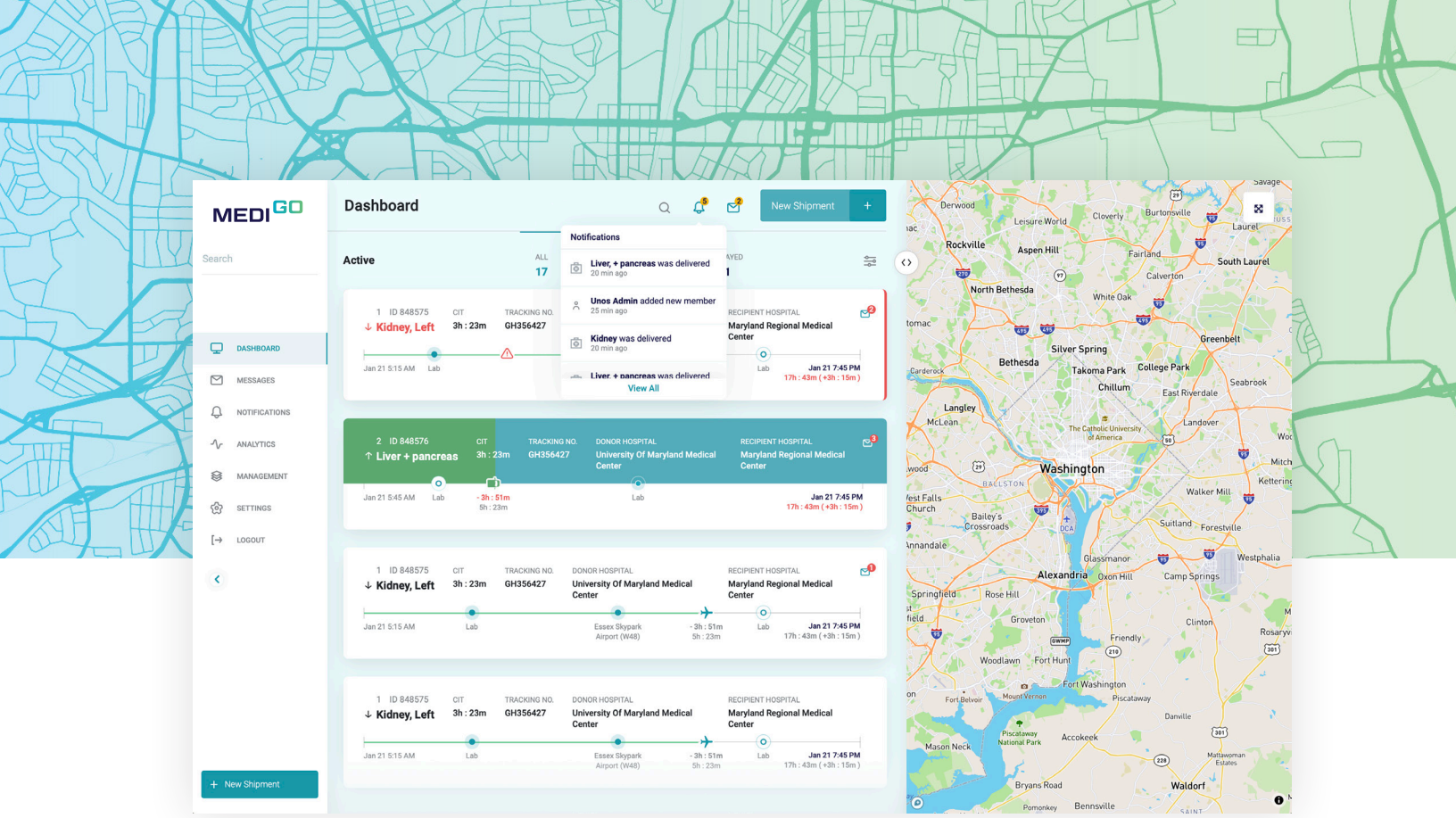


# MEDIGO

# 2021 Vision for Delivering Confidence in Organ Transplant Logistics Through Real-time Tracking and Communications Technology

## Improving Resource Utilization to Elevate the Transplant Industry

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## A Vital Need for Better Communication

**Transplantation represents a beautiful coalescence of passion, commitment, and robust science. Organ transplantation is now the gold standard therapy for patients with organ failure and saves more than 40,000 lives per year. While transplantation has shown encouraging growth, there is an urgent and exciting opportunity to access more transplantable organs. Accordingly, 58 organ procurement organizations (OPOs)[1] have committed to identifying and procuring lifesaving organs for patients in need.[2]**

It is time for technology to help the OPOs. The success of the transplant industry's growth has relied upon the OPOs, but the OPOs require advanced logistics and technology support from the private sector. Tools like artificial intelligence and data- driven predictive analytics are being used by non-transplant organizations across a breadth of industries to improve efficiency. Indeed, if smartly applied to transplantation, new logistics and communication tools could transform the transplant industry, and help improve access to human organs.

