

Developing UK NEQAS material for the measurement of Red Cell Distribution Width & Mean Platelet Volume

Susanne Kricke, Great Ormond Street Hospital for Children, London, UK

Barbara de la Salle, UK NEQAS General Haematology, Watford, UK

Vatsala Soni, UK NEQAS General Haematology, Watford, UK

Daniel Pelling, St Mary's Hospital, ICH NHS Trust, London, UK

Carol D'Souza, University of Westminster, London, UK

UK NEQAS

Haematology and Transfusion

Why develop a UK NEQAS scheme for RDW & MPV?

- RDW-CV (%), RDW-SD (fl) and MPV (fl) routinely reported as part of FBC
- Parameters of increasing clinical importance
- No UK-based EQA scheme for RDW and MPV
- No previous publications on artificial manipulation of RDW and MPV

1. Baseline study

Data review of previous UK FBC surveys:

→ *Can existing UK NEQAS survey material be used for RDW and MPV measurement?*

2. Experimental research

Develop novel ways of survey material manipulation:

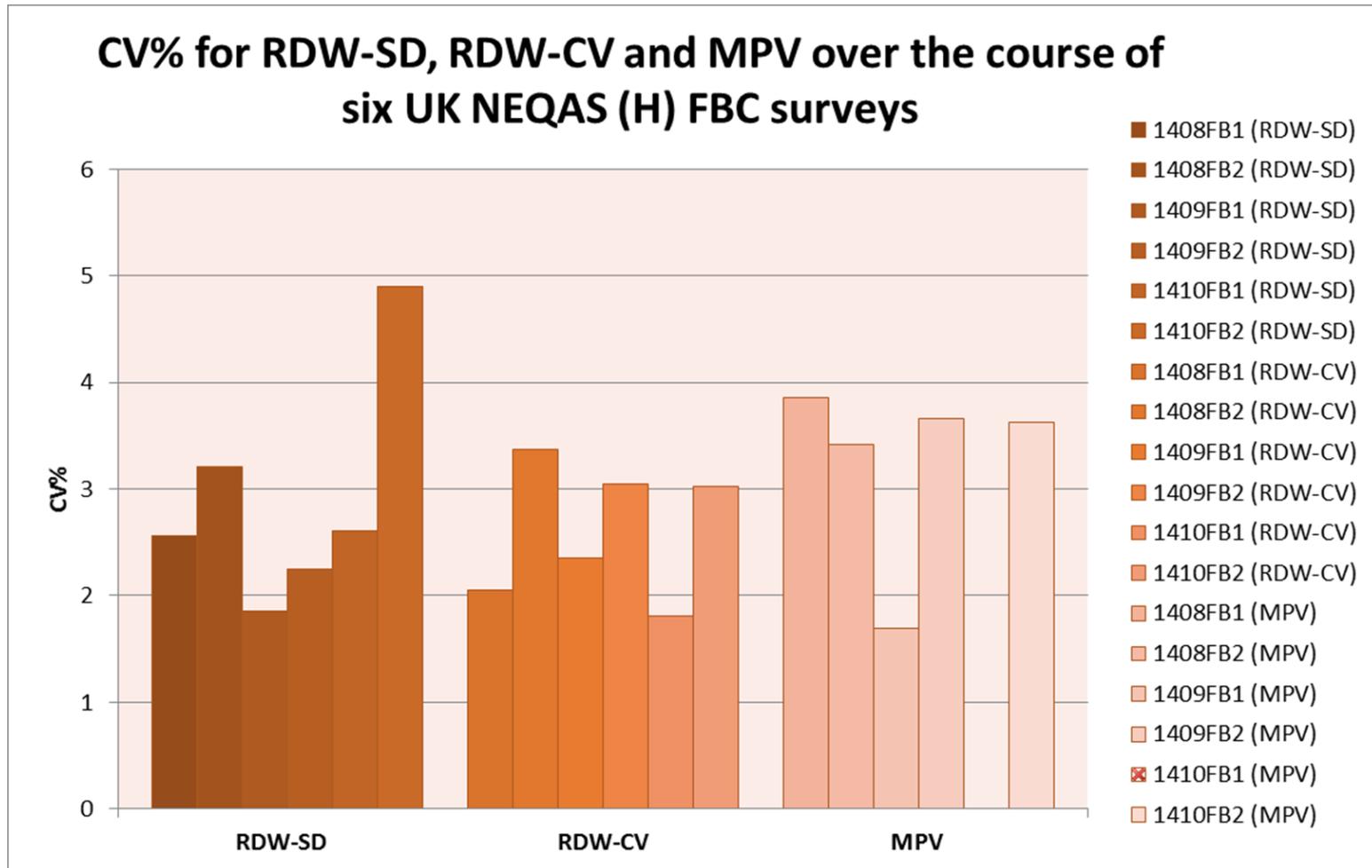
→ *Can RDW and MPV be artificially altered to give abnormal values?*

