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A clinical trial looking at maintaining hydration at the end of life

Submission date
10/09/2021

Recruitment status
No longer recruiting

Registration date
14/09/2021

Overall study status
Completed

Last Edited
30/10/2025

Condition category
Other

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
The use of clinically-assisted hydration (CAH) in the last days of life is very variable and controversial because there is no good quality research to show whether it improves (or worsens) end-of-life care. In some cases there is a clear indication to start/continue CAH, whilst in other cases there is a clear indication to not start/discontinue CAH. However, in most cases there is no indication one way or another.
The research team has just completed a feasibility (provisional) study, which included 200 cancer patients from hospices/hospitals in England and Wales. The results suggest that CAH may delay the onset of delirium, but that CAH can cause side effects in some patients (e.g. fluid retention). A larger study is needed to properly evaluate the role of CAH. Recently, the Palliative and end-of-life care Priority Setting Partnership (involving patients, carers, patient support groups, members of the general public, and healthcare professionals) concluded that CAH was an important area for research.
The aim is to assess whether giving cancer patients in the last days of life clinically-assisted hydration (or CAH) is effective at preventing them from experiencing “terminal agitation”. This is a distressing form of delirium that often occurs at end-of-life causing restlessness, anxiety and confusion in the patient, and which is very upsetting for family members. We will also explore if CAH affects other end-of-life symptoms (e.g. shortness of breath), length of survival and costs.

Who can participate?
Adults aged over 18 years with a life expectancy of less than 1 week

What does the study involve?
The study will be a so-called cluster randomised trial, which means that hospices/hospitals ('clusters') will be randomly allocated to one of two standard (usual) interventions. Intervention A involves supporting the patient to drink, regular mouth care, and management of pain and other symptoms. Intervention B involves supporting the patient to drink, regular mouth care, management of pain and other symptoms, and CAH. All eligible patients within each hospice /hospital will receive the same intervention (if appropriate). 80 hospices/hospitals in the United Kingdom and 1,600 cancer patients in the last week of life will take part in the study. Patients will be given fluids either into a vein or into the tissues under the skin. The amount of fluid given will be based on the patient’s weight, and the decision to continue/discontinue the fluids will be

made by doctors.
Patients will be assessed for end-of-life problems every 4 hours by nursing staff, and data will be collected on the presence of problems, use of medication (to treat problems), and side effects of CAH.

What are the possible benefits and risks of participating?
None

Where is the study run from?
University of Surrey (UK)

When is the study starting and how long is it expected to run for?
September 2021 to February 2025

Who is funding the study?
National Institute for Health Research (NIHR) (UK)

Who is the main contact?
Prof. Andrew Davies
andavies@tcd.ie

Contact information

Type(s)
Scientific

Contact name
Prof Andrew Davies

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

Integrated Research Application System (IRAS)
313640

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
HTA NIHR131687, IRAS 313640

Study information

Scientific Title
A cluster randomised trial of clinically-assisted hydration in patients in the last days of life - CHELsea II

Acronym
CHELsea II

Study objectives

Clinically-assisted hydration (CAH) in the last days of life reduces the frequency of delirium (and the requirement for sedative medication), as a result of preservation of renal function, and prevention of build-up of drugs and toxins. Furthermore, CAH will prevent death due to dehydration occurring before death due to the underlying disease (or its complications).

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. Main: Approved 09/08/2022, London - Brighton & Sussex Research Ethics Committee (Health Research Authority, 2 Redman Place, Stratford, London, E20 1JQ, UK; +44 (0)207 104 8202, +44 (0)207 104 8241; brightonandsussex.rec@hra.nhs.uk), ref: 22/LO/0475
2. Scotland: Approved 09/09/2022, Scotland A Research Ethics Committee (South East Scotland Research Ethics, Service, 2nd Floor, Waverley Gate, 24 Waterloo Place, Edinburgh, EH1 3EG, UK; +44 (0)131465 5680; sesres@nhslothian.scot.nhs.uk), ref: 22/SS/0053

Study design
Multi-centre cluster randomized trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Patients in the last week of life (cancer, non-malignant disease)

Interventions
Research sites will be randomised to either “standard intervention A” or “standard intervention B” (see below), and this will become the standard of care at the research site for the duration of this study. The interventions represent the current typical standards of care in the UK. Randomisation will be undertaken 1:1 by cluster, to ensure balance and equal numbers in each intervention group, stratifying by home country (i.e. England, Wales, Scotland or Northern Ireland), and by type of unit (i.e. hospital or hospice).

