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Evaluation of a Health Care Transition Improvement Process in Seven Large Health Care Systems

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ABSTRACT

Purpose: Youth and young adults require systematic planning, transfer and integration into adult healthcare. A national health care transition (HCT) learning network (LN) shared strategies during monthly calls to improve HCTs using Got Transition™'s Six Core Elements. Among LN participants, we conducted a pre-post mixed-methods evaluation of this evidence-informed process improvement framework.

Design and methods: Leaders from seven health systems in the LN recruited 55 participating practice sites (12 primary care, 43 specialty care, 47 pediatric care, and 8 adult care). Got Transition's Current Assessment (CA) of HCT Activities (possible score: 0–32) assessed implementation of HCT process improvements in all 55 sites at baseline (2015–2017) and again after 12–18 months. Pre-post results were compared overall and by type of practice (primary vs. specialty, pediatric vs. adult). In early 2018, health system leaders qualitatively described factors impacting HCT process implementation.

Results: Overall, baseline CA scores averaged 10.7, and increased to 17.9 after 12–18 months. Within each clinical setting, scores increased from: 10.8 to 16.5 among 12 primary care sites, 12.8 to 17.1 among 43 specialty sites, 12.4 to 17 among 47 pediatric sites, and 12 to 16.9 among 8 adult sites. All changes reached significance ($p < 0.05$). Qualitative feedback offered valuable feedback about motivators, facilitators and barriers to HCT process improvement.

Conclusions: Participating systems made substantial progress in implementing a structured HCT process consistent with clinical recommendations using the Six Core Elements.

Practice implications: The diverse perspectives of participating health systems provide a model for creating sustainable HCT process improvements.

Introduction

Pediatric healthcare professionals across subspecialty and primary care settings face the pressing challenge to improve their patients' health care transition (HCT) from adolescent to adult health care. With advances in pediatric care, the number of youth surviving into adulthood with chronic conditions has dramatically increased (Burns et al., 2010; Perrin, Bloom, & Gortmaker, 2007; Stoll et al., 2010; Van Cleave, Gortmaker, & Perrin, 2010) which greatly adds to the complexity of the transition process. The transition age group, defined to include individuals aged 12 through 25 years, includes >61 million individuals or 19% of the United States population (U.S. Census Bureau, Population Division, 2018). Nearly 30% of the transition age group has a diagnosis of one or more chronic conditions (Bonnie, Stroud, & Breiner, 2014). Yet, according to the 2016 National Survey of Children's Health, 85% of

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youth with and without chronic conditions report not receiving transition planning support from their health care clinicians (Data Resource Center for Child and Adolescent Health, n.d.; Lebrun-Harris et al., 2018). Unplanned HCTs for youth with childhood onset chronic disease are often associated with discontinuity of care (Montano & Young, 2012; Refaeli, Mangold, Zeira, & Köngeter, 2017), difficulties with treatment adherence (Annunziato et al., 2007), excess morbidity (Jordan, Swerdlow, & Coates, 2013), patient and family dissatisfaction and worry (Garvey et al., 2012; Shaw, Southwood, & McDonagh, 2007), and preventable emergency room and hospital visits (Fortuna, Robbins, Mani, & Halterman, 2010; Shepard et al., 2018).

Pediatric clinicians, families, youth, young adults, and health systems are calling for improvements in continuity of care from the pediatric to the adult setting (Gray, Schaefer, Resmini-Rawlinson, & Wagoner, 2017; Lemke, Kappel, McCarter, D'Angelo, & Tuchman, 2018). A recent systematic review found that structured HCTs result in improvements in the "triple aim" of health care, including 1) experience of care, 2) population health, and 3) utilization of care (Gabriel, McManus, Rogers, & White, 2017). In 2018, the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), and the American College of Physicians (ACP) jointly updated recommendations for a coordinated approach to HCT, targeting all youth beginning at age 12 and continuing into young adulthood (Cooley, et al., 2011; White, et al., 2018). The consensus statement outlines an update to the individualized planning, transfer, and integration between pediatric and adult care that is needed to overcome complications related to HCT by improving health literacy and effective use of health services (White, et al., 2018).

