*Digital Health and Informatics Innovations for Sustainable Health Care Systems*
*J. Mantas et al. (Eds.)*

*doi:10.3233/SHTI240540*

# Application of Artificial Intelligence in Clinical Practice - Perception of a Multinational Group of Nephrologists

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**Abstract.** This study investigates the perception of a multinational group of nephrologists on artificial intelligence (AI) application in clinical practice. A validated on-line survey was performed in March 2024, in 4 continents. The results revealed a prevalent familiarity with AI and machine learning (ML) terms, but traditional tools remained favored for clinical decision support. AI's future relevance was acknowledged by more than two thirds of the sample but concerns related to the use of this tool in clinical practice were shared, particularly by nephrologists without any previous contact with AI. This reinforces the need for education in this group of health professionals, to allow full adoption of AI in the management of chronic kidney disease (CKD) in the near future.

**Keywords.** Artificial intelligence, Nephrology, Chronic kidney disease

## 1. Introduction

AI techniques impacts on predicting and diagnosing CKD, and nephrologists will need to interact in their daily practice, in the near future [1, 2]. The main goal of this study was investigate the perception of a multinational group of nephrologists regarding the decision making process and the potential application of AI in clinical practice.

## 2. Methodology

A prospective and observational study in March 2024 with nephrologists from 17 countries, in 4 continents, working for a large hemodialysis provider. The survey was previously validated by 6 nephrologists. It was comprised by 8 technical questions (using a 5-point Likert scale, with 1 corresponding to totally disagree and 5 to totally agree). Demographic data were also collected. Results were presented as mean±standard deviation or proportions, as appropriate. T-test was used for statistical analysis, and a p-value below 0.05 was considered statistically significant.

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## 3. Results

We have obtained 196 valid responses. About 80% of all the population admitted to recognize the term "AI". Traditional tools in clinical decision, received the highest ratings and were considered the most suitable tools. In the challenges faced in clinical practice, "compilation of all diagnoses as a complex task" and "digital technologies being important to support clinical decisions" had the highest mean scores (3.56±1.20 and 3.55±1.14). Considering the importance of AI for clinical decision-making, scores associated with the recognition of the importance of these tools in the future were higher, when compared to the relevance attributed today (3.74±1.14 vs 3.12±1.07, $p<0.05$). This was particularly evident in the group of nephrologists not familiar with the term of "ML" (3.90±0.93 vs 3.09±1.01, $p<0.05$). When asked about the advantages of AI in supporting clinical decision-making, the highest scores were attributed to "simplification of decision algorithms" and "support of complex clinical decisions" (3.82±1.10 and 3.71±1.04). Interestingly, the group of nephrologists without any previous contact with decision-making tools supported by AI considered that the role of AI was less significant in "assist in making decisions, allowing to concentrate on high-value activities", when compared to the group with previous experience (3.38±1.22 *vs.* 3.88±0.97, $p<0.05$).

## 4. Discussion

Most of the value attributed to AI and ML, particularly by those not familiar with AI tools, was in helping in complex decisions rather in daily clinical choices. In our sample, nephrologists recognize the potential AI in the future, but nowadays rely more on traditional tools to support the clinical decision making process. As expected, this is more evident in the group of nephrologists without any previous contact with AI. Given the perceived potential of the application of AI in managing different types of CKD patients [3,4], efforts to promote AI literacy in the nephrology community may prove to be fundamental for the adoption of these tools in regular clinical practice. Further research, in a larger number of professionals, is needed to further characterize nephrologists' perception of the potential application of AI and guide interventions pointed at this area.

## 5. Conclusions

Nephrologists, in their daily practice, will have to interact with AI. Education is needed so in the near future can impact on the adoption of AI resources in the clinical practice.

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