Point of Care INR testing and CDSS (Anticoagulant dosing) exercises

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UK NEQAS BC

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Blood Coagulation

UK NEQAS for Blood Coagulation

- National
- External
- Quality
- Assurance
- Scheme

- Not for profit organisation
- Part of NHS
- Role is to improve quality of testing and ultimately patient care

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Edinburgh- Molecular genetics

Glasgow- Cardiac markers

Newcastle- Cellular pathology

Manchester-National head and Neck Histopathology, Reproductive Science

Sheffield- Blood coagulation, Immunology, Leucocyte immunophenotyping

Nottingham-Breast screening pathology

Birmingham- Clinical Chemistry, Haemonetics

Pontyclun-Histocompatibility and immunogenetics

Bristol- Antibiotic assays

Oxford- Clinical Cytogenetics

Watford-Blood transfusion

London-Microbiology, Parasitology, Vitamin K

Guildford- Peptide hormones, Trace elements

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- UK Neqas External Quality Assurance Service for Blood Coagulation (UK NEQAS BC)
- UK NEQAS BC provides samples for EQA purposes to laboratories worldwide
- In 1996 introduced POC EQA programme for INR testing
- Currently 4600+ centres registered for POC INR EQA (in lab programme currently 1100+ users)
- 78% from primary care

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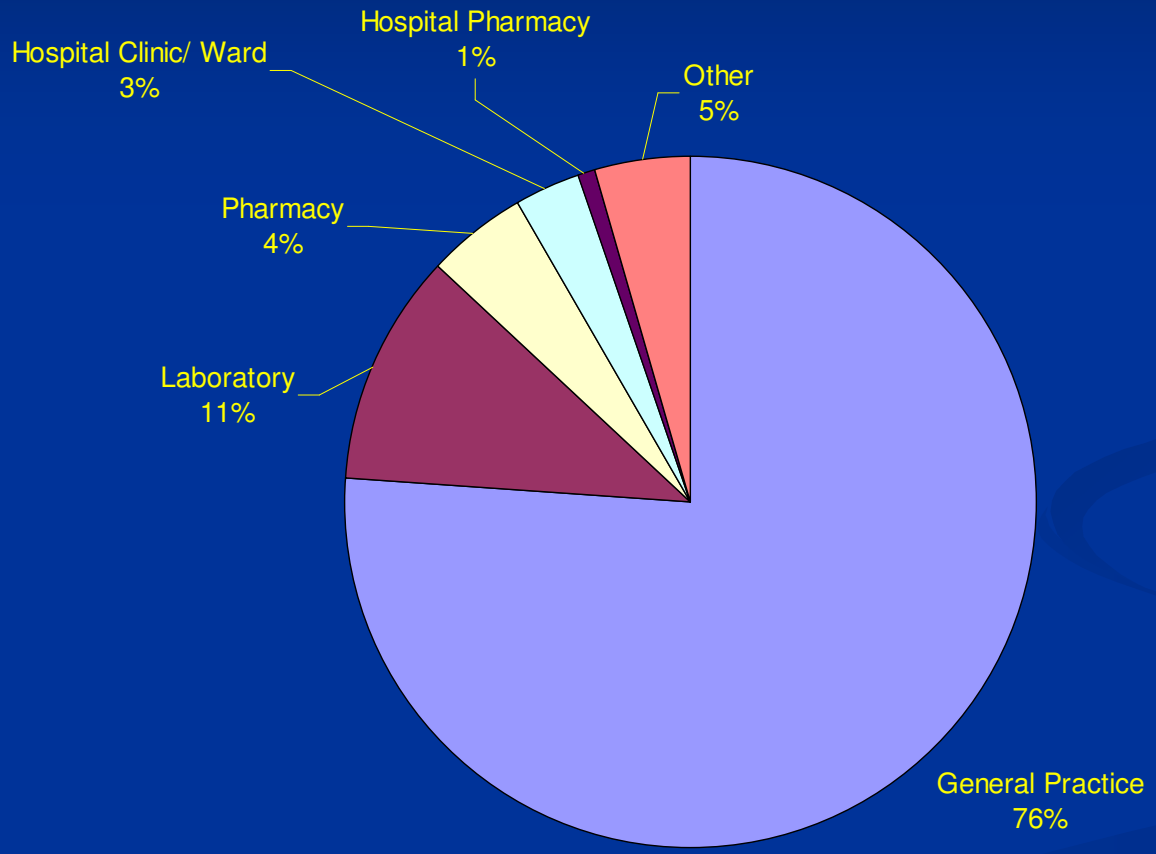
POC sites in NEQAS POC INR programme



Who performs testing?

