

### In this article...

- Why signs and symptoms of dehydration are not effective in care home residents
- Official recommendations around the fluid intake needs of older people
- Evidence-based strategies for supporting good hydration in care home residents

# Effective hydration care for older people living in care homes



Nursing Times  
Self-assessment

## Key points

**Older people are at increased risk of dehydration because of age-related changes**

**The recommended daily fluid intake for older people is 2.0L for men and 1.6L for women**

**Signs and symptoms used to detect dehydration have been shown to be ineffective at doing so in the care home setting**

**Low-intake dehydration is diagnosed by measuring serum osmolality, which requires a venous blood sample**

**Strategies are available to care home staff to help improve residents' hydration**

**Personalised approaches are needed to support care home residents to drink enough**

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**Abstract** Low-intake dehydration is common in older people because of age-related physical, physiological, cognitive and psychological changes, and care home residents are at increased risk. Signs and symptoms commonly used to detect dehydration are ineffective at doing so in care home residents. Low-intake dehydration can only be accurately diagnosed by measuring serum or plasma osmolality, which requires a venous blood sample. Therefore, in the care home setting, preventing low-intake dehydration is key and staff should support residents to drink enough using a range of strategies and a person-centred approach.

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Signs and symptoms that are commonly used to detect low-intake dehydration have been shown to be ineffective in older people living in care homes. As such, nursing and care staff need to focus on giving older people in their care adequate fluids – ideally their preferred drinks, enjoyed in a pleasant, social context – to prevent dehydration. Summarising findings from recent studies, this article gives research-based practical solutions to ensure older care home residents drink enough.

## Low-intake dehydration

Low-intake dehydration is due to not drinking enough. It is characterised by low fluid levels in cells (intracellular dehydration) but only small falls in levels of circulating fluids. Electrolyte levels rise slightly as osmolality rises, but individual electrolytes are usually still within normal range.

Serum osmolality measures the concentration of blood components such as

electrolytes, glucose and urea. It can be measured directly from a venous blood sample analysed using an osmometer. This is the most accurate test for identifying low-intake dehydration but, as it has to be requested, is only undertaken when there is a clinical indication. Alternatively, serum osmolality can be calculated from sodium, potassium, urea and glucose levels using recommended equations (Volkert et al, 2019; Hooper et al, 2016a).

Low-intake dehydration differs from salt-loss dehydration (hypovolaemia), which results from both fluid and electrolyte loss, leading to extracellular dehydration and lower levels of circulating fluids, which may be reflected in postural hypotension (Volkert et al, 2019). Hypovolaemia may occur as a consequence of excessive vomiting, diarrhoea or bleeding, for example, and is not due to insufficient drinking (Volkert et al, 2019). This article discusses low-intake dehydration, which is extremely common in older people.

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## Signs and symptoms

Low-intake dehydration is associated with an increased risk of death, disability, hospital admission and longer hospital stays. Health professionals and care staff need to accurately identify whether older people in their care are drinking enough or becoming dehydrated (Hooper et al, 2016a).

To identify dehydration, nursing staff, care home staff and informal carers routinely rely on the observation of clinical signs and symptoms, such as: feeling thirsty; dryness of the skin, hands, armpits, eyes, or oral mucosa; loss of skin elasticity; fever; rapid pulse; hypotension; urine changes (low volume, high specific gravity, dark colour); and increasing confusion, lethargy, agitation.

Observing these signs and symptoms requires little training, provides instantaneous results and is inexpensive. However,

many of them were developed to assess dehydration in children and young adults (Hooper et al, 2014; Armstrong, 2007). Do they allow for the identification of low-intake dehydration in older people? The Dehydration Recognition in our Elders (DRIE) study recently addressed this question (Bunn and Hooper, 2019).

## Change of focus

In the DRIE study, the results of observing clinical signs and symptoms were compared with the results of a serum osmolality test (Bunn and Hooper, 2019; Hooper et al, 2016a). In 56 care homes in Norfolk and Suffolk, 188 residents were interviewed about how they were feeling (head-achy, tired, thirsty), examined for clinical signs and symptoms of dehydration, and had a serum osmolality test (Hooper et al, 2016b). They were considered to have:

- Current dehydration if their serum osmolality was >300mOsm/kg;
- Impending dehydration if their serum osmolality was >295-300mOsm/kg.

