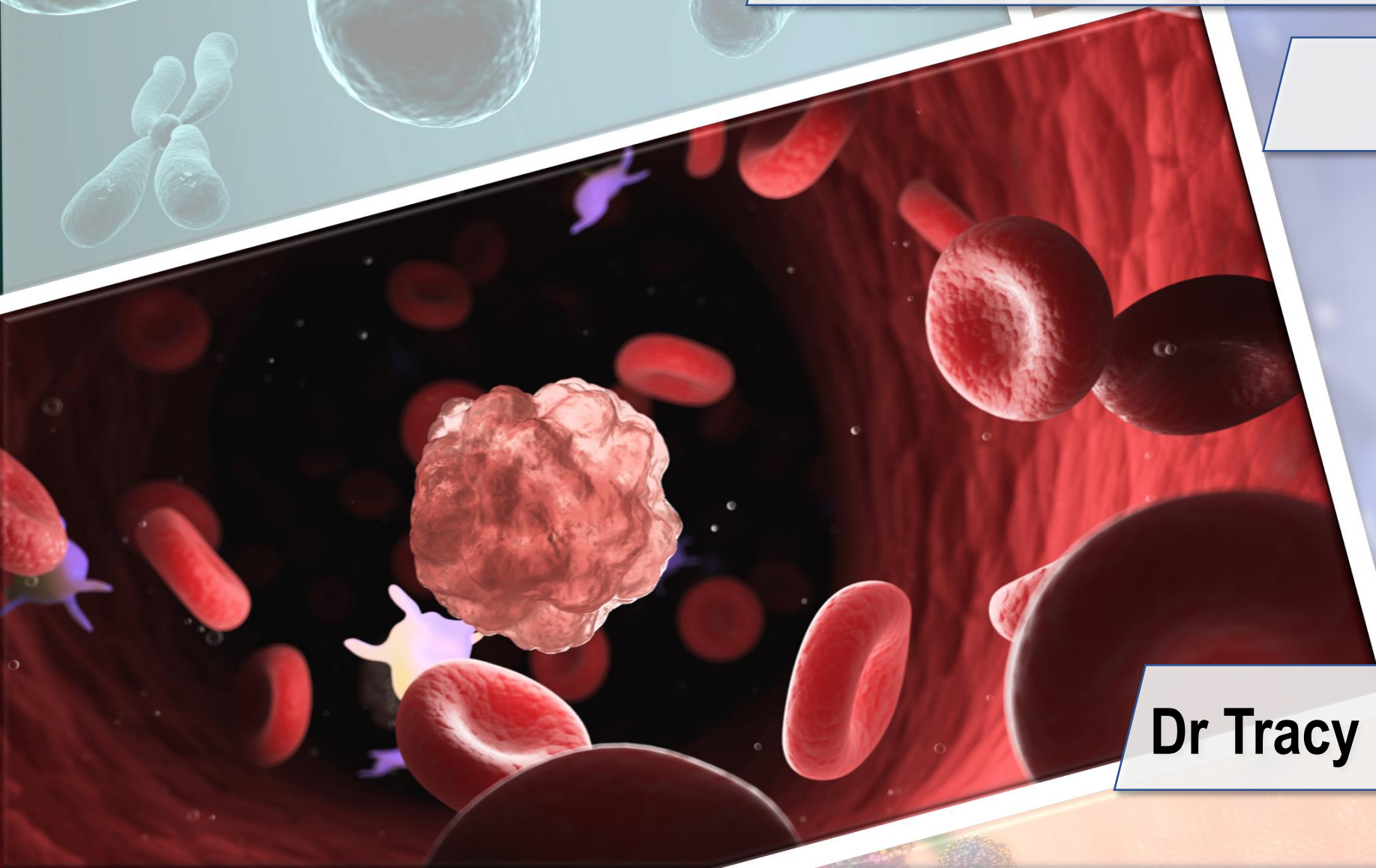
Imperial College London

TBL 4: Transfusion

PART 4



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Session plan

Part 1 – Blood groups and their clinical significance

- Blood group systems
- RBC antigens and antibodies against RBC antigens
- Haemolytic transfusion reaction
- Haemolytic disease of the fetus and newborn
- Naturally occurring antibodies
- Acquired alloantibodies