MediGO, a private sector enterprise, is collaborating with key partners, including universities, transplant centers, and the country's 58 OPOs[1], to develop the ideal communication, analytics and logistical operating system. This powerful platform will inform resource management operations for each of the industry's key stakeholders. A combined hardware-software platform, MediGO uses a tracking and monitoring device called the Centry. The word Centry is a combination of the words "central" and "sentry," connoting the idea that the system is both a convener (the central point of contact that calls people together) and a guardian (always watching over the organs it is in charge of transporting).

In preparing this Vision Document, we interviewed numerous industry partners, each with the goal of improving the field. These remarkable interviews ended with a resounding conclusion: **it is time to address the logistical challenges of transplantation. The industry wants to grow.**

[1] As of March 2023, there are 56 organ procurement organizations (OPOs) responsible for recovering organs from deceased donors for transplantation in the U.S.
[2] Health Resources & Services Administration, https://www.organdonor.gov/awareness/organizations/local- opo.html#:~:text=Organ%20procurement%20organizations%20(OPOs)%20offer,roles%20in%20their%20 service%20area.

> We must forge partnerships between public, private and other non-profit organizations to improve our reputation and notoriety by engaging in meaningful objective research that does not seek to defend a position, but rather expose opportunities for our field. It is time to let in others who have built remarkable and spectacular things that not only serve a vital community need but seek to lead innovation beyond our current horizons and constraints. Unorthodox partnerships will advance us as an industry beyond what we think is possible."

***—JOE FERREIRA***

*President of Association of Organ Procurement Organizations*[3]

**What are the challenges to tackle?**

Many of transplant's current challenges stem from an evolving distribution model. Currently, OPOs are charged with identification of donors, management of donors, recovery of organs, and the travel agency of moving organs to their final destination. As needs have evolved this has become a daunting practice.

To offset geographic disparities in organ access and balance other challenges faced by recipients around the country, the Department of Health and Human Services' Organ Procurement and Transportation Network (OPTN) is establishing a new distribution model that minimizes geopolitical boundaries for organ procurement. Therein, organs may be distributed more broadly using formulas that combine factors such as medical emergency, the likelihood of graft survival, and proximity to the donor's location.

These are significant steps forward that will expand opportunities for successful transplants, but these steps will simultaneously add logistical and communication obstacles to shipment practices. For example, expanding geographic perimeters will force the OPOs to begin shipping more organs and working with new parties. More flights will be required, more connections will be made, and more stakeholders will be involved with every shipment. Further, the time it takes to ship organs is likely to increase, proportional to the distance moved. The OPO community needs a partner.

For this growing logistical problem, technology provides the solution. Indeed, advanced logistics and communication systems have the power to manage the chain of custody and keep key stakeholders informed of an organ's whereabouts ensuring accuracy and performance gains in the face of expanding demands. In the context of a changing industry, it is time to adopt a new approach to organ management. MediGO has pioneered the technology that will help OPOs succeed.

**Changing times highlight the need for innovation**

Beyond new distribution models there are other factors adding to the complexity of organ transportation. Indeed, in 2020 and 2021 there are fewer transportation options due to COVID-19. The number of commercial flights has dropped more than 37%, affecting the ability to reliably move teams and organs. Further, the need for enhanced logistics has been magnified by transplant's own scientific progress. For example, improved immunologic matching strategies have allowed for an increase in transplant volume for sensitized patients struggling to find a donor. And perhaps most importantly, there is a growing prevalence of organ failure in the United States, increasing the need for transplantable organs.

This confluence of developing challenges in organ access requires action. It is time for OPOs and other stakeholders to invite new ideas and new technologies into the field. Value added partnerships and expansion of the ecosystem can drive important innovations in the field, as has been done in other areas of medicine. Adoption of a **growth mindset** can help reshape transplantation—allowing the industry to deliver maximum value to recipients, donors, OPOs, and transplant centers.