→ *Is the novel material stable for duration of UK NEQAS FBC survey?*

→ *Can it be included within the UK NEQAS FBC survey?*

1. Baseline Study

1. Baseline study - Data review



2. Experimental design and stability studies

2. Experimental design - Material manipulation

Red Cell Distribution Width

Method 1

Human adult blood and cord blood were mixed at ratios ranging from 10:0 to 0:10.

Method 2

Heat-treated (15h at 45°C) and non-heat-treated adult blood was mixed at ratios ranging from 10:0 to 0:10.

Mean Platelet Volume

Method 1

Aliquots were incubated for 6h at room temperature with varying EDTA conc. (ranging from 0 – 40 mg/5ml blood).

Method 2

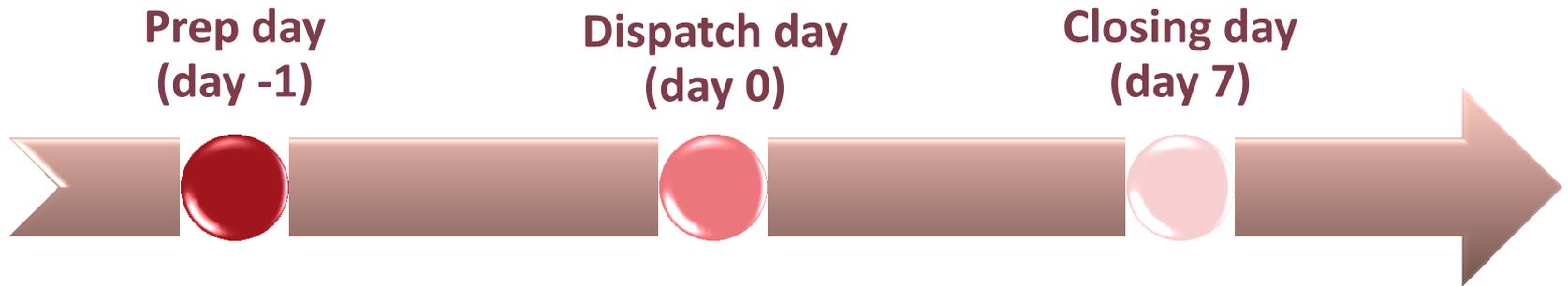
Aliquots were incubated for 4h at 4°C, 21°C or 37°C with native equine tendon type I collagen (conc. ranging from 10 - 40 µg/5ml blood).



