The Health Foundation
Inspiring Improvement

Shine

Shine 2014 Final Report

Northumbria Assessment of Hydration (NoAH)

Northumbria Healthcare NHS Foundation Trust

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Part 1: Abstract

Project title: Northumbria Assessment of Hydration (NoAH)

Lead organisation: Northumbria Healthcare NHS Foundation Trust

Partner organisation: None

Lead Clinician: Dr Christopher Price

Background

Older people in hospital are susceptible to dehydration due to pre-existing and acute health problems. This causes complications and prolongs admission. Extra support for drinking may be needed but there are no standardised nursing assessments to identify patients who are at risk of poor oral fluid intake. Simple interventions targeted at higher risk patients to encourage drinking may reduce complications and the need for intravenous fluid replacement. We aimed to:

- Develop a risk assessment and nurse-led response protocol for inadequate oral fluid intake which could be easily implemented into the care of older patients within 48 hours of hospital admission.
- Demonstrate whether the protocol improved the documentation of oral fluid intake.
- Explore how acceptable the assessment and its responses were for staff, patients and families and the impact of simple measures to promote assessment completion.
- Create a protocol and audit tool that could be transferred easily to other settings.

Methods

A narrative systematic review was conducted to identify nurse led hydration risk assessments and simple care interventions to promote oral fluid intake. Interviews with staff, patients and relatives described themes in relation to hydration assessment and fluid support to assist in the tool development and its evaluation. The resulting Northumbria Assessment of Hydration (NoAH) was constructed to reflect the content of the systematic review and interviews. This was then deployed on 4 wards across 3 hospitals for a period of 5 months with feedback provided to improve compliance. A pre- and post-deployment audit was conducted to explore the impact of introducing the NoAH tool on each ward.

Results

The systematic review identified 22 articles describing 9 dehydration risk assessments and / or simple approaches to increase opportunities for patients to drink. Most were focussed on patients who were already dehydrated and / or the settings were not directly relevant to the NHS. Staff (n= 55) and public views (n=11) confirmed that formal recognition of the support needed to maintain oral fluid intake would be helpful but NoAH should be simple to complete.

During the intervention phase 304 NoAH tools were documented for 650 admissions (average documentation compliance 46.7%). Amongst 346 patients without NoAH documentation, 143 would have been screened out at the start of the NoAH tool, mainly due to receiving intravenous fluid replacement (corrected average compliance 73.9%). Overall the pre (n=100) and post-deployment (n=650) audit highlighted an increase in the documentation of fluid balance charts (46% vs 94%), urine output (9% vs 88%), drinking preferences (10 vs 32%) and discussion about

hydration with patients (5% vs 13%). Staff reported positive opinions about the tool and reported a change in practice resulting from inclusion in the development phase.

Conclusions

A simple bedside assessment to identify the support needed to drink is feasible and acceptable to staff and patients**.** In an unblinded audit there was an increase in documentation of fluid intake across wards after deployment of the NoAH tool. Further modifications are required to achieve the most valuable combination of risk indicators and actions, followed by an examination of clinical cost-effectiveness.

Part 2: Quality impact: outcomes

Development phase

There were three strands to the development of the intervention:

1. A baseline audit of 6 wards across 4 hospital sites was completed to report the existing documentation of independent drinking ability and hydration assessment by nurses on admission, and the completion of related clinical care processes such as fluid balance. The baseline audit survey consisted of 42 questions (Appendix 1: NoAH Audit Tool). It confirmed that despite prompts in the standard paperwork completed by nurses on admission, there were uncertainties about the assessment of drinking and when it was appropriate to maintain a fluid balance record. Whilst information about confusion and communication problems were often recorded, the impact on drinking ability was not formally documented.

2. Semi structured interviews were conducted with a range of staff grades (nurses, healthcare assistants and domestic staff). Key points which arose during the development phase included:

    - Assessment should be quick to use within 24hours of admission and repeated at 24-48 hours.
    - A simple system is needed to determine the clinical response to the assessment result (e.g. red, amber, green risk categories).
    - Pre-screening questions are needed to exclude patients who would not immediately benefit from assessment e.g. already receiving intravenous fluids.

