

The NES Numeracy benchmarking project

Royal College of Nursing
Congress
Harrogate
11 May 2009



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Background

Nursing numeracy manifestly matters: to patients, to nurses themselves, to their employers, to the public and to nurse educators (Coben 2008).

.....Yet there is no consensus with regard to the level or assessment of this critical area of nursing. This is the case nationally in the UK and globally.



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How can a benchmark assessment support students and teachers?

Students in nursing must be:

- prepared effectively
- supported most effectively by their lecturers
- And employable

Variation in outcome measures for numeracy mean students learn to succeed by numbers, playing 'dot to dot' but struggling to see a whole picture



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Working with Numbers

If students and teachers and employers know what numeracy to expect of registrants at the end of nursing programmes - the whole picture is clear to see.

Lecturers can facilitate working with numbers to help students to gain the skills to meet their knowledge needs



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Study aims

To determine the numeracy skills needed for successful calculation of medicine dosages in clinical practice and the valid assessment of these.

1. Development of an evidence-based benchmark of skills required for medicines calculation.
2. Comparison of assessment mechanisms for validity



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Study Outline

- Pilot study in England – 50 students from 1 university
- Main study in Scotland up to 500 students from 6 Universities
- Last year the proposal was presented
- Today's presentation will reflect preliminary findings and pilot outcomes



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The pilot study

- 50 English student nurses at beginning of 3rd year undertook a computer based numeracy assessment including 28 medication calculation task activities
- 9 students undertook a further computer assessment and also a practical activity



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Main Study

- 67 students from across 6 Universities in Scotland participated in the main study and completed the practical and the computer analysis
- Students also evaluate the usefulness and reality of the packages appraised.
- Full analysis is ongoing and will report in September 2009



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The computer activity

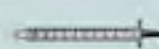
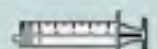

Question 22 of 30

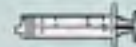
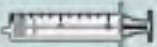
Extract the relevant information from the prescription chart and the medication product label. Calculate the correct dose to administer and choose the appropriate syringe with which to administer it.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

REGULAR PRESCRIPTION MEDICINES				DATE
MEDICINE (Approved Name)		START DATE	ADMINISTRATION TIMES	
Ampicillin		1/10/2007	06:00	
DOSE	ROUTE	SPECIAL INSTRUCTIONS		
500mg	I.M.	-	14:00	
DOCTOR'S SIGNATURE		PHARMACY SUPPLY		
Dr. Jones		A. Mann	22:00	



1ml  5ml  20ml 

2ml  10ml 


The computer activity

Question 11 of 30

Extract the relevant information from the prescription chart and the medication product label. Calculate the correct dose to administer and choose the appropriate method with which to administer it.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

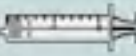
REGULAR PRESCRIPTION MEDICINES				DATE
MEDICINE (Approved Name)		START DATE	REGISTRATION TIME	
Chlorpromazine Hydrochloride		3/20/2007	06:00	
DOSE	ROUTE	SPECIAL INSTRUCTIONS		
25mg	ORAL	-	14:00	
DOCTOR'S SIGNATURE		PHARMACY SUPPLY		
Dr. Jones		A. Mann		
		22:00		




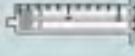
Chlorpromazine Hydrochloride
25mg / 5ml

Medicine Pot

5ml 

10ml 

5ml 

10ml 

Evaluation

SECTION 2: HOW CLOSELY THE ASSESSMENT TASKS REPRESENT MEDICATION DOSAGE AND IVI CALCULATION REQUIREMENTS IN CLINICAL PRACTICE.

2a: The assessment tasks represent an accurate method for measuring the medication dosage calculation requirements experienced in clinical practice.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2b: The assessment tasks represent an accurate method for measuring the IVI calculation requirements experienced in clinical practice.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2c: The time taken to interpret, calculate and complete the medication dosage and IVI calculation problems in the assessment is representative of the time taken in clinical practice.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please make any additional comments here:

Additional Comments:



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REGULAR PRESCRIPTION MEDICINES NAME: Jo Smith

1. Medicine (approved name): **Backlofen** Dose: **3 mg**

Route	Other directions	Pharm	12
Orally		HP	14
Start Date	Signature	Stop date	18
18/09/08	Dr Laycock		22

2. Medicine (approved name): **Nitrazepam** Dose: **1 mg**

Route	Other directions	Pharm	12
Orally		HP	14
Start Date	Signature	Stop date	18
18/09/08	Dr Laycock		22

3. Medicine (approved name): **Verapamil Hydrochloride** Dose: **160 mg**

Route	Other directions	Pharm	12
Orally		HP	14
Start Date	Signature	Stop date	18
18/09/08	Dr Laycock		22

4. Medicine (approved name): **Mefenamic Acid** Dose: **300 mg**

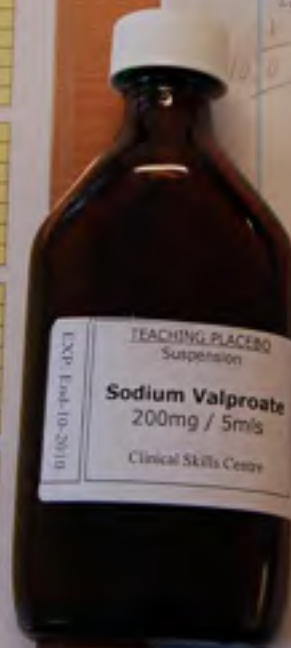
Route	Other directions	Pharm	12
Orally		HP	14
Start Date	Signature	Stop date	18
18/09/08	Dr Laycock		22

5. Medicine (approved name): **Nabumetone** Dose: **0.5 g**

Route	Other directions	Pharm	12
Orally		HP	14
Start Date	Signature	Stop date	18
18/09/08	Dr Laycock		22

6. Medicine (approved name): **Sodium Valproate** Dose: **1g**

Route	Other directions	Pharm	12
Orally		HP	14
Start Date	Signature	Stop date	18
18/09/08	Dr Laycock		22



Handwritten calculations on a piece of paper:

$$\frac{44}{100} \times 100 = 44$$

$$\frac{1500}{100} \times 100 = 1500$$

$$\frac{50}{100} \times 100 = 50$$

$$\frac{200}{100} \times 100 = 200$$

$$\frac{1}{2.5} \times 100 = 40\%$$

$$\frac{10}{25} \times 100 = 40\%$$

$$\frac{1000}{25} = 40$$

$$\frac{200}{5} = 40$$

$$\frac{200}{5} = 40$$

Other notes and calculations:

- 1.5 mg = 1500 mg
- 2.5 mg = 2500 mg
- 2.25 mg = 2250 mg
- 0.4 ml x 300
- 0.25g = 250mg
- 5ml
- 0.4 ml

Pilot Findings

- A high level of congruence (80% mean) was identified between the participants responses in the computer and practice - but sample very small
- Issues noted in both the pilot study and the main study relating to the technical measurement of medicines – this has changed thinking about numeric competence and associated thinking around competence.



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Next Steps

- Data Analysis is ongoing on main study and results should be with NES by the end of July
- A new web page for the project will be launched in September, directly linked to the NES web pages.
- This will allow others to use the exemplar benchmark assessment to assess their own programmes and assessment and to comment and add to current knowledge.



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