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Toward optimization and excellence via a multidisciplinary care model for patients with chronic kidney disease in Spain: The CARABELA-CKD initiative

Hacia la optimización y la excelencia a través de un modelo de atención multidisciplinar a los pacientes con enfermedad renal crónica en España: la iniciativa CARABELA-CKD



Dear Editor,

Despite its significant impact on public health, chronic kidney disease (CKD) is often referred as a silent epidemic due to its low diagnosis rate and the lack of awareness among the global population. The estimated prevalence of CKD in adults in Spain is 15.1%.¹ Several modifiable factors influence the development of CKD, including hypertension, diabetes, obesity, dyslipidemia, smoking, hyperuricemia, and cardiovascular disease.² The increasing prevalence of these major risk factors, along with the progressive aging of the population, are contributing to a significant rise in the CKD burden that will surely continue to grow in the next years.³ According to data from The Global Kidney Health Atlas 2019, 759 patients per million population receive kidney replacement therapies (KRT) due to the progressive deterioration of renal function over the course of disease.⁴ Indeed, in the last decade the prevalence of advanced CKD requiring KRT has increased by 30%.⁵ In addition to impairing health-related quality of life, CKD imposes a significant economic burden, accounting for more than 3% of all healthcare costs.⁶

The best strategy to reduce mortality and sanitary costs is through effective, standardized and coordinated clinical

management of factors potentially related to CKD, with the specific aim of preventing disease progression and achieving early diagnosis and treatment.

Patient-reported outcomes measures (PROM) and patient-reported experience measures (PREM) are increasingly recognized as essential components of comprehensive patient-centered CKD care. These tools allow patients to describe the impact of their disease on their health status, share their experiences, and provide feedback on the quality of care received. These measures can enhance the effectiveness of medical interventions and improve communication between CKD patients and healthcare professionals.⁷⁻⁹ In this respect, a series of face-to-face interviews with CKD patients conducted by specialized nurses revealed that while efforts are being made to provide adequate care, there is still significant room for improvement in the current CKD care pathway (Fig. 1).

In this context where the transformation and optimization of the CKD healthcare pathway could benefit from a roadmap, the CARABELA-CKD initiative was launched. Its objective was to establish a framework that serves as a catalyst for improving and innovating the current system. This collaborative effort involved the Spanish Society of Nephrology (S.E.N.), the Spanish Society of Endocrinology and Nutrition (SEEN) and the

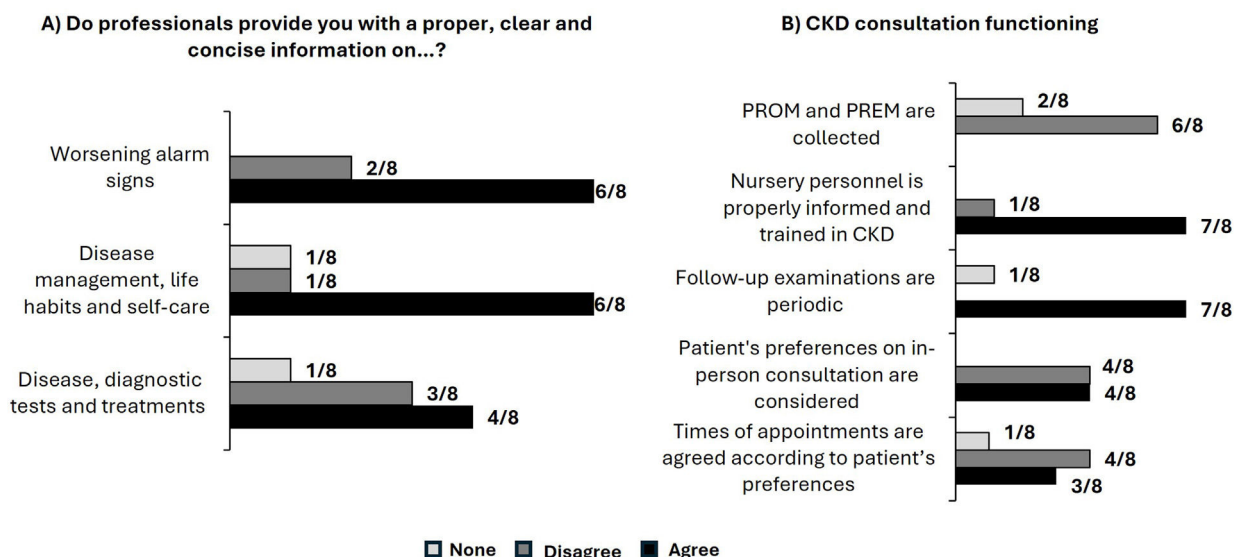


Fig. 1 – Summary of patient opinions on the current care processes in hospitals of reference.

