Engaging the third estate: the Transplant Growth and Management Collaborative

The Organ Donation and Transplantation Collaboratives that occurred within the United States from 2004 to 2008 helped contribute to a significant increase in organ donors and transplants across the country. Centers were needed to accommodate and maintain this increase in capacity to perform successful transplantations for candidates on the waiting list. The Transplant Growth and Management Collaborative was created to help fulfill this new performance level expectation. In 2007 the US Department of Health and Human Services, Health Resources and Services Administration published a best-practice report based on high-performing centers that experienced a significant increase in volume while maintaining expected, or higher than expected, outcomes. The report produced a change package that outlined common strategies, key change concepts, and actions used at the best-practice centers that could be adapted by other transplant programs by using Plan-Do-Study-Act cycles to test the impact of the changes. This change package and use of the Plan-Do-Study-Act cycles formed the foundation of the Collaborative that occurred from October 2007 through October 2008 to spread best practices to transplant programs willing to commit to making changes that could result in a 20% increase in transplant volume. More than 120 transplant centers participated at some point in the Collaborative. Although preliminary results of the Collaborative show that only a few participating programs achieved the 20% volume increase goal, many participating centers reported putting successful models in place for each of the strategies identified in the best-practice change package. (*Progress in Transplantation.* 2009;19:235-243)

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The history of organ donation and transplantation in the United States was changed in April 2003 when the US Department of Health and Human Services, Health Resources and Services Administration (HRSA), in conjunction with national leaders in the organ donation and transplantation community of practice, launched the first Organ Donation Breakthrough Collaborative.[1,2] Following its inception, a series of Breakthrough Collaboratives produced record-breaking results toward the goal of dramatically increasing the availability of transplantable organs.[1,3,4]

Although the number of deceased donor organs and the number of transplants increased 29% and 26%, respectively, between 1997 and 2007, the number of candidates on the waiting list continues to grow and had reached 101 703 as of April 20, 2009.[5,6] In 2008, 6619 patients died awaiting transplants, equating to more than 18 people per day.[7]

Due in large part to the Collaborative, organ donation rates increased in the first year of this national effort by 10.8% in 2004 compared with 2003.[3,4,6,8,9] Since that time, the number of deceased donors continued to increase through 2006 and has been sustained through 2008, thus creating a need for transplant centers to adjust to a new level of organ availability and prepare for additional growth. To assist transplant centers in meeting this challenge, HRSA created the Transplant Growth and Management Collaborative (TGMC), which sought to identify and spread best practices among centers committed to effectively growing their transplant programs.

Collaborative Methods

The Institute for Healthcare Improvement created the collaborative breakthrough series model in 1995 (Figure 1).[10] This fast-paced interactive model supports change and redesign of any core business organization through the use of existing knowledge and experience.[11] Collaboratives are designed to build clinical leaders of change and provide these leaders with the tools to implement improvements within their organizations. The key elements of breakthrough improvement are the will to do what it takes to change to a new system, the ideas on which to base the design of the new system, and the execution of the tests of change of these new ideas.

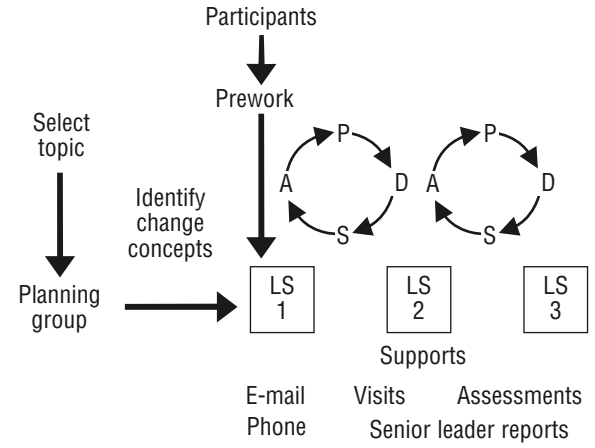

Figure 1 Collaborative engine.

Abbreviations: A, act; D, do; LS, learning session; P, plan; S, study.