PARTIAL FIXATION

Stability assessment

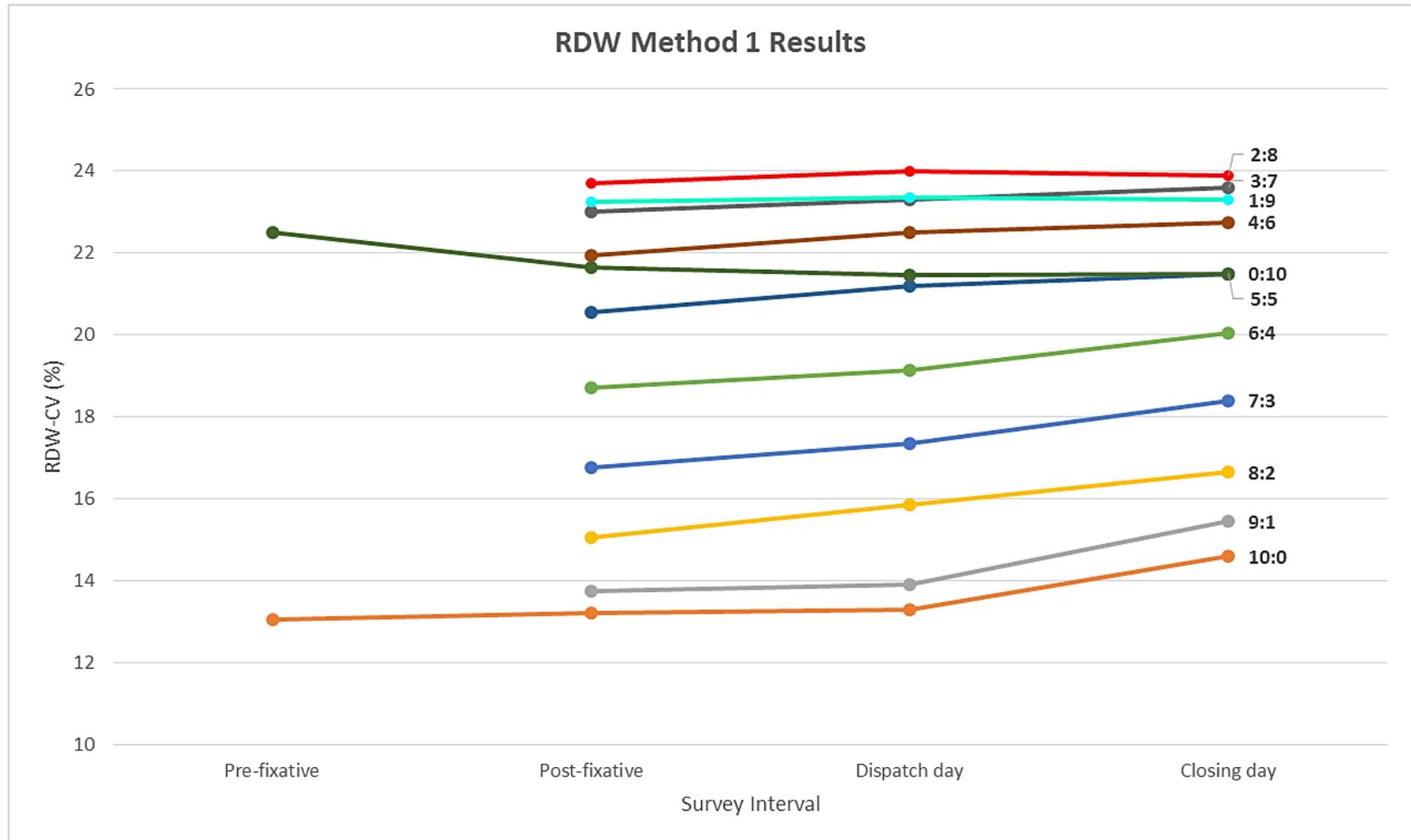
- FBC performed on all aliquots according to examination schedule designed to mimic UK NEQAS (H) FBC survey cycle:



- Assessed effect on RDW-CV, RDW-SD and MPV as well as other FBC parameters ($CV \leq 5\%$)
- Measurements undertaken on Sysmex (XE-2100™) technology only

