Geriatric Assessment in Nephrology
Avaliação Geriátrica em Nefrologia

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Abstract:

Aging is one of the greatest challenges of the 21st century. "Chronic kidney disease (CKD) is highly prevalent in geriatric patients, but its management requires particular consideration due to the high heterogeneity of this population". Comprehensive geriatric assessment (CGA), encompassing the identification of frailty and other geriatric syndromes, can modify prognostic outcomes, including quality of life, hospitalization rates, and mortality, as evidenced in oncology. Consequently, several nephrology guidelines recommend frailty screening in older adults with CKD. Nephrology-tailored geriatric assessment (NGA) emerges as a potentially valuable instrument for facilitating shared decision-making in elderly patients with end-stage kidney disease (ESKD). However, its implementation remains inconsistent in Portuguese clinical practice. This article aims to critically evaluate the potential benefits of CGA and NGA in the context of nephrology clinical practice.

Keywords: Aged; Geriatric Assessment; Kidney Failure, Chronic; Renal Insufficiency, Chronic.

Resumo:

O envelhecimento é um dos maiores desafios do século XXI. A doença renal crónica (DRC) é particularmente frequente em doentes mais velhos, mas isso impõe considerações especiais nesta população que é muito heterogénea. A identificação de fragilidade ou outra síndrome geriátrica por uma avaliação geriátrica abrangente (AGA) pode mudar o prognóstico, a qualidade de vida, a hospitalização ou mesmo a mortalidade, como foi demonstrado em Oncologia. Várias diretrizes recomendam a triagem da fragilidade em doentes idosos com DRC. A avaliação geriátrica adaptada à nefrologia (NGA) pode ser uma ferramenta útil para a tomada de decisão partilhada na doença renal em estádio avançado em idosos, embora essa não seja a prática em Portugal. Neste artigo, refletimos sobre o benefício da AGA ou da NGA na prática clínica em Nefrologia.

Palavras-chave: Avaliação Geriátrica; Falência Renal Crónica; Idoso; Insuficiência Renal Crónica.

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Introduction

Chronic kidney disease (CKD) is a prevalent organ insufficiency projected to become the fifth leading cause of death by 2040. Affecting approximately one in ten individuals globally, CKD predominantly impacts elderly patients[1] affecting 1 in 2 individuals. The incidence of patients requiring kidney replacement therapies (KRT) is also increasing within the older demographic age. In Portugal, a study estimates CKD prevalence in 9.8%[2] at any stage of the disease. In what concerns to dialysis patients in 2024, in Portugal, there were 14 089 prevalent patients and 2506 incident cases, with 65.6% and 23.3% exceeding 65 and 80 years of age, respectively. Notably, 366 patients opted against pursuing KRT.[3]

Distinct trajectories of functional decline and disease progression are observed, not solely explained by traditional risk factors or comorbidities. Current prognostic tools have limitations in accurately predicting survival, impacting shared decision-making between dialysis and conservative care. CKD is associated with premature aging, independent of chronological age.[4] This unsuccessful aging is clinically evident by the emergence of geriatric syndromes, with 98.0% of CKD patients exhibiting at least one of such syndromes.[5] These syndromes, including cognitive impairment, instability/falls/immobility, sarcopenia, polypharmacy/iatrogenesis, and frailty, contribute to adverse health outcomes, such as hospitalization, disability, institutionalization, dependence, and mortality.[6] They also significantly impact quality of life and symptom control.[7] The integration of geriatric syndrome diagnosis and intervention may significantly influence disease trajectory since traditional clinical assessments often fail to detect geriatric syndromes, demanding active screening. Their identification requires a multidimensional evaluation encompassing functional status, cognition, comorbidities, mood, falls, polypharmacy, nutrition, and social support. This is achieved through the application of a Comprehensive Geriatric Assessment (CGA), a methodology employed by geriatricians to individualize elderly care. While CGA is used in oncology or orthogeriatric to inform invasive interventions and shared decision-making, its routine

application in nephrology remains limited.[8] CGA implementation may be relevant across all CKD stages:

- Early stages: To optimize global prognosis, prevent institutionalization, and maximize patient potential, delaying CKD progression.
- CKD stages 4/5: To identify factors influencing outcomes, guide advanced care planning, and facilitate informed decisions regarding KRT versus conservative care.
- KRT: To manage complexity, identify patients experiencing functional or cognitive decline, monitor quality of life, and assess changes in prognosis that may necessitate KRT modification or transition to conservative care.
- Kidney donation: older donors should also be considered after a thorough evaluation to ensure they are in good health.[9]

