

Challenges in Regionalizing Congenital Cardiac Services: Easier Said Than Done

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Abstract

Regionalization in healthcare services is designed and implemented to address issues related to patient attrition and access, economy of scale, quality care delivery and cost containment. There are issues with duplication of services provided by the centers in close proximity competing for limited market share, resources, expertise and infrastructure to support the program. There are also variations in practice and outcomes across and within the programs with lack of public transparency and accountability from the healthcare delivery system. Regionalization in congenital cardiac services to centers of excellence have been advocated to address this variability in care delivery in the United States. This article proposes value-based practice and cooperation as more practical and sustainable models of care in congenital cardiac surgery.

Keywords: Regionalization; Value-based practice; Cooperation; Congenital cardiac surgery

Introduction

Regionalization in healthcare services is designed and implemented to address issues related to patient attrition and access, economy of scale, quality care delivery and cost containment. There are issues with duplication of services provided by the centers in close proximity competing for limited market share, resources, expertise and infrastructure to support the program. There are also variations in practice and outcomes across and within the programs with lack of public transparency, which collectively warrant the need for centralizing services to improve consistency and quality care delivery.

Congenital cardiac surgery is by far the most complex healthcare delivery service where high-quality care and outcomes are predicated on interplay of multiservice expertise and resources provided by a center of excellence in the region. It is the most scrutinized, as far as quality care delivery and outcomes, in the eyes of the society and public than any discipline in medicine. In 1994, the Society of Thoracic Surgeons developed the Congenital Heart Surgery Database (STS-CHSD) for the centers providing congenital cardiac surgery to voluntarily submit their surgical outcomes as an initiative to improve their practice by comparing to the national benchmark through a confidential feedback report. Over the past decade, there has been numerous initiatives generated by our professional society, parent advocacy group, payers, media and some states regarding public reporting and transparency of hospitals outcomes in congenital cardiac surgery. This has generated many controversies and heated discussions among our profession regarding the accuracy and interpretation of the data given wide variability in case-mix and complexity as well as the flaws and limited fidelity inherent to the analytical and statistical methodology and models [1].

Regionalization in congenital cardiac services has been proposed as a solution to the wide variability in care delivery, practices and outcomes across US centers performing congenital cardiac surgery. This has been primarily based on outcome studies generated from STS-CHSD demonstrating inverse relationship between case volume and mortality as the single denominator and indicator of institutional performance in congenital cardiac surgery. These studies have come up with an inflection point of annual case volume of >300 index cases to achieve optimal survival rate more so for high complexity cases. The studies have even

taken further steps in delineating the number of centers needed to perform the minimum recommended volume suggesting closing nearly half the programs (from 150 to 70) across the state while being cognizant of travel distance constraint (mean travel distance of 31 miles) to have access to the destination centers [2-4].

There is no dispute that a pediatric cardiac program should have all the elements and sophisticated diagnostic and therapeutic services to provide full range of treatments, interventions and surgeries needed to produce consistent high-quality outcomes in all comers. We all want the best care for our patients and programs should be made accountable by our professional society, the state and the community to deliver high quality care in the region. Is regionalization truly the panacea to this complex situation and if so, how practical and feasible is it to implement it in our complex healthcare system?

The purpose of this article is to primarily focus on the socioeconomics, financial and logistics of regionalization in healthcare services and make some practical and sustainable recommendations to ascertain quality care delivery in congenital cardiac surgery.

Methods

A comprehensive literature review was performed searching the PubMed/MEDLINE and Google Scholar databases using combination keywords of regionalization, pediatric cardiac surgery, quality improvement, cost, value-based practice and competition. The results were translated into a comprehensive evaluation of regionalization of healthcare in general and more specifically in congenital cardiac services as relates to socioeconomic, financial and other logistic issues and constraints. This review is also complemented by author's recommendations on alternative models of quality care delivery in congenital cardiac surgery.

Discussion

Socioeconomics & financial constraints

The road to regionalization is arduous and usually hindered by financial, cultural, political, strategic and operational pitfalls. The healthcare systems are reluctant to venture down the path for the fear of losing revenue inflow, the unique service line, loyalty to the community and the state and important referrals and constituencies. It potentially and invariably may incite a cascade of economic and financial downfall on the organization as the result of negative direct and indirect impact to other related services which are financially supported by the revenue generating service line. Relocating services and care providers affects the community trust and loyalty to the organization as far as providing high quality and reliable care. There are also far-reaching cultural and political ramifications in addition to the challenges of understanding the complex revenue and cost dynamics inherent to regionalization of healthcare system. Thus, the hospital executives and staff have the tendency to gravitate toward preserving the services and silo mentality with protective tendencies and myopic interest usually curtailing regionalization efforts.

A cardiovascular service line is perhaps the most robust revenue generating service in a healthcare system, which is comprised of many related services providing comprehensive and sophisticated care. It's high revenue source often supports other underfunded but important medical services which are needed not only for a full-service enterprise to provide high quality academic medical education and training, but also to support the cardiovascular service line in a positive feedback loop. Congenital cardiac service line is the crown jewel of an organization which encompasses and supports many affiliated services with high profit margin despite exuberant cost to the healthcare system. It would be very unrealistic expectation and greatly damaging for an academic medical center or a given program to relinquish a medical service of such a value and importance to education and training to a neighboring competitor diminishing their credibility and ranking in the region and country.

