UK NEQAS
International Quality Expertise

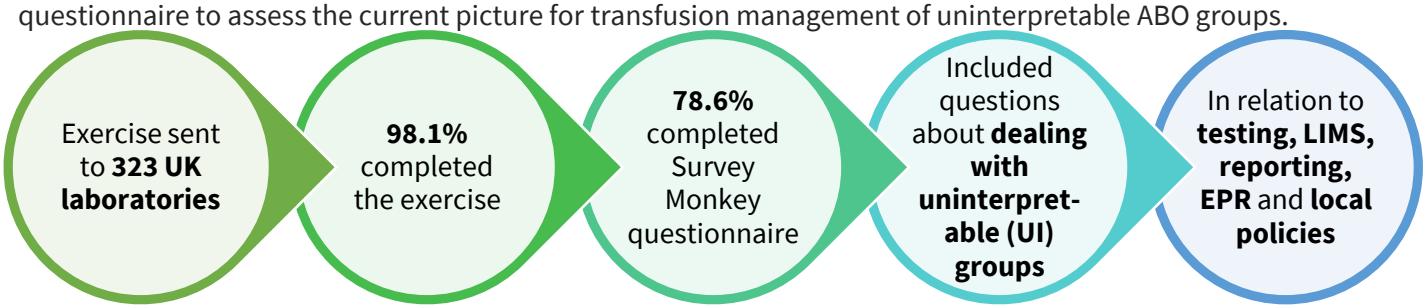
SHOT
Serious Hazards of Transfusion

INFOGRAPHIC OF UK NEQAS and SHOT 2023 report - Uninterpretable ABO: blood group, group allocation and component issuing

UK NEQAS EXERCISE 23R5 UK NEQAS exercise, distributed on 22 May 2023, provided an additional patient sample with the scenario that this patient was from a transferring hospital to the local Intensive Care Unit (ICU) following a road traffic collision (RTC). The scenario was designed to simulate a dual population of red cells, arising from transfusion of emergency O D-Negative red cells pre-hospital admission to an A D-positive patient. Participants were requested to perform a group and antibody screen on the sample and report the findings.

QUESTIONNAIRE Participants were asked to complete a non-mandatory SurveyMonkey questionnaire relating to the results and the subsequent issue of blood components.

AIM The aim was to assess the interpretation of mixed field (MF) reactions obtained during testing and the subsequent selection and issue of blood components. The questionnaire also asked about the reporting of uninterpretable blood group on Laboratory Information Management Systems (LIMS), and local policies relating to discrepant blood groups. SHOT, UKTLC and UK NEQAS BTLP collaborated on the creation of the survey questionnaire to assess the current picture for transfusion management of uninterpretable ABO groups.



KEY HIGHLIGHTS	Positives	Negatives
Testing	85% identified patient as UI (uninterpretable)	12% identified patient as group A
Component issue	97% would issue group O red cells	3% would issue group A red cells
Interpretation of group	63% LIMS would allow 'UI' as ABOD interpretation	35% LIMS would not allow UI and interpretation, with LIMS not capable of interpreting UI or no plans to implement
Component issue with no group on record	Of those who responded, 70% could issue blood with no group. 20% of these could enter 'UI', with LIMS configured to issue compatible components	The remaining 80% issue blood without a group with no LIMS rules associated, by entering 'safe' group, 'most-likely' group, or emergency issue
Electronic issue (EI)	94% of LIMS adhered to BSH guidelines in relation to modified results and EI	6% of LIMS would allow EI when results had been modified
Reporting to clinical area	93% could add a comment viewable by clinical area when anomaly detected	Only 17 % could release an interim blood group result
Amending/editing grouping results	Most reporters only allowed band 5 and up to add/delete comments to patient transfusion record, and amend blood groups	Some reporters allowed trainee BMS and support staff to add and delete comments to patient's records

LOCAL POLICIES RELATING TO UNITERPRETABLE BLOOD GROUPS

Does your laboratory have a policy for investigating uninterpretable blood groups

Yes 93.7%	No 4.3%

Does your policy for managing these uninterpretable groups include the following:

Unknown cause (Yes 92%)	Post HSCT (Yes 89%)	Antenatal (Yes 79%)	Organ donors (64%)

Do you have a policy which covers what to do if you are contacted by an organ donor liaison team for blood grouping results?

Yes (38%)	No (59%)	Blank (3%)

Transfusion laboratories must have clear policies for investigating uninterpretable blood groups. These should include how to report ABO group in LIMS, and how this impacts on LIMS ability to issue safe components

LIMS algorithms should ensure safe and appropriate provision of blood components where a blood group has not been determined

Use of LIMS flags, rules and algorithms are preferable to using a comments or notes section in patient record on LIMS

IMPACT OF ALLOCATING A 'SAFE' OR 'MOST LIKELY' GROUP ON COMPONENT GROUP PROVISION AND ORGAN DONATION INCOMPATIBILITY

Transfusion laboratories must consider the following when allocating a group to a patient when ABO result is unresolved i.e., 'safe' group O or 'most likely' group,

1. **ABO compatible components**: Entering a 'safe' group of O where group is undetermined only applies to red cells and not to other blood components such as plasma or platelets as per BSH guidelines.
2. **Adding free text comments in Notes section:** adding comments in LIMS 'notes' sections, rather than incorporating ABO LIMS rules and algorithms also may allow issue of ABO incompatible components as it is reliant on staff viewing and correctly interpreting notes.
3. **Organ donation**: As the ABO group will be made available to the clinical areas including organ donation teams, donor ABO and thus ABO suitability may be based on the incorrect blood group leading to major or minor incompatibility transplants with a potential negative outcome for the recipient including organ rejection.