Part 2 – ABO and Rh blood group systems

- ABO – Antigens, Antibodies, Selecting blood components for transfusion
- RH – Antigens, Antibodies, Selecting blood components for transfusion
- Other blood group systems

Part 3 – Pre-transfusion compatibility testing

- ABO grouping
- RhD grouping
- Antibody screen
- Crossmatch

Part 4 – Donor selection and testing

- Blood donors
- Tests undertaken on donations

Part 5 – Blood components and why we use them

- Whole blood donation
- Apheresis
- Red cells
- Platelets
- FFP
- Cryoprecipitate
- Plasma derived medicinal products

1- POM 2-5 Explain the clinical importance of major blood groups and the screening of blood donors and recall the blood components used in transfusion

Blood donors

- Unpaid volunteers

- Without any health condition which would make blood donation hazardous for *them*
  - E.g. cardiovascular disease

- Without any health condition which would make the blood donated hazardous for the *recipient*
  - E.g. viral, bacterial or parasitic infections

- Deemed eligible to donate following completion of a ‘donor health check questionnaire’ and ‘health screening interview’ with a nurse
  - Questions cover the potential donor’s general health, medical history, medication history, travel history and some lifestyle questions

- Donor education and self-exclusion are also important to prevent individuals who might have a blood-borne infectious disease from donating blood during the ‘window period’ of infection (i.e. when the infection is not yet detectable by any test)

https://www.blood.co.uk/who-can-give-blood/can-i-give-blood/

Tests undertaken on blood donations

All blood donations undergo:

- **Group and screen**
- **Infection screening**

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Group and screen

- Every blood donation has the ABO and RhD blood group determined
- In addition, on most donations in the U.K., the other Rh blood group antigens (C, c, E, e) and the K blood group are also determined
- Some donations will undergo further testing for other blood groups (e.g. Fya, Fyb, Jka, Jkb etc.) which allows provision of phenotype matched red cells for certain patients
- Every blood donation is also tested to ensure that there are no strong clinically significant antibodies against RBC antigens present in the donor's plasma
  - This is to ensure that any blood components containing plasma will only have ABO antibodies

Tests undertaken on blood donations

All blood donations undergo:

- Group and screen
- **Infection screening**

Infection screening

- Vital to reduce the risk of transfusion-transmitted infections (i.e. infections transmitted from the blood donor to the recipient)
- Minimum mandatory infection screen on all donations is for: HIV, hepatitis B, hepatitis C, hepatitis E, HTLV and syphilis
- However, testing alone is not enough to reduce the risk of infection
  - Cannot test for all infections
  - Early infections may not be detected ('window period' of infection)
- Therefore, **screening of donors** (via the donor health check questionnaire and health screening interview), **prior** to donation to identify those **ineligible to donate** is also vital
  - Particularly important for infections for which we do not currently have an available blood test (e.g. variant Creutzfeldt-Jakob disease vCJD)
  - Depending on the information gathered, additional tests can be carried out

Tests undertaken on blood donations

All blood donations undergo:

- Group and screen
- **Infection screening**

If an infection screening test is positive, further confirmatory testing is then performed, and if this is also positive, the donation is discarded.

MANDATORY SCREENING TESTS (performed on all donations)	
HIV	Anti-HIV 1+2 ab and PCR
Hepatitis B (HBV)	HBV surface ag and PCR
Hepatitis C (HCV)	Anti-HCV ab and PCR
Hepatitis E (HEV)	PCR
HLTV (Human T-lymphotrophic virus)	Anti-HTLV ab
Syphilis	Ab test (Treponema pallidum haemagglutination assay)
ADDITIONAL TESTS (only performed on some donations)	
CMV (cytomegalovirus)	Anti-CMV ab
T. Cruzii	Anti-T cruzii ab
Malaria	Anti-malarial ab

Figure: Infection screen performed on donated blood in the U.K. (Ab – antibody; Ag – antigen; PCR – polymerase chain reaction testing for presence of nucleic acids from infectious agent)