**Conceptualisation and validation of a paradigm based on uraemic toxins for management of chronic kidney disease in paediatric patients**

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**Background**

Children with chronic kidney disease have significant co-morbidities resulting in:

- a lifelong need for health care
- 3 times decreased life expectancy
- poor quality of life and integration in society

Good tools to evaluate severity and monitor adequacy of treatment of children with CKD are lacking resulting in suboptimal management.

Retention of uraemic toxins is accepted to play a major role in the pathogenesis of the comorbid conditions, but studies in children are lacking.

**Objective**

The scientific objective of this four years project is to:

- provide the clinician with new diagnostic and therapeutic tools for the management of children with chronic kidney disease based on the improved understanding of UREAemic TOXICITY

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**Methods**

1. Identify associations between concentrations of a broad array of uraemic toxins and different co-morbidities: i.e growth, protein-energy wasting, cardiovascular risk factors, quality of life, circadian rhythm, psycho-social functioning (cross-sectional & longitudinal)

2. Evaluate kinetic modelling of uraemic toxin distribution and transport in haemodialysis (HD) patients

3. Validation of the kinetic models by evaluating uraemic toxin concentrations and co-morbidity variations after interventions (e.g. optimal dialysis strategy as determined by the modelling) in PD and HD patients.

4. Development of prediction simulator to determine the most optimal dialysis strategy in the individual patient, including the organisation of the ‘CKD academy’ for nephrologists and laboratory staff with workshops about the simulator and the related laboratory techniques.

**Conclusions**

By providing clinicians, dealing with children with CKD, with more advanced and appropriate tools to improve management of all children with CKD, i.e. better assessment of the degree of renal dysfunction, better determination of the ideal time to start renal replacement therapy, and more accurate monitoring of the quality of that renal replacement therapy, we aim to improve neurocognitive and psychosocial functioning, growth, maturation into puberty, and social integration and survival.