Enhanced Resource Utilization, Reduced Waste, and Expedited Transplantation Through Real-Time Donor Screening for Infectious Disease

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MID-AMERICA TRANSPLANT, ST. LOUIS, MO. | USA

Organ Procurement Organizations (OPOs) have a crucial role in healthcare, particularly in facilitating organ and tissue transplantation. Transplantation can be a life-saving intervention for individuals with organ failure or severe organ dysfunction. Each year, OPOs touch countless lives through safe and effective organ and tissue procurement from deceased donors to transplant recipients in need.

"Just one tissue donor can impact more than 75 recipients," said Amber Carriker, Director of Laboratory Services for Mid-America Transplant, an OPO serving 4.7 million people in 84 counties in parts of Illinois, Missouri and Arkansas.

While honoring the deeply personal decisions of donors and donor families, OPOs coordinate closely with hospitals and clinicians to identify and assess potential organ and tissue donors. Timeliness is essential, as tissue procurement must take place within 24 hours of donor death and organ transplantation sometimes within hours of organ procurement.

Challenges of time-sensitive donor screening

Donation viability is evaluated in part through required screening of donors for certain infectious diseases with potentially long-lasting or fatal impacts on recipients. These include human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV). All donor screening must be performed using tests licensed, approved or cleared by the U.S. Food and Drug Administration (FDA).

Identifying the suitability of organs and tissues requires timely donor testing for infectious diseases to ensure optimal matching to suitable recipients.

Left to right: Linda Martin, Vice President, Tissue Operations; Lindsey Speir, Vice President, Organ Operations, Kevin Lee, President and CEO; Amber Carriker, Director, Laboratory Services; and Erica Hinterser, Director, Tissue Procurement at Mid-America Transplant.

At Mid-America Transplant, the methods for screening tissue donors previously involved manual testing, which can take up to four hours to complete with an increased risk of false-positive results. Additionally, tests were only performed in batches every 24 hours due to logistical constraints. Consequently, screening results from infectious disease testing were often not available until after tissue procurement was completed.

With an average testing turnaround time of 18 hours and 22 minutes, tissue donations that came back reactive were ultimately unable to be utilized – despite the clinical resources already involved in procurement.

Creating an improved screening process

The OPO's performance excellence team collaborated with front-line staff to streamline workflows and establish new

Procurement must take place within 24 hours of donor death

processes across departments. This included a new, fully automated donor serology testing platform.

Upon a donor's arrival at Mid-America Transplant, blood samples are now promptly collected and sent to the laboratory to be screened for HIV, HBV and HCV using the advanced technology. The new process enables orders and results to be automatically transmitted through the EMR, preventing manual errors or delays.

The introduction of real-time screening also eliminated the need for batch analysis, improving efficiency by 94.7%. Mid-America Transplant's average turnaround time from receipt of samples to test results went from over 18 hours to 58 minutes. This ensures the tissue and organ teams are consistently informed of a donor's reactive or non-reactive status before beginning procurement procedures.

"Now, we can be proactive and prevent unnecessary resource utilization on a donor that has a disqualifying result," Carriker said.

Essential measures of success

After implementing real-time screening, Mid-America Transplant prevented the procurement process on 8.9% of donors who were initially authorized but ultimately deemed ineligible due to disqualifying results. This change helps to honor donors and recipients by ensuring procurement procedures are only performed for eligible patients.

The automated testing platform also reduced the risk of false positives compared to past manual testing, leading to a 2.5% increase in eligible donors, translating to seven additional organ placements over an 18-month period.

Through this new process, Mid-America Transplant was able to further uphold the safety of those working in the facility, reducing clinician exposure to known infectious diseases by 89.9%.

"Whether it's equipment, supplies, time, operating room space, workforce – we're much, much better able to use our resources and improve safety," Carriker said.

The elimination of unnecessary tissue procurement in the first 18 months prevented the expenditure of more than $105,000 in supplies, indirect operating room costs, workforce utilization, and fees related to tissue processing.

Impactful collaboration that inspires

Through innovation and collaboration, Mid-America Transplant effectively created new opportunities for additional organ placement in instances previously limited by time constraints.

"We're proud to be the first organ procurement organization to utilize this particular equipment to automate donor screenings and make more transplants possible," Carriker said.

94.7% reduction in turnaround time of tissue procurement testing

For their success, Mid-America Transplant has been recognized as a 2022 UNIVANTS of Healthcare Excellence Winner of Distinction.

Organ and tissue donation is a limited resource that should be treated with as much care as possible. Through innovative processes, this life-saving resource can reach more in need.

"We have a passion for what we do, and we are very conscious of both the donor graciously giving the gift of life and the recipient who is waiting on the other end," Carriker said.

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