The National Alliance to Advance Adolescent Health's Got Transition™ developed a practical, structured approach to HCT with customizable sample tools and measurement resources called the Six Core Elements of HCT™ (Got Transition Center for Health Care Transition Improvement, 2014). Consistent with expert recommendations (Cooley, et al., 2011; White, et al., 2018), this toolkit (Got Transition Center for Health Care Transition Improvement, 2014) provides a structured process for HCT. The toolkit provides a framework to guide the implementation of patient and family preparation prior to transfer, and to ensure that appropriate integration and feedback occurs after transfer to an adult care model is complete (Betz, 2018). The Six Core Elements are presented in three packages for different settings for the transitioning youth and young adult: 1) Transitioning to an Adult Health Care Provider (for pediatric, family medicine and combined internal medicine-pediatrics clinicians), 2) Transitioning to an Approach to Health Care Without Changing Providers (for family medicine and combined internal medicine-pediatrics clinicians), and 3) Integrating Young Adults into Adult Health Care (for internal medicine, family medicine and combined internal medicine-pediatrics clinicians). The Six Core Elements are aligned with the joint AAP, AAFP, ACP clinical report (White, et al., 2018). They include the following steps for youth transitioning to an adult care provider: 1) Transition Policy, 2) Transition Tracking and Monitoring, 3) Transition Readiness, 4) Transition Planning, 5) Transfer of Care, and 6) Transfer Completion. The Six Core Elements provide a similar process for young adults integrating into an adult care model, and specific steps include: 1) Transition and Care Policy, 2) Tracking and Monitoring, 3) Orientation to Adult Practice, 4) Integration into Adult Practice, 5) Initial Visit, and 6) Ongoing Care. Each package includes a measurement tool to assess the level of HCT activity in the practice (Got Transition Center for Health Care Transition Improvement, 2014).

Implementing a standardized approach to HCT into current practice is a complex, multi-step intervention. Got Transition's Six Core Elements were originally tested in a formal learning collaborative in primary care settings and investigators demonstrated the effectiveness of the structured, planned process in pediatric, adolescent, family medicine and internal medicine practices (McManus et al., 2015). Building on previous success, and consistent with best evidence in successfully disseminating other healthcare innovations (Balas & Chapman, 2018; Wells et al., 2018), Got Transition next created a national HCT learning network (LN). The primary aim of the LN was to bring together a team of motivated leaders from diverse healthcare systems to learn, apply and share HCT improvement methods, and to promote the sharing of their ideas and data on service performance.

In 2015, Got Transition invited four large health systems to join the national LN, selected based on a self-identified interest in HCT and a commitment to try incorporating the Six Core Element approach. In 2016–2017, three additional systems were invited to join the LN, also based on self-identified interest. This is the first publication that provides a synopsis of the early implementation over a 12–18 month period of the Six Core Element structured transition process in seven health systems involved in the LN. Specifically, we aimed to evaluate the feasibility and effectiveness of implementing the Six Core Elements in various large health systems engaged in a LN using process data and qualitative health care professional feedback.

Design and methods

Setting and participants

This is a pre-post study of a structured HCT process implementation using the Six Core Elements, conducted over 12–18 months within seven health systems: six integrated health care delivery systems (four ACOs, a federally qualified health center, and a military health facility) and one free-standing children's hospital. Got Transition's co-director coordinated the LN, and team members included health system leaders representing seven large and diverse system perspectives, and various clinical backgrounds, including physicians, nurse practitioners and social workers. The LN comprises 55 clinical practice sites: 12 primary care, 43 specialty care, 47 pediatric care, and eight adult care (see Table 1).

Study methods received IRB approval and/or exemption status as a QI initiative from all participating institutions.

