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Can Virtual Reality Improve Real World Transfusion Training?

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Overview

- **Training in Transfusion Laboratories**
 - Training requirements
 - Current state
 - Training issues
- **Current use of VR in Transfusion**
 - How it all began
 - VR Crossmatch training research project
- **The Future of VR in Transfusion**
 - Availability of VR training
 - Future developments

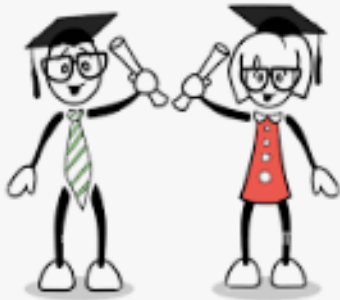


(Photo taken by L. Eastwood, NHSBT)

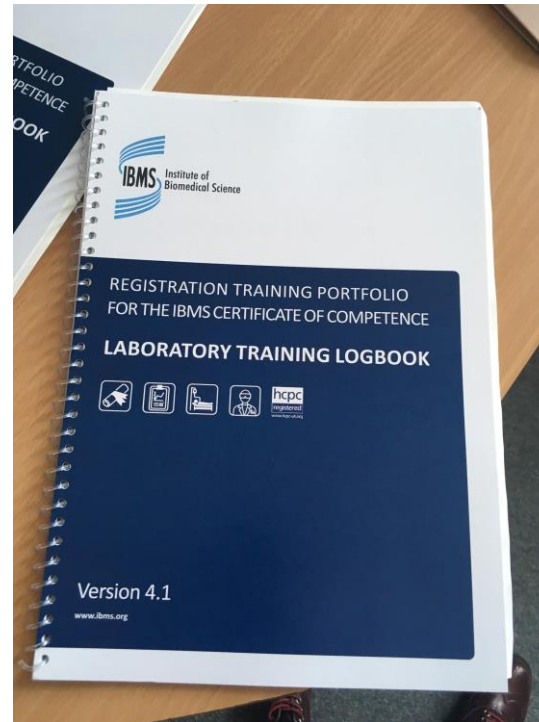
Training in Transfusion Laboratories

Transfusion Training Requirements

Accredited Degree



Registration Portfolio



Specialist Qualifications

IBMS
Higher
Specialist
Diploma



ENROLLING NOW

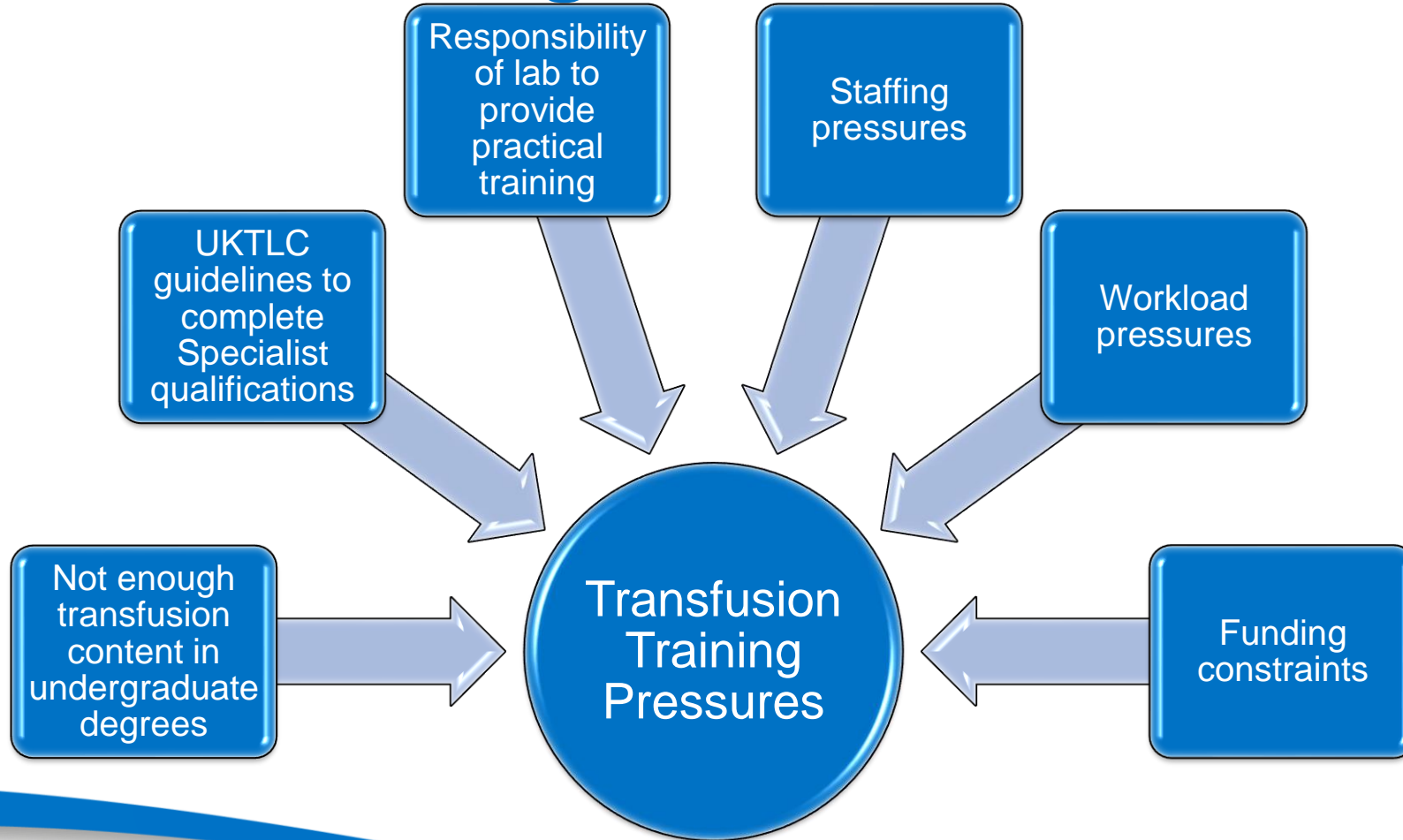
Specialist Certificate in
**TRANSFUSION
SCIENCE
PRACTICE**

BBTS Members only. Join today



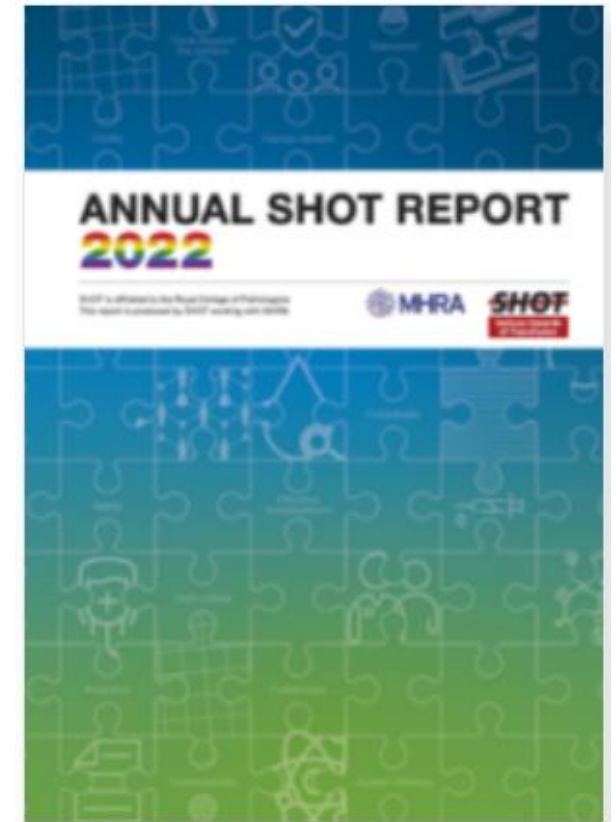
Masters in
Transfusion
Science

Transfusion Training – Current State



Why Improve Transfusion Training?