A collaborative "breakthrough series" consists of at least 3 learning sessions with action periods in between each learning session. The learning sessions provide an all teach, all learn environment in which best practices are specified and taught. The action periods are the times during which the participating teams return to their organizations to test and implement the best practices that were disseminated at the learning sessions. The premise of the collaborative model is that the knowledge needed to meet performance goals already exists; therefore, the purpose of the collaboration is to accelerate learning, foster more consistent application of the best practices, and spread the practices to all relevant organizations.[11]

Model for Improvement

The core of the collaborative model is the Model for Improvement that is used by teams to conduct tests of change and implement successful practices (Figure 2).[11-13] The Model for Improvement has 2 components. Its foundation is 3 fundamental questions: What are we trying to accomplish, how will we know that a change is an improvement, and what changes can we make that will result in improvement? The second component is a method for executing tests of change: the Plan-Do-Study-Act (PDSA) cycle.[11-14]

The PDSA method is based on the scientific method. It is attributed to Walter Shewhart, an early 20th-century engineer, and was originally termed the cycle of Plan Do, Check, Act. W. Edwards Deming later modified the cycle replacing "check" with "study." PDSA is a method that can be incorporated into any hospital's quality improvement project on both the micro and macro level. In the hospital setting, PDSA cycles can be used to test small, unit-based changes or to implement major hospitalwide quality improvement strategies. The benefits of PDSA cycles are that they are flexible, can be applied to a variety of

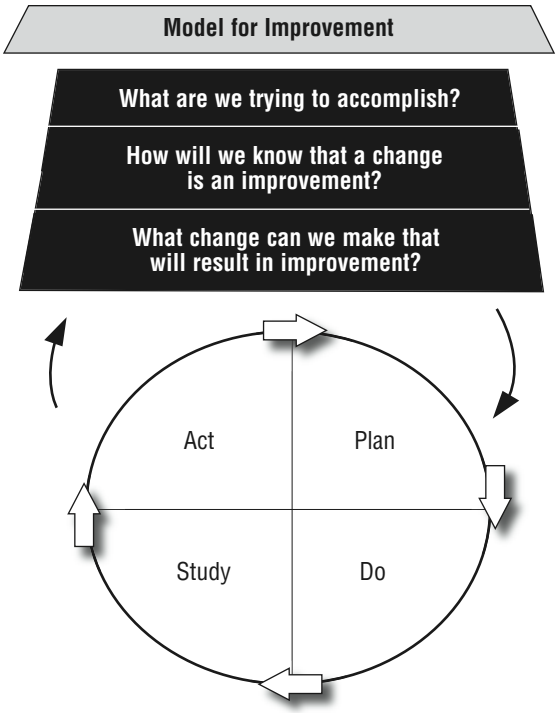

Figure 2 The model for improvement.

Source: The Model for Improvement, as seen on the Institute for Healthcare Improvement's Web site (www.IHI.org), was developed by Associates in Process Improvement (Langley et al[10]).

projects, and can be structured as a process. Thus they were a natural fit for a broad yet defined approach to achieving the TGMC goal of dramatically increasing the availability of transplantable organs.[14]

During the Plan stage of the PDSA cycle, the improvement team describes the purpose and expected outcome of the proposed test of change and develops a thorough description of how and when the test will be conducted. The Do phase requires the team to conduct the test of change as planned and collect the data and/or information needed to interpret its results and to also be aware of unexpected lessons they may learn as a result of the test. The Study phase requires the improvement team to analyze the effect of the proposed change. Act provides the improvement team the opportunity to revise its proposed change as a result of previous testing and to test an improved change that will move the team toward its intended improvement goal.[11-14]

Best Practice Evaluation of Transplant Growth and Management

The premise of the collaborative model and the Model for Improvement is to develop systems that will consistently apply existing knowledge to achieve better results. In the case of the TGMC, HRSA set out to gather and apply existing knowledge about how to effectively increase the number of organs transplanted at a single program while at the same time maintaining