Learning network activities

Each of the seven LN members served in a local leadership role within their system and gained senior leadership support and buy-in to actively back the project. At the outset, LN members recruited local QI project teams, including both pediatric and adult clinicians, health system staff and consumers. Got Transition's co-director facilitated conversation with the LN health system leaders on monthly one-hour phone calls. The LN team collaborated to establish a common base of knowledge regarding HCT clinical recommendations, QI methods, and the Six Core Elements of HCT. On a monthly basis, LN site leaders rotated the responsibility for reporting on local approaches to implementing the Six Core Elements, and shared lessons learned about challenges and accomplishments in the HCT improvement process. Over the project period, site leadership did not change and LN participants were not compensated by Got Transition.

Measures and analysis

Representatives from local QI project teams within participating clinic sites at the seven health systems in the LN completed the Got Transition's Current Assessment (CA) of HCT Activities (Got Transition Center for Health Care Transition Improvement, 2014) as a measure of process implementation of the Six Core Elements. The CA is a self-assessment tool that allows practices/systems to rank their level of implementation in each core element domain, as well as in consumer feedback and leadership. The ranking is along a continuum from level 1 (basic) to level 4 (comprehensive). Each level is defined by a brief narrative description specific to the core element. For example, in the Transitioning to an Adult Health Care Provider package, when

Table 1
Learning network (LN) health systems, clinic sites and site leadership professions.

Health system	Geographic region	Clinic sites	Site leader profession
#1	Great Lakes Region	1 adult and 1 pediatric primary care clinic	Pediatric Nurse Practitioner
#2	Great Lakes Region	2 pediatric and 2 adult primary care clinics	Physician
#3	West South Central Region	2 pediatric primary care and 31 pediatric subspecialty clinics	Master's Level Social Worker
#4	South Atlantic Region	3 subspecialty pediatric clinics	Physician
#5	Pacific States	1 pediatric and 1 family practice primary care clinic	Pediatric Nurse Practitioner
#6	Middle Atlantic Region	5 pediatric subspecialties, 3 adult subspecialties, 1 pediatric primary care, 1 adult primary care	Physician
#7	South Atlantic Region	1 subspecialty pediatric clinic	Nurse Practitioner and Physician

considering implementation of a transition policy (Core Element #1), clinicians may endorse a range of responses. Level 1 depicts clinicians in a practice "vary in their approach to health care transition, including the appropriate age for transfer to adult providers." Level 4 notes that "the practice has a written transition policy or approach, developed with input from youth and families that includes privacy and consent information, a description of the practice's approach to transition, and age of transfer. Clinicians discuss it with youth and families beginning at ages 12 to 14. The policy is publicly posted and familiar to all staff." Total scores on the CA tool range from a low of 8 to a high of 32 (Got Transition Center for Health Care Transition Improvement, 2014).

The CA was completed at the start of the project and repeated after 12–18 months of implementation. Each of the 55 clinical sites had a clinician champion who was responsible for completing the initial and follow up CA for that site. Pre-post results were compared over time using repeated measures *t*-tests, as well as between groups using independent measures t-tests based on type of practice, primary vs. specialty, and pediatric vs. adult. A clustering analysis was performed to detect the influence of regional variation on the overall changes reported, as our data included variable numbers of clinic sites within each health system, and variable health system within a geographic region. The Stata 14 MP statistical software program was used in the final analysis. Cohen's d was calculated as a measure of clinical significance (Ellis, 2010).

Descriptive and qualitative data were collected from health system leaders in the LN in an effort to explain how implementation of the Six Core Elements and HCT practice change differed across health systems and local clinic sites. In early 2018, the seven health system leaders completed written, open-ended surveys reporting on the current status of implementation of each Six Core Element (see Table 2) and all seven provided written qualitative feedback detailing facilitators and barriers of the implementation of a standardized HCT QI approach. Next, all seven health system leaders participated in a semi-structured focus group discussion by telephone, discussing the feasibility and usefulness of individual core elements, and the potential for more wide-spread dissemination of a structured transition QI process. A content analysis of written and focus group responses assessed for key motivating factors and facilitators of innovation and practice change, recurrent challenges, and implementation concerns.