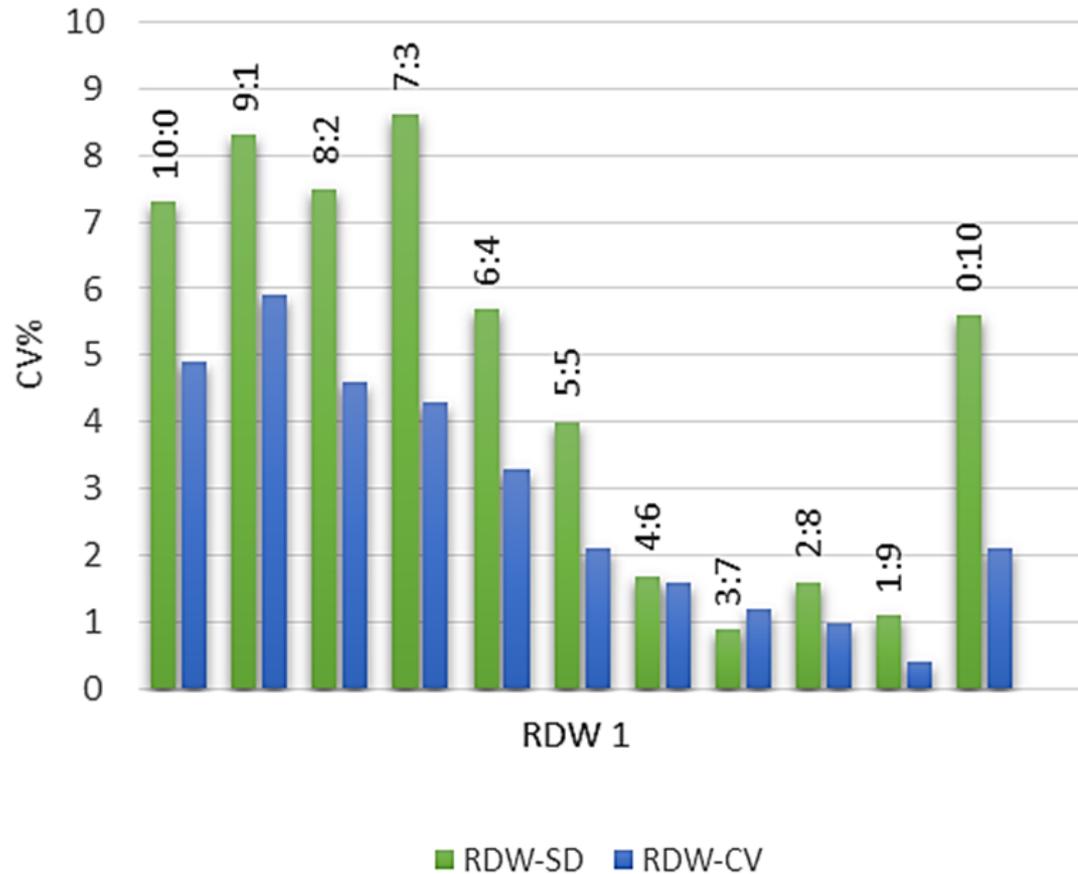
Results

Results - RDW method 1