Table 1 Characteristics of transplant centers

City, state	Transplant center	Organ program(s)
Rochester, Minnesota	Mayo Clinic	Liver
Jacksonville, Florida	St Lukes Hospital (Mayo Clinic)	Liver
Scottsdale, Arizona	Mayo Clinic	Liver, kidney
San Francisco, California	University of California, San Francisco Medical Center	Heart, kidney, liver
San Francisco, California	Stanford	Heart, kidney
San Francisco, California	Califronia Pacific Medical Center	Kidney
Philadelphia, Pennsylvania	The Hospital of the University of Pennsylvania	Liver, heart, kidney, lung
Philadelphia, Pennsylvania	Hahnemann University Hospital	Kidney
Philadelphia, Pennsylvania	Children's Hospital of Philadelphia	Heart, kidney, liver
New York, New York	New York–Presbyterian/Columbia	Heart, lung, kidney
New York, New York	New York–Presbyterian/Cornell	Kidney
Cleveland, Ohio	Cleveland Clinic	Liver, lung, heart, pancreas
Durham, North Carolina	Duke University Medical Center	Heart, lung
Indianapolis, Indiana	Clarian Health	Kidney, lung, liver, pancreas
Seattle, Washington	University of Washington Medical Center	Liver, lung

graft and patient survival rates that were as expected or higher than expected. By working with transplant programs and organ procurement organizations (OPOs) to apply the strategies and changes identified in the TGMC change package and the best practices identified in previous breakthrough collaboratives, 20% growth in the volume of transplants could be achieved.

In order to capture this knowledge, HRSA identified transplant centers that were achieving high organ transplantation rates while maintaining expected or higher than expected survival rates. Qualitative data were collected from many of these transplant programs and the knowledge generated resulted in a best-practice report and a "change package" that highlighted similar practices within the high-performing organizations. The transplant centers chosen to participate in the review were identified on the basis of 4 criteria:

1. High volume—Centers in the top 10% for number of transplants performed in 2005 and in the top 10% for mean number of transplants performed from 2000 to 2006.

2. High growth—Centers in the top 10% for mean annual absolute change from 2000 to 2005. Absolute change is the change in number of transplants from one year to the next.

3. Low graft failures—Centers with lower than expected numbers of graft failures 3 years after transplant that also met the volume or growth criteria. Expected outcomes were configured by the Scientific Registry of Transplant Recipients.

4. Low patient mortality—Centers with lower than expected patient mortality 3 years after transplant that also met the volume or growth criteria.

In addition, donor case mix (standard criteria donors, donation after cardiac death, extended criteria donors), pediatric transplantation activity, geographic diversity, percentage of imported organs, waiting list mortality, and organ type representation were also considered before the final decisions on site selection were made.[15]

Fifteen transplant centers representing 34 organ programs were selected to participate in the evaluation (Table 1). Each of the 15 centers participated in an extensive site visit conducted by representatives working under contract to HRSA to gain insights regarding best practices. Individual and group discussions with the transplant staff were conducted to determine what the informants believed were the contributing factors to the center's high rate of organ transplantation. The site visit team interviewed physicians, surgeons, coordinators, administrators, social workers, staff nurses, managers, hospital leaders, and other nonphysician clinicians totaling more than 465 participants.

Once the information was gathered from each of the 15 site visits, the findings were synthesized through both an internal (hospital participants) and external (outside organ donation and transplantation professionals) debriefing process, and a change package document was created. After the change package was created, an expert panel of participants from the site visits was chosen to review and affirm the findings.[15]

Transplant Growth and Management Change Package

A change package is a summary, or a menu, of ideas used by high-performing organizations that

Table 2 Health Resources and Services Administration's change package for transplant center growth and management