Table 1 lists the signs and symptoms assessed for their diagnostic accuracy. To be considered diagnostically accurate, and therefore clinically useful, they had to have a sensitivity and specificity of >70%. The study found that 20% of residents had current dehydration, a further 28% had impending dehydration, and that none of the signs and symptoms could distinguish between those who were dehydrated and those who were not; sensitivity and specificity were <70% for all of them (Bunn and Hooper, 2019; Hooper et al, 2016a). In other words, observing signs and symptoms did not correctly identify low-intake dehydration in care home residents. This implies that many dehydrated older people living in residential and nursing care homes are not being identified, which compromises their health and wellbeing.

This, and other recent studies, consolidate evidence that signs and symptoms commonly used to identify dehydration in older adults have no diagnostic accuracy when used in isolation (Johnson and Hahn, 2018; Fortes et al, 2015; Hooper et al, 2015a; Taniguchi et al, 2015). Furthermore, there is currently no evidence that a combination of observations may be diagnostically useful either. As a result, we recommend that:

- Signs and symptoms are no longer used in practice to detect low-intake dehydration in older adults;
- Nursing and care staff focus, instead, on supporting older people to drink well.

## Helping older people to drink enough

Older people are more at risk of developing low-intake dehydration because, with age, kidney function decreases and muscle mass drops, reducing water stores in muscle. Older people may also develop difficulties remembering to drink, accessing drinks and swallowing. If an older person is concerned about continence or needs help to get to the toilet, they often choose to drink less, thereby increasing their risk of low-intake dehydration. The risk of dehydration is increased in care home residents because they are more likely to experience these problems, relying on staff to help with drinking.

In the DRIE study, at least one in five care home residents had low-intake dehydration and the risk was higher for those with dementia, diabetes or kidney

**Table 1. Signs and symptoms assessed for accuracy in detecting dehydration**

The DRIE study assessed signs and symptoms and found to be none effective in isolation; there is no evidence that they are effective when used in combination

Body system	Sign/symptom
Mouth (19 tests)	<ul style="list-style-type: none"> <li>● Dryness of tongue and oral mucosa</li> <li>● Tongue furrowing</li> <li>● Tongue coating</li> <li>● Decreased saliva</li> <li>● Ropey saliva</li> <li>● Dry or cracked lips</li> <li>● Blueness of lips</li> </ul>
Eyes (3 tests)	<ul style="list-style-type: none"> <li>● Hypotonia of the ocular globes</li> <li>● Reduced tear secretions</li> </ul>
Skin (12 tests)	<ul style="list-style-type: none"> <li>● Reduced turgor</li> <li>● Crinkling and dimpling</li> <li>● Dryness</li> <li>● Reduced axillary and palmar sweating</li> </ul>
Cardiovascular (5 tests)	<ul style="list-style-type: none"> <li>● Increased capillary refill time</li> <li>● Hypotension</li> <li>● Orthostatic hypotension</li> <li>● Tachycardia</li> </ul>
Urinalysis (12 tests)	<ul style="list-style-type: none"> <li>● Volume</li> <li>● Colour, cloudiness</li> <li>● Specific gravity (two measures)</li> <li>● pH</li> <li>● Glucose, ketones</li> <li>● Blood, protein, leucocytes, nitrites</li> </ul>
Temperature (1 test)	<ul style="list-style-type: none"> <li>● Pyrexia</li> </ul>
Symptoms (4 tests)	<ul style="list-style-type: none"> <li>● Thirst</li> <li>● Headache</li> <li>● Lethargy</li> <li>● Feeling 'out of sorts'</li> </ul>

DRIE = Dehydration Recognition in our Elders  
Source: Adapted from Bunn and Hooper (2019) and Hooper et al (2016a)