Nurse= 63%

GP= 6%

Pharmacist= 7%

Lab scientist= 2%

Dentist/dental nurse=1%

Other= 21%

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Basis of UK NEQAS BC EQA testing

- If all centres test the same sample with the same method then it is reasonable that they should all get a similar result
- If a centre get a result not within the acceptable range then this implies that there may be a problem with their test method

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What happens after the test is completed

- Once a test is complete the result is used to direct the patients therapy
- The process after the test is reported is called the post analytical period
- There has been very little post analytical EQA for INR reporting prior to the introduction of the UK NEQAS BC programme

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Post analytical EQA

- UK NEQAS BC has introduced a programme for anticoagulant dosing EQA using virtual patients
- Users are all provided with the same information of a set of historical INR results and the dose of warfarin the patient was taking.
- They are then asked to state a dose and recall time for this patient. They can use CDSS or manual dosing or CDSS with a manual override function
- 4 surveys have been completed
- Planned programme will be 4 surveys per year

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Anticoagulant dosing exercise results survey 1

- A patient with increasing INR above target INR (2.5) over a 7 week period with a dose of 7mg per day. Today's INR is 3.8.

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Anticoagulant dosing exercise results survey 1

- A patient with increasing INR above target INR (2.5) over a 7 week period with a dose of 7mg per day. Today's INR is 3.8.
- Median dose 6.4mg per day (range 0-8mg)
- Median recall 7 days (range 2-28 days)
- 1 responder stated a dose of 2mg per day and recall in 28 days
- 1 responder stated a dose of 8mg per day (increase in dose) and recall in 7 days

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Anticoagulant dosing exercise results survey 2

- A patient with decreasing INR below target INR (3.5) in last 3 weeks on a dose of 7mg per day. Today's INR is 2.1

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Anticoagulant dosing exercise results survey 2

- A patient with decreasing INR below target INR (3.5) in last 3 weeks on a dose of 7mg per day. Today's INR is 2.1
- Median dose 7.7mg per day (range 1-10mg)
- Median recall 7 days (range 1-42 days)
- 1 responder stated a dose of 1mg per day and recall in 7 days
- 5 responders stated a dose of 7mg per day (maintaining dose as before) and recall in 42 days
- 4 responders stated a dose of 10mg per day and recall in 1-3 days.

Anticoagulant dosing exercise results survey 3

- A patient with increasing INR but with final result at top of target range (Target 3.5,INR=4.0) over a 10 week period on a dose 5mg per day

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Anticoagulant dosing exercise results survey 3

- A patient with increasing INR but with final result at top of target range (Target 3.5,INR=4.0) over a 10 week period on a dose 5mg per day
- Median dose 5.0mg per day (range 0-5mg)
- Median recall 14 days (range 1-70 days)
- 1 responder stated a dose of 0mg per day and recall in 1 day
- 1 responder stated a dose of 2.5mg per day and recall in 14 days
- 4 responders stated a dose of 5mg per day (maintaining current dose) with recall of 42 or 70 days

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Anticoagulant dosing exercise results survey 4

- A patient with increasing INR above target INR (2.5) over a 7 week period with a dose of 7mg per day. Today's INR is 3.8. (Same information as exercise 1)

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Anticoagulant dosing exercise results survey 4

- A patient with increasing INR above target INR (2.5) over a 7 week period with a dose of 7mg per day. Today's INR is 3.8. Same information as exercise 1 (Median in 6.4mg per day and 7 day recall)
- Median dose 6.5mg per day (range 0-7mg)
- Median recall 7 days (range 2-49 days)
- 99% of responders reduced dose
- 3 responders maintained dose of 7mg per day but of concern was recall for these were 28,28 and 35 days
- 27 responder stated a dose of <6mg per day (4 of which were <5 mg per day) all with recall in 7 days or less.

