ArtIPred- A Smart health system based on artificial intelligence as a predictor for chronic kidney disease development

A. Pasat, G. Suciu, I. Pop, I. Suciu - *BEIA Consult International*
G. Dodi, C. Rezus – *"Grigore T. Popa University" of Medicine and Pharmacy*

Objectives:

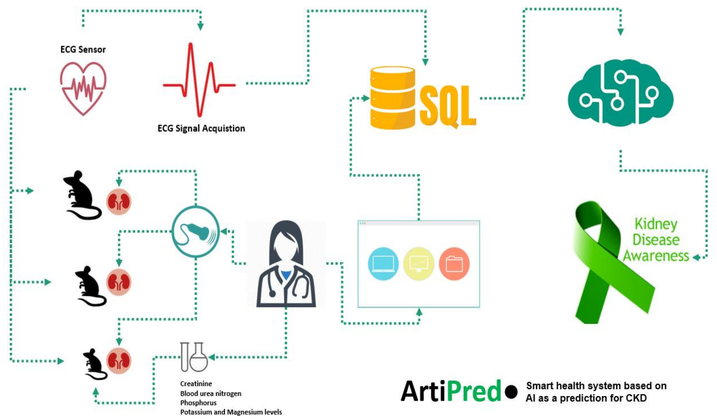
- Translate basic to clinical research outputs by **developing preclinical biomimetic models** to validate hypotheses resulting from preliminary results
- **Develop** and **optimize** the **AI** solutions for **prediction of CKD**
- Establish a **guideline** based on the **medical observations**, data acquired from the **ECG sensors**, and results of **prediction algorithms**

Methodology:

- Design of conceptual models for CKD assessment and ECG signal processing analysis
- *In vivo* evaluation of CKD models and ECG signal processing analysis
- Data acquisition, in continuation to the mechanism of disease generation
  - Biochemical
  - Imagistic motorization
- Risk algorithm implementation and validation plan for clinical translation
- Feasibility and impact study for further clinical exploitation strategy

Results:

The diagram delineates the proposed **architecture for implementing the ArtiPred system.** With the use of a wireless sensor, we can **capture ECG signals that will be further processed amongst other clinical data** acquired with medical equipment. The goal is to **establish a clinical framework that will be the basis of the CKD models development.**



To capture the clinical data, we will deploy a web interface that will allow to register and store the clinical observation of medical personnel, based on imagistic and biochemistry trials. After establishing the clinical framework and achieving the CKD data models, we will study and experiment with specific AI solutions to identify the correlations between the ECG data sets and the disease evolution.

Conclusion:

Studies for early Chronic Kidney Disease (CKD) detection are scarce in the current literature, but the recent advances in technology have enlightened our knowledge regarding challenging evidence-based medicine supremacy through artificial intelligence. **The main goal of the ArtIPred system is to develop and validate, at the laboratory level, an artificial intelligence tool that will allow the early diagnosis of CKD.**