Electronic Crossmatching -
One Year on!

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Electronic Crossmatching (eXM)

- Introducing Electronic Crossmatching
- Current Guidelines
- The application of eXM to SVUH
- eXM on Demand
- Advantages & Disadvantages
- The Future of the eXM
Electronic Crossmatching Definition


- The Electronic Crossmatch (Electronic Issue) allows for donor blood to be issued to a patient instantaneously.
Introducing eXM

- Traditional Compatibility Testing Involves:
  a) A review of the patient’s transfusion history
  b) ABO & Rh D typing of the patient
  c) Antibody Screening
  d) The Serological Crossmatch

- Role of the Serological Crossmatch (sXM)
  a) Ensuring ABO compatibility between recipient & Donor
  b) Detection of irregular red cell alloantibodies
Introducing eXM-how is it possible?

- Improvements in the antibody screening cells to allow for the detection of all clinically significant antibodies
- The necessary automation, computer software and documented quality control procedures are now in place for guaranteeing ABO compatibility.
eXM depends upon:

- Electronic Records of patients group and antibody screen and of donor unit group
- Concordance between the patients current and historical transfusion record
- The absence of a positive antibody screen on record or on the current sample for the patient
- The ability of the LIS to detect any ABO & Rh incompatibility between patients sample and donor red cells
Introducing eXM – lab requirements

- Laboratory IT system supporting eXM
- Automated blood grouping analysers
- Analyser/IT interface – no manual data transfer
- Availability of confirmed donor group blood from your supplier
- On-Site Validation of the system
Current Guidelines for Electronic Crossmatching
Current Guidelines for eXM

- Two sets of guidelines have been published for Electronic Crossmatching:
  
a) **AABB** - American Association of Blood Banking

b) **BCSH** - Blood Transfusion Task Force of the British Committee for Standardization in Haematology
Current Guidelines for eXM

- When all the criteria for eXM have been satisfied blood can be released on demand, without delay.

- If any one of the requirements cannot be fulfilled, eXM is abandoned and the sXM employed.
Electronic Crossmatching Criteria

1. Two Concordant blood groups on the recipient (BCSH)

2. The patients serum/plasma does not contain, and has not been known to contain clinically significant red cell alloantibodies reactive at 37°C (BCSH, AABB)

3. Extensive ‘on-site’ validation prior to introduction of electronic issue is essential (BCSH, AABB)
Electronic Crossmatching in SVUH-Patient Eligibility Study
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Aim of Study:

- assess the % of the patient population in SVUH who would be eligible for eXM according to the BCSH guidelines
- assess the reasons for samples being unsuitable for eXM
SVUH eXM Patient Eligibility

Sample size 507 consecutive

% Requesting crossmatch 31%
% of these eligible for eXM 61%

Conclusion:
61% of blood demands satisfied by eXM
Patients excluded from eXM

- Patients who lack a second confirmatory group (81%)
- Patients with current or historic antibodies (13%)
- Others (6%) including:
  - Patients with a positive DCT and eluate
  - Patients who receive an ABO unmatched solid organ or stem cell transplant
  - Auto immune haemolytic anaemia patients
Patients excluded from eXM

81%

13%

6%

Antibodies
First time Samples
Other
eXM Implementation Process

- Jan ‘08 Validation of eXM began
- Mar ‘09 Hospital Transfusion Committee approval
- Apr ‘09 Group O patients - 9am-5pm (as per MSBOS)
- Aug ‘09 All groups - 9am-5pm (as per MSBOS)
eXM Implementation Process

- Jan 2010    All ABO blood groups - 24/7 (as per MSBOS)
- May 2010    All ABO blood groups - 24/7 (on demand)
- Ongoing hospital ward & theatre staff education
- Audit blood usage and review the Maximum Surgical Blood Ordering Schedule (MSBOS)
Traditionally RCC’s issued as per MSBOS

Now patients that qualify for eXM RCC’s issued when the surgical team request them i.e. ‘ON DEMAND’

Meet the requirement for surgical reserves with a minimal stock sub-inventory & blood is not held for patients who ultimately may not need it. This can lead to a decrease in the outdating of blood.
Exceptions from eXM on Demand

1. Liver Resection
2. Anterior Resection
3. Whipples (Pancreatectomy)
4. Radical Prostatectomy
5. Aortic Aneurysm Repair
6. Aorta-Fem Pop Bypass
Benefits of the eXM

- For eligible patients – immediate availability of blood i.e. improved turnaround times
- Reduced administration
- Reduced wastage due to restricted movement of blood
- Improved blood management – particularly during shortages
- Improved shelf life of blood transfused
- Blood issued without delay benefitting all concerned
- Properly validated is considered safer than serological crossmatching
Blood Bank’s with eXM??
Benefits of eXM to the Blood Bank

- Significant reduction in crossmatching workload
- Staff free to work on other transfusion issues e.g. accreditation; could ultimately increase safety & promote a more efficient working environment
- Reduced stress levels on laboratory staff
- Cost saving for laboratory consumables
- Improved Blood Stock Management with consequent budget benefits
Disadvantages to eXM

- Extensive *on-site* validation prior to the introduction of eXM and checking post computer updates
- Inability to detect antibodies against low frequency antigens
- Inability to detect antibodies below a certain titre – need for a National Antibody Database
- eXM is suspended during unexpected system failures leading to computer downtime or disruption to the LIS. If eXM is suspended serological crossmatching will be re-instated
- The requirement for 2 ABO/Rh type results for the same patient
The risk of taking a sample from the ‘wrong’ patient – wrong blood in the tube (WBIT), or mislabelling the sample is an inherent phlebotomy risk and represents an important ‘near-miss’ error which may lead to an ABO-incompatible transfusion.

The risk is not peculiar to Electronic Crossmatching.

While the second sample group check of eXM increases workloads and costs, it does significantly decrease the risk of ABO-incompatible transfusions.

**Should it be extended to all crossmatching methods??**
Continued aims for eXM

- To encourage an environment of maximising the eXM resource
- To promote the need for a National Antibody Database
- To deliver a quicker turnaround time to the patient
- On-going education and training to all hospital staff
- To maintain minimal blood wastage
Questions??..Thank you!