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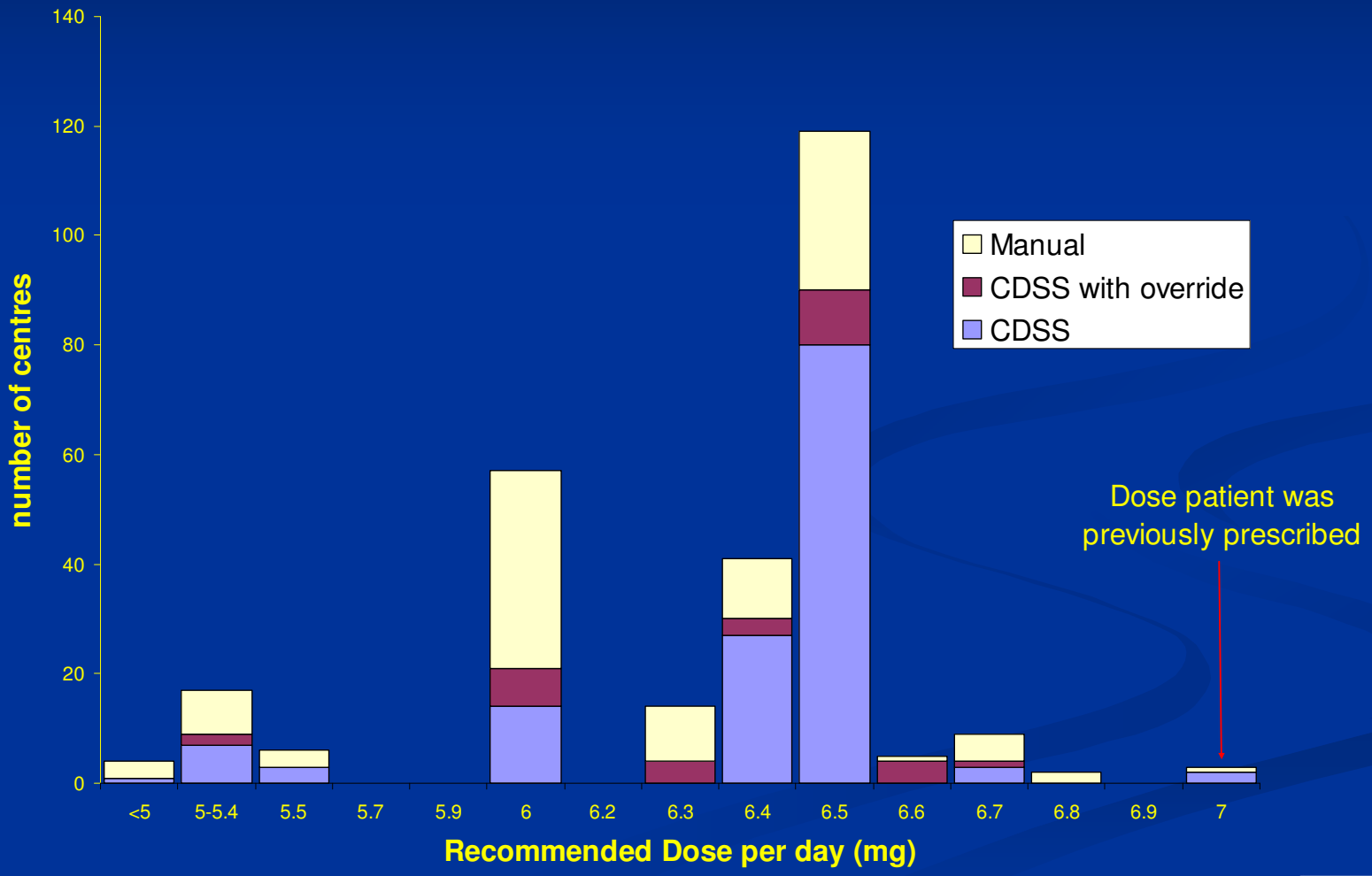
Exercise 4



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Different CDSS, Difference results?