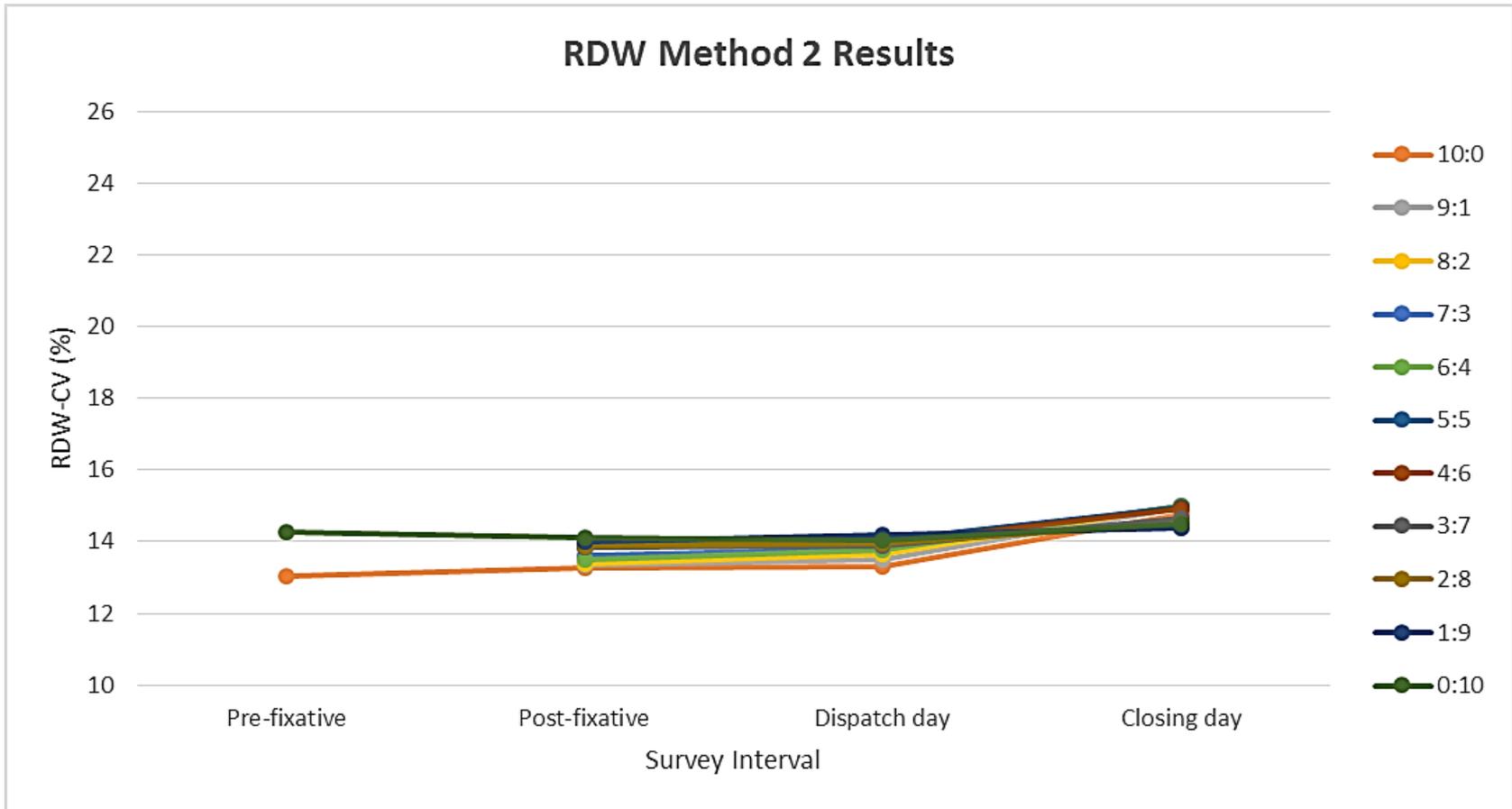


- RDW-CV reference range: 10 – 16% (adult males and females)