3. Out of 6000 references, a systematic review identified 22 articles describing 9 dehydration risk assessments and / or simple approaches to increase opportunities for patients to drink. Most were focussed on patients who were already dehydrated rather than prevention and / or the settings were not directly relevant to the NHS.

Intervention phase

The Northumbria Assessment of Hydration (NoAH) tool and response protocol were developed using the review literature (Appendix 2: NoAH tool) and interview themes. It was deployed on wards providing care for elderly (n=2) and stroke patients (n=2) within 2 general hospitals and 1 community hospital. Staff members were encouraged to develop their own pathway for the integration of the tool on their ward.

A prospective audit of NoAH tools and patient records was maintained for 5 months. Midpoint interviews allowed staff to feedback the successes and challenges of the tool. There were disruptive factors: one ward manager was on extended leave, a new emergency care hospital was opened within the trust which changed the early patient pathway, and NoAH tool stocks were sometimes low. Ward managers received monthly email feedback and staff were given NoAH branded pens as a reminder. A competition during the deployment awarded mugs with a NoAH logo according to the percentage of tools completed.

Primary and secondary data used to demonstrate quality

a) What adjustments, if any, have you made to outcome measures from your original application?

The development and evaluation of the intervention did not change from the original application. The screening assessment combined information from the patient's medical history with a simple bedside clinical examination to identify a low, medium or high priority status for monitoring and assisting oral fluid intake.

b) The source of the data and how easy it is to access

Data was obtained from medical records by a member of the project team reading the documentation related to each admission. This was an intensive process due to the varied case-

mix and varied ways in which some care processes were recorded. It was also essential to have a dedicated researcher to provide flexibility for when staff were available for interviews.

c) The validity and reliability of the data

Comparison of post intervention data with the baseline audit in the same acute and community settings was conducted to reinforce the validity of the data. Interview questions were designed to be non-leading and prompts were used to encourage open discussion during interviews with several staff grades and from various wards.

d) How satisfactory are your baseline numbers in terms of data quality?

The baseline audit showed potential for improvement in clinical documentation from only 100 case notes. Data extraction using a standardised template was compared between team members during the audit in order to agree definitions and provide consistent reporting. After deployment the audit included 304 NoAH tools from 650 admissions. Statistical testing was not undertaken because this was an unblinded intervention without control of external factors, but there was an obvious increase in the completion of fluid-related care documents.

Results

During the intervention phase 304 NoAH tools were completed for 650 admissions (46.7%). Amongst 346 who did not have a NoAH completed, 143 would have been screened out at the start of the NoAH tool, mainly due to receiving intravenous fluid replacement (41.3%). Including these ineligible patients in the results produces a corrected average compliance of 73.9%. (Appendix 3: Results data). The low and medium risk categories were the most common, with antibiotics (36.6%) and confusion (25%) being the most frequently scored risk items.

The nursing documentation from 100 patients (34 stroke / 66 other) across 6 wards were compared to 650 patients (170 Stroke/ 459 other/ 21 not reported) across 4 wards before and after introduction of the NoAH tool. There was an increase in the documentation of fluid balance, urine output, drinking preferences and support needed (Appendix 3: Results data).

Following inspection of the results and discussion with the staff some modifications were made to the tool. There has been an increased weighting for confusion and the diarrhoea/vomiting within the last 24 hours question was removed as these patients were usually given intravenous fluids (Appendix 4: NoAH tool (2)).

Staff interviews (n= 55) reported that formal recognition of support for oral fluid intake was helpful and NoAH was simple to use. Public interviews (n=5) and consultation (n=6) reported that this was an important care process and some families might be willing to assist the nurses if prompted (Appendix 3: Results data).

Impact

According to the quantitative and qualitative data collected, a simple bedside assessment to identify the support needed to drink is feasible and acceptable to staff and patients during the first 48 hours of admission to hospital. A revised NoAH tool is being formatted for formal adoption as a care document within the Trust**.**

Part 3: Cost impact

This project has not sought to demonstrate a change in healthcare costs. Based upon existing evidence of the negative impact of preventable dehydration in hospital (e.g. NICE guidelines), it is implicit within the intervention that prevention of dehydration in hospital will reduce complications and length of stay i.e. cost savings for acute care providers. The protocol will drive clinical decision making and actions which may have occurred anyway (i.e. no new cost attached) but should be more effective and timely after implementation. Due to the broad range of acute and pre-existing conditions found amongst patients admitted to elderly care wards it would require a much larger project to demonstrate cost-effectiveness.

