Blood Transfusion

Dr Will Dooley

Plan

- Cases
- OSCE practice scenario
- Blood groups
- Monitoring / Reactions

SIMPLY FINALS

Miss Irene Bleede, 23yo

Asymptomatic, healthy woman with menorrhagia

Hb 78 g/l, MCV 73fl

Would you give a blood transfusion?

Miss Irene Bleede, 23yo

Asymptomatic, healthy woman with menorrhagia

Hb 68 g/l, MCV 73fl

Would you give a blood transfusion?

SIMPLY FINALS

Indications for transfusion (1)

Restrictive blood transfusion

If Hb **<70 g/L**

Target = **70–90** g/L after transfusion.

Single-unit red blood cell transfusions if no active bleeding

Mr Oliver Negg, 86yo

Presenting with acute MI

Hb 76 g/l, MCV 85fl

Indications for transfusion (2)

If Hb **<80 g/L and Acute Coronary Syndrome**

Target = **80–100** g/L after transfusion.

Mr Oscar Dere, 73yo

Presenting with acute upper GI bleed

BP 80/60, Pulse 120 thready

Hb 82 g/dl, MCV 101fl

GROUP AND SAVE OR CROSS MATCH

ABCDE resuscitation
Call for help / 2222 emergency
Cross match 4-6 units (+FBC/clotting/U+E)
Consider ONeg blood transfusion
May require urgent OGD

Blood products

Packed Red Cells
1 unit → raise haemoglobin by **~10-15g/l** in 70kg patient
NICE 2015: Restrictive transfusion (1 unit and aim for **70-90g/L** post Hb)

Platelets
For severe thrombocytopenia; consider if patient still actively bleeding
1 unit → raise platelets by **$20x10^9$**
Same bedside checks and ABO/RhD checks as with red cells

Fresh Frozen Plasma (FFP) / Cryoprecipitate - emergency use

Whole blood - Rarely used – components more valuable

Mrs A Smith, 35yo

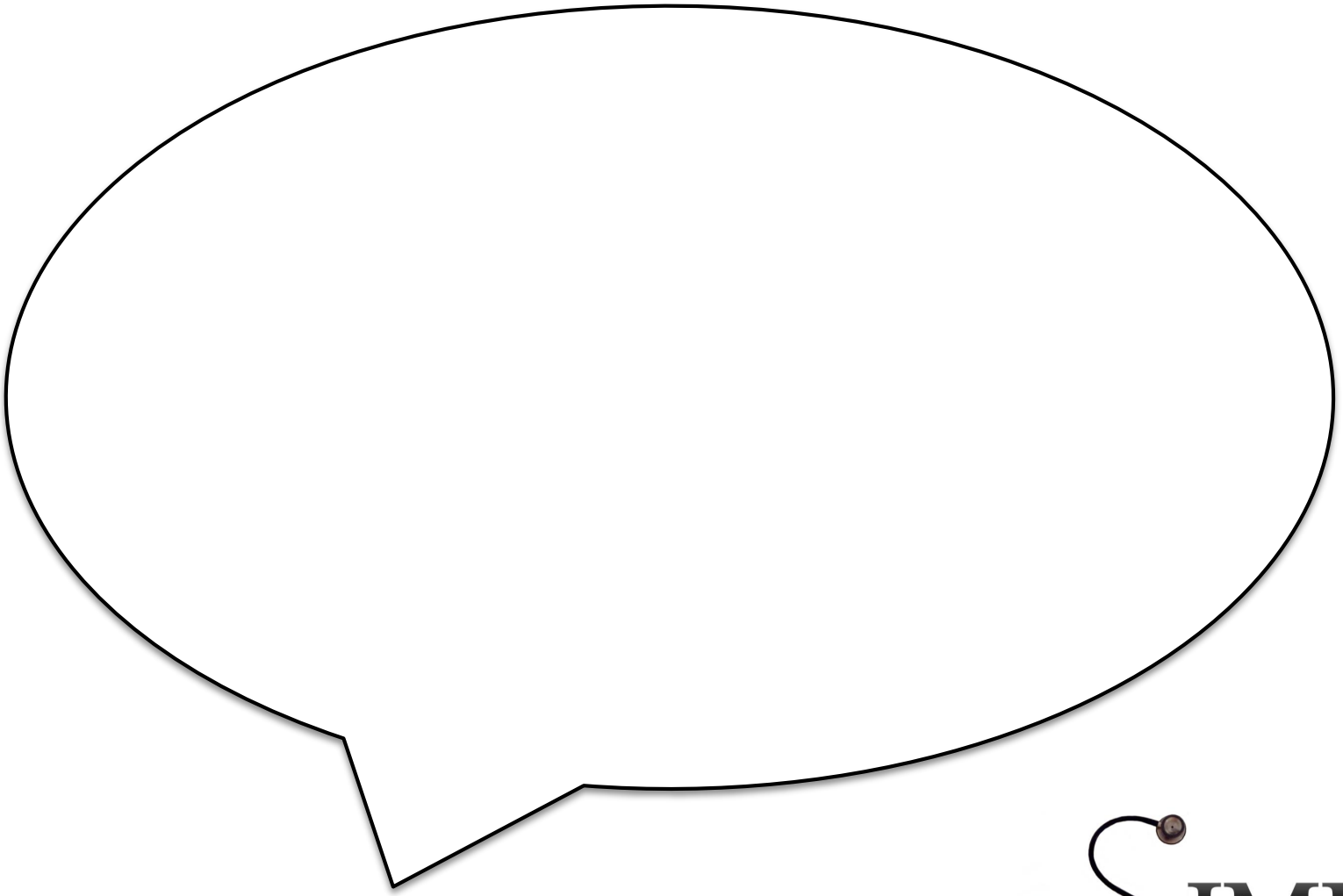
Day 1 post Caesarean section
Blood loss 2000mls

Dizzy on standing

Observations stable

Hb 66 g/dl (pre op 112)

Transfusion discussion



SIMPLY FINALS

Transfusion discussion – BRAIN-PID

1. Benefits / Indication
2. Risks *(Inform patient that following a blood transfusion they can no longer be a blood donor)*
3. Alternatives to blood transfusion e.g. oral / IV iron / nothing
4. *(Instinct – you recommendation)*
5. *(Nothing – is doing nothing an options and what are risks/benefits)*
6. Process / how administered e.g. IV access, time taken transfusion
7. Information - Provide leaflet and offer time to consider
8. Document everything

SIMPLY FINALS

'I got HIV from a blood transfusion'

Melanie McKay tells new! how she copes with the virus that she contracted as a toddler…

As a child, Melanie McKay had to swallow a vile-tasting syrup six times a day. She assumed it was to keep the heart condition she had at bay. The truth was very different. After undergoing two blood transfusions as a baby, she had contracted HIV – and the syrup was AZT, a drug to suppress the virus.

She was 14 when she was told the true nature of her condition. Now 28, Melanie volunteers at a HIV support centre in Sheffield. Here she tells her story…

Left: Melanie, left, with her twin sister. Above: at 14, when she was first told she had contracted HIV through a transfusion

"I'm no stranger to hospitals. I was born one of twins, six weeks early. In 1981, when I was three, I had major heart surgery to have my pulmonary valve corrected, and two years later I haemorrhaged after an operation to remove my tonsils. Both times I needed blood transfusions.

"After the transfusions, I began to feel different. While my two brothers and sister would be running around and playing, I often felt tired and lethargic. I remember going for a blood test when I was eight years old. From that moment I had to take a horrible medicine six times every day. I wasn't sure why, but I wondered if it was something to do with the fact I still had a heart murmur."

HIV bombshell

"In 1992, when I was 14, Mum and Dad took me to Sheffield Children's Hospital for a meeting with a consultant. I was ushered into a room, where she gently told me I'd contracted something called HIV during one of my blood transfusions.

"She asked me if I knew what being HIV positive meant and I shook my head. I'd never even heard of it. I had no idea how it was about to affect my whole life. She told me that the syrup was a drug called AZT – the first drug used to treat people with HIV. She told me my immune system would be affected and I would find it more difficult to fight off infections. I would have to take medication for the rest of my life.

"It was a real bombshell. I couldn't help but feel angry but I was frightened, too. I knew I could die, and at night I'd lie in bed and ask myself, 'Why me?' There were a lot of misconceptions about HIV at that time, in the early 90s, and the virus tended to be associated with gay men and children in Africa.

"To protect myself, I kept my condition a secret. I couldn't bear to feel like an outcast. But I did tell two of my closest friends. They asked me lots of questions about how and why I got it. They didn't treat me any differently and were supportive, but that didn't stop me feeling like an outsider. To make matters worse, the medication I was on left me feeling sick all the time and I had terrible headaches and diarrhoea, though thankfully no HIV-related illnesses.

"Sometimes there were dark days when things felt hopeless. But when I started volunteering as an administrator at an HIV support centre in 2003, I found something to focus on. I made a lot of friends at the centre who were also HIV positive."

I knew I could die and I'd ask myself, 'why me?' – to protect myself, I kept my condition a secret

new drug

"In 2005 I was given the chance to try another drug called Fuzeon or T-20. I knew the side effects were not as severe, but it meant using a syringe to inject the drug twice a day.

"Since then the HIV has become undetectable in my blood, which means the virus is suppressed enough to stop it attacking my immune system.

Melanie has lived with HIV since she was a child and now helps others cope with the virus

"I feel much better. I'm happier, more confident. I've even started going into schools and talking about my experiences.

"But my HIV is always at the back of my mind. My brothers and sister have grown up and had children of their own. Sadly, I know it is unlikely that I'll ever have kids. It's not even down to being HIV positive – these days a lot can be done to reduce the risks of the mother passing the virus on to her children – but rather my heart condition, which is hereditary."

borrowed time

"To this day I've never had a boyfriend. I'm not one for socialising much and I just haven't met anyone.

"So I really don't know how I'd handle the issue of HIV if I do meet someone. It's still hard knowing that I'm living on borrowed time.

"I can't really make plans for the future. I have to be so careful to keep myself healthy. I have to have a flu jab every year and must stay away from anyone with a cold. Apart from that, I lead a pretty normal life and I'm happier than I've ever been. I love babysitting for my three nephews, and my family has been so supportive.

"This year I went on holiday to Spain for the first time, and I'm thinking of moving to a little place of my own by the sea in Bridlington, Yorkshire. For now, I just take one day at a time." ☐

Words: Katherine Dawson PHOTOS: Carl Rose/ANP

HIV and blood transfusions

- In the UK, all donated blood has been screened for HIV since 1986. All blood donors are asked a number of questions to help rule out anyone who may pass on an infection. Every donor is tested for certain infections each time they give blood. As such, the chances of contracting HIV from a blood transfusion are now one in several million.
- The most common cause of HIV, and other sexually transmitted infections (STIs), is infection through sexual intercourse. In 1999, heterosexual sex overtook homosexual sex as the most common route of transmission among new HIV cases. There is a growing public complacency about the risks of HIV and other STIs.
- A recent survey conducted by The Body Shop and MTV found that 70 per cent of women do not think that they are at risk of contracting HIV. Only a third of women ask new partners about their sexual history and 92 per cent of women do not consider a condom to be a "handbag essential".
- To reduce the risk of HIV and other STIs, you should use a condom for all forms of penetrative sex, including oral sex.
- For more information on giving blood, see www.blood.co.uk. For information on HIV and AIDS, contact the Terrence Higgins Trust on 0845 122 1200 or see www.tht.org.uk.

If you want to share your amazing true story with new! call 0871 520 2807 or email truelife@express.co.uk

Chronic: Infections

Risk of HIV per unit transfused = 1 in 6 million
Risk of Hep B per unit transfused = 1 in 1.3 million
Risk of Hep C per unit transfused = 1 in 28 million

All blood products are tested for
Hep B / Hep C / HIV / Human T-cell lymphotropic virus / syphilis +/- CMV and malaria

Risk = asymptomatic window period

Prescribing Blood

Prescribing Blood

Usually on separate blood transfusion chart, prescribe:

“PACKED RED CELLS”

Timing:
Needs to be **complete** in 4 hours (so logistically usually over 1-3 hours)

Normal prescribing principles:

Who? Sign/Print name/Contact number
When? Date/Time

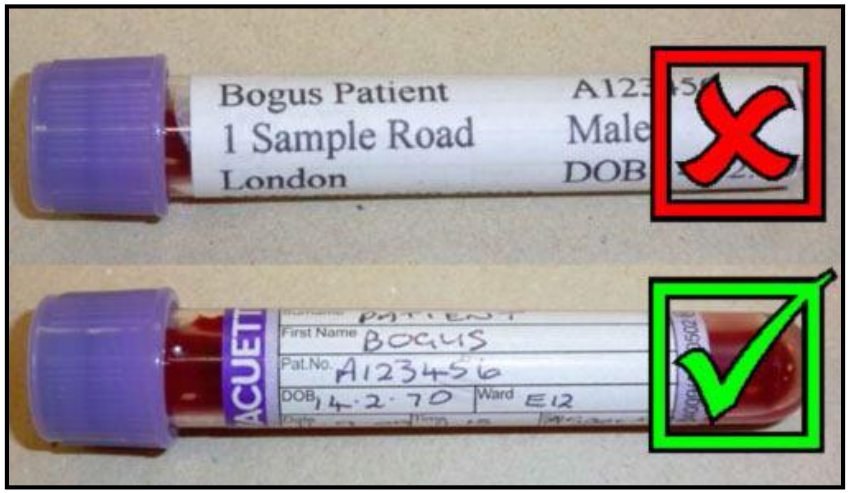
Taking blood sample

SIMPLY FINALS

Taking blood sample

Write details on blood bottle ***after*** blood added and **at bedside**

1. Who? Name/DOB/hospital number
2. Where? Location
3. When? Date/time
4. Who? Signature



SIMPLY FINALS

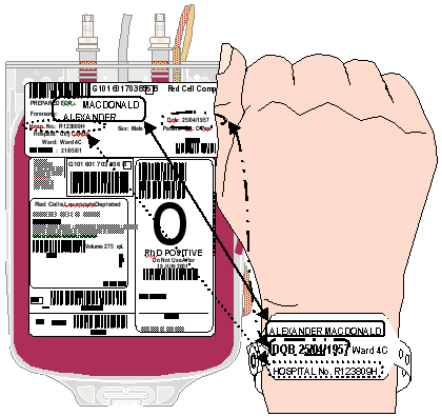
Pre Transfusion Checks

1. IDENTIFICATION CHECKS

a) **Positive identification** with TWO STAFF: Ask patient full name / DOB

b) Check against **wristband on the patient**

c) Check against **compatibility label on blood unit / request form**



2. BLOOD UNIT CHECK

a) Check **blood unit** expiry date / number and blood group

b) Check **blood bag:** ensure free from clots / leaks

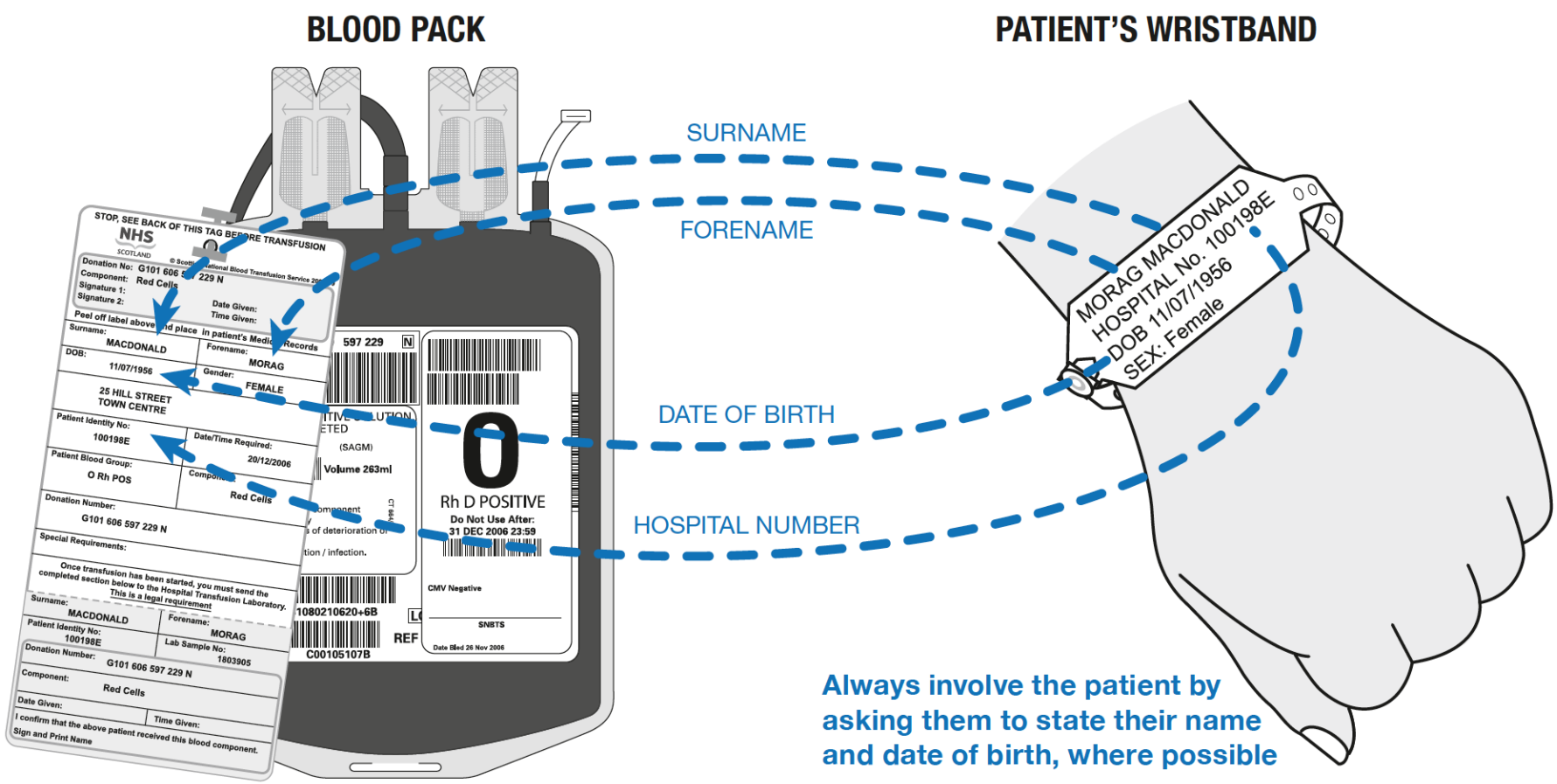
3. DOCUMENTATION

a) **Record-** blood pack number, date/time and signature of both staff

b) **Send request label** back to lab to monitor completion

Pre Transfusion Checks – what to check

Check the laboratory-generated label against the patient's identity band



Always involve the patient by asking them to state their name and date of birth, where possible

Putting up the blood

Putting up the blood

1. PRE CHECKS
Aseptic technique – wash hands, gloves, apron
Double lumen giving set - check expiry
Baseline observations

2. CONNECT BAG
Connect the giving set to the blood bag
Squeeze blood into both chambers
Prime the giving set with blood
Attach to cannula

3. GO!
Set drip rate

4. DOCUMENT
Record when started / by who / checks done

During procedure checks

Checks during procedure

When should observations be checked?

Initial/baseline observations
15 minutes after starting
Hourly thereafter
At end of transfusion

What should you be checking for?

Temperature
Heart rate/Blood Pressure
Respiratory rate/Saturation

What symptoms should you be advising the patient to report?

ANY!

- **Chest/Abdo pain**
- **SOB**
- **Restlessness/anxiety**
- **Rash**
- **Blood in urine**

SIMPLY FINALS

… Mrs Smith

Baseline observations:

- Temperature: 36.5
- Blood pressure: 120/80
- Heart rate: 80
- Saturations: 99% OA

15 mins into transfusion

- Patient c/o difficulty breathing

What would you do?

SIMPLY FINALS

… Mrs Smith …

ABCDE Assessment

A- patent, B- wheeze throughout, C- well perfused, good cap refill

Consider stopping transfusion

Repeat Observations

Temperature: 36.5
Blood pressure: 120/80
Heart rate: 80
Saturations: 99% OA

Temperature: 36.9
Blood pressure: 105/70
Heart rate: 90
Saturations: 97% OA

When to stop the transfusion

Temperature - Increase by 1 degree

Blood Pressure - Significant change (+/- 10mmHg)

Heart Rate - Significant rise

Symptoms

Transfusion Reactions

General management:

STOP Transfusion
Send blood products back to lab
Maintain line with IV Fluid
Call for help

New FBC/U+E/Clotting samples
Clear history of symptoms
Document

Think specifics for management

Complications – which one?

Acute haemolytic reaction

Allergic rxn

Graft vs host disease

TRALI

Post-transfusion purpura

Infections

Non-haemolytic febrile transfusion rxn

Fluid overload

TACO

Anaphylaxis

Bacterial contamination

Iron overload

SIMPLY FINALS

A Acute Haemolytic Transfusion Reaction
B Allergic Reaction
C Anaphylaxis
D Bacterial Contamination
E Delayed Haemolytic Transfusion Reaction
F Fluid overload
G Graft vs Host disease
H Haemolytic Disease of the Fetus and Newborn (HDFN)
I Iron Overload
J Non-haemolytic Febrile Transfusion Reaction
K Transfusion Associated Lung Injury (TRALI)

1. 55yo complains of itching 20 mins into blood transfusion. Examination reveals urticaria over his body. B

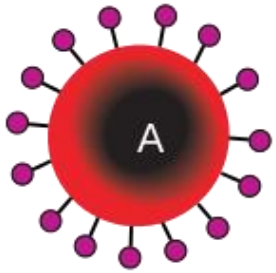
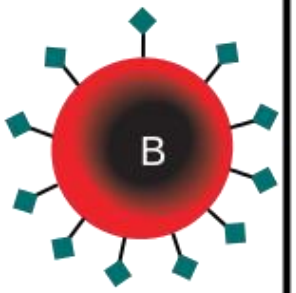
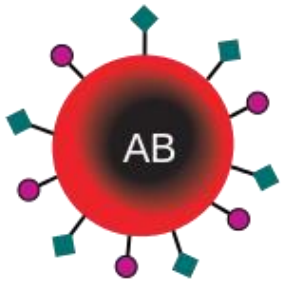
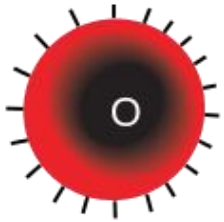
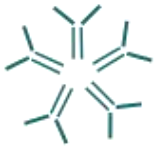
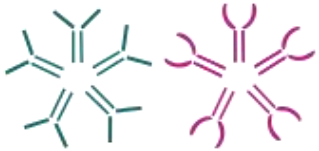
2. 40yo intra-operatively becomes acutely hypotensive, tachycardic and pyrexial (38 degrees) upon transfusion starting. A

3. 50yo recieving a blood transfusion develops dyspnoea and a cough 3 hours later. K

4. 30yo complains of chills but found to have temperature of 40 degrees and HR 105 after blood transfusion with no other symptoms. J

5. 65yo having blood transfusion in Togo hospital becomes acutely pyrexic (39ºC), hypotensive with rigors. D

Blood Groups

	Group A	Group B	UNIVERSAL RECIPIENT Group AB	UNIVERSAL DONOR Group O
Red blood cell type				
Antibodies in Plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in Red Blood Cell	 A antigen	 B antigen	 A and B antigens	None
UK Frequency	42%	8%	3%	47%

Early vs Delayed complications

Early (<24hrs)

Late (>24hrs)

Early: Acute haemolytic reaction

ABO incompatibility

Signs/symptoms: agitation, rapid onset fever, hypotension, flushing, abdominal/chest pain, DIC +/- death

LARGELY PREVENTABLE

COMMONEST CAUSE = HUMAN ERROR

LUNG INJURY CARDIAC OVERLOAD

	TRALI	TACO
Patient characteristics	? More common in haematology and surgical patients	Most common in age >70 but can occur at any age
Implicated blood components	Usually plasma or platelets	Any
Onset	Up to 6 hours from transfusion (usually within 2 hours)	Within 6 hours of transfusion
Oxygen saturation	Reduced	Reduced
Blood pressure	Often low	Often high
Jugular venous pressure	Normal or low	Elevated
Temperature	Often raised	Normal
Chest X-ray	Bilateral peri-hilar and nodular shadowing or 'white out', heart size normal	Enlarged heart and characteristics of pulmonary oedema
Echocardiogram	Normal	Abnormal
Pulmonary artery wedge pressure	Normal	Elevated
Blood count	Fall in neutrophils and monocytes followed by neutrophil leucocytosis	No specific changes
Fluid challenge	Improves	Worsens
Response to diuretics	Worsens	Improves

Acute: Other reactions

Non-haemolytic febrile transfusion reaction
- Fever (1-2hrs post start)
- Notlife threatening
- Mx: Consider paracetamol

Bacterial Contamination
- Fever, hypotension and rigors
- Mx: Urgent septic screen, Broad spectrum antibiotics

Anaphylaxis
- Emergency
- Bronchospasm, cyanosis, hypotension, soft tissue swelling
- Mx: Maintain airway + Oxygen. Call help/2222

Allergic reaction
- Urticaria and itch
- Mx: Chlorphenamine

Chronic reactions

Post Transfusion Purpura
- 5-7 days post transfusion
- Thrombocytopenia– can be lethal

Graft-versus-host disease
- Rare and fatal.
- Donor lymphocytes mount an immune response against the immunocompromised host
- Prevented by irradiation of donor blood

Summary

Is blood transfusion necessary?

If so, ensure:

Right blood
Right patient
Right time
Right place

ANY QUESTIONS???

SIMPLY FINALS