Results

Current Assessment tool data

Significant progress was made in implementing a structured HCT process consistent with clinical recommendations among all 55 sites, including primary and specialty care sites in both pediatric and adult clinic settings, as shown in Table 2. Overall, the mean CA score increased by 37.1% from 12.4 at baseline to 17.0 (possible range 8–32) after 12–-18 months of LN involvement. This represents a change from a mean CA level of 1.6 to 2.1 (possible range 1–4). Among the 12 primary care sites, scores increased by 52.8% from 10.8 to 16.5 (average change in level from 1.4 to 2.1). Total scores rose by 33.6% for the 43 specialty sites from 12.8 to 17.1 (average change in level from 1.6 to 2.1). For the 47 pediatric sites, scores went up by 37.1% from 12.4 to 17 (average change in level from 1.6 to 2.1), and for the eight adult sites, scores went up by 40% from 12 to 16.8 (average change in level from 1.5 to 2.1). All changes reached statistical significance ($p < 0.05$), and large effect sizes (Cohen's $d > 0.8$) support clinical significance. A clustering analysis continued to reveal statistically significant differences between baseline and follow up CA scores, both at the "health care system" level (7 clusters, $p = 0.012$) and at a "geographic region" level (5 clusters, $p = 0.026$).

Baseline scores between subspecialty and primary care sites differed significantly (12.8 vs. 10.8, $p = 0.01$); however, at follow up no differences existed between these practice settings. No statistically significant differences in CA scores were identified between pediatric and adult clinical practice settings at baseline or follow up (Table 2).

Description of Six Core Element implementation

After the initial 12–18 month implementation period, most of the seven health system leaders had reported the successful implementation of transition policy (#1) and transition readiness and/or young adult orientation (#3) Core Elements. Almost all health systems reported making attempts at implementing all but the final Core Element (#6), obtaining youth and family feedback (Table 3).

Table 2
Current Assessment (CA) of HCT implementation pre/post scores by practice site.

	n Clinic sites	n Health care systems	Baseline CA Level Mean	Follow up CA level Mean	Baseline CA score Mean (SD)	Follow up CA score Mean (SD)	Percent change	P-value (pre-post)	Cohen's d
All sites	55	7	1.6	2.1	12.4 (4.5)	17.0 (4.7)	37.1%	<0.01	1.01
All pediatric sites	47	7	1.6	2.1	12.4 (4.4)	17.0 (4.7)	37.1%	<0.01	0.97
All adult sites	8	4	1.5	2.1	12.0 (5.0)	16.8 (4.9)	40%	<0.01	0.97
P-value (between groups)	–	–			0.63	0.88		–	
All subspecialty sites	43	4	1.6	2.1	12.8 (4.3)	17.1 (4.6)	33.6%	<0.01	0.97
All primary care sites	12	5	1.4	2.1	10.8 (5.0)	16.5 (5.1)	52.8%	<0.01	1.12
P-value (between groups)	–	–			0.01	0.52		–	

Table 3
7 LN sites implementation of the Six Core Elements (6CE).

Health System	Clinic Type	#1 Policy	#2 Tracking	#3 Readiness & Orientation	#4 Planning & Integration	#5 Transfer & Initial Visit	#6 Feedback & Ongoing Care
#1	Pediatric PC						
	Adult PC						
#2	Pediatric PC						
	Adult PC						
#3	Pediatric PC						
	Pediatric SC						
#4	Pediatric SC						
#5	Pediatric PC						
	Family Medicine						
#6	Pediatric SC						
	Adult SC						
	Pediatric PC						
	Adult PC						
#7	Pediatric SC						

Table 3 Key	
	CE Attempted, Mostly Implemented
	CE Attempted, Not Yet Implemented
	CE Not Yet Attempted
CE = Core Element, PC = primary care, SC = subspecialty care	

Qualitative feedback

All health system leaders in the LN confirmed that having regular calls improved accountability and facilitated shared learning to enable the continuous adaptations needed to implement more efficient and sustainable approaches to HCT. LN members engaged in brainstorming around key activities needed to establish a HCT process: initiating and sustaining practice change, identifying and overcoming barriers, and individualizing recommended processes based on contextual factors.