The NoAH tool was designed through an iterative process with nursing staff to be intuitive and therefore minimize training time. Familiarisation with the tool took less than 10 minutes and could be done between nurses during care delivery on the ward rather than requiring additional training sessions. The audit results suggest that the on-going use of the tool requires feedback to teams rather than additional training costs. During interviews the nurses reported that the tool took less than a couple of minutes to complete.

Part 4: Learning from your project

The original objectives of the project have been met:

1. Development of a risk assessment tool and matching response protocol to encourage oral fluid intake during the early stages of hospital admission, using a systematic literature review and stakeholder interviews to inform the content and clinical care process. 60 participants completed the interviews. The systematic review was more challenging than expected because of the large number of citations which were initially identified and their varying quality / relevance to the project. Hence it was completed after the first version of the NoAH tool was developed, but has been used to inform the final version.

2. A baseline audit was completed to report the existing documentation of independent drinking ability and hydration assessment by nurses, and establish which important factors are not routinely considered on admission.

3. Evaluation of the NoAH tool in practice through observation of completion and the documentation of care related to oral fluid intake in the medical notes. By prospectively collecting this information from the ward this phase went well.

The audit received support from the ward managers and the operational service manager. The tool was well received by staff as it formalised an area of care for which no existing assessment was in routine use. There was little awareness amongst staff of national guidelines (such as NICE) or previous campaigns relating to support for drinking fluids. There was some awareness that inadequate provision of fluids had featured in the Mid-Staffs investigation.

Some wards performed better than others during the evaluation. This improved with feedback and the use of NoAH branded pens / mugs given to nursing teams to highlight the NoAH audit. The two stroke units did not perform as well as the care of the elderly wards for completing NoAH, possibly because of higher patient throughput and a large paperwork burden already related to stroke care. During the last 6 weeks of the evaluation period, the Trust underwent a major service re-organisation which changed the flow of patients into wards and the re-distribution of some staff. Although this did not change the purpose of the project, there was a reduction in NoAH completion during this time but it was improving again by the end of the data collection interval.

For other similar projects we would recommend early and clear engagement with senior members of the clinical team, and to engage staff by involving them with development of the clinical tool. It should be simple and quick to use. Ideally any evaluation of a new clinical assessment should be during a period of clinical service stability, but this too can be an opportunity to assess whether the tool is considered to be valuable enough that it continue to be used against competing priorities. Although a paper form may be considered to be a low technology solution, this made it accessible to staff and did not introduce any additional training needs. We did revise the NoAH tool twice after the initial version, so it is important to evaluate a new assessment prospectively and use interviews / consultation with staff to understand how it can be improved.

Part 5: Plans for sustainability and spread

As the NoAH tool was well received by staff and appears to have had a positive impact on the documentation of patient care, we will use the Trust's approval process for it for be formally adopted as a routinely used clinical assessment tool.

Our project report will be hosted on the Trust website. We will send it to the regional strategic clinical network and the North East and North Cumbria Academic Health Science Network for sharing with clinical services. We will share the report with the Royal College of Nursing, British Dietetic Association and National Hydration Council (www.naturalhydrationcouncil.org.uk).

An abstract will be prepared for the British Geriatrics Society Spring meeting (May 2016) and the RCN Annual Research Conference (April 2016). The systematic review will be submitted to Age & Ageing for publication. A paper describing the development and initial impact of the assessment will be submitted for publication in a European nursing journal.

As key project staff remain employed by the Trust, we will continue to meet until the best balance has been struck between the content of the protocol, training and indicators of compliance in clinical practice. The group will also consider the additional value of the protocol in other settings (e.g. surgical wards) and will engage with relevant staff to explore what modifications may be required.