CDSS	Number of users	Median dose mg per day	Dose varied between	Median recall in days	Recall varied between
Coventry	10	6.5	6.5-6.7mg	7	3-7 days
DAWN AC	22	6.0	5.96-7.0mg	7	All stated 7 days
INR Online	6	5.5	5-6.5mg	7	All stated 7 days
INR star	91	6.5	4.1-7mg	7	2-49 days
RAID	7	6.3	5.5-6.5mg	14	7-14 days
RAT	24	6.4	All stated 6.4mg	7	5-7 days

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Exercise 4 DAWN responses

- 22 centres used DAWN recommendations without any over rides
- Median Dose = 6mg per day
- Dose quoted ranged between 6.0-7.0 mg per day (6mg n= 20, 6.75mg n=1 and 7mg n=1)
- Median recall = 7 days
- All quoted 7 days for recall

Different results from same centre

Patient with increasing INR over target (INR=3.8) with previous dose of 7mg per day.
Overall Median dose = 6.5mg per day, Overall Median recall =7 days
DAWN Median dose = 6.0mg per day, DAWN Median recall =7 days

Centre	Number of returns	Routine CDSS in use	Used on this occasion	Doses suggested	Recall suggested
A	6 (different individuals)	DAWN AC	4 manual 2 DAWN with override on recall	3x 6.29 3x 6.0 (DAWN with override)	4 stated 7 days 2 stated 14 days (DAWN with override)
B	4 (different individuals)	DAWN AC	All manual	3 x 6.0 1x 6.71	3 stated 7 days 1 stated 14 days
C	10 (different individuals)	DAWN AC	All manual	1x 6.28 3x 6.43 4x 6.5 2x 6.56	5 stated 7 days 5 stated 14 days

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Different results from same centre AND same person

- Patient with increasing INR over target (INR=3.8) with previous dose of 7mg per day.
- Overall Median dose= 6.5mg per day, Overall Median recall =7 days
- 1 centre returned 2 sets of results, both by same person
- Set 1, Dose suggested 7.0mg per day (maintaining dose as before) recall in 5 weeks (35 days)
- Set 2, Dose suggested 2.7mg per week (much reduced dose) per day recall in 8 weeks (56 days).
- For both sets of results states used CDSS

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Who performed this EQA

	Survey1	Survey 2	Survey 3	Survey 4
Nurse	47%	51%	60%	52%
Doctor	19%	16%	12%	20%
Lab scientist	14%	8%	6%	6%
HCA/ Phlebotomist	14%	18%	13%	9%
Pharmacist	5%	5%	6%	5%
Other	1%	6%	3%	8%

Other include: Practice manager, administrator, clinic director

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Anticoagulant dosing Virtual patient exercises

	Jan-16 n=303	Jul-16 n=410	Dec-16 n=282	June -17 n=281
Laboratory users	94 (31%)	110 (27%)	79 (28%)	61 (22%)
POC users	209 (69%)	300 (73%)	203 (72%)	220 (78%)
taking part in pilot from Lab	**10.7%**	**12.3%**	**8.7%**	6.6%
taking part in pilot from POC	**4.6%**	**6.7%**	**4.4%**	4.8%

- "would like some more information about how to do this and why I would do it?"
- " not sure of the point of doing this"
- "don't want to use the CDSS for a virtual patient as it will affect my clinic stats"
- "we have done this as a favour to our lab staff"

