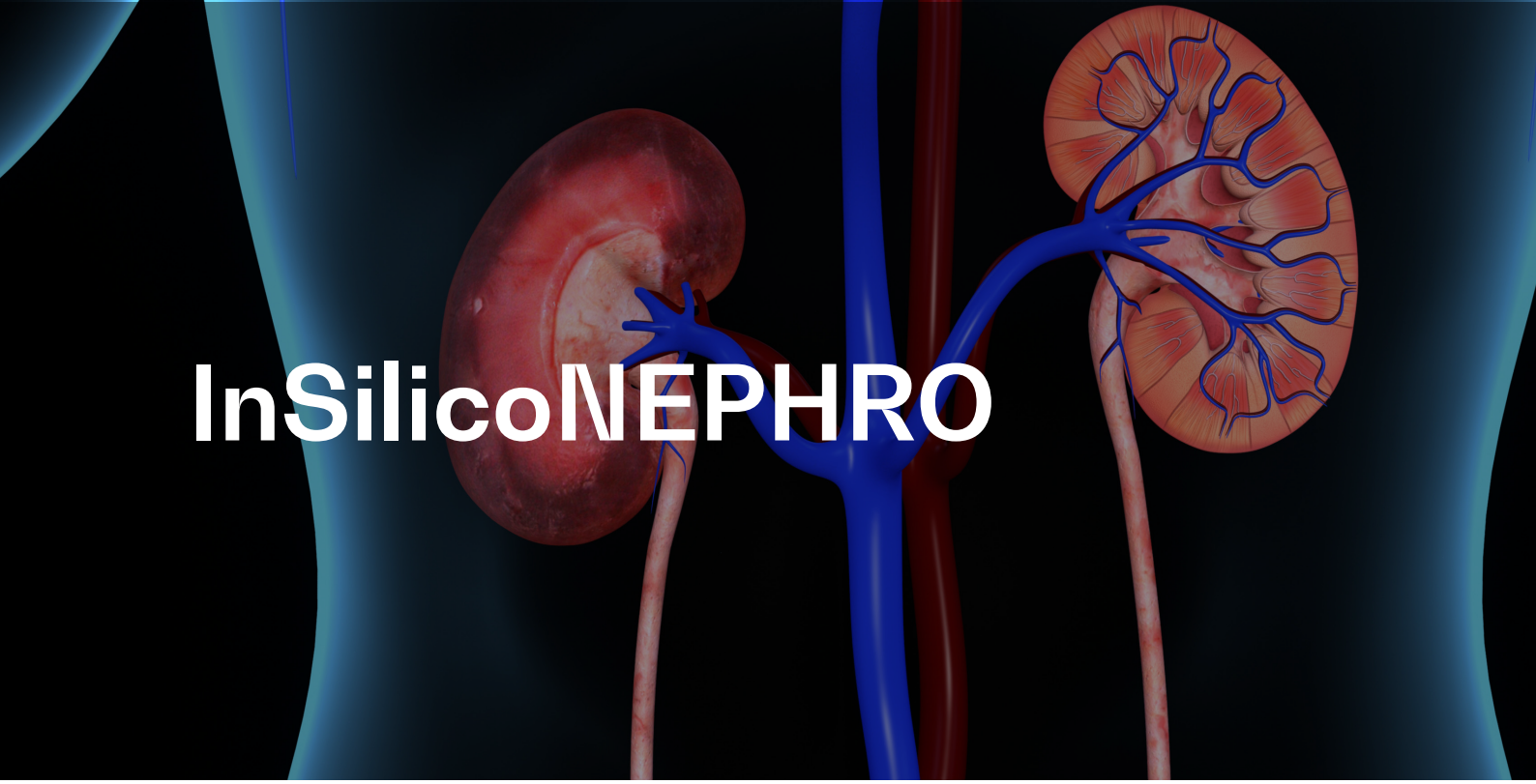


ADPKD Segmentator

A prognostic tool for Autosomal Dominant Polycystic Kidney Disease based on automated kidney and cysts volume calculation

Autosomal dominant polycystic kidney disease (ADPKD) is the most common life-threatening human genetic disorder characterized by the growth of numerous cysts in the kidneys.

ADPKD is a progressive disease, where the expanding total cysts volume (TCV) determines a continuing increase of total kidney volume (TKV), with symptoms tending to get worse over time up to end-stage kidney failure.

Current treatments for ADPKD involves managing the symptoms and reducing the growth speed of TKV, without halting or reversing disease progression.

FDA and EMA accept TKV as a prognostic biomarker to identify ADPKD patients likely to experience a progressive decline in renal function. However, manual calculation of TKV from medical images (currently considered the gold standard) is labor-intensive and requires radiological expertise and specialized computer software.

- ADPKD is estimated to affect at least 1:1000 people
- Diagnosed prevalence of 1:2000 and incidence of 1:3000-1:8000
- Decline in renal function often noted in adulthood
- Over 50% of ADPKD patients eventually develop end stage kidney disease
- No available treatment to halt or reverse disease progression

What is ADPKD Segmentator?

ADPKD Segmentator is the result of a collaboration between the University of Bologna and InSilicoTrials Technologies.

