SÃO JOSÉ DOS CAMPOS
SIBGRAPI '16
XXIX CONFERENCE ON GRAPHICS, PATTERNS AND IMAGES

# A medical tool for the study of cognitive decline in patients with chronic kidney disease

Clarisse S. Lenzoni, Gustavo de Paula, Lucas W. de Freitas, Virgínia F. Mota
COLTEC - Colégio Técnico
Universidade Federal de Minas Gerais
Belo Horizonte, Brasil

Leopoldo Pires, Natália M. S. Fernandes
Universidade Federal de Juiz de Fora
Juiz de Fora, Brasil

## INTRODUCTION

Chronic Kidney Disease (CKD) is a public health problem worldwide. CKD is mainly present in individuals older than 65 years, in which is also higher the prevalence of Mild Cognitive Impairment (MCI). Correlations between changes in neuropsychological tests (like MoCA) and anatomic impairment observed at Magnetic Resonance Imaging (MRI) can provide clinical information for better understanding the cognitive impairment in CKD patients.

## OBJECTIVES

- Develop a system to reconstruct magnetic resonance imaging in three dimensions.
- Define a correlation between changes found in neuropsychological tests (MoCA and MRI), once the studied correlation is crucial for early identification of MCI in patients with CKD.

## PROPOSED METHOD

Initially a descriptive analysis of the data will be expressed as standard deviation or percentage depending on the characteristic variable.

- MoCA variables: executive function, memory, attention, language, abstraction and guidance;
- Patient variables: age, sex, race, income, education, CKD cause, category of CKD and medications in use;
- Changes found at reconstructed MRI will be described based on notes made by medical professionals.

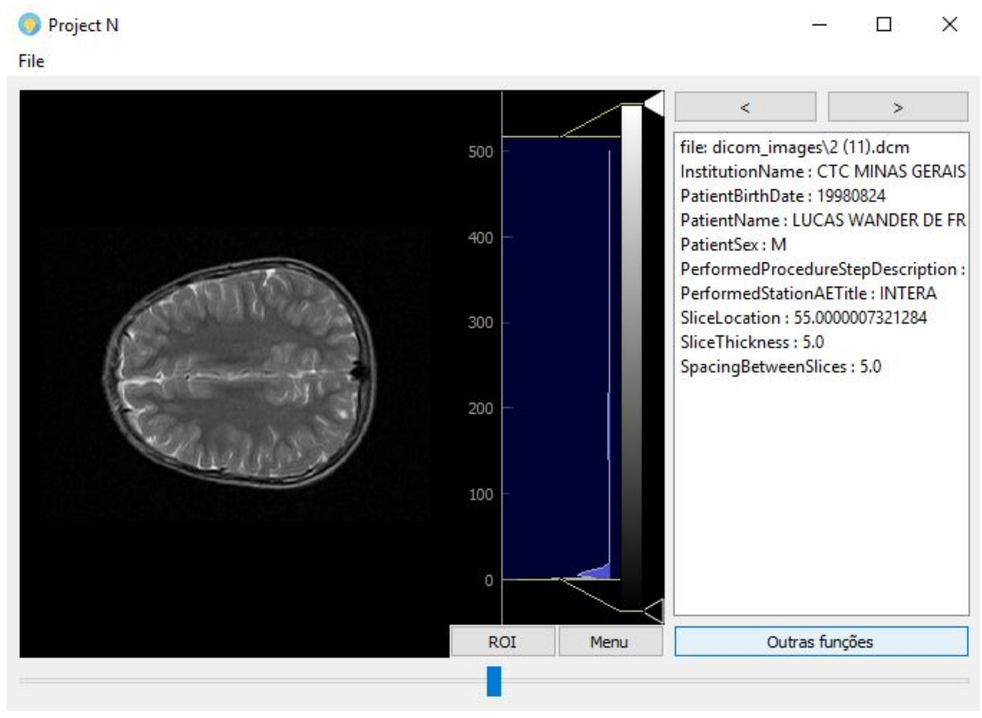


Figure 1 - Prototype of our MRI visualization.

## PRELIMINARY RESULTS

We have acquired data from 72 CKD patients.

The prototype of our MRI visualization is depicted in Fig 1. We are now working on reconstruct the 3D imaging with the notation of medical professionals. Therefore, we will be able to analyze whether there is an association between the site of injury and cognitive impairment.

## CONCLUSION

We believe that the preliminary study and prototype developed so far is showing promising results. In a context where there is no available method of analysis of cognitive decline and MoCA detected by MRI in connection with CKD, this study shows its importance on understanding CKD and to improve patients quality of life.

Acknowledgments

Authors would like to thank FAPEMIG and CNPq for funding.