### Box 1. ESPEN recommendations relevant to the care home setting

#### Prevention of low-intake dehydration

- Men should be offered at least 2.0L and women at least 1.6L of fluids per day in addition to fluids in food (unless otherwise medically indicated)
- All older people should be considered at risk of low-intake dehydration and encouraged to consume adequate amounts of drinks
- Care home residents should be offered a variety of drinks based on individual preferences
- Care homes should implement strategies including offering drinks frequently, increasing availability and variety of drinks, increasing staff awareness of the importance of drinking, helping residents to drink and helping residents with continence needs
- Strategies should be developed with residents, not just about them, as well as with staff, management and policy makers
- Barriers and promoters of drinking should underpin plans to support residents' drinking and be recorded in personalised care plans

#### Identification of low-intake dehydration

- Simple signs and symptoms (see Table 1) should not be used to identify (or rule out) low-intake dehydration
- For residents who are in regular contact with, or referred to, the healthcare system, diagnostic testing may be needed using a venous blood sample:
  - Directly measured serum osmolality: low-intake dehydration is present when directly measured osmolality is  $>300\text{mOsm/kg}$
  - When directly measured osmolality is not available, use the following recommended equation to calculate osmolality from serum sodium, potassium, urea and glucose levels (all measured in mmol/L):  

$$\text{Osmolarity} = 1.86 \times (\text{Na}^+ + \text{K}^+) + (1.15 \times \text{glucose}) + \text{urea} + 14$$
 Low-intake dehydration is present when calculated osmolality is  $>295\text{mmol/L}$

#### Treatment of low-intake dehydration

Older adults with low-intake dehydration who appear well should be encouraged to increase their fluid intake in the form of their preferred drinks. Those who appear unwell or are unable to drink may require additional fluids using alternative enteral or parenteral support in consultation with the medical team. This may require hospital admission.

ESPEN = European Society for Clinical Nutrition and Metabolism  
Source: Adapted from Volkert et al (2019)

were drinking the recommended daily amounts. Despite most drinks being offered during meals, most were drunk between meals.

Residents who drank enough:

- Were offered drinks more often throughout the day;
- Drank more with medications;
- Had a drink first thing in the morning before breakfast.

Waiting until breakfast to offer drinks is a missed opportunity to improve hydration. Offering a substantial drink with medications provides extra fluid, as well as making it easier to swallow pills and reducing the risk of side-effects of some medications.

In the DRIE study, residents tended to drink more during the day, before 6pm, which provides a clue about when to offer drinks. Some participants limited their fluid intake, particularly in the evening, because of worries about incontinence or difficulties accessing toilets. Residents rarely helped themselves to, or asked for, drinks, which puts the onus on nursing and care staff.

Residents drank more when given their preferred drinks. Preferred drinks were tea, coffee, all fruit juices (which were not often served) and hot, milky drinks such as hot chocolate (which, in many care homes, was only offered in the evening). Alcoholic drinks were completely consumed when offered. Provided there are no medical or pharmaceutical contraindications, a glass of beer/lager, as well as some other alcoholic drinks (but not spirits or liqueurs) are hydrating and enjoyable beverages that can be supplied in addition to non-alcoholic drinks. In contrast, squashes and cordials were left unfinished 86% of the time and water 58% of the time, so relying on residents to help themselves to water and squash provided in jugs does not work.

Drinks in care homes are often served in cups, glasses or mugs that contain 150-180ml of fluid; to achieve recommended daily fluid intakes, men need to drink 11-14, and women 9-11, of these. Table 2 shows how much older people need to drink in terms of drinking vessels of different sizes.

#### Personalised hydration care

Personalised approaches to hydration are needed and involve finding out residents' preferences for drink types and presentation. Residents and relatives can be asked to identify preferences. Care home staff can also ask residents whether they sometimes drink less than they would like and, if so, why. Preferences can then be recorded in

problems (Hooper et al, 2016b). El-Sharkawy et al (2015) showed that, in hospital, 37% of 200 older patients admitted acutely were dehydrated on admission and most were still dehydrated 48 hours later.

Drinking adequate amounts of fluid is critical in preventing low-intake dehydration. However, it is not easy for older people living in care homes to drink enough. There are many challenges to achieving daily fluid intakes of 2.0L (3.5 pints) in men and 1.6L (almost 3 pints) in women. Nursing and care staff need to use a range of approaches, as no single strategy works on its own (Abdelhamid et al, 2016; Bunn et al, 2016; Bunn et al, 2015; Hooper et al, 2015b).