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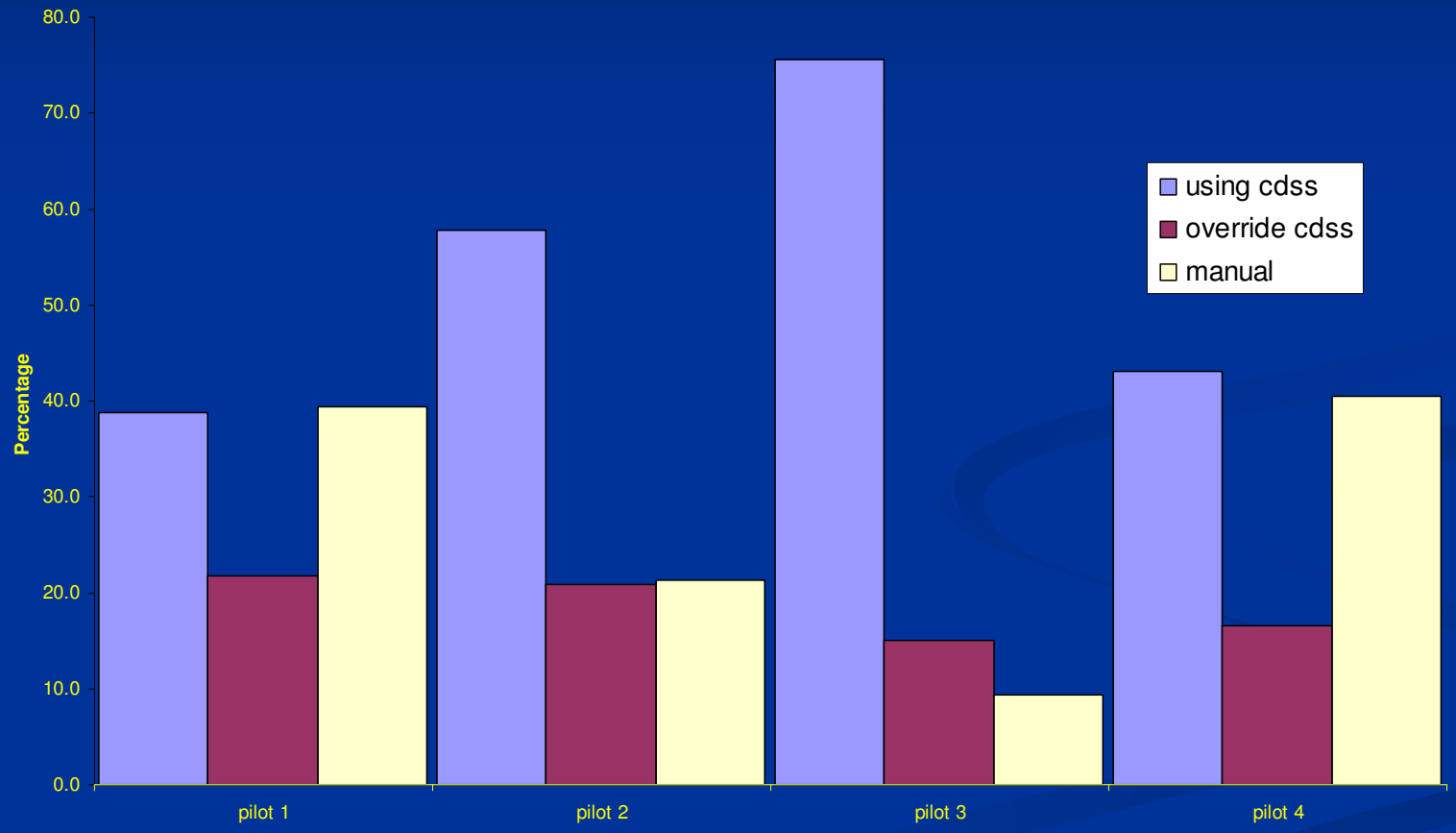
CDSS or manual?



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CDSS or manual?

- In routine use 86% of POC centres in UK NEQAS BC INR programme use CDSS for patient dosing
- Why not use for these exercises?
- Too difficult to enter historical results?
- Don’t want these virtual patients to effect clinic stats?
- Easier to do manually?

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Future studies

- UK NEQAS BC will continue to provide these virtual patient exercises
- At some point we will have to charge a fee
- Need to encourage users to take part and get benefit from these studies
- Need to increase percentage of users to treat in same way as a real patient ie use their CDSS
- Could be useful as training exercises or competency checks

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Thank you for Listening

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