Standard intervention A involves:
continuance of oral intake (if appropriate) - includes assistance with drinking as required.
regular “mouth care” - mouth care should be performed at least every four hours, and should correspond to the research site’s usual procedures for oral care in the terminal phase. Mouth care should be undertaken by the clinical team (but can involve carers if deemed appropriate). Mouth care should be discontinued/withheld if it causes distress/discomfort to the patient, or is otherwise difficult to undertake.
standard management of pain and other end-of-life symptoms/problems - should correspond to the research site’s usual procedures for managing relevant problems in the terminal phase.

Standard intervention B involves:
continuance of oral intake (if appropriate) - see above.

regular mouth care - see above.
standard management of pain and other end-of-life symptoms/problems - see above.
CAH - see below.

The parenteral fluids may be given either intravenously (if an intravenous cannula is present), or subcutaneously (if no intravenous cannula is present). Intravenous fluids must be administered using an infusion pump, and subcutaneous fluids must be administered using gravity (and not using an infusion pump). The type/volume of fluid administered is based upon relevant NICE guidance: the fluid to be given is dextrose saline (4% dextrose, 0.18% sodium chloride), and the volume to be given is dependent on the patient's weight. It should be noted that the volume of fluid is based on a figure of 25 ml/kg/day, which is the lower limit for generic patients, and the upper limit (for consideration) in “old” or “frail” patients.
Intravenous fluids should be administered according to the research site’s usual procedures. Subcutaneous fluids should be administered according to the following guidelines:

Patient’s weight Volume of fluid
≤ 40 kg 1 L
50 kg 1.25 L
60 kg 1.5 L
70 kg 1.75 L
≥ 80 kg 2 L

Site of cannula - the preferred cannula sites are the lower lateral abdomen, and the upper lateral chest (rather than the upper arm, or the upper leg). If the cannula needs to be changed, then an alternative site should be used.
Type of cannula - the preferred cannula is a 24 g BD Saf-T-Intima cannula.
Rationale for changing cannula - the decision to change/re-site a cannula is at the discretion of the clinical team. Minimal (asymptomatic) swelling is expected at the site of the cannula, and is not in itself a reason to discontinue the infusion and/or re-site the cannula.
Rate of infusion - the preferred method of infusion is continuous infusion with the drop rate calculated in the usual manner.
Rationale for discontinuing the infusion - the decision to discontinue the infusion is at the discretion of the clinical team. Minimal (asymptomatic) swelling is expected at the site of the cannula, and is not in itself a reason to discontinue the infusion. The development of audible upper airways secretions (“death rattle”) is also not in itself an indication to discontinue the infusion, since the development of this problem seems independent of hydration status/use of CAH.

Participants will be reviewed at least every four hours by the clinical team, and an assessment made as to whether or not certain symptoms/problems are present, i.e. delirium, audible upper respiratory secretions (“death rattle”), pain, shortness of breath, and nausea and vomiting. The clinical team will also assess patient’s level of sedation every four hours, and document the indication for dispensing all as required and regular medication. The clinical team will complete a study-specific clinical observation document, which will be transcribed by the research team into the study case report form.
The maximum duration of the study is 14 days: the end of the study occurs with the death of the patient, the withdrawal of the patient, or the completion of 14 days. The duration of the interventions is the same as the duration of the study, unless the clinical team deem that the relevant intervention should be modified/discontinued. For example, mouth care should be discontinued if it causes distress/discomfort to the patient. Patients that have their treatment modified/discontinued will remain in the study (and their data analysed on an intention to treat basis).

Intervention Type
Other

Primary outcome(s)
Number of patients that develop delirium during the study. The Nursing Delirium Screening Scale (Nu-DESC) will be used to diagnose patients with delirium.

Key secondary outcome(s))
Measured throughout the study:
1. The proportion of patients that receive as-required and/or regular medication for delirium (data derived from drug chart).
2. Time to the first dose of medication for delirium (as-required or regular – data derived from drug chart).
3. Modified Richmond Agitation and Sedation Scale (m-RASS) scores during the study (mean score; proportion time with score 0; proportion time with score 0 to -2 – data derived from clinical observation document).
4. The proportion of patients with audible upper airway secretions (“death rattle” – data derived from clinical observation document).
5. The proportion of patients that receive as-required and/or regular medication for audible upper airway secretions (data derived from drug chart).
6. Time to the first dose of medication for audible upper airway secretions (as-required or regular – data derived from drug chart).
7. Proportion patients that experience pain, shortness of breath, and nausea and vomiting (and require medication for these symptoms – data derived from clinical observation document and drug chart).
8. Adverse effects of clinically-assisted hydration (data derived from clinical observation document).
9. Overall survival (data derived from clinical observation document).
10. Health economic analysis (data derived from clinical observation document and drug chart).
11. Carer feedback on end-of-life care and research participation.