Appendix 1: NoAH Audit Tool

NoAH Case Note Audit

(Northumbria Assessment of Hydration)

T Number	
Age	
Gender	
Audit ID:	

Audit Completion Date:		Auditor:	
Patient Admission Date:		Audit Ward:	
Admission Date to Audit Ward:		48hr Date:	

Is the patient over 65 and a non-stoke? Or a patient of any age with a Stroke diagnosis at discharge?	**Yes** **No** If no, do not continue the audit, otherwise please continue.
What was the patient's initial diagnosis on admission to the ward?	
What was the patient's primary coded diagnosis at discharge for this admission? Including ICD10 Code? This can be found on PAS.	
Did the patient receive palliative care within 48hrs?	**Yes** **No** If yes, do not continue the audit, otherwise please continue.

Discharge Status: (**a**) Alive (**b**) Dead

Discharged to: (**a**) Home (**b**) Into 24hr care

Please document the following:

	Complete	**Partially Complete**	**None**	**Volume mls 24 hours**	**Volume mls 48 hours**	
Oral Fluid Intake Recorded						
Urine Output						
Nursing Assessment of Oral Fluid Safety (Swallow Screen)						
					Yes	**No**
Was question 10 in the Nursing Assessment document completed during the first 48 hours of this admission, for the question- Does the patient need support with drinking?						

If this question is completed please state what the answer was documented as…		
Was the patient prescribed Subcutaneous Fluids / Intravenous Fluids / Nasal Gastric Tube Fluids during the first 48 hours? If yes please identify which one was prescribed by circling the name above.		
Were their U&E's measured on admission?		
If yes what was the Urea and the Creatinine? Urea If this is not documented in the notes it may be found on ICE. Creatinine		
What was the patient's maximum level of Creatinine during this whole admission? If this is not documented in the notes it may be found on ICE.		
	Yes	**No**
Was the patient seen by speech therapist in the first 48 hours?		
If yes, did the speech therapist recommend a modified oral fluid consistency?		
Was a MUST score completed at any point during this admission?		
If yes, what was the MUST score result?		
Was the patient weighed during the first 48 hours?		
Please document what was the patient's weight was at any point during their admission?		
Was there any documentation of the patient's preferences for drinking during the first 48 hours?		
Was there any documentation of discussions with the patient / relatives regarding hydration during the first 48 hours?		
Was there any documentation that the patient was confused during the first 48 hours?		
If yes, was a mental test score completed at any point during this admission? (MOCA, MMSE, Mini Mental Test)		
Was it documented that the patient had any communication difficulties during the first 48 hours?		
Did the patient have any functional restrictions of movement which could have impacted upon their ability to drink during the first 48 hours? Ie. Arm weakness/amputation		

Was this documented noted as impacting upon their ability to drink during the first 48 hours? Ie. Arm weakness/amputation		
Did the patient have a reduced conscious level during the first 48 hours? Ie. V/P/U on an AVPU		
Has the patient have a fall at any point during this admission?		
If yes, please state when the falls occurred?		
Did the patient have a Stroke?		

If no, no further information is required.

If yes what type of stroke? **PACS ☐ LACS ☐ POCS ☐ TACS ☐**
Was the Stroke due to a? **Infarct ☐ Haemorrhage ☐**

Please document the following scores as documented on Admission to hospital:

Total NIHSS Score		NIHSS Facial Score	
NIHSS Dysarthria Score		NIHSS Dysphasia Score	

Appendix 2: NoAH Hydration Tool (1) – Prospective audit

NORTHUMBRIA ASSESSEMENT OF HYDRATION TOOL

To be completed within 48 hours of arrival to the ward

ADDRESSOGRAPH

Screening Questions:

Is the patient receiving formal palliative/end of life care?	No	☐	Yes	☐
Is the patient receiving intravenous fluids? (Exclude subcutaneous fluids)	No	☐	Yes	☐
Does the patient have a fluid restriction in situ?	No	☐	Yes	☐
Is the patient nil by mouth?	No	☐	Yes	☐

If you have answered yes to any of the questions above, you do not need to complete anything further.

Sign: _____ **Date:** _____

Risk Assessment Questions	**No** 0 Points	**Yes** 1 Point
Is the patient receiving thickened fluids?		
Does the patient have a severe visual problem?		
Would the patient be unable to communicate their needs?		
Is the patient prescribed Furosemide or Bumetanide?		
Is the patient prescribed antibiotics?		
Has the patient had diarrhoea or vomiting in the last 24 hours?		

