Although adequate hydration is recognised as a fundamental care need (Care Quality Commission, 2017), ensuring that frail older people consume the recommended minimum amount of fluid each day can be challenging, particularly in care homes. Older people admitted to hospital from a residential care setting have been found to be 10 times more likely to be dehydrated than those admitted to hospital from their own home (Wolff et al, 2015). This article describes practical approaches used to improve the hydration of older people in a care home environment. These were informed by a quality improvement project called I-Hydrate carried out in two London care homes, which provided valuable insights into both the challenges of keeping care home residents hydrated and the development of practical solutions.

**Key points**

- Dehydration can lead to delirium, falls, constipation and urinary and respiratory tract infections, and may require admission to hospital
- Care home residents do not always receive or consume enough fluids to meet daily requirements
- Giving residents a larger choice of drinks and better equipment can increase fluid intake
- Introducing protected drinks times and giving staff specific hydration tasks can help improve hydration
- Care home staff need to be made aware of the importance of good hydration
- Ageing and dehydration

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**Abstract** As people age, they become increasingly vulnerable to dehydration. Older people living in care homes are particularly at risk and ensuring that they receive and consume adequate amounts of fluid every day can be a challenge. This article describes the findings of a quality improvement project conducted in two London care homes aimed at optimising residents’ fluid intake. A range of simple and inexpensive practical solutions were developed and implemented with good results. The research team that worked with staff on the project has since developed a free resource pack on hydration in care homes.

**Citation** Greene C et al (2019) Practical solutions for optimising hydration in care home residents. *Nursing Times* [online]; 115: 9, 30-33.
Dehydration is difficult to diagnose in older people, as reliable and non-invasive methods of detection are not currently available (Oates and Price, 2017). Measuring blood osmolality is considered the best approach for determining the presence of dehydration but is impractical in the care home environment.

According to the World Health Organization (2002), adults should consume at least 1,500ml of fluid per day, while the European Food Safety Authority (EFSA) recommends a minimum of 1,600ml/day for women and 2,000ml/day for men (EFSA, 2010). There are methods of calculating individual fluid requirements based on body weight, body surface area and the quantity of calories or proteins consumed (EFSA, 2010).

I-Hydrate project
The aims of the I-Hydrate project were to optimise the hydration of care home residents, decrease dehydration and associated morbidity, and therefore improve the quality and safety of care. The two participating care homes were facilitated by the commissioning collaborative of the local clinical commissioning group. Both had been rated ‘good’ in their most recent CQC inspections in 2015. Home A had 160 rooms distributed across eight units; Home B had 146 rooms distributed across five units.

The project began in October 2015 and took place over an 18-month period. It was led by the research team at the University of West London. A local project team was created in each home, which included the unit manager, nurses, healthcare assistants (HCAs), residents and relatives.

Baseline data collection
Practice in relation to hydration was explored through observations of care and interviews with five staff and 27 residents and relatives.

To establish daily patterns of hydration care and fluid consumption, observers from the research team captured data on the provision and intake of fluids (and fluid-rich foods such as custard and porridge) between 6am and 8pm in a stratified sample of 14 residents. The amount of fluids served and consumed was observed over four days across the two care homes. The forms used by observers included space for explaining why drinks were not consumed (for example, because they had been removed by staff or spilt).

To provide us with insight into the experiences and needs of residents with differing levels of need, the stratified sample included residents from each of three hydration groups:

- Independent: resident is able to drink independently;
- Needs prompting: resident requires verbal encouragement to consume their drink;
- Needs assistance: resident relies on staff for the provision and consumption of drinks.

Findings from baseline data
There was some variance between staff perceptions (as expressed in the interviews) and observed practice, which highlighted some important barriers to hydration. Fig 1 gives an overall picture of all the barriers to hydration that were found in the two care homes.

HCAs provided most direct care, including serving drinks and meals to residents and helping them to eat and drink. Hydration care was not allocated to individual staff members but undertaken as a collective responsibility. In general, drinks were offered to residents at specific times of day: breakfast, lunch, mid-afternoon and dinner. Some residents could be offered a drink before breakfast, mid-morning or before bedtime, but these extra drinks tended to be offered to independent residents. Drinks were rarely offered to any residents outside of the above-mentioned times.

