Virtual Crossmatch
Newsletter No. 2

VIRTUAL CROSSMATCH

What is the Virtual CrossMatch project?

Advances in the level of detail of donor HLA typing for transplantation has resulted in a shift internationally from the Complement Dependent Cytotoxicity (CDC) crossmatching that is currently used in Australia to virtual crossmatches. This shift has resulted in the equipment and reagents required for CDC becoming increasingly difficult to source, and Australian stocks are likely to run out within 12–18 months.

Virtual Crossmatch (VXM) uses detailed information about the HLA antibody profile of recipients combined with accurate HLA typing of the donor to assess whether potentially damaging antibodies are present. To provide Australian transplant programs this detailed clinical information a substantial project is underway to transition from CDC to a national VXM program.

Further information about histocompatibility testing can be found in the first VXM newsletter.

What will VXM look like in practice

Waitlist workup

- Prior to entering the wait list, patients will require full HLA typing and HLA antibody testing as per current practice, noting that this should be limited to patients who have been referred to a transplant unit and authorised for workup.

Waitlist management

- VXM neccessitates an increase in the frequency of antibody screening to reduce the risk of not detecting clinically significant sensitisation.
- It will be vital for clinicians to report potential sensitising events so that additional antibody screening can be performed.
- Clinicians will discuss and list in OrganMatch ‘unacceptable antigens’.

Organ allocation

- OrganMatch will be able to report on donor HLA type and recipient antigens for exclusion to identify potential organ offer.
- Potential recipient lists will be generated in OM as per national organ offer guidelines. Most organ offers will be matched using a VXM, including for: unsensitised recipients, sensitised recipients without a DSA, sensitised recipients with a historic DSA that is not present in current serum, and sensitised recipients with a low risk DSA.

Flow cross match (FXM)

- For certain recipients (for instance where a potential DSA has been identified) a prospective flow crossmatch (FXM) may be undertaken to assist in defining immunological risk based on agreed patient characteristics.
- It will only be feasible to perform a limited number of prospective FXM for a particular deceased donor. The national guidelines will advise on the patient characteristics for conducting a FXM.

When will the transition to VXM occur?

The transition to VXM will occur in three phases over the next 18 months.

Phase 1
Now

All transplant waitlist patients are listed in OrganMatch.

TWL patients Luminex screening increases from once to four times a year and after any sensitising events.

Transplant units work with Tissue Typing laboratories to identify antigens for exclusion for the TWL patient and list in OrganMatch. Donation offers will be made based on these exclusions in phase 2.

Phase 2 **From September 2021**	At the time of donation offer VXM will occur in low risk recipients. This will allow for a faster turnaround of suitability results than is currently experienced in CDC crossmatching.
	CDC crossmatching will be limited to sensitised kidney recipients, heart and lung transplant waitlist patients.
	Retrospective flow crossmatches (FXM) can be performed if required.
Phase 3 **From March 2022**	VXM will be performed for all crossmatches. A small number of prospective FXM may be performed in identified TWL patients.
	Retrospective FXM will be performed if the recipient is sensitised.
Review **From June 2022**	A 3-month post implementation review will occur to ensure effectiveness of the National Histocompatibility Guidelines.

What does our Transplant Unit need to do?

To receive an organ donation offer in phase 2 all patients on the transplant waitlist (TWL) will need to be registered in OrganMatch so that a VXM can be performed. Transplant units also need to:

- Increase patient Luminex screens to quarterly. Ensure patient sera is sent to the Tissue Typing laboratories for testing to meet this timeframe.
- Educate patients why they need to have increased blood tests.
- Review internal patient enrolment protocols to include listing antigens for exclusion. Tissue typing laboratories can help with this.

How will clinical practice change?

The National Histocompatibility Guidelines will establish a nationally consistent approach to identifying and managing recipients with HLA antibodies. These Guidelines are being developed through the VXM working group and will be published shortly. The Guidelines will be widely circulated and will detail the clinical requirements for a VXM to occur.

How do I find out further information?

Education opportunities are being planned and will be available in the near future. Details will be circulated and provided on the OrganMatch website. For further information please contact projects@tsanz.com.au.