Observation	**No** 0 Points	**Yes** 1 Point
Does the patient have a dry tongue and/or mouth?		
Does the patient appear to be confused?		

Please observe the patient and identify if they can: Locate a drink, pick it up and take a drink?	**Independently** 0 Points	**Partially** (Spilled/Assisted) 1 Point	**Unable** 2 Points
Could they complete this?			

Initial Risk Score: _____ /10 **Initial Risk Category:** _____

Low = 0 to 1 Points LOW ☐ **Medium = 2 to 4 Points** MED ☐ **High = 5+** HIGH ☐

Sign: _____ **Date:** _____

Response Protocol:

Risk Category	Response Protocol	Please initial on completion
Low 0 to 1 Points 	Identify the patient's drinking preferences. ie. Tea with Milk.	
	Inform the patient that the drinks trolley is free of charge.	
	Provide the patient with a fluid intake monitoring chart and ask them to complete it over the next 48 hours, inform all staff to provide assistance to the patient if required.	
	Inform patients relatives, about the use of fluid monitoring Chart, that they can assist their relative to drink/record on the chart whilst they are visiting.	
Medium 2 to 4 Points 	Complete all tasks from the low category.	
	Prompt the patient to drink throughout the day, provide assistance as required.	
	Regularly review the bedside table position.	
	Consider using a lighter water jug if there is arm weakness or half fill water jug.	
High 5+ Points 	Complete all tasks from the low and medium categories.	
	Consider supplemental subcutaneous fluids.	
	Senior Nurse to check the fluid monitoring chart each shift, to ensure i is being completed and prompt all staff as required.	

Risk Review after 24 hours:

Review Risk Score: _____ / 10 **Review Risk Category:** _____

Low = 0 to 1 Points  ☐ **Medium = 2 to 4 Points**  ☐ **High = 5+**  ☐

Sign: _____ **Date:** _____

Fluid Monitoring Chart Summary:

	Day 1	Day 2
Total Number of Beakers		
Total Number of Teacups		
Total Number of Drinks		

Note: After 48hours please review and document the best drinking support plan for this patient

Appendix 3: Results data

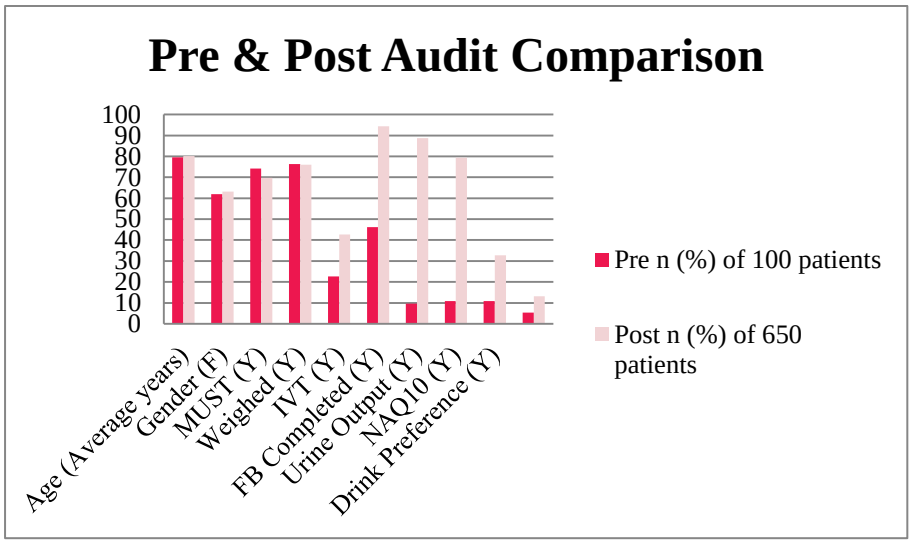
Frequencies of exclusions for completed NoAH tools.

Exclusions	Number	% of Noah completed
IVT	113	37.9
Fluid Restriction	7	2.3
NBM	19	6.4
Palliative	0	0
Screened Out	124	41.6
*143 of 346 none completed also excluded		

Frequencies for NoAH risk factor responses.