Strategy/driver	Key change concepts
1. Institutional vision and commitment: Hospital leadership demonstrates a commitment to making transplantation an institutional priority and to assuring the necessary resources to make this vision a reality.	1.1 Establish transplant as a strategic priority 1.2 Develop and implement business/strategic plan to secure institutional resources 1.3 Actively educate internally about goals, expected outcomes and accountabilities 1.4 Commit to providing a comprehensive, multidisciplinary approach to the full continuum of transplant care 1.5 Organize transplant services into a service line
2. Dedicated team: Create and support a collaborative and rewarding work environment to attract and retain highly dynamic, committed and skilled specialists in transplantation.	2.1 Organize around and empower committed surgeons and physicians who are aligned with the institution's vision to build and grow the transplant program 2.2 Recruit, train, and retain program staff that are specialized, dedicated, and committed 2.3 Establish and live by a collegial, nonhierarchical team approach to quality care
3. Aggressive clinical style: Assure program growth through advanced clinical practices in organ and patient acceptance and waitlist management and collaborate with referring physicians and OPOs on optimal care for donors and patients.	3.1 Create high threshold for rejecting organ offers and potential recipients 3.2 Maintain preparedness by building, managing and optimizing your waitlist 3.3 Reach out and collaborate with referring community and professional staff 3.4 Partner with OPOs to implement best practices 3.5 Actively market program to increase referrals and organ offers
4. Patient and family centered care: Establish institution-wide practices, systems and mechanisms to organize care around the needs of patients and families in an effort to provide the best possible care to every patient and family everyday.	4.1 Remove patient access barriers and streamline workflow to provide more efficient care 4.2 Educate patients and their "families" early and often 4.3 Don't forget the "family": Involve and support "families" throughout the entire transplant process
5. Financial intelligence: Achieve transplant program financial strength through a detailed understanding of program finances, sound financial management, and excellent payer relations.	5.1 Track and understand your program finances, reimbursement mechanisms, performance, and volume 5.2 Negotiate payer contracts with awareness of program strategy, finances, and strengths 5.3 Develop and maintain constructive, mutually beneficial payer relationships 5.4 Provide transplant-specific counseling and coordination to patients and families
6. Aggressive management of performance outcomes: Optimize transplant program performance through the implementation and use of protocols, research and innovation, and data-driven quality improvement/performance.	6.1 Implement protocol-driven, standardized care 6.2 Be on the cutting edge: be a research leader and innovator 6.3 Implement data-driven continual quality improvement

can be shared with other improvement teams. Typically, changes that work in one setting must be adapted for use in another, depending on the culture, personalities, skills, and practices at the new institution. PDSA cycles help institutions test these changes from other programs and adapt them for use in a new environment. The change package created for the TGMC consists of 6 strategies/drivers and corresponding sets of key change concepts and action items. The strategies/drivers represent very broad and common attributes that were identified among the various high-performing centers. Key change concepts that correlate with each strategy driver offer specific examples of ideas to be tested. Finally, the action items provide concrete examples from the high-performing centers of how each change concept works.[15]

The 6 TGMC change package strategies are described here. The specific change concepts are provided in Table 2.[15] The action items that are part of the TGMC change package can be found at http://www.healthdisparities.net/hdc/hdcsearch/isysquery/a55595c8-2ea7-43c2-8e54-4cdeac54b5a8/8/doc/.

Strategy 1: Institutional Vision and Commitment

This leading strategy emphasizes the critical importance of commitment to and support of the transplant center by the organization within which it is housed. Effective transplant programs demand high-intensity resources such as person hours, operating room space, space in the intensive care unit, and regulatory expertise. It takes the support of the entire organization to meet all of these demands successfully. The key concepts

in this strategy describe how transplant programs must correlate their mission, vision, and goals with that of their broader institution if they are to obtain the necessary resources to maintain and grow their program. Programs must provide internal education about their mission, outcomes, and needed resources to ensure a sufficient degree of awareness within the corporate suite to garner the support and investment required.[15]

