NATIONAL KIDNEY REGISTRY®
FACILITATING LIVING DONOR TRANSPLANTS

Expediting Anatomical Review Across 56 Healthcare Institutions

Zero Footprint Imaging technology improves the speed of kidney transplant matches—reducing a 10-day process to minutes

Giving Life through Kidney Matching

Since 1954, when the first successful living donor transplant took place in Boston, living kidney donors have been giving the gift of life to loved ones as well as strangers. This tradition has allowed thousands of people facing kidney failure to live longer, healthier lives, free from the challenging routine of dialysis. Unfortunately, more than one-third of potential living kidney donors who want to donate their kidney to a friend or family member cannot because of blood type or antibody incompatibility.[1] Therefore, in the past these donors would be turned away and the patient would lose the opportunity to receive this life-saving transplant.

One such family struggled with this incompatibility issue when their youngest daughter lost her kidney function. Both parents, Jan and Garet Hils, were unfortunately ruled out from donating a kidney to their daughter because they were biologically incompatible. After many attempts to find a compatible donor through numerous kidney paired exchange programs in the United States, a compatible donor was finally located. Out of this difficult and frustrating experience, the Hil family founded the National Kidney Registry (NKR) whose mission is to eliminate the problem of incompatible donors and facilitate matches, by building a national kidney paired donation program.

Through the National Kidney Registry's (NKR) Advanced Donation Program (ADP), donors can donate their kidney before an intended recipient receives a kidney. For instance, this allows a grandparent to donate a kidney to a grandchild who is at risk for developing kidney failure later in life.

GE Healthcare

INSTANTANEOUS ACCESS TO IMAGES

with

Centricity™ Universal Viewer Zero Footprint

10-day Process Reduced to Minutes

1400 hrs/yr Staff overhead Reduction

Lowered Canceled Match Rate

Utilizing a Paired Kidney Exchange process to overcome donor incompatibility

The NKR facilitates the kidney matching process by consolidating the incompatible pairs of donors and recipients from transplant centers all over the United States, into a single registry, using computer technology to facilitate the matching process. It overcomes the donor incompatibility challenge by utilizing a Paired Kidney Exchange (PKE) process where kidneys are swapped between donor-recipient pairs. These are often a long chain of swaps as a proper match is sought. Moreover, compatible pairs seeking to obtain an even better match often participate as well. Additionally, good Samaritan donors wishing to donate to a stranger participate by front ending chains of these pairs to help facilitate even more transplants.

Time is of the essence

Many factors determine what is considered a suitable kidney match. An improved match between the donor and patient will increase the chance that the transplanted kidney will function better and last longer. Beyond blood type combination and the patient's cPRA (Calculated Panel Reactive Antibodies, a measure of the rejection potential of the donated kidney by the recipient), size and vascular structure are important to ensure a successful transplant. Therefore, CT images are taken of donor kidneys for use by the recipient's surgeons and radiologists in match determination.

Once a potential recipient-donor match is made, quick access to donor images is essential to determine if the match is a good enough fit so that the transplant can move forward. Conversely, if a donor kidney is not a viable match, the sooner that is known, the quicker a patient or donor can be resubmitted to the match pool to allow the NKR coordinators to resume the match search. "For many patients needing a kidney transplant, time can be of the essence," said Dr. Jeffrey L. Veale, MD, Associate Professor at the David Geffen School of Medicine in the UCLA Department of Urology. "The faster we can review imaging, determine a viable match and clear patients for surgery, the better the outcome will be."

The NKR image review portion of the match process consisted of taking a donor's kidney CT images, burning the images to a CD, then mailing the CD from a donor hospital to a transplant center. This was a process that could take 10 days or longer when finally delivered to the recipient surgeons and radiologists for review. If the anatomy of the kidney is deemed unacceptable, kidneys may be declined, which increases the wait times for critically ill patients and can potentially cancel entire viable match chains involving as many as 10 patients. Therefore, a good deal of time and resources was consumed by this matching process.

