

# Chapter 3

## Objective of the research

### General objective

The general objective of this thesis is to study the relationship between bioimpedance measurements, in mono and multifrequency, with clinical parameters in patients undergoing hemodialysis treatment HD and continuous ambulatory peritoneal dialysis CAPD. We studied different new methods of measurement and new estimators based on transversal and longitudinal impedance measurements.

The clinical objectives are oriented to contribute to the prevention and control of the cardiovascular risk, hydration state and nutritional state, reverted in the adjustment of the hypotensors, diuretics and dialytic treatment; through a noninvasive, innocuous and repetitive method.

### Specific objectives

1. To establish bivariate reference intervals for the impedance vector in the healthy Cuban population (which is a mixture of several race-ethnicities), through BIVA method, at 50 kHz in “right-side” configuration using the BIVA software (Piccoli et al 2002-b). The 50%, 75% and 95% of tolerance ellipses and 95% confidence ellipses will be obtained.
2. To analyze the hydration and nutritional state and their relationship with oedema and mortality, in critical and stable Cuban patients, undergoing HD treatment through the trajectory and displacement of the normalized impedance vector  $Z/H$ , before HD and after HD session by BIVA at 50 kHz and by interpretation of the representation of the Cole-Z equation (Cole 1940) in a Wessel diagram (commonly known as Cole-Cole arc) using multifrequency signals.

3. To propose new methods based on segmental, longitudinal and/or transversal, impedance measurements for the diagnosis of hydration status in continuous ambulatory peritoneal dialysis (CAPD) patients.
4. To found a relationship between clinical parameters of cardiovascular risk, hyper-hydration, malnutrition, hypertension, and endothelial dysfunction, in Spanish patients undergoing continuous ambulatory peritoneal dialysis (CAPD) classified in two groups: normo-hydrated, and hyper-hydrated leading to hypertension; with monofrequency bioimpedance (50 kHz).