[3] Ferreira served as the 2020-2021 president of AOPO. As of March 2023, the role is currently held by Barry Massa, executive director of LifeCenter Organ Donor Network in Cincinnati.

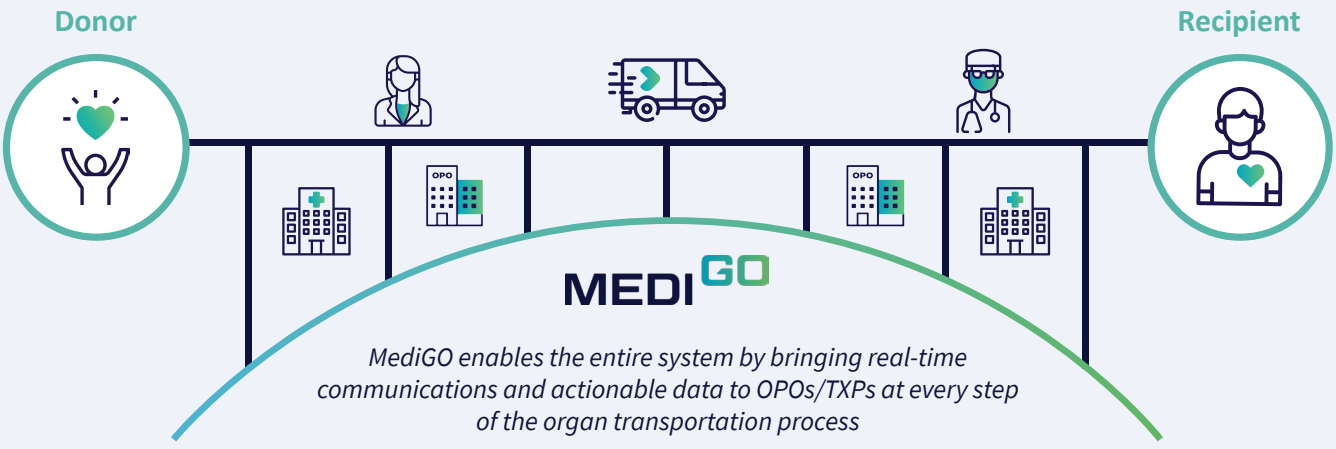
As an OPO, a partnership with MediGO will deliver important changes in organ management. MediGO's platform will provide for a new industry standard for organ transportation allowing stakeholders to:

- Improve resource management strategies
- Reduce miscommunication and communication overload
- Reduce hospital and OPO waste (time, money, access)
- Gain better situational awareness to easily track organs in transit
- Better communicate to improve decision making
- Collect and analyze data through an AI-powered system so logistics and transportation can be continuously improved
- Gain quality assurance through technology that analyzes factors that could impact transport choices including temperature, vibration, and more

MediGO forecasts suggest that redeployment of critical OPO resources will contribute to improved cold ischemic time (CIT) and on-time delivery. Surgical planning will be simpler and less chaotic—especially in an unpredictable procurement environment. Doctors, other healthcare workers, and OPOs will have the information they need to perform their jobs more effectively, adding thousands of potential life-years to recipients in the present system.

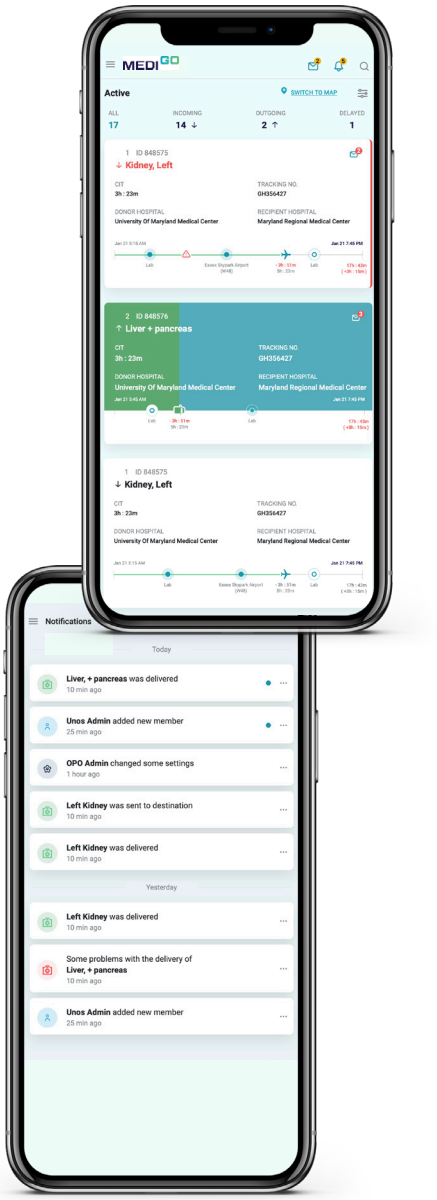
MediGO's goal is to convene everyone in the industry. In this way, MediGO will help save lives and engender trust between OPOs, heroic donors, their courageous families, and transplant centers. The MediGO platform will support OPOs' efforts to be trusted stewards of lifesaving organs throughout the entire process.