- Serious Hazards of Transfusion:
 - If a patient is transfused the incorrect blood, this can be potentially fatal
 - 4,371 reports were received
 - Laboratory errors, n = 651 (15%)
- UKTLC Survey:
 - Staffing and workload pressures



<https://www.shotuk.org/shot-reports/>

Current Use of VR in Transfusion

What is Virtual Reality?

- Immersive virtual reality (VR) training is becoming increasingly used in healthcare.
- Trainee wears a headset to place themselves in a simulated environment.
- Allows for more independent, practical training.
- Potentially reduces:
 - the burden on trainers.
 - risks to patients from training related errors may be reduced as no patient samples are required.



(Photo taken by L. Eastwood, NHSBT)

Why Use VR?



Virtual laboratory with interactive knowledge-based training and competency assessment.



Learnbloodtransfusion
the essential guide
Produced by the UK Blood Services

vd.10 Feb. 2016



Focusses on clinical aspects of transfusion

How It All Began....

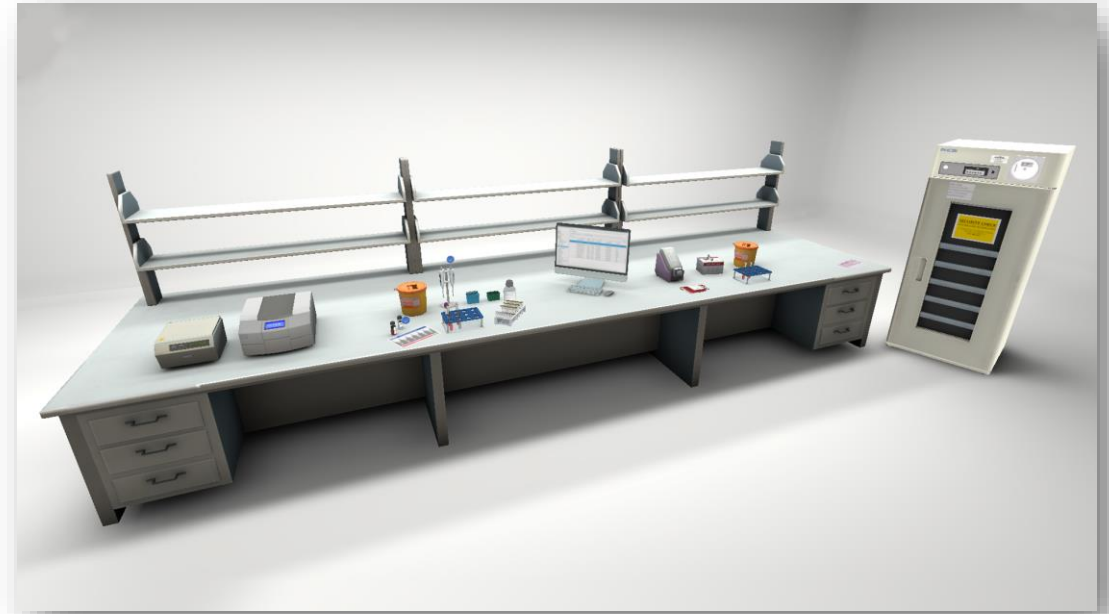
- In 2019, SCTE developed a blood identification VR package.
- Initially developed to demonstrate proof of concept, and to clearly link to the patient.
- Crossmatch identified as the next transfusion process to develop a training package for.



(Screenshot shared courtesy of NHSBT and MakeReal)