Strategy 2: Dedicated Team

Not only do transplant programs need the support of senior leaders from their institution, but they also must be staffed with highly skilled and dedicated transplant specialists who are devoted to building the program and providing the best possible care to patients. A key change concept of this strategy is having a team that is led by focused and committed physicians and surgeons who are dedicated to carrying out the mission and vision of the program and institution. These surgeons and physicians have a passion to create highly successful programs that perform a significant volume of transplants while maintaining expected or higher than expected outcomes. To partner with these medical professionals, the centers recruit and retain staff that is specialized, dedicated, and committed to successful transplantation. The centers focus on recruitment and retention of staff members who are specialized in transplant and whose vision aligns with that of the transplant center. Each member of the multidisciplinary team has a unique and specialized area of knowledge that must be considered when providing care to patients. These team members work collaboratively and value each member of the team equally.[15]

Strategy 3: Aggressive Clinical Style

In order to grow their programs, high-performing teams must be innovative in their approach to accepting and using organs. Each visited center demonstrated an evidence-based, aggressive clinical style that valued increasing the volume of transplants without compromising clinical outcomes. One key concept to achieve this goal is creating a high threshold for organ and recipient refusal. Many of the centers found it important for the surgeon to be involved in all organ offers, which enabled the program to identify the right organ for the right recipient.

Also, the use of data from the OPO regarding the outcome of organs that were rejected by the program but accepted and transplanted elsewhere helped surgeons to determine whether the declined organ should have been retained within their program. Not only did these surgeons accept more organs, but they also expanded their acceptance of various recipients and developed evidence-based protocols to care for these higher morbidity patients. This strategy also focuses on optimizing transplantation through effective waitlist management.

The composition of the program's waiting list must be diverse and large enough to successfully accommodate a variety of organ offers. Streamlining the flow of patients from referral through evaluation and listing is essential in the pretransplant management phase. Some centers instituted a "top 10" review of the highest ranked candidates on the waiting list so that coordinators and surgeons could maintain a keen awareness of the patients most likely to receive an organ offer in the coming hours, days, or weeks. High-performing programs also reached out to referring communities to encourage a collaborative partnership with the transplant center. Some centers created treatment protocols and/or educational material for referring physicians to provide care to their patients after transplant. Partnerships also extended to the local OPO to implement best practices. High-performing transplant centers collaborated with their OPOs to ensure that donors were being managed in a way to optimize organ viability and usability.[15]

Strategy 4: Patient- and Family-Centered Care

The transplant centers found that placing the needs of the patients first and foremost helped produce the best outcomes possible. These centers analyzed their delivery of care through the eyes of every patient and adapted their health care services to be as convenient to patients and their families as possible. Transplant recipients are typically chronically ill people who experience a life-changing surgical procedure and are faced with a plethora of new information and new health management expectations upon receipt of the organ. Shaping the management of care so that patients can meet their health care, educational, and emotional needs is of utmost importance. A key change concept for this strategy is providing more efficient care by removing patient access barriers and streamlining work flow. This patient-centered care model creates a health care environment that focuses on the needs of the patient and creates a streamlined process from referral through evaluation and listing.

Some centers created a transplant clinic where patients would be seen before and after transplant so recipients would already be familiar with the clinic process after receiving their organ; other centers ensured that patients had access to their health care providers 24 hours a day, 7 days a week. Another key change concept focuses on the need to provide education to patients early and often. Transplant patients are faced with many new health management regimens after transplant. By teaching patients self-management strategies, patients can better understand their role and responsibility as a transplant recipient. One example is providing "drip education" to ensure patients are educated consumers

of health care by slowly providing patients with education throughout the transplant process, thus allowing ample time for absorption of the material.

Also important is to offer various types of education to meet the learning needs of the patient. Transplant programs also must support the patient's family throughout the entire transplant process. Creating a family friendly environment that provides support to the "supporter" is a goal of many of the centers. One center has a hospitality house that provides a homelike environment that houses the families of transplant recipients.[15]

Strategy 5: Financial Intelligence

Achieving and maintaining the financial health of a transplant program through a mix of strategies, processes, systems, and necessary skills was deemed an important factor by the transplant centers. This process involves successful management of financial planning by understanding program finances, maximizing third-party reimbursement, establishing beneficial payer relationships, and providing financial counseling to patients and their families.[15]