Safest group for blood transfusion is not the safest group for organ donation

Case study 1 - Safe group O allocated leading to ABO incompatible transfusion: Patient X has a mixed-field reaction following massive transfusion of emergency O red cells. Patient is unknown on LIMS prior to this admission. Group cannot be confirmed. 'Safe' group O is allocated to patient X and note added to LIMS to state 'give group O until group can be confirmed'. Request for FFP made, and BMS issues group O FFP as per note. ABO-incompatible FFP transfusion occurs.

Case study 2 - Incorrect ABO group allocated to donor leading to organ rejection: Patient Y has a mixed-field reaction following massive transfusion of emergency O red cells prior to hospital admission. Group is uninterpretable and cannot be confirmed. 'Safe' group O is allocated to patient Y and note added to LIMS to state 'give group O until group can be confirmed'. Patient is deemed a candidate for organ donation. Organ retrieval team inspect patient record and note reported group is O. Donor organs allocated group O. Organs donated to group O recipients, leading to transplant rejection.

The following recommendations are grouped according to relevant areas to address gaps and optimise safety

Recommendations

Staff knowledge - dealing with discrepant groups

- Organisations should have a local procedure detailing the process for dealing with uninterpretable groups which includes identification, investigation, resolution, and transfusion management of patients with ABO/D discrepant results.
- These policies should include dealing with discrepancy of unknown cause, antenatal patients, post-BMT/PBSCT transplant recipients, and organ donors.
- Staff should be aware of how to issue blood components when a blood group is uninterpretable (UI)
- Staff should be aware of the implications of reporting an uninterpretable group (UI) in relation to blood component issue and viewable results in the clinical area. The implication of entering a 'safe' blood group in order to issue blood components must be considered in relation to organ donation teams.

Information technology - LIMS management of discrepant groups

LIMS providers

- LIMS providers should ensure that the LIMS does not allow EI where blood group results have been edited. Cases where EI is currently allowed in these circumstances must be reviewed by laboratory management and LIMS provider for urgent resolution.
- LIMS providers should ensure that the LIMS can record an uninterpretable blood group, ABO and/or D, that can be reported to results systems/LIMS/EPR.
- LIMS providers should ensure that the LIMS has a pathway for provision of safe and appropriate red cells where a blood group (ABO/D) has not been determined. This should use existing processes, with informed decisions when allowing overriding of warnings. This pathway should not be reliant on use of an emergency group O release process that does not include algorithms for matching or alerting to the presence of transfusion specific requirements including, red cell antibodies, antigen negative requirements, irradiated, washed, CMV negative, HbS negative.

Transfusion laboratories

- Organisations should have a local policy detailing the process for dealing with uninterpretable groups which includes identification, investigation, resolution and transfusion management of patients with ABO/D discrepant results.
- These policies should include dealing with discrepancy of unknown cause, antenatal patients, post-BMT/PBSCT transplant recipients, and organ donors.
- LIMS systems should be fully auditable to allow scientists to view blood groups that have been manually edited, but original or ambiguous groups to be visible in audit trails.
- LIMS notes/alerts must be visible, clear, and not easily ignored or overridden.
- Where the LIMS currently requires a blood group to be entered to release red cells, there must be a robust process for selection of red cells, plasma and platelets.
- If anomalous/unresolved blood groups are reported to the clinical teams there should be a process to alert the clinical team to any updates, revisions, or confirmation of the blood group.

Amending / editing grouping results in LIMS

- Organisations should have policies detailing the which staff grade/banding can alter ABO groups in LIMS
- There should be a specific SOP and competency assessment for altering ABO groups to ensure the impact of such changes are understood and process is performed correctly.
- Where possible, different levels of LIMS access should be applied for those working at different staff grades/bandings to prevent unintentional/inappropriate edits occurring.

IT Interfaces
• Organisations should have access to automated analyser 24/7. • Where edits are made on the analyser or middleware systems, there must be effective mechanisms in place to prevent EI in the LIMS. • Where analyser interface and/or middleware, does not transfer analyser flags, comments, and reaction edits there must be an effective process for ensuring that these are available on the LIMS.
Organ donation
• Organisations should have a local procedure detailing the process for dealing with queries from organ donation teams regarding blood groups of patients and donors and any transfusion history. • Laboratories should have a process for identifying organ donors who have received transfusions for traceability and recall purposes.

Useful links

Resource	Link
British Standards in Haematology	Home (b-s-h.org.uk)
BSH transfusion specific guidelines	Guidelines (b-s-h.org.uk)
BSH Information Technology guidelines (2024)	Guidelines for the specification, implementation and management of IT systems in hospital transfusion laboratories (b-s-h.org.uk)
BHS Pre-compatibility guidelines (2012)	Pre-Transfusion Compatibility Procedures in Blood Transfusion Laboratories (b-s-h.org.uk)
Transfusion 2024 and Transfusion Transformation	National Blood Transfusion Committee
SHOT Reporting Definitions	Reporting - Serious Hazards of Transfusion (shotuk.org)
SCRIPT IT working group	SCRIPT - Serious Hazards of Transfusion (shotuk.org)
SCRIPT IT Toolkit	SCRIPT - Serious Hazards of Transfusion (shotuk.org)
Infected Blood Inquiry Overview and Recommendations	The Inquiry Report | Infected Blood Inquiry
SHOT Good Practice Guide for managing indeterminate ABO blood groups to support safe decision-making UK NEQAS / SHOT including main report and summary report	Good practice guidance document for managing indeterminate ABO blood groups to support safe decision-making - Serious Hazards of Transfusion
UK NEQAS	Home - UK NEQAS | External Quality Assessment Services
MHRA Electronic Issue guidance	letter (publishing.service.gov.uk)