## MediGO Helps OPOs and Transplant Centers by Being the Bridge Between Donor and Recipient




*MediGO enables the entire system by bringing real-time communications and actionable data to OPOs/TXPs at every step of the organ transportation process*

MediGO's User Friendly and Intuitive Interface Simplifies Organ Tracking




## Improving Clarity, Situational Awareness, and Interconnectedness

With changing organ transplant center and OPO needs contingent on organ distribution strategies, consistency and accuracy of organ location and estimated time of arrival (ETA) are more important than ever.

MediGO is a secure convener. MediGO's platform provides (previously unavailable) geolocation and status for organs during every step of their journey. Surgeons can effortlessly determine organ location and receive a recipient hospital ETA. Stakeholders can receive alerts when status changes or when ETA is modified. There is complete transparency around this life-critical process. Likewise, OPOs will be able to closely and accurately track the status of the organ throughout every step of the shipment gaining control of the process.

MediGO establishes interconnectedness. MediGO connects doctors, OPO staff, couriers, carriers, and others, all of whom contribute to a transplant's outcome. Through improved and secure lines of communication, transplant stakeholders will have real-time contact, improving situational awareness and collaboration between the previously disconnected parties in the transplant process.

### MediGO's *Centry* hardware will focus on four critical components:

**Centralized communications hub**

Improving communication among all stakeholders is a key component of MediGO. The industry believes real-time communication will improve accountability and the quality of organ procurement and transplantation. Enhanced communication among everyone in the chain of custody will result in improved efficiency as broader organ sharing takes place across the country.

Indeed, maintaining open dialogue is critical as organs pass through more hands. MediGO serves as a centralized communication hub allowing stakeholders to remain in secure contact. For example, a surgeon awaiting an organ can now quickly and accurately communicate with the OPO, OR, or courier without multiple calls to determine the involved staff. Conversely, an OPO team member can remain in constant communication with their airlines, cargo handlers, and ground couriers. Secure, comprehensive communication is here.

MediGO creates accountability and transparency. Each stakeholder has access to the data critical for their role. If something goes wrong during shipment, the necessary team member will be aware of the problem—immediately.

When unexpected events do arise, the applicable team members will be automatically notified, obviating manual, time-consuming communications—such as phone calls or texts that have been traditionally used to update everyone in the chain. Further still, communication is customizable, so notifications can be tailored to the needs of a particular user.

In summary, MediGO is the new communications hub. It will be the bridge that connects key stakeholders and allows them to track and monitor resources in real-time.

> "The organ transportation process is enormously complex, with a lot of people involved at various stages as organs move from one location to another. This complexity calls for a system that makes communication easier and more cohesive so that we can continue to be the best possible stewards of the gifts that donors have entrusted to us"

***—MATTHEW WADSWORTH***
*President and Chief Executive Officer of Life Connection of Ohio*

**Real-time tracking and monitoring**

Visibility is extraordinarily important to the organ transplant process for several reasons. Greater visibility allows stakeholders to better understand where organs are and who is handling them. This can mitigate potential risks to organs, but also help OPOs ensure their exceptional reputation as good stewards of donor organs. Indeed, avoidance of negative media attention around organs lost in transit is important as it only injures the trust that fuels transplantation.

Current visibility into the organ transportation process is limited. Internal systems do not yet provide the granular information pertaining to departure and/or hand-offs needed by downstream stakeholders. In fact, it is easier to track a child's toy ordered on Amazon.com than it is a human organ. MediGO is changing that.

The lack of organ shipment visibility is especially problematic when trying to obtain the location of multiple organs in transport or organs transported across great distances. A simple 30-minute delay can result in cascading effects that adversely affect the ability to transplant that organ. This problem now has a solution.

