Best Practices for Automating Organ Transplant Data Collection and Sharing

Nearly every study, review or investigation of the end-to-end organ transplant process finds room for improvement and advocates for modernization through more use of technology and less reliance on manual data entry and communication. Manual processes are seldom the best practices, yet in transplantation manual data entry remains the status quo. There is widespread support for making more use of digital technologies and automation, and the specter of regulations requiring it, but what would a digitally-enabled management process look like for transplant centers and the hospitals and health systems they work with?

> **"The longer a surgeon has to spend in evaluating an organ for acceptance, the more time is lost on the viability of that organ. All of this can lead to worse outcomes for patients and may suggest that these highly manual and time-consuming processes are contributing to the current organ waste issues in the transplant system."**
>
> **U.S. Digital Service**[i]

This guide presents a vision for digitizing and automating clinical workflows and communications throughout the organ transplantation process (from organ review and acceptance, to patient referral, waitlist management and post-transplant care), with fundamental principles for introducing information technology into processes, and their benefits for transplant coordinators, physicians, surgeons and quality, finance and other administrators.

Introduction

Manual processes are neither fast nor mistake-proof, yet transplantation requires its processes to be both. The fundamental nature of the transplant process makes it difficult to maintain accurate, efficient, and fast communication and data sharing because there are many touchpoints and handoffs in the transplantation ecosystem, and each one creates the opportunity for errors and delays. Often, successful communication and data sharing occur only after many missed calls and electronic messages, many of which are not seen or acted on promptly – the workflow for a single transplant typically requires more than 500 calls, emails, texts and faxes.[ii]

The many specific workflows within the organ transplant process are not consistent from organization to organization. Workflows and best practices need to be more consistent across transplant programs. This variation across programs, even when part of the same transplant center, makes it hard for leadership to improve efficiency and performance. Further, with recent allocation changes, communication with OPOs has become increasingly challenging because centers often may need more experience working with specific individual OPOs from which they receive offers, which isn't always possible in today's new and evolving landscape. Even when workflows are consistently followed within one organization, personal preferences vary at the individual transplant coordinator and physician/surgeon levels.

Two things are consistent across transplant centers regardless of the staffing model they operate: manual processes are heavily used within these organizations, and manual processes are a source of frustration. The following quote comes from a study[iii] on data management in the kidney transplant process.

> **"Data capture during the transplantation patient journey requires meticulous administration to prevent delays and bottlenecks. However, managing high-volume, complex clinical data across organizations is time consuming and error prone and incurs significant administrative costs."**

A different study[iv] of the U.S. transplant ecosystem by Bloom Works concluded "technical seams" where computer-to-computer communication does not take place are a major contributor to inefficiencies that ultimately lead to unused donations and unnecessary deaths. Its report said: "When there are unnecessary, human-powered technical seams between computer systems, we create risk for lost or corrupted data." It recommended addressing this problem by supporting innovative software development.

In today's digital age, it is time to extend the concept of app-based, templated data collection and sharing to more parties and tasks in the organ transplantation process. One study reported the use of mobile applications produced a 35% increase in organs transplanted and a 50% reduction in time from initial organ offer to transplant.[v]

> **"There is a growing chorus of dedicated professionals who believe that the wait list could be reduced and even eliminated for certain organs with simple technological and process improvements.[vi]"**

The following sections describe how software-based systems could automate and accelerate some common activities to reduce overall offer-to-transplantation time, improve documentation and reporting and protect information security.

BEST PRACTICE #1

Digitize Forms and Checklists Used for Required/Desired Data

It is worth saying again: Manual processes are rarely best practices, in transplant or any other discipline.

