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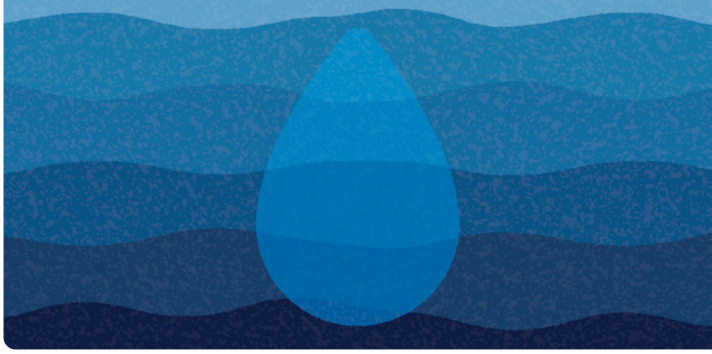

Dehydration, Cognitive Functioning, & ADLs

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Dehydration is common among nursing home residents, and it bears both immediate and potentially, long-term associations with both cognitive health and ability to perform activities of daily living (ADLs).

Prevalence of dehydration in LTC

In research conducted in 8 LTC facilities, Marra and colleagues found that more than 38% of residents met criteria for dehydration, with serum osmolality of 300 mOsm/kg, and another 30% met criteria for impending dehydration (serum osmolality 295-300 mOsm/kg). Inadequate fluid intake was significant, with an average daily deficit of 700-1800 mL per day.

More than three-quarters of the residents studied had dementia, and more than half needed ADL assistance with eating and drinking. Additionally, nearly half of those studied had dysphagia, which can make fluid consumption more challenging. Many residents were prescribed oral nutritional supplements, but these did not improve overall fluid intake.

Causes of dehydration

Multiple factors can contribute to dehydration, note Marra et al.:

- Age-related sarcopenia reduces total body water content.
- Age-related decline in renal function reduces the ability to concentrate urine and conserve body water.
- Age-related decline in the thirst mechanism can lead to reduced fluid intake.
- Medications can affect fluid balance as well as food and beverage intake.
- Residents experiencing incontinence or needing assistance may intentionally self-restrict fluid intake.
- Residents who have cognitive impairment may not recognize or communicate their own needs.
- Staffing patterns may influence the level of assistance with eating and drinking provided.

Consequences of dehydration

There may be both short-term and long-term negative consequences of dehydration among older adults. Dehydration is a common reason for hospitalization among people over age 65, and it affects healthcare outcomes, hospital readmission rates, expenditures, and quality of life, explain Sfera et al.

Among long-term care residents, dehydration can contribute to constipation, hypotension, pneumonia, seizures, UTIs, confusion, delirium, development of pressure ulcers, and other conditions, say Marra et al. Hydration status specifically affects attention and mood, according to Lauriola and colleagues.

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Dehydration, Cognitive Functioning, & ADLs *continued*

It's important to note that the brain is 80% water, Sfera et al. point out. Ordinarily, brain cells called astrocytes store a great deal of this water. In response to peripheral dehydration, though, they can store too much water—leading to extracellular dehydration. "If severe enough, this condition may turn into a medical emergency, dehydration encephalopathy, or delirium," say the authors. A loss of just 1-2% of total body water can lead to "impaired cognitive performance," they note.

Several lines of research are exploring long-term associations between dehydration and dementia. Sfera et al. describe the role of water in clearing beta amyloid, which may influence the progression of Alzheimer's disease over time. They call out an association between dehydration, loss of astrocyte cells, and progression of Alzheimer's.

Overall, found Lauriola and colleagues, "dehydration was associated with the risk of developing dementia conditions." They explain that chronic dehydration may impair cellular metabolism and reduce brain volume, potentially contributing to neuropathologies.

Data collected by Lauriola et al. showed that individuals who have Alzheimer's disease also have a high likelihood of being currently dehydrated. Marra et al. emphasize the double-sided coin of hydration and cognitive status: "While impaired mental status (cognition) can be a contributing factor for becoming dehydrated, it can also be an adverse outcome of dehydration." Dehydration can negatively affect short- and long-term memory, perceptions, and reaction time, they say. It can also be associated with anxiety and agitation. They further emphasize that severe dehydration can lead to hallucinations, delusions, and delirium.

Dehydration and ADLs

The research by Marra et al. and Lauriola et al. suggests that dehydration and ADLs may be connected. Reduced functional ability and the need for assistance with ADLs can be a contributing factor to dehydration. Meanwhile dehydration may reduce a resident's functional ability.

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Dehydration, Cognitive Functioning, & ADLs *continued*

Optimizing fluid intake

While there are several algorithms for estimating fluid needs, Marra et al. offer a simplified recommendation of aiming for a fluid intake of 2000 mL/day to prevent dehydration among nursing home residents. This is significantly higher than the average intake of 1147 mL/day they found in their research. They advocate for individualized evaluation of hydration status and proactive management. In addition, they point out that the risk of dehydration is not limited to residents considered frail on the basis of a low BMI. Their research revealed that overweight and obese individuals were also at risk of dehydration.

Encouraging fluid intake, including beverages with snacks, evaluating fluid intake of any dysphagic individuals who are limited to thick liquids, and assisting residents are all useful strategies. It is clear from the research that attention to adequate hydration is an important step in optimizing each resident's functional ability and quality of life—and this may be especially important for nursing home residents who are living with dementia.

888-837-5440
info@guidestareldercare.com

GUIDESTAR ELDERCARE
One Professional Center
2100 N Main Street,
Suite 304, Crown Point, IN 46307

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