Strategy 6: Aggressive Management of Performance Outcomes

Programs cited the importance of aggressively managing the outcomes of patients through the use of protocols, research, and data-driven quality improvement. One key change concept for this strategy stresses the importance of providing patients with evidence-based standardized care. Another change concept builds on this by emphasizing the need to ensure care is innovative and on the cutting edge. Finally, this strategy focuses on implementation of data-driven quality improvement. Centers emphasized the need to employ a quality improvement specialist who focuses on the data on a daily basis and reviews these data with program leaders regularly.[15]

Transplant Growth and Management Collaborative

The purpose of the TGMC was to disseminate the information described in the HRSA best-practice report with the goal of achieving 20% increases in transplant volume at participating centers. The TGMC occurred from October 2007 through October 2008 and consisted of 3 learning sessions. The purpose, or aim, of the initiative, in partnership with HRSA's previous collaboratives, was to save or enhance thousands of lives a year by spreading known best practices to the nation's transplant hospitals to reach an annual goal of 35 000 deceased donor organs transplanted. More than 120 transplant centers along with their partnering OPOs from across the country participated in at least 1 of the 3 learning sessions (although each participating center was expected to attend all 3 learning sessions). A strategy was created to measure the quantitative progress of the collaborative. Transplant volume was tracked as the outcome measure, and volume changes were benchmarked against the goal of increasing transplant volume by 20% in a major organ such as heart, liver, or kidney over the base period of July 1, 2006, to June 30, 2007. The process measure tracked from the transplant center was the number of days between referral for transplant evaluation (as defined by the transplant center) and the date each candidate became active on the Organ Procurement and Transplant Network (OPTN) waiting list.

An additional process measure reflected the effectiveness of the donation service area's ability to optimize organ viability of all consented donors and maximize organ utilization as a result. This measure, known as "percent donor management goals met," required OPOs, donor hospitals, and transplant programs to set specific hemodynamic targets for several key donor clinical variables and assess the frequency with which these targets were met. Participating OPOs indicated the number of cases in which 100% of the donor management goals were met, and assessments were made at the national level as to whether this measure was linked to a higher number of organs transplanted per donor.

Collaborative teams were encouraged to identify a process that needed improvement and to organize a team of individuals who knew the process, could clarify current knowledge of the process, understood the causes of process variation, and could identify tests of change to improve the process and then report the results of these tests of change via reports to the national collaborative leadership team. These reports were qualitative descriptions of various PDSA cycles implemented within the organization to meet the purpose of their improvement efforts. Many of the participating centers created PDSAs that were dedicated specifically to the Collaborative's overall goal of increasing the volume of organ transplants within their center.

Common themes of PDSAs that were dedicated to this goal emerged as the TGMC progressed. These themes included increasing organ acceptance rates of standard criteria donations, extended criteria donations, and donations after cardiac death; use of virtual cross-matching; increasing conversion rates; increasing acceptance rates for transplant candidates; waiting list management; outreach projects to increase referral rates; and review of organs offered to a center that were turned down and accepted elsewhere. One center-specific example of a PDSA implemented by a TGMC participant is described in the following section.[16]

Center-Specific Plan-Do-Study-Act Example

Plan

The NewYork-Presbyterian Hospital team partnered with its OPO to review organs that were accepted

or turned down by other local programs by establishing a weekly call with the OPO to review accepted versus turned down organs for each site within the donation service area. This gave the team the intelligence it needed to focus its programs to accommodate more, and different types of, organs. A 30-minute call each week to review the entire area's organ offers provided a meaningful medium for dialogue and discussion. Although some organs were rejected for clinical reasons, a clear identification of other factors such as operating room capacity/availability and other operational reasons for rejection helped guide the team.

Do

OPO representatives were invited to team meetings, and a team member was chosen to act as a liaison to the OPO.

Study

Acceptance and refusal patterns and outcomes of allocated organs were analyzed.