Reducing a ten-day process to minutes

The National Kidney Registry, in conjunction with GE Healthcare's largest U.S. channel partner of diagnostic imaging products, VasoHealthcareIT (VHCIT), defined and designed a solution to reduce the 10-day image review process to just minutes. The solution leveraged GE Healthcare's Centricity™ Universal Viewer Zero Footprint (ZFP) to provide radiologists and surgeons instant access to donor images from almost any browser or mobile device[3], expediting anatomical review and reducing wait times for patients.

"The reliability and well-known capabilities of GE Healthcare products led NKR to choose Centricity Universal Viewer Zero Footprint for real-time viewing and storage of images," stated Joe Sinacore, NKR Director of Education and Development. "As our donor pool grows and our volume grows, we don't want to lose any momentum. We need to remain focused on getting people matched and off dialysis as soon as possible, or in some cases, get a preemptive transplant even before dialysis."

Improving the quality and reducing the cost of patient care

By collaborating with NKR and understanding their complex workflow, VHIT and GE Healthcare were able to create a solution that not only met NKR's current needs, but could also adapt to future growth and keep NKR on the cutting edge of imaging technology. It is anticipated the solution will enable the NKR to have an optimized match process to grow its registry.

As donor chains can be comprised of up to 10 or more patients and multiple donors from various hospitals, timing and coordination are essential when matching donors with patients in the match chain. "With the old process, any patients who were identified for a match in a kidney swap and then ultimately canceled 10 days later, could potentially miss out on other viable matching opportunities," Sinacore said. "Patients return to the matching pool to wait for another match; however, if another match is not found, a patient's wait time in the pool can increase by many weeks, months or even years. Reducing match cancellations late in the process, means patients having access to and receive more transplants per month and year."

The new solution also provides significant operational savings. The switch to the real-time imaging process has saved over 1,400 hours per coordinator per year. With at least one lead coordinator per hospital for the approximately 80 hospitals affiliated with NKR, this amounts to huge efficiency savings across the network, and frees up coordinators to spend more time on patient cases, freeing them up to focus on the match process which could lead to improved patient outcomes.

Centricity™ Universal Viewer Zero Footprint

An intuitive user interface requires minimal training, saving valuable time and resources for patient care

FLEXIBILITY for Physicians

With Centricity Universal Viewer Zero Footprint (ZFP), clinicians have a consolidated view of a patient's image data across multiple multi-department DICOM archives and other data repositories. This modern HTML5-based viewer accesses images stored in GE Healthcare's Centricity Enterprise Archive (EA), a standards-based clinical content repository for patient images and data, serving as a Vendor Neutral Archive (VNA) that stores, indexes and provides access to images from a variety of sources and modalities to create a longitudinal record of the patient's clinical image history from across the healthcare enterprise.

Supports:

Server side rendering with progressive and adaptive streaming for real-time image access.

Fast navigation of large data sets, such as volumetric images, allowing clinicians to scroll through donor images quickly.

Viewing of any relevant clinical notes that might be included with the images.

Side-by-side comparison to allow surgeons to compare donor and recipient pathology.

Display of key images and annotations attached to the donor image.

Zoom window leveling, measurements, and annotations which can also be saved for future reference.

National Kidney Registry®
FACILITATING LIVING DONOR TRANSPLANTS

The National Kidney Registry (NKR) is the largest and most successful living donor kidney transplant program in the world. NKR works with eighty of the top transplant hospitals in the country and has facilitated well over 2,000 exchange transplants—which is more than any other exchange program worldwide. Their mission is to save and improve the lives of people facing kidney failure by increasing the quality, speed, and number of living donor transplants in the world, which may be why the patient outcomes from transplants facilitated by the National Kidney Registry exceed the average U.S. living donor transplant outcomes.

Imagination at work

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world. GE (NYSE: GE) works on things that matter – great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

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[1] Segev; Gentry; Warren; Reeb; Montgomery (20 Apr 2005). "Kidney Paired Donation and Optimizing the Use of Live Donor Organs". JAMA. Original Contribution. 293 (15): 1883–1890. doi:10.1001/jama.293.15.1883.

[2] Refer to the list of supported devices and supported browsers in the technical information section of the Centricity Universal Viewer Zero Footprint solution sheet.

[3] Anywhere the Internet is available