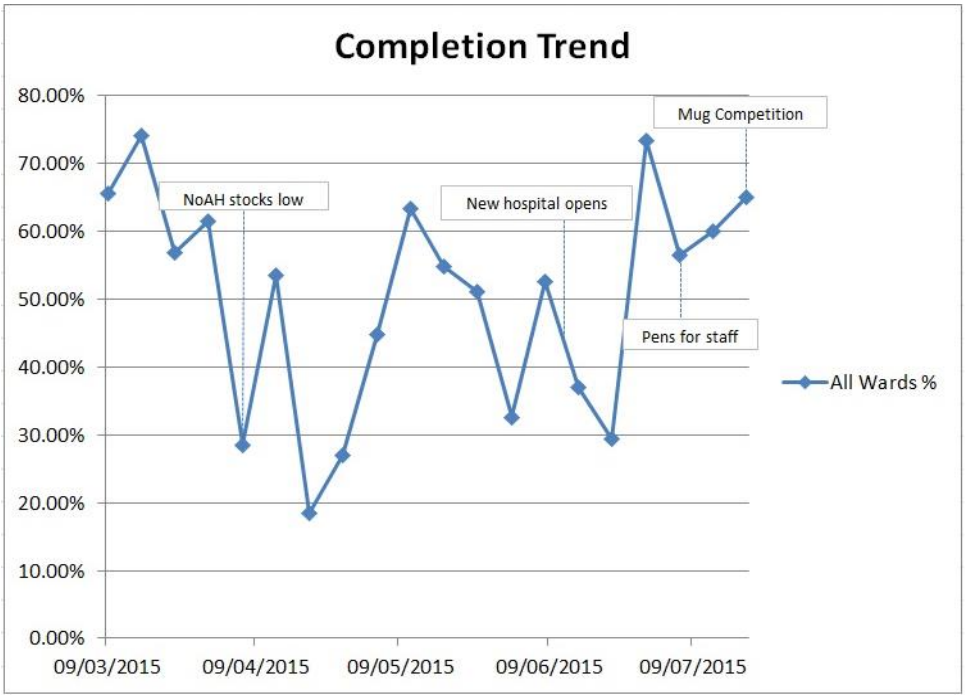
NoAH responses	Number	% of NoAH completed
Risk Factors		
Thickened Fluid	5	2.9
Visual Difficulty	19	11
Communication Difficulty	16	9.3
Diuretics	37	21.5
Antibiotics	63	36.6
D&V last 24 hours	8	4.7
Dry Tongue and/or mouth	7	4.1
Confusion	43	25
Locate, pick and take a drink		
Independently	132	76.7
Partially	30	17.4
Unable	10	5.8
Risk Category		
Low	93	54.4
Medium	73	42.7
High	5	2.9

Pre and post audit comparison



Key
Average age
Female gender
Malnutrition Universal Screening Tool score completed
Patient weighed in the first 48 hours
Patient on intravenous fluid
Fluid balance chart completed
Urine output recorded
Nursing assessment question 10 - does the patient need support with drinking completed
Documentation of drinking preference
Discussion of hydration with patient or relatives

A timeline to show tool adherence throughout the intervention phase.



Quotes from interviews

“I think there is value in having overall hydration education such as needs and consequences etc. It was nice to be included in the development and know where and why something came from.”

“The form for the assessment itself was a two minute job”

“There is definitely a need for the tool, because even though it’s in the notes the tool is right in front of you and you don’t have to go searching for the information so you can see quickly people’s needs.”

“The tool backs up my thinking, before I was mentally assessing and now I can see the process in front of me.”

“It’s simple, easy and quick.”

Appendix 4: NoAH Hydration Tool (2) –Post audit

NORTHUMBRIA ASSESSEMENT OF HYDRATION TOOL

To be completed within 48 hours of arrival to the ward

ADDRESSOGRAPH

Screening Questions:

Is the patient receiving formal palliative/end of life care?	No	☐	Yes	☐
Is the patient receiving intravenous fluids? (Exclude subcutaneous fluids)	No	☐	Yes	☐
Does the patient have a fluid restriction in situ?	No	☐	Yes	☐
Is the patient nil by mouth?	No	☐	Yes	☐

If you have answered yes to any of the questions above, you do not need to complete anything further.