Act

A comprehensive quality dashboard was developed for each organ type. The dashboard lists total referrals, total consultations, evaluation by organ type, arrived, no shows, waiting list additions, waiting list removals, medical reasons for removal, financial reasons, transfers in and transfers out, as well as a host of other metrics. The dashboard is shared with an interdisciplinary team on a monthly basis and helps define the growing needs of the programs (eg, availability of operating room time, availability of operating room teams, and availability of intensive care units). Timely feedback to the OPO about program growth and needs is essential as we collaborate together to continually meets the needs of our patients.[16]

Results

According to the senior leader reports submitted by the teams, the team described in the preceding section was not unique in its implementation of rapid tests of change. Numerous teams reported that they were developing successful ways to implement changes in each of the 6 change package strategies (Table 3). Examples of successful change implementation included building stronger partnerships with OPOs, streamlining the process of referral to listing, establishing a more robust quality improvement program, increasing education programs for patients and referring health care providers, increasing the acceptance of extended criteria and donation after cardiac death organs, extensively reviewing organ offers, and improving waiting list management.

To determine the effect of the TGMC on achieving the 20% volume growth goal at participating programs,

Table 3 Percentage of Transplant Growth and Management Collaborative teams reporting a successful model is in place for a specific strategy (N = 49)

Strategy/driver	% of teams reporting a successful model in place
1. Institutional vision and commitment	77.5
2. Dedicated team	65.3
3. Aggressive clinical style	46.9
4. Patient- and family-centered care	69.4
5. Financial intelligence	53.1
6. Aggressive management of performance outcomes	40.8

OPTN data were reviewed and volume changes between the baseline and TGMC time periods were assessed. Table 4 displays the percentage of teams that experienced volume increases when the volume from the year before the Collaborative (November 2006-October 2007) is compared with the year of the Collaborative (November 2007-October 2008). Table 4 also includes the overall percentage increase per organ. The overall number of deceased donor transplants at participating centers the year before the Collaborative was 15 953, compared with 16 115 the year of the Collaborative. This relatively small change may be due to the success of the Collaborative or it may be due to other circumstances such as changes in organ allocation policy or changes in medical/surgical staffing. The data may be too new to reflect the true results that may have occurred with this collaborative.[17]

In addition to the volume goals, participating programs also committed to decreasing the number of days from candidate referral to being listed to receive an organ. Data reports submitted by 44 of the 120 TGMC teams that attended a learning session showed 72.7% experienced a decrease in median number of days between referral to active listing on the OPTN candidate registration list in at least 1 organ group when baseline data (data from the first month reported by the transplant center) are compared with August 2008.[18]

Data submitted by participating OPOs indicated that if donor management goals were met, the number of organs transplanted per donor was higher than if the donor management goals were not met. Also the participating OPOs experienced an increase in the total number of organs transplanted per donor as demonstrated by comparing baseline data submitted in November 2007 with data submitted in August 2008 (Table 5).[19] This relatively small increase may have been due to chance; however, the increase may also be attributed to participation of the OPOs in the Collaborative.

Many of the PDSAs completed by the OPOs that were reported on the qualitative report were focused on

Table 4 Transplant center volume

Organ	Total No. of centers	% of centers that experienced a volume increase ≥20%[a]	% of centers that experienced a volume increase between 0.1% and 19.9%[a]	% of centers that experienced a volume increase greater than 0%[a]	% of total volume increase for all centers participating in Collaborative[a]
Kidney	121	31.4	19.0	50.4	1.5
Liver	73	19.2	23.3	42.5	-1.4
Heart	76	32.9	14.5	47.4	1.1
Pancreas	87	35.6	57.5	41.4	-4.7
Lung	44	38.6	25.0	63.6	9.2
Intestine	17	29.4	5.9	35.3	-11.8
All organs	124	25.0	27.4	52.4	1.0

[a] Does not account for centers that had 0 in the first time period and >0 in the second time period.

improving the center's hemodynamic management of donors to improve the number of organs transplanted per donor. Again, the data may be too new to reflect the true results that may have occurred with this collaborative.