Stability assessment for RDW method 1

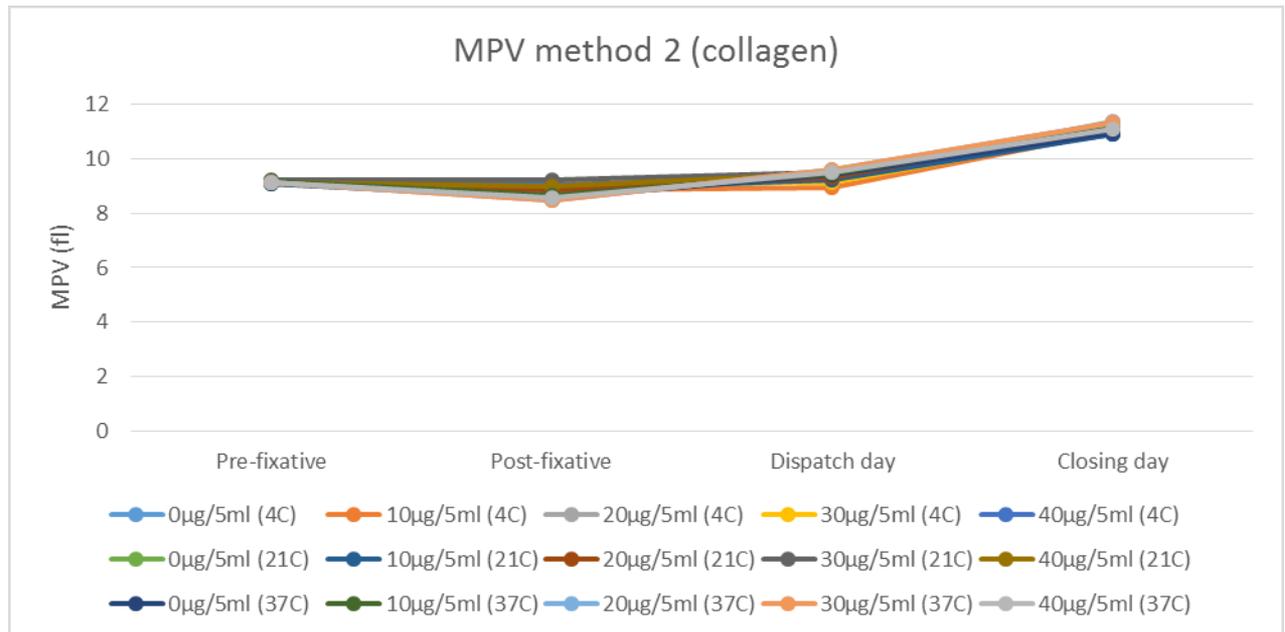
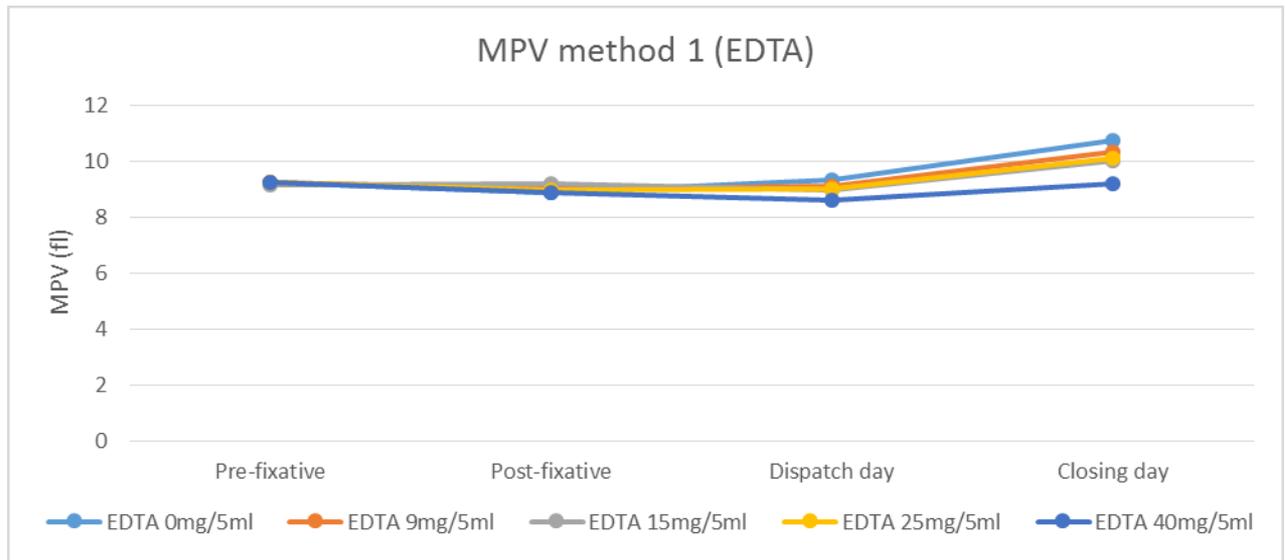


Results – RDW method 2



- RDW-CV reference range: 10 – 16% (adult males and females)

Results – MPV method 1 and method 2



MPV reference
range:
7.4 fl - 11.5 fl (for
adult males and
females)

Outcome

□ Baseline study:

- ✓ Existing material is suitable for performance assessment of RDW and MPV

□ Research:

✓ RDW method 1:

- ratios from 5:5 to 1:9 (adult:cord) recommended to UK NEQAS
- feasible design
- all other FBC parameters appear stable

✗ RDW method 2:

- not recommended at this stage

✗ MPV method 1 & 2:

- not recommended at this stage

What's next?

- ▶ Scale up to 1 litre and 5 litres
- ▶ Assess RDW and MPV when prepared in large quantities
- ▶ Extension to other technologies (Beckman Coulter[®], SIEMENS)
- ▶ Pilot exercise

Acknowledgements

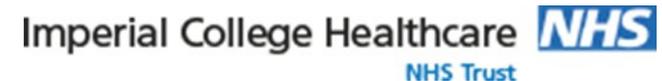
▶ **UK NEQAS General Haematology, Watford, UK:**

- Barbara de la Salle
- Vatsala Soni



▶ **St Mary's Hospital, Imperial College Healthcare NHS Trust, London, UK:**

- Daniel Pelling
- Imperial College Healthcare NHS Trust Award Scheme



▶ **University Of Westminster, London, UK:**

- Carol D'Souza