Initiating innovative health care transition process improvement

LN representatives described several shared factors motivating senior leadership within their respective health systems to invest in HCT QI. These included: 1) Families, providers, and health system leadership expressed shared concerns about the absence of a structured HCT process, 2) Many young adults were lost to follow up within integrated delivery systems, and 3) Timely access to specialty pediatric care and clinicians needed to be improved.

Sustaining motivation to address health care transition practice change

LN representatives selected the Six Core Elements because it provided an evidence-informed approach aligned with the 2018 AAP/AAFP/ACP clinical report to guide the process (White, et al., 2018). Also, the sample tools were easily adaptable to diverse patient populations within pediatric and adult settings.

Beyond sharing a standardized framework to promote practice change, LN members cited the importance of achieving buy-in from other key stakeholders, including clinicians, staff members, patients and families. Most LN representatives chose to work with practices in their systems who had an easily identifiable champion for transition planning efforts, and many cited combined internal medicine-pediatric champions as facilitators of this work. Many found it helpful to target primary care populations or groups with a single chronic condition before attempting to replicate a systematic process with more medically complex patient populations. The majority of the LN participants selected a pilot population and clinic sites within their health system to model the process before trying to disseminate throughout the health system.

Identifying common barriers to full implementation

The LN representatives commented that this transition improvement process takes time. A key barrier cited by many was the lack of time to incorporate HCT tools easily and quickly into the electronic medical record (EMR). Additionally, most LN systems look forward to incorporating the remaining Core Elements of youth and family feedback, a crucial component to ensuring that all key stakeholders are engaged in HCT improvement efforts.

Overcoming common challenges

While some health systems acquired administrative support (i.e. project coordinator, clinician administrative time), others implemented the HCT QI process without this dedicated time or staff support. Those without protected time noted that having support for their time to work on implementing this structured HCT process would have resulted in faster incorporation of the process into their systems. Others cited the importance of basic working knowledge in QI methods to support health systems change efforts before engaging in transition-specific QI.

Individualizing the step-wise Six Core Element approach

All LN sites began implementing the Six Core Elements by customizing a health care transition policy (Core Element #1). Each site was creative on how they decided to share their policy with youth and young adults, and their families. Draft policies were reviewed by youth and families via Plan-Do-Study-Act cycles and revised accordingly. Examples of dissemination of the HCT policy among the LN include incorporating policy statements in the after-visit summary (AVS), patient portal communications, clinic websites or paper handouts.

The creation of a registry (Core Element #2) often required EMR changes and was more difficult to implement than other processes. For this reason, many LN members reported skipping this Core Element or moving on to other Core Elements before fully implementing this process.

Most of the LN sites designed customized transition readiness and self-care skill assessment tools (Core Element #3). The three major issues in implementing a standardized assessment into routine care were: 1) deciding on when and how the assessment would be given, 2) creating written resources and scripted anticipatory guidance for addressing self-care skill needs, and 3) incorporating the assessment

results into the EMR. The clinic processes used by each site varied most around disseminating the readiness assessment. Strategies included using a system's electronic health portal to send the assessment to the youth, and providing HCT information and resources such as counseling scripts for health care professionals, as well as written and media-based resources for patients and families.

Creating a transition plan and medical summary and emergency care plan (Core Element #4) that incorporated the results of the readiness skill assessment was more challenging to implement than the policy and readiness assessment. Plans of care with HCT goals were not consistently created even for those with chronic conditions. Systems often struggled to include simple medical summaries and emergency care plans in a convenient location in the EMR. A solution often involved creating a medical summary template that was completed by clinicians and printed to be shared with youth, family and the receiving clinician.