Sign: _____ **Date:** _____

Risk Assessment Questions	**No** 0 Points	**Yes** 1 Point
Is the patient receiving thickened fluids?		
Does the patient have a severe visual problem?		
Would the patient be unable to communicate their needs?		
Is the patient prescribed Furosemide or Bumetanide?		
Is the patient prescribed antibiotics?		

Observation			**No** 0 Points	**Yes** 1 Point
Does the patient have a dry tongue and/or mouth?				
	None 0 Points	**Mild 1 Point**	**Moderate/Severe 2 Points**	
Does the patient appear to be confused?				

Please observe the patient and identify if they can: Locate a drink, pick it up and take a drink?	**Independently** 0 Points	**Partially** (Spilled/Assisted) 1 Point	**Unable** 2 Points
Could they complete this?			

Initial Risk Score: _____ /10 **Initial Risk Category:** _____

Low = 0 to 1 Points LOW ☐ **Medium = 2 to 4 Points** MED ☐ **High = 5+** HIGH ☐

Sign: _____ **Date:** _____

Response Protocol:

Risk Category	Response Protocol	Please initial on completion
Low 0 to 1 Points 	Identify the patient's drinking preferences. ie. Tea with Milk.	
	Inform the patient that the drinks trolley is free of charge.	
	Provide the patient with a fluid intake monitoring chart and ask them to complete it over the next 48 hours, inform all staff to provide assistance to the patient if required.	
	Inform patients relatives, about the use of fluid monitoring Chart, that they can assist their relative to drink/record on the chart whilst they are visiting.	
Medium 2 to 4 Points 	Complete all tasks from the low category.	
	Prompt the patient to drink throughout the day, provide assistance as required.	
	Regularly review the bedside table position.	
	Consider using a lighter water jug if there is arm weakness or half fill water jug.	
High 5+ Points 	Complete all tasks from the low and medium categories.	
	Consider supplemental subcutaneous fluids.	
	Senior Nurse to check the fluid monitoring chart each shift, to ensure it is being completed and prompt all staff as required.	

Risk Review after 24 hours:

Review Risk Score: _____ / 10 **Review Risk Category:** _____

Low = 0 to 1 Points  ☐ **Medium = 2 to 4 Points**  ☐ **High = 5+**  ☐

Sign: _____ **Date:** _____

Fluid Monitoring Chart Summary:

	Day 1	Day 2
Total Number of Beakers		
Total Number of Teacups		
Total Number of Drinks		

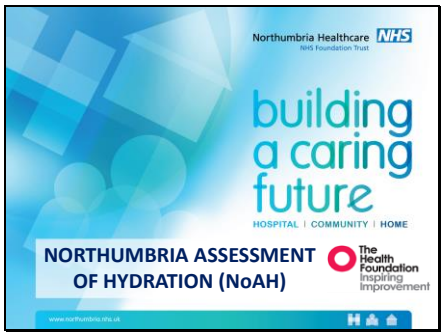
Note: After 48hours please review and document the best drinking support plan for this patient

Appendix 6: Resources from the project

Please attach any leaflets, posters, presentations, media coverage, blogs etc. you feel would be beneficial to share with others

Power Point Presentation

Slide 1



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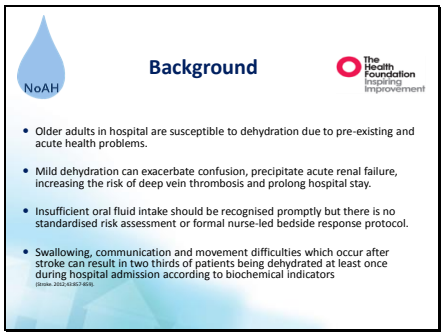

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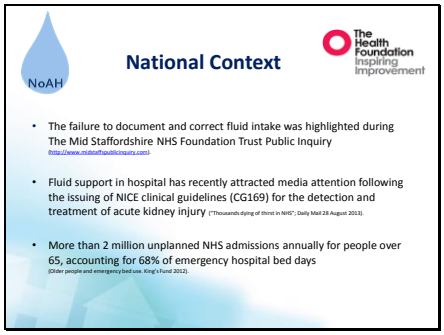