In transplantation, many data request, data entry and data sharing activities are typically manual. However, through software, any checklists, forms or other documents used in offer, intake and other processes can be digitized. Digitizing data entry and communication does more than substitute keyboard and screen data entry for handwriting on paper forms. Transplant workflow software can include notification features to alert transplant coordinators and others to missing or questionable data, and to time-sensitive actions that are required. It can also ensure activities are performed in a prescribed sequence, and that records or requests are not submitted if mandatory information is missing. These built-in quality control checks save time in downstream processes while helping standardize how data is collected and presented. Workflow software can also offer configurable preferences for alerts. This allows surgeons and professionals in other roles to get real-time notification of pertinent information without having to receive numerous texts or emails that aren't relevant at the time. Another advantage to digitizing intake forms and other transplant-related documentation is that all data can be encrypted, both when in the computer system and when being communicated, which contributes to information security compliance.

What Is the Opportunity Cost of the Status Quo?

Inefficient communication that causes delays and impacts outcomes is not specific to organ transplants. The Joint Commission (JCAHO) has continually made improving communication a top National Patient Safety Goal (NPSG) and has educated healthcare leaders about the risks of communication errors, citing a 2016 study that found communication failures in U.S. hospitals and medical practices were responsible for 1,744 deaths and 30% of malpractice claims annually. The organization's research into communications for patient care responsibility handoffs found up to 37% of handoffs are considered unsuccessful.[1]

A separate CAQH analysis found that converting administrative tasks into electronic transactions would save the U.S. healthcare system $16.3 billion annually, equivalent to 42% of the cost of completing those transactions using current methods.[2]

[1] Joint Commission "Sentinel Event Alert" Issue 58, September 12, 2017 www.jointcommission.org/-/media/tjc/documents/resources/patient-safety-topics/sentinel-event/sea_58_hand_off_comms_9_6_17_final_(1).pdf?db=web&hash=5642D63C1A5017BD214701514DA00139.]
[2] CAQH "2020 CAQH INDEX® Closing the Gap: The Industry Continues to Improve, But Opportunities for Automation Remain" www.caqh.org/sites/default/files/explorations/index/2020-caqh-index.pdf

BEST PRACTICE #2

Create a Single Source of the Truth for Data Related to Each Transplant

With digital forms and data entry, organizations can create a single comprehensive record that is shareable and auditable. It eliminates the need for different departments and organizations to work from their own siloed records on the same organ and/or patient. Encryption provides security, and security is enhanced by providing role-based access to the system so transplant staff and collaborating external partners and departments can all get the information they need without having unrestricted access to all the patient/organ data in the system.

Having a central information repository can potentially eliminate many of the 500+ point-to-point communications that occur to arrange a single transplant by giving stakeholders real-time access to information, without requiring them to request it and wait for the request to be received and acted on. Shareable data can eliminate the silos and "technical seams" that have been identified as a leading source of delay and error. A U.K. study to inform process improvement found that a physician at a transplant center had to consult six different IT systems to get the information needed[vii]; that does not count multiple systems used at other organizations in the ecosystem.

BEST PRACTICE #3

Document All Transplant-Related Communication to Improve Charge Capture

Revenue leakage is another aspect of the transplantation status quo that can be improved by applying digital tools. In transplant processes today, many texts, calls and other communications to physicians, surgeons, coordinators and other staff go unrecorded and thus become uncompensated. Automated forms, checklists and other workflow software can automatically provide documentation and/or prompt the user to provide it. Bundling transplant data collection functionality and clinical communication in an application reduces undocumented communication, which improves charge capture and audibility.

BEST PRACTICE #4

Support Integration to Outside Systems

Transplant workflow software should provide connectivity for easy integration to the most important systems used by each organization in the ecosystem for its decision-making and execution (e.g. offer management, laboratory information systems, EHRs, logistics tracking systems, etc.). Non-proprietary connectivity (for example, through application programming interfaces/APIs) is essential for enabling the computer-to-computer data exchange that eliminates siloes and prevents the need for manual or redundant data entry. Such connectivity enables the time-saving and accuracy-improving benefits associated with electronic, non-manual processes.

The U.S. Digital Service's examination of current processes in transplant services led the agency to conclude: "A more ideal solution would be to develop data integrations directly with the EHRs at the points of care so that there is zero delay between new lab test results, organ viability indicators, or a patient's health degrading and calculating a more immediate match." Transplant workflow software may be embedded with clinical decision support functionality, including AI and machine learning capabilities.

