The I-Hydrate project
Optimising the hydration of older people residing in care homes

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No of episodes of infection by organism

- E. coli
- S. aureus
- Klebsiella spp
- S. pneumoniae
- Pseudomonas spp
- Total (consistent laboratories)

No of episodes of infection - all organisms

Year and quarter


2004 2005 2006 2007 2008

0 1,000 2,000 3,000 4,000 5,000 6,000
**Epidemiology of E.coli bacteraemia**  
Abernethy et al 2017

Sentinel surveillance: 35 NHS hospitals in England; n = 1731

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Proportion of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community onset</td>
<td>68.3%</td>
</tr>
<tr>
<td>Healthcare exposure in last month</td>
<td>55%</td>
</tr>
<tr>
<td>Antibiotics in last 4 weeks</td>
<td>32.4%</td>
</tr>
<tr>
<td>Urogenital tract source</td>
<td>51.2%*</td>
</tr>
<tr>
<td>- Previous treatment for UTI (4 weeks)</td>
<td>62.4%</td>
</tr>
<tr>
<td>- Urine catheter last 7 days</td>
<td>21%</td>
</tr>
</tbody>
</table>

*Hepatobiliary 16%; Gastrointestinal 7%, Unknown 15%
Dehydration in elderly people is common
Why are older adults vulnerable to dehydration?

Changes as the body ages
- Kidneys concentrate urine less
- Less muscle – stored water
- Loss of thirst reflex

Physical/cognitive impairments
- Difficulty swallowing
- Difficulty holding cups
- Dementia
- Fear of incontinence

Dependence on others to meet needs

• Constipation
• UTI, other infections
• Falls
• Stroke
• Kidney failure
• 10% of the elderly admitted as emergencies are found to be dehydrated

Consequences of dehydration are numerous and can be costly when hospitalizations are taken into account.
**Aim:** to optimise the hydration of residents in nursing homes

**Key objectives:**
- Increase the number of residents consuming **minimum daily fluid intake of 1500ml**
- Reduce morbidity associated with dehydration
- Improve experience and quality of life of residents

**Improvement science methods:**
- Co-design with staff and residents/families to understand the barriers/facilitators & design new ways of working
- Changes tested using Plan Do Study Act (PDSA) cycles
  - a structured approach for making incremental changes
Understanding hydration practice in two care homes

Baseline data collected Oct 2015 – Dec 2015

1. Unit-wide observations of how and when fluid is delivered
   • Patterns of fluid delivery and types of fluid available/offered
   • Variation between resident location (own room, dining room/sitting room)
   • Observed between 6am and 9pm

2. Baseline measures of fluid intake
   • Followed individuals for whole day to determine mean intakes
   • Stratified into three groups: independent, needs prompting, needs assistance
   • Observed between 6am and 9pm

3. Information from staff, residents and relatives
   • Logistics and organisation of care
Results – care routine

Recommended **minimum** daily intake is 1500ml
That’s at least 10 cups/glasses of *any* fluid

- Seven opportunities in the day where drinks are provided
  - One cup (150ml) at each opportunity = 1050ml
- Drinks served are not necessarily consumed)

Residents not often given more than one drink at each opportunity: 4% (Home A) and 8% (Home B)

- Need to provide more than one drink per opportunity
- Need to supplement with fluid-rich foods
## Timing and location of fluid delivery (drinks only)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Own room</th>
<th></th>
<th>Lounge/dining room</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no of residents</td>
<td>no (%) of residents receiving drinks</td>
<td>no of drinks per resident</td>
<td>no of residents</td>
</tr>
<tr>
<td>Early morning</td>
<td>8</td>
<td>0 (0%)</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Breakfast</td>
<td>5</td>
<td>5 (100%)</td>
<td>1.40</td>
<td>9</td>
</tr>
<tr>
<td>Mid-morning</td>
<td>15</td>
<td>0 (0%)</td>
<td>0.00</td>
<td>8</td>
</tr>
<tr>
<td>Lunch</td>
<td>10</td>
<td>6 (60%)</td>
<td>0.80</td>
<td>11</td>
</tr>
<tr>
<td>Mid-afternoon</td>
<td>15</td>
<td>8 (53%)</td>
<td>0.53</td>
<td>9</td>
</tr>
<tr>
<td>Dinner</td>
<td>11</td>
<td>10 (91%)</td>
<td>0.90</td>
<td>10</td>
</tr>
<tr>
<td>Evening</td>
<td>19</td>
<td>8 (42%)</td>
<td>0.53</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>83</td>
<td><strong>37 (45%)</strong></td>
<td><strong>0.52</strong></td>
<td>49</td>
</tr>
</tbody>
</table>
Fluids given and consumed by level of assistance