The mean volume of fluid served per resident was 1,521ml/day and the mean volume consumed was 1,421ml/day. Of the 14 observed residents, only one drank more than 1,500ml; one consumed less than 500ml. Residents who were able to drink independently were more likely to receive and consume fluids. Those who needed prompting were served enough fluids, but only drank half of what they were served, as staff did not always give them enough encouragement to drink. Residents who needed assistance were less likely to receive drinks and most of the fluid they consumed was received at mealtimes, when staff focused on assisting them.

The interviews with residents established that tea, coffee and hot chocolate were all popular hot drinks. Cold drink preferences were explored through drink tasting sessions involving 47 residents in total. Results showed that residents preferred fruit juices to squash and favoured sweet, strong-flavoured and less acidic juices such as pineapple (95% positive responses), apple (83% positive responses) and mango juice (81% positive responses) – as opposed to orange squash (50% positive responses) or blackcurrant squash (40% positive responses).

Some participants had mild-to-moderate dementia: for them, cold drink
preferences were measured on a five-point scale using a tool designed to facilitate communication with people with cognitive impairment (Pouyet et al, 2015). Understanding residents’ preferences meant that popular drinks could be made routinely available at an additional cost of approximately £0.50 per resident per day.

**Strategies to improve hydration**

The baseline findings informed the areas of focus for subsequent improvement work. Since they indicated that all residents, regardless of their level of need, were at risk of under-hydration, strategies to improve fluid consumption were targeted at all residents.

A number of strategies (Table 1) were developed to:

- Increase the amount of fluid served and consumed across the day;
- Increase the choice of fluids;
- Provide more suitable drinking equipment;
- Increase staff awareness and knowledge of dehydration.

To measure the impact of improvement work, every four weeks six residents in each home were randomly selected for one day of observation of fluid provision and consumption. In addition, one of the registered nurses provided weekly data on the occurrence of dehydration and adverse health events that could be associated with dehydration, such as urinary tract infections, chest infections, falls and hospital admissions. The number of laxative doses and courses of antimicrobial therapy were retrieved from prescription charts every four weeks.

Changes to practice were tested using Plan-Do-Study-Act (PDSA) cycles. This involves carefully planning and carrying out changes on a small scale to identify any problems, before implementing them on a larger scale. Using PDSA cycles ensures changes are effective before they are rolled out. Once a PDSA cycle has been carried out, it is important to ask staff, residents or relatives for feedback, which can be integrated into future cycles until the new practice is working effectively. By using PDSA cycles, each strategy was adapted to fit the local context.

**Outcomes and challenges**

The strategies varied in their success and in the length of time they took to become established. In home A, the four-weekly fluid consumption data showed that, over the 12-month data collection period, the mean amount of fluid consumed by residents increased but did not quite reach the recommended 1,500ml/day. In home B, eight months from the start of improvement work, residents were found to consume a mean of 1,500ml/day or more and this remained unchanged in the last three measure points of the project. In addition, there was a significant reduction in the use of laxatives at both homes. The outcomes of the project are discussed in more detail elsewhere (Wilson et al, 2018).

A two-hour staff training session was facilitated by academic staff from the project team with backgrounds in nursing or nutrition. Across the two homes, 161 staff attended the training. They were asked to evaluate the session and their pre- and post-knowledge on six facets of hydration care. Most enjoyed the training (95%) and found it useful (95%), and their knowledge significantly increased in all facets of hydration care. More detail on the training aspect of the project can be found in Greene et al (2018).

The main challenges we encountered in achieving these improvements were:

- Implementing changes in practice in the context of high staff turnover and reliance on verbal communication with staff;
- Dependable leadership from the unit manager to drive change;
- Effective communication between carers and kitchen staff to ensure consistent supplies.