ADPKD Segmentator is based on advanced image processing techniques for fast and highly automated calculation of TKV and TCV from MRI, and provides a reproducible and precise morphologic classification of ADPKD disease progression.

ADPKD Segmentator integrates techniques which are faster and very precise compared to manual segmentation of medical images, and faster and more accurate than commonly used ellipsoid-based method, resulting in a manifold reduction of misclassification error and therefore potential therapeutic consequences.

ADPKD Segmentator is currently used as prognostic tool for ADPKD patients, and it can be leveraged by drug companies for fast and reliable stratification of patients involved in clinical trials, or offered as digital companion to assist nephrologists in monitoring disease progression and support a correct and effective therapy administration.

Advantages

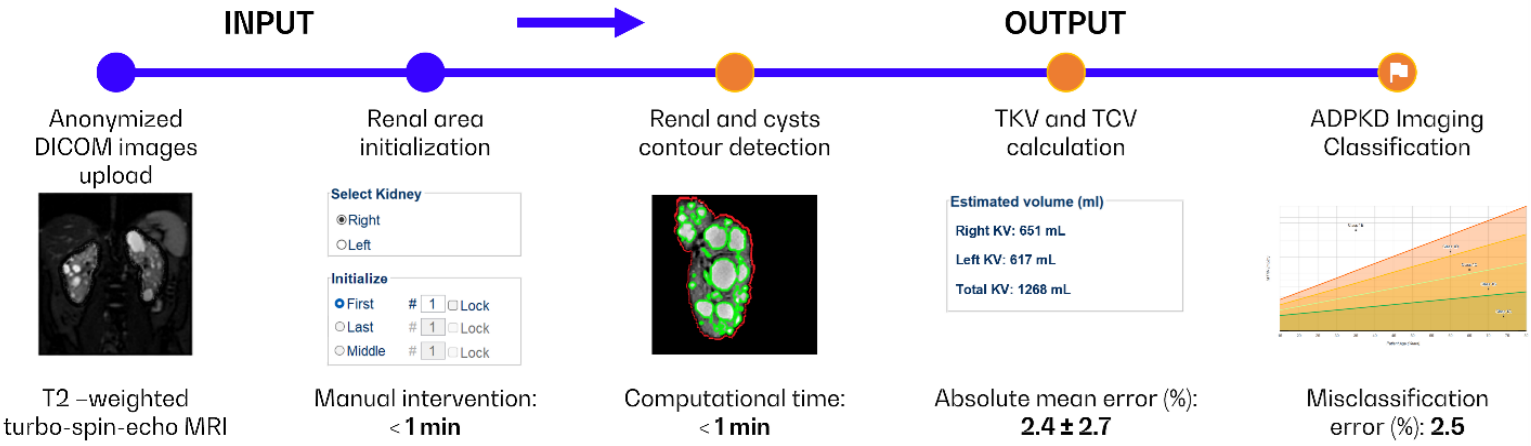
User-friendly and reproducible technique for fast and reliable TKV and TCV estimation.

Highly automated technique, with greater accuracy than existing methods.

Based on MRI images obtained without the use of contrast medium.

Effective patient's disease stratification and progression monitoring.

How it works



ADPKD SEGMENTATOR

Highly automated MRI image processing

Manual Intervention: < 1 min

Absolute mean error: 2.4% ± 2.7%

Misclassification error: 2.5%

ELLIPSOID-BASED METHOD

Manual measurement of kidney lenght, width and depth

Manual Intervention: up to 5 min

Absolute mean error: 7.4% ± 5.1%

Misclassification error: 13.7%

In silico is key to innovate drug development

Today, the very long and expensive development and the complex registration processes for new drugs are becoming financially unsustainable.

Regulatory agencies have been encouraging the use of in silico methods in drug research and development for years (5) because the use of these methods can greatly accelerate the time-to-market of new medicines for the benefit of the patients while significantly reducing development costs and allowing companies to exploit patents for a longer period.

Solvers, IT infrastructure and computational specialists require a continuous investment from companies.

To help solve these challenges, **InSilicoTrials Technologies** has developed a game-changing-solution. Our experts:

Select computational models from outstanding research centers around the world
Integrate them in our cloud-based platform
Make them available through user-friendly online products

This solution enables companies to leverage cutting-edge in silico methods at low costs without specific computational expertise, IT infrastructure and solvers investments requirements. On our cloud-based platform, users can select the online computational product of their choice in pay-per-use, or ask us to build the digital product they need.

Why working with InSilicoTrials

SaaS

Buy tokens and use the online products of your choice among those available on the platform

VIRTUAL PATIENTS

Design and accelerate your clinical trials with the virtual patient populations you need

ON DEMAND & CUSTOM

Ask us for the models and simulations you need, or ask us to evaluate where modeling and simulation can support you

TECHNOLOGY-ENABLED SERVICES

Ask us for support on technology integration, in silico trials planning, execution and reporting, in line with regulatory requirements

References:

[1] Am J Nephrol, 2011, 33: 176–184.
[2] Am J Nephrol, 2017, 45: 373–379.
[3] J Am Soc Nephrol, 2015, 26(1): 160–172.
[4] Sci Rep, 2019, 9:10996

Contact us: **info@insilicotrials.com** **www.insilicotrials.com**