Transfer of care (Core Element #5), especially in an optimized manner that went beyond preparing a transfer checklist proved to be a challenging process. This time-consuming task involved more deliberate attention to identifying available adult primary and specialty clinicians. Often a key barrier to integration into the adult practice (Core Element #6) was gaining timely access to adult primary care providers. Making direct arrangements with adult primary care appointment systems through special telephone connections or scheduling appointments to accommodate the wait time assisted with more timely appointments. Another barrier was ensuring payment for the initial adult visit if the last pediatric visit was a preventive care visit. One of the systems made a financing change to allow adult providers to receive credit for a visit of a new young adult before the usual one-year time lapse often required by insurance. Still another issue was ensuring continuity of specialty care of young adults with childhood onset conditions. Some of the systems arranged to have the adult primary care clinician consult back to the pediatric specialists while the adult clinician was trained in the subspecialty condition. Until workforce issues improve, this approach allowed for the young adult to be cared for in an adult primary care model.

Discussion

This multi-site transition LN demonstrated statistically significant improvements in implementing the Six Core Elements in pediatric and adult primary and specialty clinical settings over a 12–18 month period. These improvements were quite consistent across a diverse set of health care systems. Participants in the LN noted the importance of aligning their transition efforts with system-wide strategic priorities. Further, key to implementation was involving both pediatric and adult partners at the outset, starting with motivated pilot populations to customize and refine transition tools, clinic processes, and the delineation of roles and responsibilities. Though health systems made impressive gains, continued levels of improvement are needed across all the Core Elements. This is particularly true for incorporating registry tracking and readiness assessments into the EMR, improving the transfer of care, and enhancing youth and family feedback/engagement throughout the improvement process.

Our findings are consistent with previous evaluations of implementing the Six Core Elements. However, previous studies have been based solely in a single geographic area, system or chronic condition (Hickam, White, Modrcin, McManus, & Cox, 2017; Jones et al., 2017; McDonagh, Southwood, & Shaw, 2006; McManus et al., 2015). Our results suggest that similar success can be seen across various regions, health systems and patient populations. Within this LN, pediatric clinical sites have the largest representation and appear to be leading the HCT effort. However, this may simply reflect the involvement of one large free-standing children's hospital and additional studies should better assess how the responsibility for transition improvement is shared between clinical practice settings. While pediatric sites comprise the majority of those participating in this evaluation, involved adult clinic sites also demonstrated significant improvements. Both pediatric and adult clinics are likely to benefit from aligning priorities and collaborating together.

The collaborative process among professionals from various backgrounds in the LN enabled each site to create a vision for their transition process improvement approach. Clinicians from nursing, social work and physician backgrounds brainstormed together how to convey key messages to youth and families, how often, and through what communication channels. LN participants shared facilitators and barriers to success, adapting strategies to their local work flows. It is likely that this collaborative national LN contributed to participants' success, similar to other studies' demonstrating similar strengths of learning collaboratives in QI efforts (Wells et al., 2018). Gaining senior leadership support for a transition policy, which can often be a substantial hurdle involving layers of bureaucracy, was comparatively easy with this LN because of the initial senior leadership support obtained at the outset of the project. Once LN members acquired senior health system and local clinic site leadership engagement, our results confirm that substantial process improvements can be achieved within an 18 month time period.

An underlying challenge that significantly impeded the progress and efficiency of putting a structured health care transition process in place was the nature of each of the health system's EMR. The consistent lack of functionality of EMRs on health care transition has been identified as a national issue that requires attention. In many cases, the creation of a transition registry became a major barrier to future progress, and therefore LN sites were not required to use a registry to track the numbers of transitioning youth/young adults that received specific core elements. Unfortunately, this limits our ability to report on patient level outcomes, and in many cases impeded QI teams in their efforts to monitor clinically relevant outcomes. Ensuring that local QI teams include representatives with information technology expertise may be necessary to accelerate and achieve the successful implementation of HCT process improvements.

