# Current and Future Management of Ischemic Stroke in Elderly Patients With Chronic Kidney Disease

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Ischemic stroke in elderly patients with chronic kidney disease (CKD) presents complex clinical challenges, given the high prevalence of vascular comorbidities, altered pharmacokinetics, and increased risk of both thrombotic and hemorrhagic events. Current management approaches follow the conventional phases of stroke care—hyperacute, acute, and secondary prevention—but require modification in this population. In the hyperacute phase, intravenous thrombolysis and endovascular therapy must be applied judiciously, accounting for renal impairment and associated complications. The acute phase focuses on blood pressure optimization, fluid and metabolic management, and early rehabilitation, while the secondary prevention phase involves careful adjustment of antithrombotic and lipid-lowering therapies to balance efficacy with safety. Despite these structured approaches, evidence tailored specifically to CKD populations remains limited, underscoring the need for innovation in diagnosis and treatment. Recent advances in digital health and precision medicine offer promising avenues for future management. One such development is a smartphone-based auscultation system designed to detect carotid artery stenosis through sound analysis. In a prospective study, machine learning algorithms applied to recorded carotid sounds effectively differentiated patients with significant stenosis from controls, demonstrating potential as a non-invasive screening tool. Additional work has focused on the analysis of thrombi retrieved during mechanical thrombectomy. Morphologic and compositional analysis, supported by artificial intelligence, may provide insights into stroke etiology, particularly in cases classified as cryptogenic, and enable more targeted secondary prevention strategies. Furthermore, the integration of whole genome sequencing into clinical care is being explored through a mobile application that allows individuals to store and utilize their genomic data. This platform aims to support pharmacogenomic decision-making and individualized risk assessment. Together, these approaches represent a shift toward more personalized, data-driven stroke management

strategies. As digital diagnostics and genomic medicine continue to evolve, their incorporation into clinical workflows may enhance the precision and safety of stroke care in patients with CKD.