MediGO provides continuous visibility for all parties involved in the transplant process and offers transparency in an increasingly complex transportation environment. More accurate data collection and tracking is expected to result in less CIT. This is important because longer CITs are associated with higher graft failure rates after transplantation[4]; thus, shortening CIT may improve organ quality and long-term recipient outcomes. Enhanced organ management will also allow for better operative planning, timely mobilization of patients, and rapid remediation when organs are lost or rerouted.

[4]Koizumi N, DasGupta D, Patel AV, et al. Geographic Variation in Cold Ischemia Time: Kidney vs. Liver Transplantation in the United States, 2003-2011. Transplantation direct. 2015;1(7):e27.

“It’s important that all stakeholders understand how the system learns. We need to know how it’s coming to the conclusions it reaches, and we need to be able to query and secure the data that’s being collected.”

*—JOE FERREIRA*

*President of Association of Organ Procurement Organizations*[5]

**AI-powered data cataloguing and analysis**

MediGO’s data collection powers an AI engine that will learn and improve transportation processes as it ingests data. The AI engine will perform root cause analyses to uncover shipment challenges. It will make each team member a better organ steward. Further, MediGO allows for auditability. As such, OPOs can audit each cargo journey, or groups of journeys. Ultimately, MediGO will become an AI- informed travel agent for organ transportation.

Additional analytics are in development. Throughout every journey, MediGO collects exhaustive data that will inform process improvements. Environmental factors affecting organ shipment including temperature and vibration levels will be collected to better understand organ transplant outcomes. Just as “pumping” organs informs outcome and management, MediGO will provide information related to the quality of the organ’s trip.

MediGO’s approach to AI reflects its overall commitment to improving transparency and improved efficiency in the industry. Eliminating the “black box,” or void of information that exists between explant and implant, MediGO allows visibility into a previously blind system. The data generated from this visibility inform valuable decision making and AI.

All MediGO data are securely collected, catalogued, analyzed, and available for access in real-time. OPOs can both contribute to the data pool and query the information on demand.

**Operating in a COVID world**

Operating in a COVID environment highlights the need for OPOs and transplant centers to reimagine transport processes. The industry needs to establish closer relationships and maximize collaboration. Social distancing has added an entirely new challenge to an already complicated organ transport system. For example, organ procurement teams may have limited ability to travel to donor hospitals. In some cases, they may not be able to travel at all. Further, local hospitals may lack the PPE to support transplant teams from outside facilities.

Because of COVID, contactless deliveries are now preferred, particularly for surgeons caring for immunocompromised patients. The expanding requirement for transplantable organs and urgent needs around organ transportation innovation exacerbate COVID related pressures.

[5] Ferreira served as the 2020-2021 president of AOPO. As of March 2023, the role is currently held by Barry Massa, executive director of LifeCenter Organ Donor Network in Cincinnati.

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**103,000+**
people on the national transplant waiting list as of March 2023.[6]

> “Everything we do must be done in the context of quality. We need to be able to deliver high quality organs to patients in a timely manner.”

***—SUSAN GUNDERSON***
*Chief Executive Officer and Founder of LifeSource*[7]

MediGO enhances touchless transfers. MediGO leverages its novel platform in two fundamental ways. Firstly, the AI-powered algorithm helps reduce the number of transfers. This reduction is particularly important because COVID has reduced the number of available commercial flights and increased the complexity of chartering.

Secondly, MediGO will help eliminate the need for surgeons and their teams to travel to donor facilities. MediGO is already tracking and monitoring unattended organs, such as kidneys. However, MediGO will establish a trusted collaboration network amongst donor and recipient hospitals, facilitating a new standard for post-COVID organ recovery. In this innovated world of local organ recovery for previously attended shipments, MediGO gives users “eyes” on the shipped organ—building confidence and trust.

## Saving Lives and Improving Economics

MediGO will yield significant efficiencies in time and operating costs. These savings result from reductions in wasted time, redundant communications, miscommunication, more accurate tracking, and improved organ quality metrics. Time reductions allow for OPO resource redeployment strategies, enhancing access to transplant donors. With improved efficiencies, OPO and transplant center professionals can focus on optimal clinical outcomes for heroic donors and desperate recipients, rather than the nuances of travel agency.

Technology-facilitated efficiencies will have a direct positive impact on procurement coordinators at OPOs and Transplant Coordinators at transplant centers, around the country. Coordinators will be able to spend more time on value-added work and maintain focus on each organ shipment with less distraction. MediGO has estimated significant reduction in “call overload,” giving OPOs more time to address critical tasks, directly impacting patient outcomes. Meanwhile, increased efficiencies will allow transplant centers to be as productive as possible saving lives – the key objective.