Completion date
28/02/2025

Eligibility

Key inclusion criteria
1. Aged ≥18 years
2. Estimated prognosis of ≤1 week
3. Patient unable to maintain sufficient oral fluid intake (i.e. <1l/day).

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Total final enrolment
1563

Key exclusion criteria
1. Patient is dehydrated (patient eligible for inclusion after correction of dehydration)
2. Patient has a relevant Advance Directive to Refuse Treatment (ADRT)
3. Clinical indication for CAH
4. Clinical contraindication to CAH
5. Contraindication to cannulation
6. Total parenteral nutrition/enteral feeding in situ
7. Patient has had delirium in last 24 h
8. Patient has had audible upper airway secretions in last 24 h
9. Patient likely to be transferred elsewhere for end-of-life care

Date of first enrolment
01/10/2022

Date of final enrolment
28/02/2025

Locations

Countries of recruitment
United Kingdom

England

Northern Ireland

Scotland

Wales

Study participating centre
Royal Surrey County Hospital
Egerton Road
Guildford
United Kingdom
GU2 7XX

Study participating centre

Phyliss Tuckwell
Waverley Lane, Farnham, Surrey
United Kingdom
GU9 8BL

Study participating centre
Princess Alice Hospice
West End Lane
Esher
United Kingdom
KT10 8NA

Study participating centre
St Peter & St James Hospice
North Common Road
North Chailey
Lewes
United Kingdom
BN8 4ED

Study participating centre
St Catherine's Hospice
Grace Holland Avenue
Pease Pottage
United Kingdom
RH11 9SF

Study participating centre
St Barnabas Hospice
Titnore Lane
Worthing
United Kingdom
BN12 6NZ

Study participating centre
St Wilfreds Hospice
Walton Lane
Bosham
Chichester
United Kingdom
PO18 8QB

Study participating centre
Pilgrims Hospice In Thanet
Ramsgate Road
Margate
United Kingdom
CT9 4AD

Study participating centre
St Wilfred's Hospice
Broadwater Way
Eastbourne
United Kingdom
BN22 9PZ

Study participating centre
Hospice In the Weald
Maidstone Road
Pembury
Tunbridge Wells
United Kingdom
TN2 4TA

Study participating centre
St Elizabeth's Hospice
Beccles Hospital
St. Marys Road
Beccles
United States Minor Outlying Islands
NR34 9NQ

Study participating centre
Pilgrims Hospice In East Kent
56 London Road
Canterbury
United Kingdom
CT2 8JA

Study participating centre

Ty Olwen
Heol Maes
Eglwys
Swansea
United Kingdom
SA6 6N

Study participating centre
The Heart of Kent Hospice
Preston Hall
Aylesford
Maidstone
United Kingdom
ME20 7PU

Study participating centre
Wisdom Hospice
High Bank
St Williams Way
Rochester
United Kingdom
ME1 2NU

Study participating centre
John Eastwood Hospice
Mansfield Road
Sutton-in-ashfield
United Kingdom
NG17 4HJ

Study participating centre
Loros
Leics & Rutland Hospice
Groby Road
Leicester
United Kingdom
LE3 9QE

Study participating centre
Lindsey Lodge
Burringham Road

Scunthorpe
United Kingdom
DN17 2AA

Study participating centre
Royal Derby Hospital (nuh)
Uttoxeter Road
Derby
United Kingdom
DE22 3NE

Study participating centre
Nottingham University Hospitals NHS Trust - Queen's Medical Centre Campus
Nottingham University Hospital
Derby Road
Nottingham
United Kingdom
NG7 2UH

Study participating centre
St Nicholas Hospice
Macmillan Way
Hardwick Lane
Bury St. Edmunds
United Kingdom
IP33 2QY

Study participating centre
Arthur Rank Hospice Charity
Cherry Hinton Road
Shelford Bottom
Cambridge
United Kingdom
CB22 3FB

Study participating centre
Specialist Palliative Care Services
Priscilla Bacon Centre
Unthank Road

Norwich
United Kingdom
NR2 2PJ

Study participating centre
Pilgrims Hospice at Ashford
Hythe Road
Willesborough
Ashford
United Kingdom
TN24 0NE