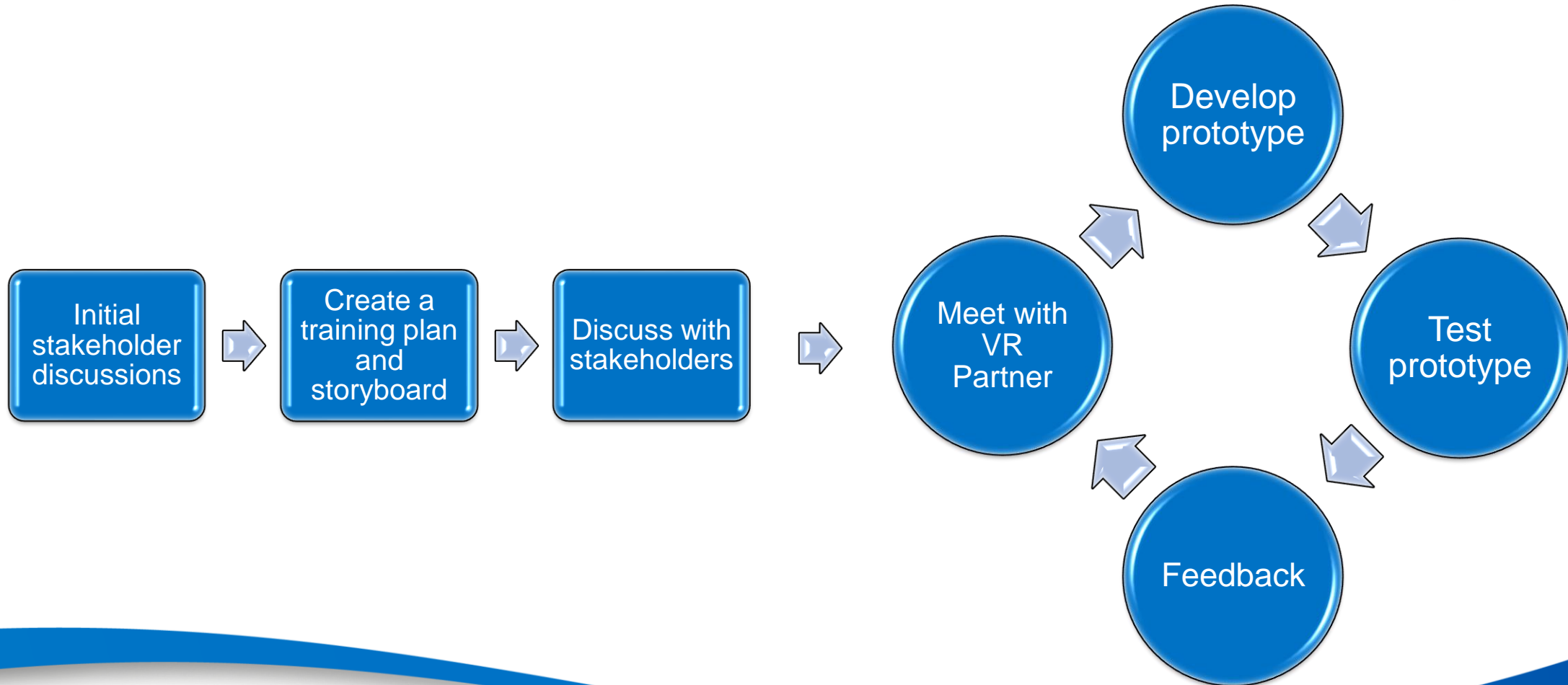
Developing VR for Crossmatch Training

- NHSBT and stakeholders worked with an external company to create a virtual reality training package for crossmatching.
- Stakeholders included representatives from:
 - NHSBT (SCTE and RCI)
 - Hospital Transfusion Laboratories
 - BSH Guidelines Working Group
 - SHOT
 - MHRA
 - UKTLC
 - Patients and donors



(Screenshot shared courtesy of NHSBT and MakeReal)