<table>
<thead>
<tr>
<th>Type of resident</th>
<th>No of residents</th>
<th>Mean fluids served (ml)</th>
<th>Mean fluids consumed (ml)</th>
<th>% of fluids consumed</th>
<th>% of fluids served at mealtimes</th>
<th>% from food</th>
<th>Mean no of drinks served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>8</td>
<td>1574</td>
<td>1071</td>
<td>68%</td>
<td>58%</td>
<td>32%</td>
<td>10</td>
</tr>
<tr>
<td>Needs prompting</td>
<td>2</td>
<td>1938</td>
<td>1040</td>
<td>54%</td>
<td>41%</td>
<td>24%</td>
<td>12</td>
</tr>
<tr>
<td>Needs assistance</td>
<td>4</td>
<td>1175</td>
<td>946</td>
<td>81%</td>
<td>70%</td>
<td>34%</td>
<td>8</td>
</tr>
<tr>
<td>Total*</td>
<td>14</td>
<td>1512</td>
<td>1031</td>
<td>68%</td>
<td>59%</td>
<td>31%</td>
<td>10</td>
</tr>
</tbody>
</table>

* Total mean derived from the individual intakes (Home A and B)

- **Independent residents**: offered just above minimum – consume less than 1500ml
- **Residents who need prompting**: offered sufficient – consume less than 1500ml
- **Residents who need assistance**: not offered enough – consume less than 1000ml
What can we do to improve?

**Key components of care**

- Understanding each residents’ drinking needs, preferences and abilities
- Providing residents with the drinks and fluids to meet their needs, preferences and abilities
- Increasing opportunities for fluid consumption in daily care
- Identifying & responding when hydration needs are not met

**Proposed interventions**

- Staff training on hydration
- Mealtime guides for each resident
- Drinks menu
- Evaluate drinks preferences; extend choice
- Evaluate cup preferences; extend choice
- Protected Drinks Time
- Drinks & other fluids with meals
- Documenting fluids & monitoring at risk residents
Hydration training for care home staff

• Interactive activities (case studies, quiz) focused on:
  - Recognising the importance of individual needs and preferences
  - Raising awareness of common hydration issues in the elderly
  - Practical skills in: prevention techniques, identifying residents at risk of dehydration and preparing thickened fluids

• Knowledge before training rated ‘good’, after training rated “very good/excellent”
  - Staff do not recognise their own training needs
  - Lack of skills in ‘Reflection’?
  - Learning not translated into practice

• Training session supported by ‘huddle’ training on the units
  - On shift 10-15 minute training about key messages
  - Role modelling key behaviours - relating training to Mental Capacity Act
**Protected Drinks Time**

**Aim:** To focus HCA on hydration during a routine care activity

**Intervention:**
- All HCA focus on resident hydration during 3pm drinks round
- Assist residents who need help to drink
- Allocate to staff to roles
- Offer refills
- Ensure sufficient equipment (trolleys, cups, fluids)
- Takes around 45mins
### Outcome of Protected Drinks Time

#### Results of PDT

- ↑ % of residents getting drinks
- ↑ number of drinks per resident
- ↑ amount of fluids consumed

Positive staff and resident feedback

However, a few weeks later…

- No. drinks & No. residents receiving drinks returned to baseline levels
- Strong leadership to ensure prioritised

#### Critical to success

##### Leadership
- Clear allocation of roles & responsibilities
- Ensuring hydration is the priority
- Embedding as a routine activity