MANAGEMENT OF CKD IN THE ELDERLY

Management options for end-stage kidney disease (ESKD) patients include dialysis (haemodialysis or peritoneal dialysis), kidney transplantation or conservative / supportive care (Fig. 1):

- Hemodialysis is a blood purification treatment that is usually performed three times a week for about four hours in a healthcare facility. While prevalent in Portugal, it implies frequent lifelong travel and sleep–wake rhythm disruptions in patients residing at a distance from the treatment centre or required to wake up early due to morning-shift haemodialysis. Most patients choose hemodialysis, an option that does not require them to manage their own treatment. Older patients face more intra and extra dialytic complications such as fatigue, arterial hypotension, or vascular access issues. Peritoneal dialysis allows uremic toxin removal via the peritoneal membrane, performed daily at home three to four times a day for half an hour. This modality offers flexibility but may require caregiver assistance (or a formal caregiver in some countries) if the patient is unable to perform the procedure independently. Besides, older individuals exhibit reduced peritoneal membrane function and greater change of peritoneal adhesions from previous surgeries, abdominal wall weakness and weakened immune system which makes them prone to infection.
- Kidney transplantation is the modality associated with improved survival and quality of life. However, age-based criteria and concerns regarding immunosuppression-related complications (infections or cancer development) limit its application in older patients. Ethical considerations regarding organ allocation further complicate decision-making: younger patients are often prioritized due to the scarcity of organs. Nevertheless, older patients for whom transplantation offers a better prognosis should not be denied the treatment solely on the assumption of equity. In what concerns

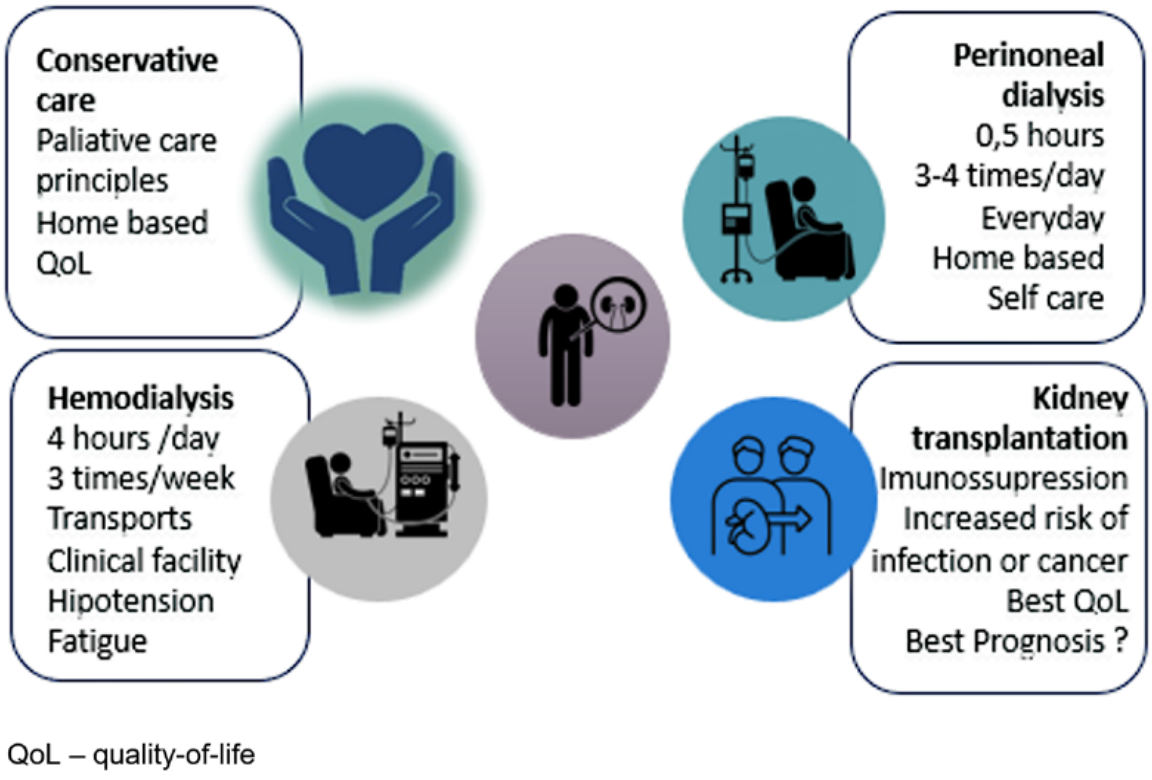

Figure 1: Options to manage elderly CKD patients and its particularities.