Developing the VR Training Package



Pilot Study

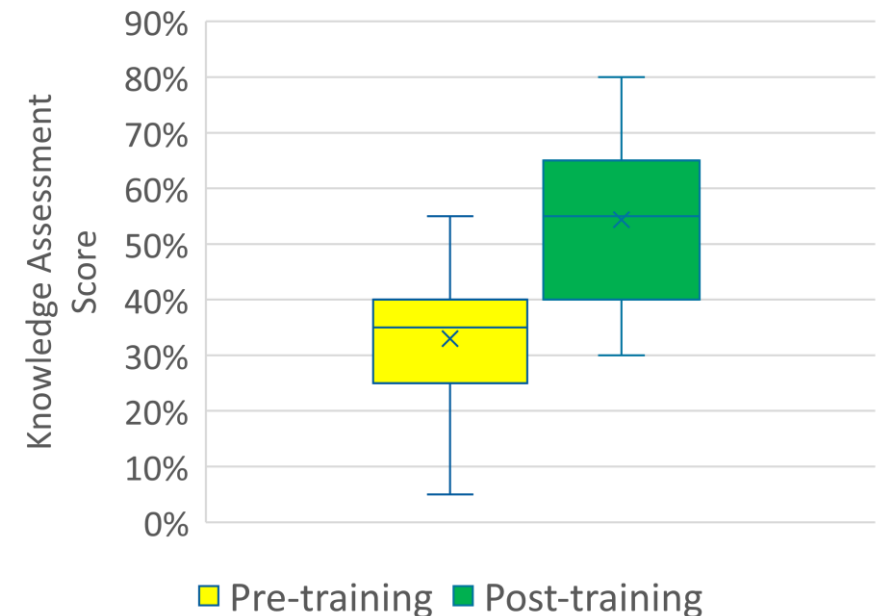
- **METHOD:**

- 16 undergraduate BMS students with no prior transfusion experience
- Assessments were carried out before and after VR training.
- Practical skills relating to crossmatching were self assessed.

- **RESULTS:**

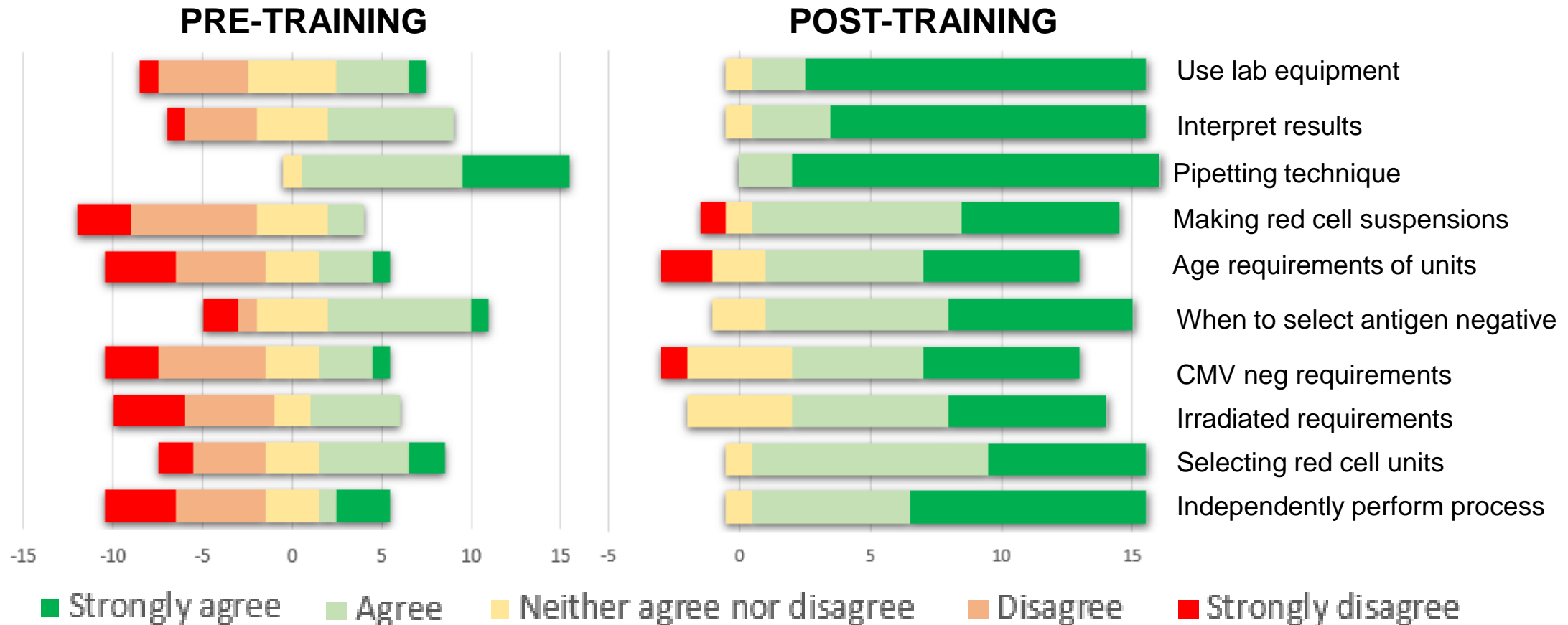
- Significant increase in knowledge scores.