In most cases, involving both pediatric and adult systems in the composition of local QI teams was essential to define optimal short and long term outcome measures and to recommend feasible practice changes. LN leaders endorsed the need to identify more adult providers and the barriers posed by current payment models which prevent pediatric and adult care team members from being reimbursed for shared care as significant difficulties in achieving final Core Elements (#5 and #6), even when both systems of care were involved in the process improvement process. Previous research has shown that many adult providers are genuinely interested in caring for youth with special healthcare needs if their practices are not full. To feel comfortable caring for youth with pediatric onset conditions, they requested infrastructure and educational supports (White, Cuomo, Johnson-Hooper, Harwood, & McManus, 2016). Additional work is needed to ensure that healthcare providers can receive appropriate reimbursement for planning and coordinated transfer efforts during the HCT process.

Despite remaining challenges, the success reported by participating health systems suggests that the Six Core Elements can benefit HCT improvement efforts within other accountable care organizations (ACOs), hospital systems, statewide learning collaboratives, practice improvement projects, and multi-site disease groups. Working with large and diverse systems of care, including 4 ACOs, a major children's hospital, a federally qualified health center, and a military health facility, afforded the group the chance to consider the adaptability of the Six Core Elements approach as well as alternative processes for implementation. Engaged health system representatives appreciated the opportunity to gradually establish a structured process, aided by both the involvement of local health system leaders, as well as the availability of a ready-made set of transition tools and the guided learning approach from Got Transition's co-director. The overall average mean Current Assessment score (17.0, with range 8–32) and level (2.1, with range 1–4) suggest that participating health systems continue to demonstrate highly variable typical practice around HCT improvement activities. These health

systems look forward to the long-term aim of system-wide implementation, building from early successes in pilot clinical practice sites.

Limitations

This project has several limitations. This study aimed to document the feasibility of adopting of a structured process for transition planning, transfer and integration into adult care. This initial study examined process measures, not outcome measures. While the diverse nature of clinical sites, geographic regions and patient populations is a strength of this LN, our data are not sufficient to analyze any confounding effects which may be inherently related to specific practice characteristics. Subsequent studies are encouraged to evaluate the impact of structured transition interventions on quality, experience, and cost (Prior, McManus, White, & Davidson, 2014), as well as the associations between regional variation and HCT process improvement efforts which might impact overall transition success. Another limitation was that our experience may not be generalizable to systems in which senior leadership and clinical champions are not already motivated to incorporate HCT into their health systems. All too often transition pilots begin in a single clinic, led by a single HCT champion, and fail to gain senior buy-in resulting in limited effect on the health system or loss of the effort when the champion moves on to another position. Additionally, QI teams inconsistently involved youth, young adults and families, and our LN and many QI teams failed to incorporate behavioral health team members into HCT process leadership. Ongoing HCT efforts should strive to further broaden inter-professional collaborations and engage all key stakeholders in the improvement process.

Conclusions

All participating health systems reported statistically significant progress across pediatric and adult clinical settings in establishing a structured transition process. This study demonstrated that the Six Core Element approach, sample tools and measurement resources can be adapted to a variety of clinical settings and facilitate early implementation of HCT improvement efforts. While the diverse perspectives and approaches of this LN are a strength, more research is needed to identify other ways to advance this HCT improvement process, identify key strategies to move toward improved HCT process and outcome, and gather youth, young adult, family and provider outcomes and feedback across more clinical settings.

Declarations of interest

None.

CRediT authorship contribution statement

Marybeth R. Jones: Data curation, Formal analysis, Conceptualization, Writing - review & editing. **Tisa Johnson Hooper:** Conceptualization, Writing - review & editing. **Carrie Cuomo:** Conceptualization, Writing - review & editing. **Gary Crouch:** Conceptualization. **Teresa Hickam:** Conceptualization. **Lisa Lestishock:** Conceptualization. **Sarah Mennito:** Conceptualization. **Patience H. White:** Conceptualization, Writing - review & editing.

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