to donation, considering older donors or marginal ones might improve organ availability.
- Conservative care: Employs palliative care principles, including symptom management, advance care planning, family support and end-of-life care alongside the treatment of CKD complications (such as anaemia, metabolic acidosis and uremic syndrome).[10]

Chronological age alone should not dictate ESKD therapy selection. Modality selection should be based on a shared decision-making process, incorporating patient values, goals of care, and a clear discussion of prognosis and quality of life. Current practice often relies on paternalistic or purely informative models, which may not adequately address individual patient needs. In the paternalistic model, doctors recommend the modality they believe is best for their patients without considering patients' values and goals of care. In an informative model, a large amount of data is provided without adaptation to the specific case. This model does not consider a shared decision also.[11] The implementation of multidisciplinary counselling consultations on renal replacement therapy focusing also on patient's and/or caregiver's needs, beliefs and restraints should be encouraged.

Halting a KRT is a difficult decision for clinicians, patients and, sometimes, even more for caregivers/family when patients have cognitive impairment and are unable to decide for themselves. In this matter, the relevance of objectively and periodically monitoring the functional and cognitive declines through validated NGA tools, despite interventions to slow or revert this trend, and the importance of establishing advanced care directives at the earliest opportunity cannot be overemphasized.

GUIDELINES

Nephrologists have great expertise in controlling traditional risk factors for CKD progression (namely diabetes mellitus or hypertension) but have limited experience in managing geriatric syndromes or improving quality of life.

To face these limitations, several societies have issued guidelines on how to optimize CKD management in elderly patients.

- In 2016, the European Renal Association through its European Best Practice Committee published a guideline "on management of older patients with chronic kidney disease".[12] It emphasizes six key pillars for managing older CKD patients, including glomerular filtration rate (GFR) estimation, prognosis of disease progression and mortality, assessment of functional and nutritional status, and appraisal of KRT versus conservative care. These guidelines advocate regular functional status evaluation using validated tools and draw attention to the importance of frailty assessment. The recommendation to evaluate functional status states "the intention to identify those who would benefit from a more in-depth geriatric assessment and rehabilitation". They suggest including *"self-report scales and field tests ([sit-to-stand (STS), gait speed or 6-min walk test]"* and they even advice periodicity *"On a regular basis implies for dialysis patients 6–8 weekly; for ambulatory patients at least at every visit"*. They also highlight that *"frailty scores are interlinked with functional status and can provide additional information during assessment and shared decision-making"*. To our knowledge, there is no Nephrology unit in Portugal (in a hospital setting or dialysis one) that fulfills that recommendation. These guidelines also put at the same level of importance the progression to ESKD/deterioration of residual renal function, the survival/mortality and the functional status or QoL/patient satisfaction defining them as equal *"critically important outcomes"*.
- The 2017 Royal Society of Medicine symposium underscored the need for geriatric syndrome screening in older ESKD patients. They called for research to validate screening tools and intervention strategies, to mitigate the impact of these syndromes on renal patients, and defend the integration of geriatrics into renal medicine.[13]
- In 2019 a joint position paper by the Italian Society of Nephrology and the Italian Society of Geriatrics and Gerontology emphasized the importance of collaborative CGA and tailored therapeutic approaches between nephrologists and geriatricians emphasizing that *"a nihilistic attitude would carry the risk of leaving a treatable condition untreated and, then, prone to deterioration but on the other hand, a too aggressive and untailored approach to be harmful"*.[14]
- The 2024 Kidney Disease Improving Global Outcomes (KDIGO) guidelines advocate for multidimensional evaluation of older CKD patients, including multimorbidity, frailty, sarcopenia, cognitive function, polypharmacy, and end-of-life care.[15]

All of these considerations are not routinely integrated into quality-of-care indicators in Portugal.

THE RELEVANCE OF COMPREHENSIVE GERIATRIC ASSESSMENT

CGA is a multidisciplinary process for identifying and addressing medical, psychosocial, social and functional limitations in older adults. It is the cornerstone of geriatric medicine to manage complex patients and facilitate tailored therapy adjustments or improvement of outcomes such as the likelihood of patients remaining at home, mitigating decline, and averting mortality. Its application in recent years in oncology,[16-18] cardiology,[19] surgery,[20] or emergency medicine,[21] demonstrates its value. The use of CGA allows safe and effective treatment, predicting tolerance and avoiding the harmfulness of invasive interventions in this heterogeneous population.