As measurements did not continue past the end of the project, we do not know

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**Table 1. Strategies used to improve the hydration of residents**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinks menu</td>
<td>A simple A4 menu with large images of all the hot and cold drinks available</td>
<td>• Increased variety of drinks served&lt;br&gt;• Increased fruit juice consumption&lt;br&gt;• Positive feedback from residents</td>
</tr>
<tr>
<td>Protected drinks time</td>
<td>Mid-afternoon drinks round designated as protected drinks time, with all HCAs given designated roles and assisting residents to have at least two drinks</td>
<td>• Increased amount of fluid served and consumed&lt;br&gt;• Positive feedback from residents</td>
</tr>
<tr>
<td>Drinks before breakfast</td>
<td>Care staff offer a drink to all residents in the dining room while they wait for breakfast to be served</td>
<td>• Increased amount of fluid served and consumed before breakfast&lt;br&gt;• Did not affect amount of fluid consumed during breakfast</td>
</tr>
<tr>
<td>Drinks after meals</td>
<td>Care staff offer a drink to all residents when clearing away plates after lunch and dinner</td>
<td>Increase amount of fluid served and consumed after meals</td>
</tr>
<tr>
<td>Mealtime guides</td>
<td>An A4 laminated sheet giving staff a brief overview of each resident’s food and drink preferences, level of support required, and hydration groups</td>
<td>Helpful for new or agency staff but difficult to embed into daily practice</td>
</tr>
<tr>
<td>Offer of fluid-rich foods</td>
<td>Increase the offer of fluid-rich foods, such as pureed fruit, during mid-afternoon drinks round</td>
<td>Positive feedback from residents</td>
</tr>
<tr>
<td>Suitable drinking vessels</td>
<td>Teacups with small handles and capacity replaced with lightweight mugs with wider handles and larger capacity</td>
<td>• Increased amount of fluid served and consumed&lt;br&gt;• Positive feedback from residents</td>
</tr>
<tr>
<td>Staff training</td>
<td>Two-hour interactive training session on hydration open to all staff</td>
<td>Increased reported levels of staff knowledge</td>
</tr>
</tbody>
</table>

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whether the improvements noted have been sustained.

Keys to success
Key changes that improved the effectiveness of the improvement work included:
- Allocating specific hydration activities to staff members;
- Incorporating changes into existing care activities;
- Ensuring suitability of drinking vessels;
- Establishing responsibilities for restocking drinks;
- Ensuring sufficient availability of different drinks;
- Holding team briefings we termed ‘huddles’.

Allocating specific hydration activities to staff was important in defining and delegating responsibilities. It also created a sense of teamwork, as all staff were contributing to a common goal. Another key to success was to incorporate changes into existing care activities. Changes worked best if they were tied up with established routines. Two examples are: getting care staff to offer a drink to residents after meals while they are removing plates; and designating the mid-afternoon drinks round as protected drinks time. The latter enhanced the effectiveness of an existing drinking opportunity. For protected drinks times, all HCAs are given designated roles, offer residents at least two hot and/or cold drinks, and support and encourage fluid intake – including offering refills.

Ensuring equipment was suitable for residents’ needs and preferences was another important aspect (Bak et al, 2018). The relatively simple intervention of providing suitable drinking vessels offered a practical way of increasing fluid provision without affecting staff time. The standard tea cups in the care homes held 150ml or 200ml. Introducing a mug that was larger but remained lightweight allowed residents to receive up to 280ml in one serving.

Training resources
The strategies developed for the project have been collated in a ‘Hydration in Care Homes’ resources pack, which has been used to train care home staff in the local area. The pack describes each strategy and provides implementation resources such as forms and posters. It also contains materials and ideas for a hydration training session for staff, as well as information about quality improvement and how to use PDSA cycles – a key step in changing practice that is sometimes overlooked. Another key factor in enacting change is involving the whole team, to share ideas about how practice can be improved and highlight potential barriers.

The resource pack is supported by five videos highlighting key aspects of hydration care. The topics covered are: an introduction to hydration, offering choice to residents, protected drinks time, swallowing difficulties (dysphagia), and how to position a resident and help them to drink.

Conclusion
The I-Hydrate project demonstrated that care home residents were at risk of dehydration due to inadequate fluid provision and intake. Incorporating strategies to increase fluid offer and consumption into routine care delivery increased the amount of fluids residents received and drank. Other important aspects of the improvement work included providing more suitable drinking equipment, offering a larger choice of drinks, and increasing staff awareness through training.

Although I-Hydrate focused on hydration in care homes, we believe that many of the strategies would be effective in other health and social care settings. Most are relatively inexpensive. However, they would require careful planning and adaptation to local circumstances. Information about these strategies and important things to consider when planning changes to care is available in our resource pack (Box 1).

References


European Food Safety Authority (2010) Scientific opinion on dietary reference values for water. EFSA Journal, 8: 1, 1459. Bit.ly/EFSAPurposeWater


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