Study participating centre
Alice House Hospice
Alice House
Wells Avenue
Hartlepool
United Kingdom
TS24 9DA

Study participating centre
Teesside Hospice
1 Northgate Road
Middlesbrough
United Kingdom
TS5 5NW

Study participating centre
North Tyneside Specialist Unit
Rake Lane
North Shields
United Kingdom
NE29 8NH

Study participating centre
St Davids Hospice
Abbey Road
Llandudno
United Kingdom
LL30 2EN

Study participating centre
Ysbyty Penrhos Stanley
Penrhos Beach Road
Holyhead
United Kingdom
LL65 2QA

Study participating centre
Marie Curie Cardiff and Vale Hospice
Bridgeman Road
Penarth
United Kingdom
CF64 3YR

Study participating centre
Velindre Cancer Centre
Velindre Road
Cardiff
United Kingdom
CF14 2TL

Study participating centre
Wansbeck Specialist Unit
Woodhorn Lane
Ashington
United Kingdom
NE63 9JJ

Study participating centre
St Cuthberts Hospice
Park House Road
Durham
United Kingdom
DH1 3QF

Study participating centre
St Oswalds Hospice
Regent Avenue
Newcastle upon Tyne

United Kingdom
NE3 1EE

Study participating centre
St Clare's Hospice
Hastingwood Road
Hastingwood
Harlow
United Kingdom
CM17 9JX

Study participating centre
Peace Hospice
Peace Drive
Watford
United Kingdom
WD17 3PH

Study participating centre
Farleigh Hospice
North Court Road
Broomfield
Chelmsford
United Kingdom
CM1 7FH

Study participating centre
Saint Francis Hospice Sccs
The Hall
Broxhill Road
Havering-atte-bower
Romford
United Kingdom
RM4 1QH

Study participating centre
St. Helena Hospice
Myland Hall
Barncroft Close
Highwoods
Colchester

United Kingdom
CO4 9JU

Study participating centre
North London Hospice
47 Woodside Avenue
North Finchley
London
United Kingdom
N12 8TT

Study participating centre
St Johns Hospice (in Wirral)
Mount Road
Higher Bebington
Wirral
United Kingdom
CH63 6JE

Study participating centre
Willowbrook Hospice
Portico Lane
Eccleston Park
Prescot
United Kingdom
L34 2QT

Study participating centre
St Catherines Hospice
Lostock Lane
Lostock Hall
Preston
United Kingdom
PR5 5XU

Study participating centre
Trinity Hospice Community
Low Moor Road
Bispham

Blackpool
United Kingdom
FY2 0BG

Study participating centre
St Columbas Hospice
15 Boswall Road
Edinburgh
United Kingdom
EH5 3RW

Study participating centre
The Prince and Princess of Wales
20 Dumbreck Road
Bellahouston Park
Glasgow
United Kingdom
G41 5BW

Study participating centre
Royal Trinity Hospice
30 Clapham Common
London
United Kingdom
SW4 0RN

Study participating centre
St Raphael's Hospice
London Road
Cheam
Sutton
United Kingdom
SM3 9DX

Study participating centre
Weston Hospicecare
Jackson Barstow House
28 Thornbury Road
Uphill

Weston-super-mare
United Kingdom
BS23 4YQ

Study participating centre
Marie Curie Hospice Edinburgh
45 Frogston Rd
Edinburgh
United Kingdom
EH10 7DR

Study participating centre
Dorothy House Hospice
Dorothy House Hospice Care
Winsley
Bradford-on-avon
United Kingdom
BA15 2LE

Study participating centre
St Margarets Hospice
Heron Drive
Bishops Hull
Taunton
United Kingdom
TA1 5HA

Study participating centre
Weldmar Hospicecare Trust
Herringston Road
Dorchester
United Kingdom
DT1 2SL

Study participating centre
Countess Mountbatten Hospice
Botley Road
West End
Southampton
United Kingdom
SO30 3JB

Study participating centre
Earl Mountbatten Hospice
Halberry Lane
Newport
United Kingdom
PO30 2ER

Study participating centre
Winchester Hospice
Royal Hampshire County Hospital,
Romsey Road
Winchester
United Kingdom
SO22 5DG

Study participating centre
Countess of Brecknock Hospice
Charlton Road,
War Memorial Community Hospital
Andover
United Kingdom
SP10 3LB

Study participating centre
St Michaels Hospice
Aldermaston Road
Basingstoke
United Kingdom
RG24 9NB