Spanish Society for Healthcare Quality (SECA), in partnership with AstraZeneca. The CARABELA-CKD initiative is part of a “fleet” of CARABELA initiatives aimed at catalyzing a mindset shift to enhance the effectiveness and sustainability of current care models for chronic diseases that generate a significant burden for the public national healthcare system.¹⁰ These initiatives are led and powered by scientific societies and are co-organized and supported by AstraZeneca.

The main objective of CARABELA-CKD is to achieve the standardization and excellence of CKD care nationwide, ensuring all patients have equal access to early high-quality care and innovative therapies. We outline the general workflow of the CARABELA methodology in Fig. 2.

Phase 1 focused on the initial characterization of current CKD care models in Spain. This investigative phase 1 was overseen by a scientific committee comprising specialists in CKD management appointed by their respective scientific societies including S.E.N., SEEN and SECA. During this phase, current CKD management models were characterized in five participating pilot hospital centers and key healthcare quality indicators of CKD management, improvement areas (grouped into four challenges), and potential solutions (grouped into eight axes of change and 17 lines of actions) were identified.

Phase 2 primarily aimed to validate the findings from phase 1. To this end, a group of professionals with expertise in CKD nominated by their respective scientific societies convened in

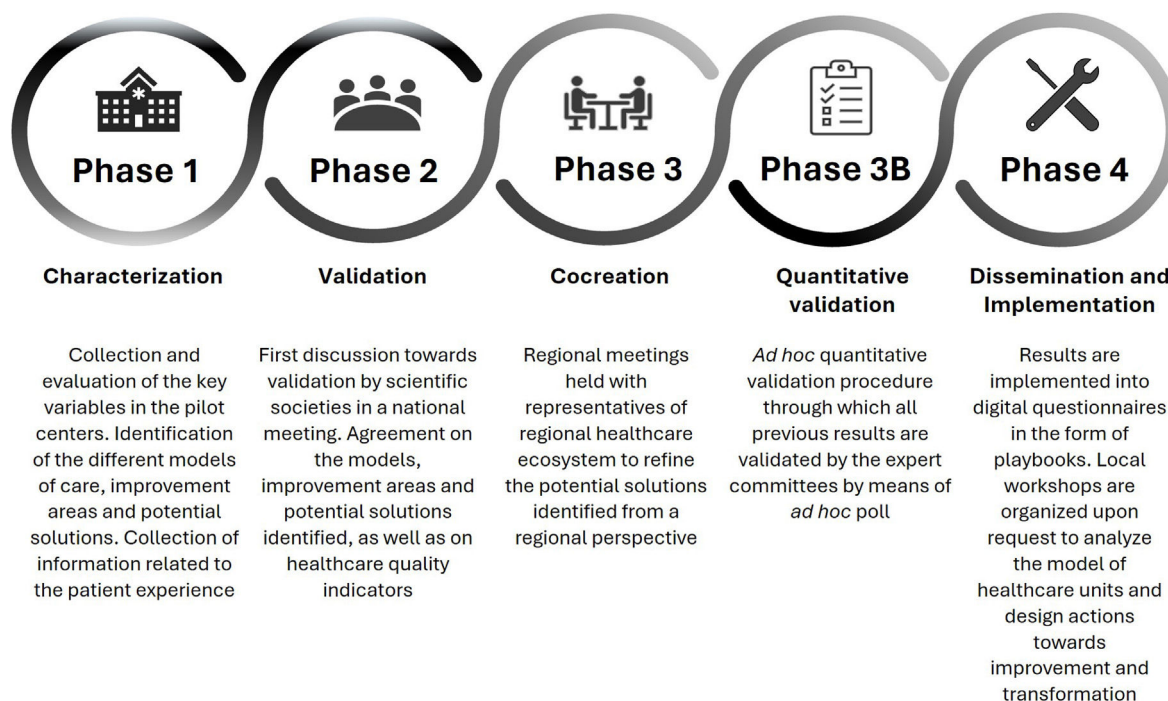


Fig. 2 – Flowchart of the CARABELA methodology. Adapted from Escalada J et al.¹⁰

a national meeting to validate the improvement areas and potential solutions applicable to all identified care models and key CKD healthcare quality indicators that were identified in the previous phase.