In Oncology, in 2005, the International Society of Geriatric Oncology (SIOG) defined the importance of CGA use in older cancer patients. It presents evidence on the benefits and

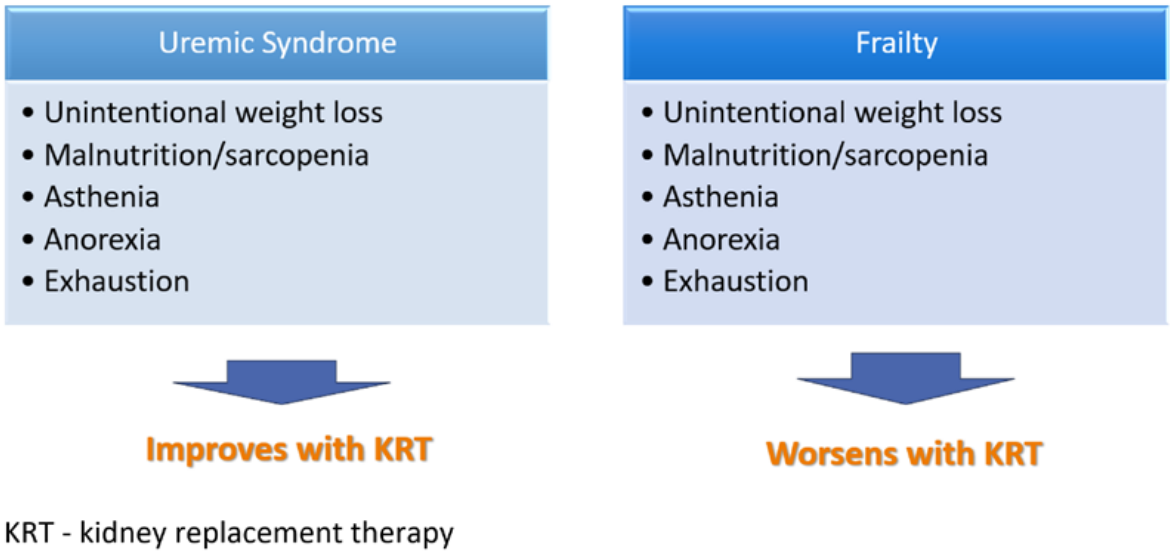

Figure 2: Differential diagnosis between uremic syndrome and frailty.

effectiveness of CGA on top of standard care and suggests screening tools and alternative assessments.[17] In 2014 the guidelines were revised and reinforced with suggestions of models of implementation since in these 9 years growing evidence supports the importance of CGA in treatment choices and outcomes achieved. In 2021, the same society published an updated version of the priorities for the global advancement of care for older adults with cancer. It comprises 4 pillars: education (namely residency training programs on geriatrics); clinical practice (models of care implementation; guidelines development and centres of excellence establishment); Research and Collaborations and partnerships.[18]

Given the invasive and lifelong nature of KRT, CGA holds significant potential in nephrology highlighting the importance of a more in-depth understanding of the older patient before deciding on an invasive procedure.

Evidence supports the benefits of CGA in dialysis and pre-dialysis patients,[22-25] meaning in all phases of the disease. For example, CGA facilitates the differentiation of frailty from uremic syndrome.[26,27] Frailty identification might be an important differential diagnosis from uremic syndrome where both loss of appetite, malnutrition or fatigue are shared. Dialysis initiation improves uremic syndrome, but it worsens frailty syndrome (Fig. 2).[26] CGA also allows risk stratification and supports shared decision-making: fit patients might benefit from KT; frail patients should consider conservative care and vulnerable patients might be suitable for dialysis (Table 1).

GERIATRIC NEEDS IN CKD PATIENTS

Studies in the Netherlands have explored the assessment and implementation of geriatric needs in CKD patients.[26,28,29] CGA benefit is now recognized but it is a time-consuming process for both patients and healthcare providers that poses logistical difficulties.[21,30,31] In recent years, new forms of CGA delivery have emerged. Modified approaches of geriatric assessment are conducted to identify multi-domain vulnerabilities without the traditional involvement of geriatricians in diagnosis and follow-up care plan. This approach is particularly interesting for nephrology. The project Pathway for OLDer patients with End stage Renal disease (POLDER) was initiated in 2018; it was designed to make a nephrogeriatric assessment and to evaluate all Dutch older patients with ESRD. A national multi-centre registration was built to investigate determinants of adverse outcomes, implement interventions and improve outcomes for these patients.[29] This project has been concluded and led to the follow-up project DIALOGICA to implement the geriatric assessment and to compare QoL, clinical outcomes, and costs between conservative care and dialysis in older patients.[32] POLDER evaluated a test set of a maximum duration of 1 hour, run by specialized nurses, that included.