Study participating centre
St Peters Hospice (brentry)
Charlton Road
Brentry
Bristol
United Kingdom
BS10 6NL

Study participating centre
Sue Ryder Care Home
Leckhampton Court
Church Road
Leckhampton
Cheltenham
United Kingdom
GL53 0QJ

Study participating centre
Birmingham St Mary's Hospice
Birmingham St. Marys Hospice
176 Raddlebarn Road
Birmingham
United Kingdom
B29 7DA

Study participating centre
Compton Palliative Care Team
Compton Hospice Ltd, Compton Hall
4 Compton Road West
Wolverhampton
United Kingdom
WV3 9DH

Study participating centre
St Giles Hospice
Fisherwick Road
Whittington
Lichfield
United Kingdom
WS14 9LH

Study participating centre
Douglas Macmillan Hospice
Barlaston Road
Blurton
Stoke-on-trent
United Kingdom
ST3 3NZ

Study participating centre
The Mary Stevens Hospice
221 Hagley Road
Stourbridge
United Kingdom
DY8 2JR

Study participating centre
Warwick Myton Hospice
Myton Lane
Warwick
United Kingdom
CV34 6PX

Study participating centre
Saint Michael's Hospice - Harrogate
Crimple House,
Hornbeam Park Ave.
Harrogate
United Kingdom
HG2 8NA

Study participating centre
Dove House Hospice
Chamberlain Road
Hull
United Kingdom
HU8 8DH

Study participating centre
The Prince of Wales Hospice
Halfpenny Lane
Pontefract
United Kingdom
WF8 4BG

Study participating centre
Saint Catherine's Hospice - Scarborough
Throxenby Lane

Scarborough
United Kingdom
YO12 5RE

Study participating centre
Bolton Hospice
Queens Park Street
Off Chorley New Road
Bolton
United Kingdom
BL1 4QT

Study participating centre
Kccg-chc St Julias
St Julia's Hospice
Foundry Hill
Hayle
United Kingdom
TR27 4HW

Study participating centre
St Kentigern Hospice
Upper Denbigh Road
St Asaph
United Kingdom
LL17 0RS

Study participating centre
Oxford University Hospitals
John Radcliffe Hospital
Headley Way
Headington
Oxford
United Kingdom
OX3 9DU

Study participating centre
University Hospital Southampton NHS Foundation Trust
Southampton General Hospital
Tremona Road
Southampton

United Kingdom
SO16 6YD

Study participating centre
Sue Ryder Manorlands Hospice
Manorlands
Keighley Road
Oxenhope
Keighley
United Kingdom
BD22 9HJ

Study participating centre
Salisbury NHS Foundation Trust
Salisbury District Hospital
Odstock Road
Salisbury
United Kingdom
SP2 8BJ

Study participating centre
Dr Kershaws Hospice
Turf Lane
Royton
Oldham
United Kingdom
OL2 6EU

Study participating centre
St Christophers Hospice
51-59 Lawrie Park Road
London
United Kingdom
SE26 6DZ

Study participating centre
Ipswich Hospital
Heath Road
Ipswich
United Kingdom
IP4 5PD

Study participating centre
Prospect Hospice
Moormead Road
Wroughton
Swindon
United Kingdom
SN4 9BY

Study participating centre
Royal Marsden Hospital
Royal Marsden Hospital
Downs Road
Sutton
United Kingdom
SM2 5PT

Sponsor information

Organisation
University of Surrey

ROR
https://ror.org/00ks66431

Funder(s)

Funder type
Government

Funder Name
National Institute for Health Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request. Anonymised raw data will be available to bone-fide academic researchers on request at the end of the study (and for 5 years afterwards) - requests need to be made to the study chief investigator (Prof Andrew Davies - andavies@tcd.ie), and a data sharing agreement will be produced between the study sponsor (University of Surrey) and the researchers' academic institution outlining the conditions of use of the data (including proposed analysis of the data). The participant information sheet will discuss the issue of data sharing.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		23/11/2022	24/11/2022	Yes	No
HRA research summary			28/06/2023	No	No
HRA research summary			28/06/2023	No	No
Other publications	Qualitative study	29/10/2025	30/10/2025	Yes	No
Participant information sheet	version 1.0	27/07/2022	20/10/2022	No	Yes
Participant information sheet	version 1.0	27/07/2022	20/10/2022	No	Yes
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes
Protocol file	version 1.0	27/07/2022	21/10/2022	No	No
Protocol file	version 1.2	09/09/2022	28/10/2022	No	No
Protocol file	version 1.5	19/02/2025	05/03/2025	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes