SWISS CHEESE EFFECT

A CASE STUDY

TRANSFUSION BITES 2018

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Swiss Cheese in transfusion

- The transfusion process has many layers of defense including LIMS rules, bedside checks etc
- Each of these has little holes (latent conditions)
- These may be caused by human decision making, poor protocol, equipment error and many more things
- If latent conditions become aligned the opportunity is opened for patient safety incident

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Swiss cheese case at UHS

- 11.04.18
- Request for 1 unit of blood into the lab
- 1 year old female
- On children's oncology ward
- Hb 66
- Clinical details = post liver transplant
- Patient last seen 19.03.18 B+ NAD
- MLA requests group/screen and EI

- An hour later the junior doctor calls the lab
- She speaks to an AP – band 4
- She informs the lab that the patient requires CMV- and irradiated components and has just been admitted post liver transplant at Kings
- The AP adds the special requirement flags and a comment about the transplant.

Error 1 and 2 – decision making

- We are all asked "to do more with less"
- It is common for MLA staff to man BT sample reception and phone calls
- Is this the right thing to do?

- Needs good training and belt and braces procedures

Group and screen

- Automated
- QC on analyser passed
- Antibody screen = negative
- Blood Group =

Anti-A	Anti-B	Anti-D	Ctrl	A cell	B cell
0	4	4	0	4	3

- ? Valid
- What would you do next

BMS ACTIONS

- BMS 1 very experienced
- Performs a manual tube group

Anti-A	Anti-B	Anti-D1	Anti-D2	A cell	B cell
0	4	2	2	2	0

- As expected? B+

WHAT ABOUT THAT NONCESNCE RESULT

BMS 1 ACTIONS

- The CAT cards have been giving false positive WEAK reactions
- This has been attributed to delivery errors which the manufacturer is working to resolve
- Temporary process to repeat all unexpected weak positives and investigate clinical details
- BMS 1 chooses to accept the tube group results.

Factors

- Reagents (productive activities)
- Decision making
- Failure to follow or understand procedure
- Inattenional blindness?
- Incorrect method

BMS 2 & 3

- A newly qualified BMS receives the sample for electronic issue of 1 unit
- The LIMS gives an error that EI is not valid
- BMS 2 asks a band 7 (BMS 3) for advice
- BMS 3 is looking at the audit trail when she is asked several questions about other patients by colleagues
- BMS 3 concludes the error is the lack of automated group transfer
- A quick automated forward group is performed and electronically transferred

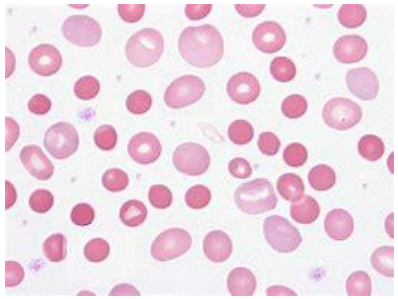
BMS 3

- Full group not performed to avoid delay as the child is symptomatic and the ward are calling for the unit
- After transfer LIMS will still not allow EI
- BMS 3 overrides the LIMS and a B+ unit is issued electronically

Factors

- Over riding LIMS warnings
- The ability to override LIMS warnings
- Distraction
- Pressure from the clinical team
- Not following procedure

And many more……

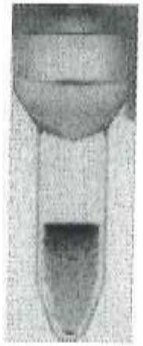


The outcome

- Shortly after start of transfusion
- Patient presented with dyspnoea and temperature increase
- Transfusion stopped
- DAT positive, Bili & LDH ↑, Hb ↓, Haptoglobin ↓
- Treated with 15L O2 and paracetamol
- Increased dose immunosuppresion

- Haemolytic Transfusion Reaction – Why?

Investigation



- Serological XM of the unit shows 3+ incompatibility
- Repeat Tube group shows anti-B 3+
- ?BMS 2 – shook it out or didn't see it – expected a negative result – human error manual method or inattentional blindness

An individual fails to perceive an unexpected stimulus

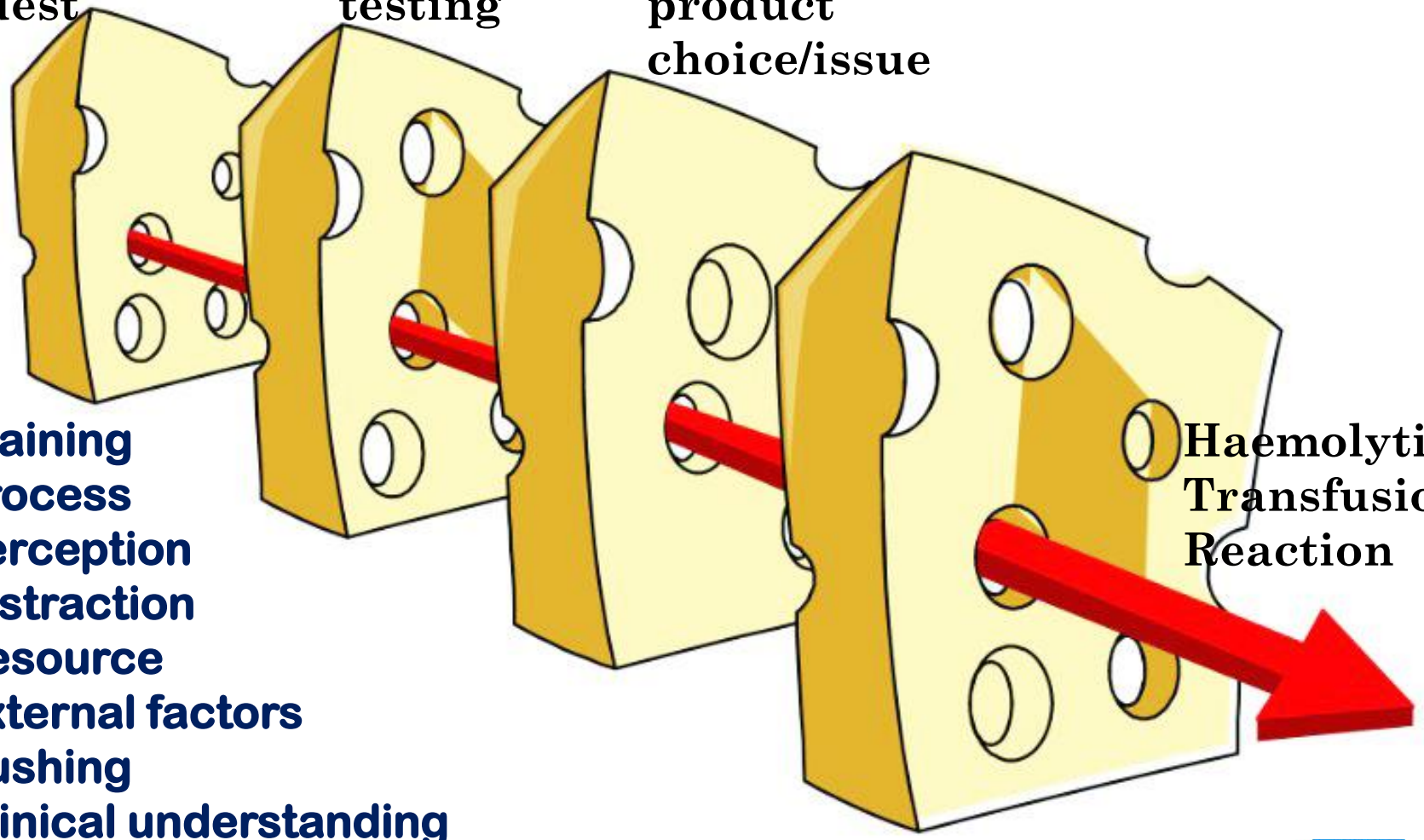
ANSWERS

- The patient received a group O+ liver at Kings 3 weeks previously
- UHS do not usually see patients return this quickly
- BSCH guidelines state full serological crossmatch required for 3 months post solid organ transplant
- Viable lymphocytes transplanted with the liver produce anti-B and haemolyse the patients own RBC
- Passenger Lymphocyte Syndrome
- Serology present in 40% liver transplant cases
- PLS rare due to protective measures in the transfusion process

Conclusion?

- Patient made a full recovery
- Further Blood provision O+ units and full XM

- All clinical details SOT now set to full match until senior team or TP follows up on date of transplant
- Competency assessment for all staff on EI and practical tube group
- Requests for the addition of special requirements now taken by qualified BMS staff only



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THANK YOU

- "Success does not consist in never making mistakes but in never making the same one a second time."

  George Bernard Shaw

- People do not go to work to do harm

- Have a "Just culture" and learn

- Today we share our learning…….

Questions

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