Pre- and post VR knowledge scores



Pilot Study

Pre- and post-training Self Assessment of Application of Practical Skills



Determining the Effectiveness of VR

- Two study groups
 - Control group = trained using local standard laboratory training plans
 - VR group = trained using the VR headsets
- Comparison of increase in knowledge and changes in application of practical skills
- 102 participants required
- Please get involved!



(Screenshot shared courtesy of NHSBT and MakeReal)

The Future of VR

What Happens Next?

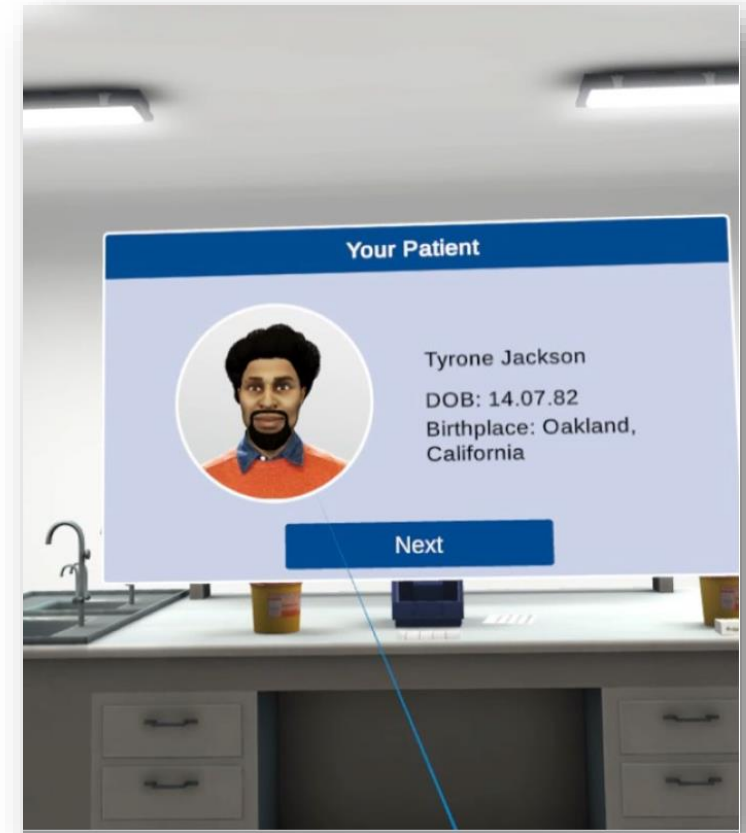
Blood Identification VR Training

- Available from the Meta Quest App Lab Store to download (£25)
- Search for “NHSBT Blood identification VR AL”

Don't just learn – immerse yourself! Download the NHSBT Blood Identification App today and be part of the revolution in healthcare education!