- **Functional:** Katz ADL-6, Lawton iADL, Hand grip strength
- **Cognition:** MOCA, 6-CIT, Letter Digit Substitution Test
- **Mood:** Geriatric Depression Scale, Optimism check
- **Proms:** SF-12 (QOL), Dialysis Symptom Index (DSI)
- **Nutrition:** PG-SGA
- **Other:** Charlson comorbidity index, Clinical judgement, Surprise question, Clinical Frailty scale, Caretaker questionnaire, Questionnaire on choice of treatment.

Based on this evaluation, a nephrology-tailored geriatric assessment (NGA) was constructed. A modified geriatric assessment tailored to kidney care may offer a practical solution to overcome implementation barriers of a full CGA.[26,28,29,33]

Table 1: Function age, its evaluation and recommendations for kidney replacement therapy (KRT).

Functional Age	Clinical Description		Recommendations for Kidney Replacement Therapy
Healthy/ usual or fit	Few hospitalizations Good QOL	CFS > 3 Independent in ADLs and iADLs Low comorbidity score (CCI <4) No geriatric syndromes (dementia, frailty, functional disability, depression, malnutrition, falls) Negative physical frailty testing Answer yes to surprise question	Optimal for transplant or dialysis
Vulnerable or intermediate	Increasing hospitalizations	CFS 4-6 Dependent in one ADL and iADLs Comorbidity score (CCI 5–7), 1–2 geriatric syndromes Prefrail (1–2 criteria) to 1 frailty testing Unclear answer to surprise question: I don't know	Typical dialysis patient Assessment of and intervention on geriatric issues to optimize factors that may adversely affect outcomes
Frail	Susceptible to poor outcomes High risk of hospitalizations Nursing home patients with notable disability	CFS <6>6 Dependent in >2 ADLs and iADLS Significant symptom burden Answer no to the surprise question High comorbidity score (CCI 8) >2 geriatric syndromes Physical frailty Cognitive dysfunction Inability to transfer	Suboptimal dialysis candidate Recommend conservative care or time-limited trial of dialysis

ADL – activities of daily living; CCI – Charlson Comorbidity index; CFS – Clinical Frailty Scale; QoL – quality-of-life

In 2019, in the United Kingdom, two different nephrologists employed two different but similar programs of nephrology-tailored geriatric assessment.[8,22]

The implementation of CGA or NGA should be personalized to the specific characteristics of each healthcare system.[27] In some realities, there is a geriatrician that works with the nephrology clinic performing a standardized geriatric assessment. On other models a team with a nephrologist with education on Geriatrics leads the NGA to conduct the geriatric assessments. In the USA, in 2009, a Nephrogeriatrics curriculum was defined by the Accreditation Council for Graduate Medical Education (ACGME) to guarantee that nephrologists have basic knowledge and skills in Geriatrics.[34]

In Portugal, a country where Geriatrics is not implemented as a medical specialty and where geriatricians are scarce, the second model seems more feasible. In what concerns to the choice of screening tools to perform a NGA, its evaluation is also recommended: the validation of a test set should be performed before widespread application. The authors are now conducting such study in all stages of CKD.

Conclusion

The progressive demographic shift towards an aging population presents significant societal and patient management challenges. Beyond the consideration of comorbidities, the evaluation of functional status and quality of life is paramount in the care of geriatric individuals. Traditional clinical evaluation often proves insufficient in detecting geriatric syndromes that can significantly impact adverse outcomes. Comprehensive geriatric assessment has demonstrated efficacy in enhancing care for older patients, particularly in oncology. The judicious selection of aggressive therapeutic interventions should be predicated on the patient's performance status, which can be accurately assessed through this specialized methodology. There is growing evidence suggesting that a nephrology-tailored geriatric assessment can facilitate informed shared decision-making in ESKD when determining the appropriateness of KRT, thereby improving overall outcomes. Further research within the Portuguese population context is warranted to establish optimal implementation strategies and to identify the most effective screening instruments. ■

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AF – Writing and data collection
FT, PV – Statistical analysis and review
CF – Data collection and review
JS – Review and final decision
All authors approved the final version to be published.

Declaração de Contribuição

AF – Redação do manuscrito e recolha de dados
FT, PV – Análise estatística e revisão
CF – Recolha de dados e revisão
JS – Revisão e decisão final
Todos os autores aprovaram a versão final a ser publicada.

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