In phase 3, a series of four regional meetings were organized in which additional experts in CKD management refined potential solutions from a regional perspective.

During phase 3B, an ad hoc quantitative validation procedure was conducted and reviewed by the steering committee as the final step.

Finally, in phase 4, the analysis and potential solutions were disseminated to as many Spanish healthcare centers as possible, to facilitate an in-depth transformation of the CKD healthcare process for the optimization of clinical pathway and patient management. Results were implemented in a digital questionnaire in the form of playbook that provided a detailed analysis of CKD healthcare units at each center and the design of improvement actions.

The results from the CARABELA-CKD initiative will be published shortly after this communication and will offer a framework for the development of an improved future CKD care model, based on a comprehensive and integrated approach aimed at addressing the improvement areas associated with the transversal potential solutions identified. The goal is to provide attending specialists and patients with standardized, excellent care aimed at optimizing the early detection and management of the disease and delaying its progression to more advanced stages.

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Conflicts of interest

BQ is secretary of Sociedad Española de Nefrología, and has received consulting fees, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events, and support for attending meetings and/or travel from Vifor-Pharma, Astellas, Amgen, Ferrer, Novartis, AstraZeneca, Sandoz, Laboratorios Bial, Esteve, Sanofi-Genzyme, and Otsuka. JJGM has the following financial relationships: advisor on scientific boards for AstraZeneca, Bayer, Janssen Pharmaceuticals, Eli Lilly and Company, Menarini and Novo Nordisk; lectures for Abbott, Amarin, AstraZeneca, Boehringer Ingelheim Pharmaceuticals Inc, Janssen Pharmaceuticals, Eli Lilly and Company, Menarini, Mundipharma Pharmaceuticals, Novo-Nordisk and Roche Pharma, and research activities for AstraZeneca, Eli Lilly and Company, Mundipharma Pharmaceuticals and Novo Nordisk. JID is an employee at the Medical Department of Departamento médico, AstraZeneca Farmacéutica Spain. PR declares no conflict of interest.

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Appendix A.

The CARABELA-CKD Scientific Committee consists of the following members: Borja Quiroga (Sociedad Española de Nefrología, S.E.N.), Javier Escalada (Sociedad Española de Endocrinología y Nutrición, SEEN), Juan José Gorgojo (SEEN), Manuel Pérez Maraver (SEEN), Mercedes Salgueira (S.E.N.), Patricia de Sequera (S.E.N.), Pedro Ruiz (Sociedad Española de Calidad Asistencial), Alberto Prado Dominguez (Departamento médico, AstraZeneca Farmacéutica Spain), Jesús Ignacio Diago (Departamento médico, AstraZeneca Farmacéutica Spain), and Lucía Regadera (Departamento médico, AstraZeneca Farmacéutica Spain).

BIBLIOGRAFÍA

1. Gorostidi M, Sanchez-Martinez M, Ruilope LM, Graciani A, de la Cruz JJ, Santamaria R, et al. Chronic kidney disease in Spain: prevalence and impact of accumulation of cardiovascular risk factors. *Nefrologia* (Engl Ed). 2018;38:606-15, <http://dx.doi.org/10.1016/j.nefro.2018.04.004>.
2. Kuma A, Kato A. Lifestyle-related risk factors for the incidence and progression of chronic kidney disease in the healthy young and middle-aged population. *Nutrients*. 2022;14, <http://dx.doi.org/10.3390/nu14183787>.
3. Prieto-Velasco M, Del Pino YPMD, Buades Fuster JM, Craver Hospital L, Pons Prades R, Ruiz San Millan JC, et al. Advanced Chronic Kidney Disease Units in Spain: a national survey on standards of structure, resources, results and patient safety. *Nefrologia* (Engl Ed). 2020;40:608-22, <http://dx.doi.org/10.1016/j.nefro.2020.06.006>.
4. Airg E, Ekpf, Alcer, Friat, Redinren, Ricors, Senefro, Set, ONT. CKD: the burden of disease invisible to research funders. *Nefrologia* (Engl Ed). 2022;42:65-84. [doi:10.1016/j.nefro.2021.09.005](http://dx.doi.org/10.1016/j.nefro.2021.09.005).
5. Nefrología SED. La Enfermedad Renal Crónica en España; 2022.

