Virtual Crossmatch Assessment and Kidney Transplant
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What is VXM?
- Virtual crossmatch (VXM) technology with significant applications for kidney transplantation.
- Research shows that VXM is safe, efficient, and much faster than a physical crossmatch for selecting kidney transplant recipients and is the current gold standard.
- VXM is used to identify pre-existing donor-specific human leukocyte antigen (HLA) antibodies in patients awaiting kidney transplantation, without a physical crossmatch.
- The presence of donor specific antibodies (DSA) in pre-transplant clients has positive correlation with post-transplant rejection.

Benefits of VXM
- VXM can be applied at the time of or after organ allocation.
- VXM can be used as an alternative or replacement to pre-transplant PXM testing.
- VXM can be implemented beneficial for use in highly sensitized Patients.

Time and Money
- No shipping of donor lymph nodes is needed.
- Wait times are greatly reduced for donor recipients seeking a match.
- VXM is much quicker than standard physical crossmatching.
- VXM is more cost effective than PXM.

Safety & Reliability
- VXM is just as accurate and reliable as PXM.
- VXM is an excellent indicator of how host cells will react to donors post transplant.
- VXM is less time consuming to conduct - resulting in reduced cold ischemic times.

How does VXM work?
- VXM tests immunological compatibility of recipient & donor by analyzing results of 2 independently physical laboratory tests.
- Patient anti-HLA antibody and donor HLA typing.
- In VXM, the immunologic compatibility between patient and donor is determined via computer simulation (Bhaskaran, Heidt, & Muthukumar, 2022).

Impact on Future
With a switch to distance-based kidney allocation in the United States in 2021, it is likely that VXM will be used more often in the future - especially for:
- First-time kidney transplant male recipient.
- With no IgG anti-HLA antibodies.
- With no recent sensitizing events.

However, PXM will still be needed and used depending on the individual's tolerance of immunologic risk.
Continuous education of all stakeholders and standardization of HLA laboratory practices are needed.