The European Society for Clinical Nutrition and Metabolism (ESPEN) recently developed 22 evidence-based recommendations for preventing, identifying and treating low-intake dehydration,

which set out basic expectations of hydration care for older people in all settings (Volkert et al, 2019). Box 1 summarises those relevant to the care home setting.

#### Research-based strategies

Jimoh et al (2015) developed a drinks diary that older care home residents who are physically and cognitively able can complete themselves. Observing residents, the authors found they kept accurate records – much more accurate than nursing and care staff records or fluid charts – and that this helped residents understand how much they drank and needed to drink.

In the DRIE study, researchers documented how much, what and when care home residents were drinking, and then compared patterns between those drinking enough and those not drinking enough (Jimoh et al, 2019). Just over half

**Table 2. Older people's fluid intake needs according to drinking vessel size**

Drinking vessel type	Fluid volume	Daily fluid intake needs of drinks of this size	
		Women	Men
Small wine glass 	120ml	14	17
Small glass 	140ml	11	14
Small cup 	150ml	11	14
Large glass 	180ml	9	11
Regular mug 	200ml	8	10
Large mug 	250ml	7	8
Pint glass 	500ml	3.5	4



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the person's hydration care plan and staff can provide residents with their preferred drinks in their preferred cup, mug or glass.

Setting blanket hydration targets for residents without acknowledging personal habits and patterns of drinking may lead to failures in achieving daily targets and, therefore, failure to fulfill Regulation 14 of the Health and Social Care Act 2008 ([Bit.ly/CQCRegulation14](http://Bit.ly/CQCRegulation14)). Care homes with 'outstanding' CQC ratings often demonstrate a person-centred approach to hydration.

### Role of quality improvement nurses

In Norfolk, quality improvement (QI) nurses, who provide support and guidance to care homes on a range of subjects, found that care home staff's training and awareness around hydration varied and this, coupled with high staff turnover, could contribute to suboptimal hydration care in some care homes. They designed a hydration care bundle to improve support care workers' understanding of hydration in older people, with a 90-minute training session on the principles of good hydration, main causes of dehydration, and need for regular hydration.

Recognising that hydration is everyone's responsibility, QI nurses work with all care home staff. Chefs and cooks, often overlooked, have an important role, as the fluid content of food will be crucial when strategies to improve hydration have not worked. Activities coordinators have an invaluable part to play in supporting residents to drink and creating a sociable atmosphere. A good mealtime experience and a pleasant environment can encourage fluid intake. Many care homes show creativity in making drinking a social event – for example, calling drinks rounds 'Mocktail Mondays', 'Thirsty Thursdays' and 'Shandy Saturdays'.

### Box 2. Tips for improving hydration in care homes

- Offer more drinks more frequently
- Offer drinks earlier in the day, including before breakfast
- If using small cups, glasses or mugs, offer drinks more often
- If drinks are not finished, offer more frequent drinks
- Do not rely on residents asking for, or helping themselves to, drinks, but proactively offer them
- Avoid missing drinks rounds and ensure all residents are offered drinks during each round
- Promote the intake of fluids with medications
- Offer a variety of drinks, including hot milky drinks, fruit juice and alcohol, so drinking is more enjoyable
- Encourage drinking in a social, pleasant environment so it is more enjoyable
- Find out residents' preferences for drinks types and presentation, and record them in the resident's individual hydration care plan
- Improve continence support and access to toilets
- Involve all care home staff – including activities coordinators, chefs and cooks – in promoting residents' hydration

The QI nurses also promote person-centred care by using tools such as Life Story ([Bit.ly/DUKLifeStory](http://Bit.ly/DUKLifeStory)). The process involves listening, thinking together, coaching, sharing ideas and seeking feedback. The preferences, needs and values of the older person guide decisions and inform care that respects and is responsive to them.

### Conclusion

Box 2 lists tips for helping older people to drink enough. Many of the strategies described in this article can also be used in the home or hospital setting. Low-intake dehydration is common in older people, who are at high risk of it because of age-related physical, physiological, cognitive and psychological changes. Signs and symptoms commonly used to identify dehydration have been shown to be ineffective in care home residents. As a result of this, prevention is key and residents need to be supported to drink enough using a range of strategies along with a person-centred approach. **NT**

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