6. Documento Marco sobre Enfermedad Renal Crónica (ERC) dentro de la Estrategia de Abordaje a la Cronicidad en el SNS; 2015. Available from: https://www.sanidad.gob.es/organizacion/sns/planCalidadSNS/pdf/Enfermedad_Renal_Cronica_2015.pdf.
7. Aiyegbusi OL, Kyte D, Cockwell P, Anderson N, Calvert M. A patient-centred approach to measuring quality in kidney care: patient-reported outcome measures and patient-reported experience measures. *Curr Opin Nephrol Hypertens.* 2017;26:442-9, <http://dx.doi.org/10.1097/mnh.0000000000000357>.
8. Nimmo A, Bell S, Brunton C, Campbell J, Doyle A, MacKinnon B, et al. Collection and determinants of patient reported outcome measures in haemodialysis patients in Scotland. *QJM.* 2017;111:15-21, <http://dx.doi.org/10.1093/qjmed/hcx180>.
9. Tang E, Bansal A, Novak M, Mucsi I. Patient-reported outcomes in patients with chronic kidney disease and kidney transplant – Part 1. *Front Med (Lausanne).* 2017;4:254, <http://dx.doi.org/10.3389/fmed.2017.00254>.
10. Escalada J, Carretero Gómez J, Anguita M, de Sequera P, García-Río F, Dávila I, et al. Enhancing the management of chronic diseases in clinical practices: the CARABELA methodology. *J Healthc Qual Res.* 2024, <http://dx.doi.org/10.1016/j.jhqr.2024.06.001> [in press].

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¿Es útil medir el grosor de la grasa peri-pararrenal mediante ultrasonografía como marcador de riesgo cardiovascular en pacientes obesos con enfermedad renal crónica?



Is it useful to measure peri-parenal fat thickness by ultrasonography as a marker of cardiovascular risk in obese patients with chronic kidney disease?

Sr. Director,

La obesidad se ha convertido en una pandemia mundial¹ y se considera un factor de riesgo cardiovascular (RCV) independiente para el desarrollo y progresión de la enfermedad renal crónica (ERC)². Además, el tejido adiposo visceral es en sí, también un factor de RCV. Recientes estudios han observado que la acumulación de grasa renal ectópica (GRE) en tejido no adiposo, denominada «fatty kidney» o «riñón graso», se encuentra relacionado con la enfermedad renal asociada a la obesidad, y presenta una mejor correlación con la grasa total y visceral que aquellas mediciones como el perímetro de cintura o el índice de masa corporal^{2,3}.

La distribución anatómica de la GRE se divide en: a) grasa del seno renal (GSR), tejido adiposo situado en la cara medial del riñón, que comparte espacio con estructuras vasculares, nerviosas, linfáticas, cálices mayor y menor, pelvis renal y uréter proximal; b) grasa perirrenal (GPeR) que se encuentra entre

la cápsula renal y la fascia de Gerota (FG); c) grasa pararrenal (GPaR) que rodea al riñón fuera de la FG y d) grasa parenquimatosas renal (GPR), es el tejido adiposo dentro de la corteza y la médula renal. El impacto de la toxicidad lipídica a nivel renal se produce por una acumulación de gotas lipídicas en el parénquima renal (podocitos, mesangio y células tubulares proximales), contribuyendo a la disfunción renal a través de mecanismos de inflamación crónica por liberación de adipocinas y citocinas que pueden exacerbar la aterosclerosis y otros procesos patológicos cardiovasculares, el estrés oxidativo, la disfunción mitocondrial, la autofagia, además de la compresión mecánica directa por el depósito de grasa que conduce a la hipoperfusión^{4,5}.

Múltiples técnicas de imagen como la ultrasonografía (US), tomografía axial computarizada (TAC) y resonancia magnética (RM) han sido utilizadas para cuantificar el grosor de la grasa peri-pararrenal (GGPPR), la GSR y la GPR, respectivamente⁴. Estas medidas ofrecen una perspectiva directa sobre la distri-