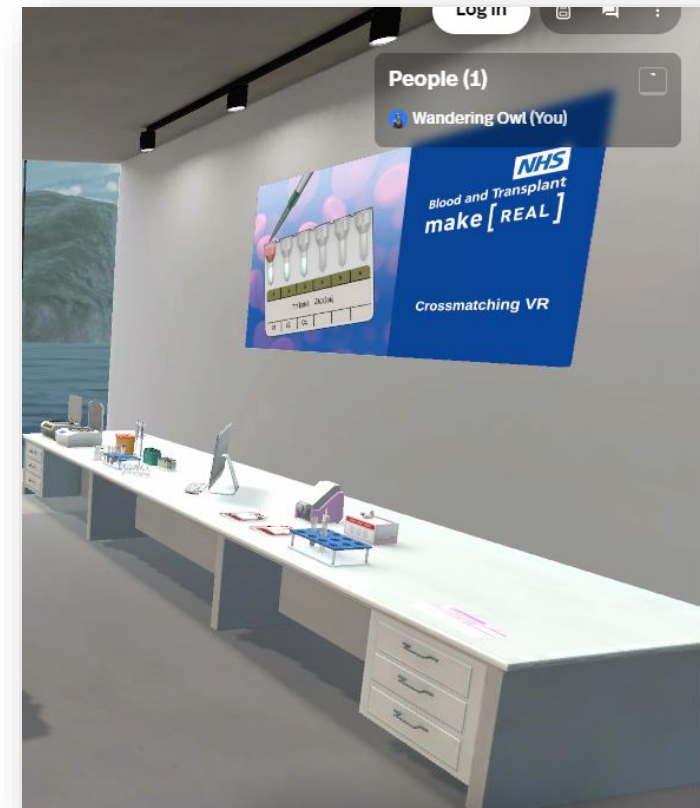
Download now on Meta!

(Screenshot shared courtesy of NHSBT and MakeReal)

Virtual Transfusion Laboratory

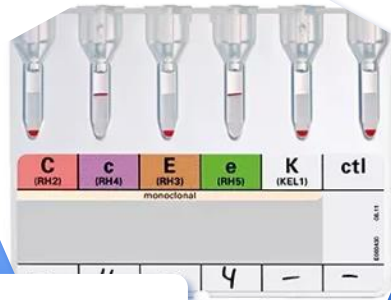
- Potential to develop separate packages for individual transfusion processes.
- Funding currently being sourced to develop an ABO grouping package.
- Different to 'Blood Identification' as it will be based on card groups.
- Stakeholder involvement similar to crossmatch package to ensure it is applicable across the UK.



(Screenshot shared courtesy of MakeReal)

Longer Term Vision

- New activities could include:



RhK phenotyping

Sample reception



Pipette skills

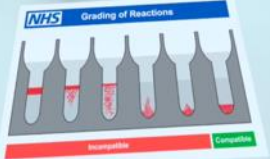
Major haemorrhage scenario



Antibody screening

Component selection

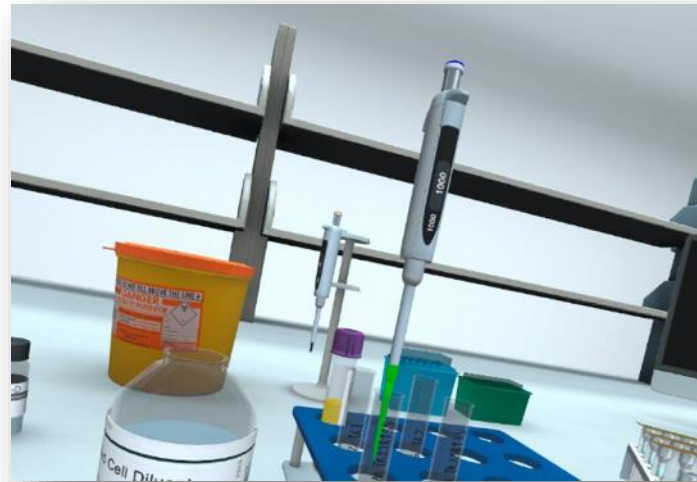
Crossmatching



Virtual Transfusion Laboratory



The environment will be designed to be interactive, where equipment can be picked up and conversations take place.



Solo lab challenges could be launched from the environment, in which learners completed detailed simulations of procedures.



Exploring the environment will uncover patient stories, and other contextual information about the work the NHS is doing.

Thank you for listening



- If you are interested in participating in the crossmatch VR research project, please email:
laura.eastwood@nhsbt.nhs.uk
- Have a go on the headsets today!