Discussion

Overall, it is too early to determine the full effect of the TGMC. The goal of 20% growth in transplant volume at participating programs has yet to be achieved. Undoubtedly, the most important reason for this outcome is the stagnant number of donors in the United States in 2007 and 2008. Recent data indicate that the number of deceased donors in 2008 (7984) is less than the number of donors in 2007 (8085).[20] Without additional donors, the transplant centers are limited in the number of deceased donor transplants they can perform.

Another possible reason for not experiencing a volume increase may be that the timing of the TGMC correlated with the publication of new regulatory requirements by the Centers for Medicare and Medicaid Services. Efforts to comply with these new regulations required a substantial commitment of time and effort on the part of administrative and clinical personnel at every transplant center. These efforts typically were prioritized ahead of reviewing the TGMC change package, conducting tests of change (PDSA cycles), submitting data and senior leader reports, attending national learning sessions, and participating in monthly team conference calls. The TGMC faculty went to great lengths to identify opportunities to demonstrate synergy between the goals and activities of the TGMC and federal regulatory compliance efforts by highlighting how use of PDSA cycles and the change package could help centers prepare for compliance inspections. Many of the changes that centers made to adhere to the regulatory requirements were best practice suggestions from the change package.

The Collaborative's primary goal is yet to be achieved, but via the TGMC change package, the groundwork is now being laid to enable transplant programs to anticipate, plan, and prepare to perform more transplants. Although not every participating center achieved the goal, many did. And with this accomplishment, not only are there lessons to share with other transplant programs about how to do it, but because of HRSA's commitment to continue its annual National Learning Congress, there will be an ongoing forum to broadly disseminate the information to a multidisciplinary audience.

The premise of the TGMC was to teach transplant centers how to implement changes within the organization that could result in improvement. Although the quantitative data might not reflect these changes for years to come, anecdotal information from the qualitative reports from senior leaders provided by many of the participating teams suggest that PDSAs are occurring at the participating transplant centers and are resulting in process improvements. During this collaborative, transplant program staff reached out to the hospital's quality improvement professionals (in many cases for the very first time) to gain a better understanding of PDSA cycles, to map system processes (such as the transplant candidate referral and evaluation process), to determine whether and how improvements could be made, and to conduct specific tests of change to achieve their goals. The TGMC provided the opportunity for many quality improvement professionals to meet and exchange ideas and experiences that could improve their local programs.

Building improvement-focused relationships within a single hospital and among many hospitals could have a substantial effect on the transplant community if these relationships are sustained. Additionally, the opportunity for quality improvement professionals from each of the 3 estates (donor hospitals, OPO, transplant programs) to map the continuum of the donation and transplantation system at the level of the local donation service area could lead to better detection of improvement

Table 5 Correlation of donor management goals (DMGs) met to number of organs transplanted per donor (OTPD)

		Donors where DMGs were met 100%			Donors where DMGs were NOT met 100%			All donors		
Month	No. of OPOs reporting	Donors	Organs transplanted	OTPD goals met	Donors	Organs transplanted	OTPD goals not met	Total donors	Organs transplanted, All	Overall OTPD
Nov 07	37	177	601	3.40	274	719	2.63	451	1320	2.93
Dec 07	38	162	550	3.39	297	803	2.70	459	1353	2.95
Jan 08	34	157	558	3.55	224	566	2.53	381	1124	2.95
Feb 08	33	182	601	3.30	270	703	2.60	452	1304	2.89
Mar 08	34	164	548	3.34	245	642	2.62	409	1199	2.93
Apr 08	36	177	610	3.44	256	725	2.83	433	1335	3.08
May 08	34	265	793	3.37	265	793	2.99	430	1348	3.14
June 08	33	133	456	3.43	223	615	2.76	356	1070	3.01
July 08	32	153	588	3.84	196	554	2.83	361	1142	3.16
Aug 08	28	129	453	3.51	199	569	2.86	327	1022	3.13

Abbreviation: OPO, organ procurement organization.

opportunities, more robust tests of change and, ultimately, greater organ availability, utilization, and successful transplantation for candidates on the waiting list.

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None reported.

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