, but some teams need the help of the adult nephrology center. Many centers, collaborate for all or part of their kidney transplantation activity with one another center whose critical mass is greater. It may be a combination based on geographical or scientific criteria. All centers carry out renal biopsies for a total of about 800 renal biopsies per year and can use electronic microscopy. All are involved in clinical research and actively participate in the continuing education offered by the societies of the SNP (Société de Néphrologie pédiatrique), SFNDT (Société francophone de néphrologie dialyse transplantation), ESPN (European society for paediatric nephrology), and regional groups. They are also involved in the epidemiological surveillance through a formalized and funded national care network (REIN).

In addition to the pediatric population in the hexagon, a limited number of hospitals (about nine out of twenty) respond to requests from non-residents, mainly for renal transplantation. The number of non-resident claims reported is about 56 per year.

The main concerns of pediatric nephrology teams are:

- The dilution of the specific activity of pediatric nephrology in general pediatrics, leading to difficulties in maintaining a level of expertise for medico-technical activities such as hemodialysis.
- The significant increase in time-consuming activities such as telephone consultation for correspondents facing pediatric nephrology problems, participation in registries and networks requiring up-to-date records, lack of attractiveness and hence difficulty in the recruitment of young people and the lack of anticipation of retirements.
- The shortfall of staff in terms of medical time for certain centers.

It is common that hospital management underestimates the workload in pediatric nephrology. Even if the diversification of activity is not very reproducible from one center to another (pediatrics, hemapheresis, resuscitation, etc.), the continuation of a paediatric specific hemodialysis activity requires the recruitment of doctors and nurses trained in this technique.

The creation of rare diseases reference network marked a turning point in the organization of the management of rare diseases in the country. The public health goal has gradually replaced the single reference center model, usually central, by a functional network with the objectives of sharing information with patients and all type of practionners for improved efficiency. This development evolved towards few reference centers and a network of competence centers where the clinical management of these patients is taking place, all the centers being linked all together in « Filière de santé » ORKID .

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