

# Sleeping Position, Deep Sleep, and Dementia Prevention: Clinical and Mechanistic Perspectives

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## Abstract

Sleep has emerged as a central, modifiable determinant of neurodegenerative disease risk, particularly Alzheimer's disease (AD). Increasing evidence demonstrates that slow-wave sleep (SWS) plays a critical role in facilitating glymphatic clearance of neurotoxic proteins, including beta-amyloid and tau, which are central to AD pathophysiology. Disruption of sleep architecture, especially reduction in deep sleep, has been associated with increased amyloid burden, impaired cognitive function, and accelerated neurodegeneration. In parallel, emerging experimental and observational data suggest that sleeping position may influence glymphatic transport, with lateral positioning potentially enhancing cerebrospinal fluid (CSF) dynamics and waste clearance. However, human evidence remains limited and causality is not established. This review provides a clinically oriented synthesis of current evidence (2020–2026), integrating epidemiological, mechanistic, and translational perspectives on sleep, sleep position, and dementia prevention. While optimization of deep sleep represents a robust and evidence-based preventive strategy, sleep posture remains an evolving and promising adjunctive factor. Future research should focus on integrating sleep architecture modulation and positional interventions into comprehensive dementia prevention frameworks.

**Key words:** sleeping position, deep sleep, dementia