Role-based Benefits & Considerations

A common bond to the best practices described above is that they automate many routine data entry and communication tasks. Preventing manual, redundant data entry and verification time improves productivity, which in turn mitigates the staffing shortages that are common in many medical and administrative positions. The following sections summarize how automating clinical workflows can help specific roles in the transplant process.

Transplant Coordinators

Transplant coordinators may stand to benefit the most from automated clinical workflows and digital data because they have the most touchpoints in the transplant process. During a transplant, coordinators deal with multiple individuals at OPOs, transplant centers, logistics providers, and as many as five different departments of the hospital, up to 40 individuals per case. If multiple offers are received in close proximity, there is a high potential for confusion.

In typical processes, coordinators provide some of the same information to multiple parties via one-to-one communications. They must consult multiple internal and external IT systems to gather the information that is requested, and telephone tag is common. Using automated checklists helps ensure information is as complete as possible when it is presented, which reduces the need for follow-up phone calls, emails, texts and faxes.

Call Centers

Call centers have helped transplant centers handle the increase in organ offer volume as a result of allocation changes with broader distribution. Call centers are a great resource for transplant centers to help augment staff and reduce the on-call burden for their coordinators, surgeons and physicians, reducing burnout and improving staff experience. That said, the external call center model has shown challenges with its scalability as a long-term solution. Highly trained nurses with the experience and clinical knowledge to be effective transplant coordinators are in short supply. This negatively affects call center providers equally, and in some cases more, than transplant programs themselves. In fact, five out of 15 transplant programs surveyed reported they had a last-minute crisis or other issues with their call center partners because staffing issues prevented them from adequately handling offer volume and providing screening services.[viii] This also means that call centers, like transplant centers, could benefit by using clinical workflow automation and communication to drive efficiencies within their programs to positively impact the transplant centers that they serve.

Administrators

Transplant surgery is complex and resource intensive, making it prone to revenue leakage. Automating workflows helps reduce this revenue leakage through the automated documentation and notifications that can be included in transplant workflow software. Administrators value this functionality not only for its benefit for charge capture but because it also simplifies record keeping, audits and helps compliance. Required data is logged, stored and encrypted automatically, and users can be prompted to add or request any needed fields that are missing. Those features create comprehensive records that help to document how decisions were made and make lookups and audits more manageable.

The estimated cost for organ procurement and recovery increased by an average of 150% according to a survey of transplant administrators. Respondents cited higher logistics costs and increases in organ offer screening that require additional investments in overtime, hiring additional staff or expensive third-party call centers, plus costs associated with burnout and staff churn, as reasons for the overall cost increase. As a result, it is critical that transplant administrators are maximizing the accurate documentation, collection and reimbursement of billable activity. Transplant-related communications during organ offer reviews, organ recovery, as well as patient referral evaluation and waitlist management are considered "pre-transplant expenses" and reimbursable on the Medicare Cost Report.

One area of revenue leakage that has the most opportunity for improvement and can make a considerable impact on transplant center finances is the accuracy and compliance of time reported during organ offer review and recovery, or phase 3 of pre-transplant activities. Faculty underreport their time spent reviewing organ offers and procurement services by 60% according to estimates from a study performed by OmniLife Health in 2022. Said differently, even if your center has strong time study compliance, the accuracy of that time is probably grossly underestimated and thus underbilled.

Further, time study compliance typically drops sharply among non-transplant department staff, such as histocompatibility Human leukocyte antigen (HLA) or operating room (OR) staff, whose time spent on organ procurement is eligible on the transplant center time study and cost report. These compliance drop-offs occur even in well-managed programs with strong compliance within the transplant department. With communication and clinical workflow automation software, all time and activities performed by transplant staff, and time study eligible staff outside of the transplant center, are automatically tracked. This provides administrators and staff the ability to not only automate the collection of time logs, but equally important, to increase the accuracy of the time reported. This drives revenue to help offset the organ recovery cost increases that have impacted so many transplant centers nationwide.