## A Community-led Effort

MediGO was built by transplant professionals and is guided by transplant principles. MediGO will help the transplant community by creating a proactive, supportive and cohesive community dedicated to improving volumes and outcomes. Led with passion and conviction, **MediGO is the result of the private and public healthcare sectors coming together** with the clear goal of improving access to lifesaving organs through technology and efficiency.

[6] Health Resources & Services Administration, organdonor.gov.
[7] As of March 2023, Susan Gunderson no longer serves as CEO of LifeSource. This role is now held by Kelly White, RN, MS.

MediGO's success relies on the commitment of OPOs and other stakeholders. MediGO is always under development and values input from OPOs across the United States. These organizations have embraced the vision MediGO has put forward and recognize that technology can improve logistics and communication in this precious field.

OPOs want change. The OPO community has been integral to this project from its inception and has proactively participated in research and analysis of requirements from day one. All 58 OPOs participated in a needs-based survey, the results of which formed MediGO's foundation. Members of the community are testing the solution while writing and publishing white papers on the need for improved logistics and communications in organ procurement and transplantation.

While all 58 OPOs[8] have provided direct input to chart MediGO's course, MediGO relies a special group of advisory OPOs to help make critical decisions. However, MediGO always welcomes more input – MediGO wants to hear from you.

Future innovations are coming. In addition to its work with OPOs and the extended transplant community, MediGO is working with aviation leaders to improve organ transportation. MediGO is working diligently with national air carriers to integrate transplant logistics into aviation systems. Further, MediGO is analyzing modes of transportation to optimize transport, reduce transportation time, and provide accurate ETAs. MediGO will help carry transplantation into the next decade.

"What we are proposing is a unique and necessary approach that we believe will improve transplant quality--a comprehensive organ tracking and management system accessible to every transplant stakeholder in the United States. This solution will benefit all members of the transplant family, including OPOs, surgeons, couriers, and, most importantly, donors and recipients"

***—DR. JOE SCALEA***
*Chief Medical Officer, MediGO and multi-organ transplant surgeon at University of Maryland School of Medicine and University of Maryland Medical Center*[9]

[8] As of March 2023, there are 56 organ procurement organizations (OPOs) responsible for recovering organs from deceased donors for transplantation in the U.S.
[9] As of March 2023, Dr. Joseph Scalea currently serves as medical director of Innovation/Solutions for Medical University of South Carolina (MUSC).

## A Time for Action

MediGO is bringing attention to the emerging needs facing organ transportation. It is imperative that OPOs, transplant centers, and stakeholders leverage innovative technologies to improve visibility, awareness, connectedness, and clarity to minimize risk and improve outcomes, particularly as organs travel further. The organ donation and greater transplant community have an opportunity to improve access to organs and increase quality of care, using technology.

*MediGO is a mission-driven company that uses technology to elevate the entire transplant industry.* MediGO seeks to help the field smartly grow, while improving transparency and quality. MediGO provides key stakeholders with a vital new tool that facilitates collaboration, communication, and awareness, with the greater goal of saving lives.

## Help us realize this vision.

Let's bring this to life. We are extending an invitation to you to directly participate in the MediGO ecosystem, contribute to the data warehouse that drives the solution, and provide feedback. We are here to help you grow. We are MediGO.

***Contact us to learn more about how you can take part.***
***Because the time for action is now.***


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MediGO's organ logistics system was developed as a comprehensive collaboration of transplant stakeholders. Source data for vision document generated by MediGO key stakeholder interviews with 1) director(s) of clinical operations at each of the nation's 58 organ procurement organizations between 7/2019-9/2019; 2) families of deceased organ donors; 3) geographically varied surgeon members of the American Society of Transplant Surgeons (ASTS); 4) leading commercial airline leadership and operations officers. MediGO data collection tools, software, analytics, and hardware derived from objective data taken from non-for-profit funded research and peer- reviewed publications authored by MediGO scientific advisor: Am J Transplant. 2019 Mar;19(3):962-964; JAMA Surg. 2020 Jan 15. (Epub); IEEE J Transl Eng Health Med. 2018 Nov 6;6:4000107; Ann Surg. 2019 Oct 28. (Epub). MediGO organ tracking and monitoring system Beta testing of human organs 10/2019-12/2019 used to inform V1 system solution.