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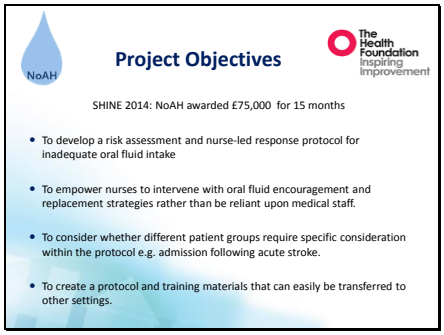

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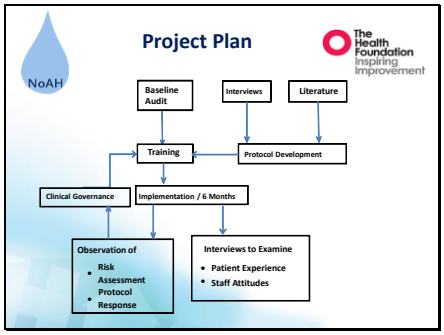

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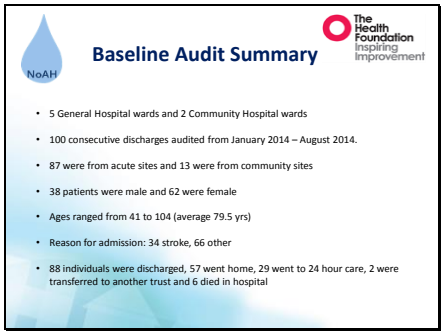

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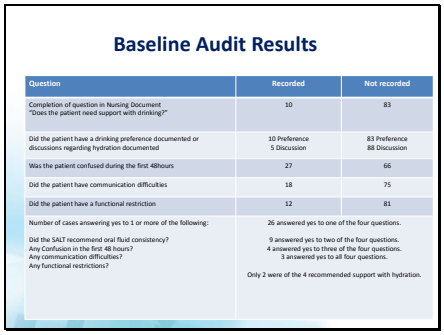

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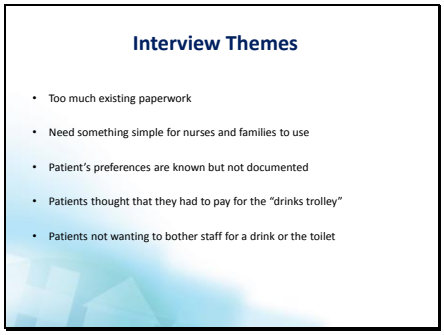

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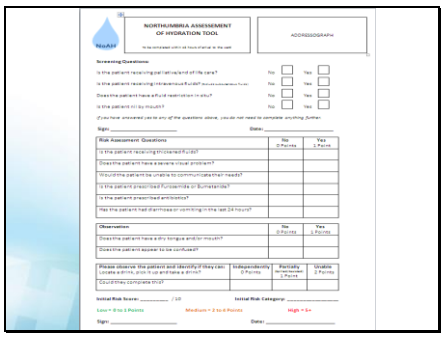

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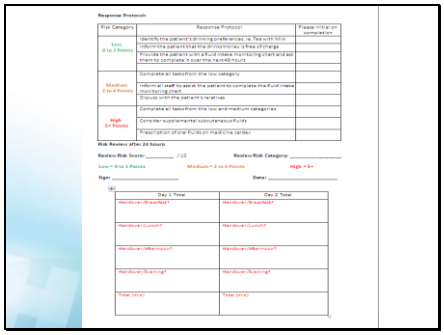

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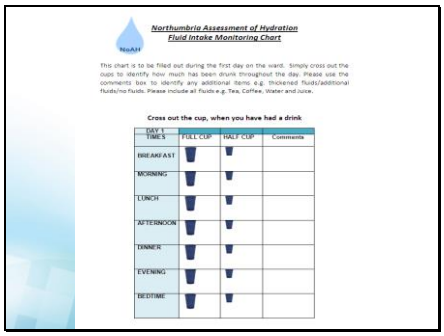

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