Physicians (PCPs, transplant surgeons)

Transplants require many phone calls and other communication among the recovery team, OPO, receiving hospital and others, and the surgeons involved are frequently included in communications when they don't need to be. That raises the risk that important messages may be missed or not responded to promptly. When a transplant workflow software app is used, the information exchanged is standardized, which reduces the need for follow ups to clarify. Apps can also provide a way for physicians to document their decision-making regarding organ offers, and can provide evidence-based clinical decision support. Messages and data exchanged through such apps are encrypted, which extends compliance protections to messages that may be accessed on personal devices outside the hospital. A comparative study found the use of dedicated apps in the kidney transplant process improved clinical productivity and reduced redundant, contradictory and untimely phone calls[ix]. Workflow software can also give surgeons at the receiver site self-service access to check the status of in-transit organs, thereby eliminating the need to make contact with the transplant coordinator and/or the logistics provider.

Finally, in a 2022 report from the National Academies of Sciences, Engineering, and Medicine (NASEM), "Realizing the Promise of Equity in the Organ Transplantation System," the authors and contributors made several recommendations regarding to increase transparency and standardization of organ offer evaluation. They even suggested that more detailed documentation surrounding the reason for declining certain organs should be documented and provided to the patient upon request. As mentioned earlier, the current status quo for this decision-making process is through conversations in undocumented phone calls and text messages between transplant and OPO staff. Implementing clinical workflow and a centralized communication platform help transplant surgeons and transplant leadership have more data and contextual information to ensure that the best decisions are being made, and that this decision-making process is well documented should the patient request additional information or upon an audit.

Conclusion

The time-sensitive and highly manual, highly redundant process of arranging organ transplants is ripe for automation. Clinical workflow automation facilitates positive process changes because it reduces the total time needed to request information and document results, rather than shifting tasks from one party in the ecosystem to another. All parties benefit, especially patients, whose outcomes depend on fast, accurate decision making and execution at every point in the process. With CMS requiring improved performance in organ transplantation, and security and documentation requirements ever growing, organizations should explore how to integrate digital-based best practices into their transplant processes. To learn more about digital tools that are helping care teams improve communication prevent errors, accelerate decision making and mitigate risk exposure, please visit omnilife.health.

[i] U.S. Digital Service "LIVES ARE AT STAKE The Government's Role in Modernizing the OPTN" January 5, 2021 https://www.finance.senate.gov/hearings/a-system-in-need-of-repair-addressing-organizational-failures-of-the-uss-organ-procurement-and-transplantation-network.

[ii] Eric Pahl, BSE, Robert W. Emery, MD, Michael Noce, BS, Suzanne Conrad, BSN, MS, Nicole Patterson, BSN, CCTC and Brynn Timm, BSN "Mobile Application for Communication Increases the Efficiency of Organ Procurement and Transplantation"

[iii] Sharma V, Eleftheriou I, van der Veer S, Brass A, Augustine T, Ainsworth J "Modeling Data Journeys to Inform the Digital Transformation of Kidney Transplant Services: Observational Study" J Med Internet Res 2022;24(4):e31825.
URL: https://www.jmir.org/2022/4/e31825 DOI: 10.2196/31825.

[iv] Bloom Works "The Costly Effects of an Outdated Organ Donation System" https://bloomworks.digital/organdonationreform/Technology/

[v] Pahl.

[vi] Bloom Works.

[vii] Barcley M, Burnapp L. Transplant First: Timely Listing for Kidney Transplantation. NHS Kidney Care. 2013. URL: https://www.england.nhs.uk/improvement-hub/wp-content/uploads/sites/44/2017/11/Transplant-First-Timely-Listing-for-Kidney-Transplantation.pdf.

[viii] The Organ Donation and Transplantation Alliance webinar "Re-thinking Organ Intake: The Effects of Allocation Changes and Staffing Shortages on Clinical Productivity Date & Time" Tuesday, October 11, 2022 Poll, 2022

[ix] Pahl.

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