##### Equipment
- Trolley or trollies
- Adequate stock of drinks
- Clean and appropriate cups/mugs

##### Skills
- Training in assisting & positioning to drink

“Allocating roles means everyone is contributing to the drinks round” (HCA)
Resident drink preferences

- Residents preferred fruit juices to squash
- Water was not a popular drink
- Preferred drinks available in home but rarely given

- 47 residents tested 28 different drinks tested
Aim:
• To enable residents to choose their preferred drink
• Encourage consumption of more than one drink

Intervention:
• Visual drinks menu created
• Available in own rooms and communal areas
• Staff asked to use it during PDT
• Pureed fruit made available as alternative to cake

"I am not always being given what I like” (Resident)

"I like my morning cup of tea; I do get one, but I would like more...” (Resident)
Drinks menu combined with PDT (Home B)

**Key outcomes**

- Mean fluid intake for residents receiving a drink in mid-afternoon (ml):
  - Baseline: 170
  - PDSA 1 - Drinks menu*: 194
  - PDSA 2 - Drinks menu: 219
  - PDSA 3 - Drinks menu: 202
  - PDSA 4 - Drinks menu: 157
  - PDSA 5 - Drinks menu: 149
  - PDSA 6 - Protected: 246
  - PDSA 7 - Protected: 240

**Critical to success**

- Leadership / mentoring / role modeling
- Importance of offering choice
  - Requirement of Mental Capacity Act
  - Regular ‘huddle’ training to reinforce
- Ensuring all drinks on the menu are available
  - Defined responsibility for stock
- Costed with the manager/catering manager

Drinks menu ☝️ the types of fluids available
☝️ consumption of juice
Residents offered more choice - even if menu is not used
Staff were surprised by the choices residents made
Drinks before/after meals

Aim (Home A)
Drinks given to residents brought to dining room before breakfast

Aim (Home B)
Hot drinks offered to residents in lounge/dining room after lunch and dinner

Intervention
- Tea/coffee dispensers set up in dining room (juice/squash available)
- Encourage choice by using the drinks menu

Outcomes
- ↑ fluid consumption (intake not reduced at the next drinks opportunity)
- Independent drinkers drank more than those who needed assistance
- Mostly benefited residents in lounge/dining room (more likely to be independent) with residents in their rooms or who need full assistance less likely to get a drink
Identifying cup preferences

Cup preferences
Tested with 10 residents:
- Ease of handling, volume, pleasantness to drink, appearance

Standard teacup
- Holds 150ml
- Small handle, difficult to hold
- Thick china

“*The handle on the teacup burns my fingers*” (Resident)

Trial mug
- Preferred by residents
- Holds 250-280ml
- Lightweight (<250g)
- Large wide handle, easy to hold

Impact of new mugs
Effect on fluid intake measured at breakfast and lunch:

↑ fluid consumption (some residents consumed a full mug of 280ml)

Staff need to fill the mugs (not assume a full mug is too much for residents to drink)

Need consistent, sustainable mug supply

“They drink more, they are given bigger volumes and drink more” (HCA)

“It’s great! It works, he’s drinking so much more now” (Family member)
Routine monthly observations (6am – 9pm) of 4-6 randomly selected residents (includes fluid-rich foods)
Monthly fluid intakes – Home B

Routine monthly observations (6am – 9pm) of 4-6 randomly selected residents (includes fluid-rich foods)
Laxative consumption (Home A)

![Graph showing laxative consumption over time with trend lines and limits.](image-url)
Success criteria for improvement

1. Leadership & Culture
   - Strong senior management support - reinforcing hydration as a priority
   - Allocation of roles and responsibilities – clear communication
   - Mentoring and role modeling of good practice
   - Embedding hydration as a routine activity – otherwise progress can be lost

2. Training & Skills
   - Competence in assisting & positioning residents to drink
   - Confident in communicating with residents to support and enable choice (Mental Capacity Act)
   - ‘Huddle’ training to reinforce learning & practice in care team
   - Accuracy of recording fluid intakes and taking appropriate action

3. Equipment/Resources
   - Ensuring adequate stock of drinks, appropriate cups/mugs available
   - Trolleys equipped and available to distribute drinks