With market forces playing integral role, any negative externalities imposed on regionalization initiatives will carry with it certain costs. Patients have to travel further to receive care, transportation and time costs away from home must be borne. There will invariably be a major opposition from the families and the patients disrupting and limiting their access to services, time off work, travel and relocation costs, and most important of all, being away from support of family, friends, and loved one. All these constraints and more will lead to the under provision of needed care especially in emergency situation and more notably in marginalized and socioeconomically despaired population. The population of children of racial and ethnic minorities is exponentially rising in US and with rapid changes in population demographics and distribution mostly in isolated areas, it will invariably make travel and prompt access to high quality care a major challenge and a valid argument against regionalization. The direct association between distance to a cardiac center and mortality has been clearly demonstrated with 6-fold increase in pre-surgical and 2-fold increase in post-discharge mortality due to delay access to care, lack of prenatal diagnosis, and less experience local hospital managing complex congenital cardiac diseases [5,6]. This trend could be magnified in a sense that the designated centers must accommodate for larger population over a wider geographic area impacting pre-hospital care, diagnosis, management and post-discharge follow-up, which frequently needed to provide expeditious care [7].

The other major obstacle to regionalization in US is the hesitancy of the local state, elected officials and congressional bodies supporting laws that would threaten their constituent's local institutions that are popular and have been serving the community for decades. There are also issues across states such as variations in public health policies, preexisting geopolitical jurisdictions, tensions between formal organizational relationships and informal professional networks. There will be a major hesitancy and apprehension to even entertain the idea of regionalization by the federal government due to uncertainty of its effect on public health and preparedness to deal with pandemic crisis such as Covid-19 and respiratory infection surge. There is also vast variability within the regions and across the state border in terms of their congruence in organizational structure of congenital cardiac service as well

as service competitive markets and payer system. In general, government at all levels face a major challenge in attempting to analyze and turn abstract notions of societal costs and benefits into practical implications when it comes to complex public health project choices.

Other logistics & constraints

Regionalization of congenital cardiac services have been vigorously advocated by our professional society using volume-outcome relationship as the surrogate measure for high quality care delivery [2-4,8]. Their proposal suggests closing at least half, if not more, of the existing programs and somehow to consolidate and accommodated all the related staff into geographically preselected programs while providing care across a wide range of geographic zone and population density. This initiative basically translates into loss of local cardiology and cardiac surgery services, skilled ancillary staff and services, support of other pediatric services. There will be a significant loss of revenue stream from lack of complex imaging, interventional cardiology, electrophysiology, genetics and myriads of care coordination and home screening needed to keep a healthcare system financially solvent. Other constraints to consider are the capacity and financial health of the destination centers to accommodate the new staff, patients' inflow, process capacity, physical space and beds, which will make the regionalization attempt quiet challenging.

The other complicating factor is the design and leadership structure of the organization, hierarchy and most importantly, equitable surgical case allocation among the surgeons while fostering an environment for technical competency, academic growth and eligibility for recertification in the discipline. There are going to be cultural and structural design challenges as well as trade-offs which members and leaders of the organizations will have to face and embrace. There are multitude of possible architectural structures with formal/informal, hierarchical, divisional, functional or matrix design with unique incentive, coordination and negotiation mechanisms that will be imposed transitioning from one organization to the next. There is a potential for fierce hesitancy of the leaders of the abandoned programs to become subordinate of the leaders of the centralized location curtailing productivity, innovation and loyalty to the program. There also will be attrition in the number and case-mix of index procedures allocated fairly to all the surgeons, which will create a competitive than a collaborative environment among the partners. The American Board of Thoracic Surgery (ABTS) mandates performing minimum number of index cases per annum to be eligible for certification and maintaining recertification in congenital cardiac surgery. This requirement will become exceedingly far reached due to reduction of centers and dilution of case allocation among multitude of the active surgeons. Given variabilities in organization's compensation philosophy and current pay scales where your base salary and compensation are tied to RVU and clinical productivity, there will be a major cut back in the take home salary for the staff. And yet the biggest impact of center reduction will be faced by the graduating trainees who are already facing catastrophic unemployment in the current system

that will undoubtedly impact attracting surgical residents into pursuing a career choice in congenital cardiac surgery.

What Should We Strive for in Care Delivery and Model in CHS Programs?

Value-based care (Quality/Cost)

Achieving high value care for patients must become the overarching goal of any health care delivery, with value defined as the health outcomes achieved per dollar spent without compromising quality. This goal is what matters for patients and unites the interests of all actors in the system. If value improves, patients, payers, providers can all benefit while the economic sustainability of the health care system increases. Value should define the framework for performance improvement in congenital cardiac surgery. Rigorous, disciplined measurement and improvement of value is the best way to drive system progress and differentiate high performing from poorly performing organization. Since value depends on results, not inputs, value in health care should be measured by the outcomes achieved, not the volume of services delivered, and shifting focus from volume to value should be a central mission in high performing program. Since value is defined as outcomes relative to costs, it encompasses efficiency. Cost reduction without regard to the outcomes achieved is dangerous and self-defeating, leading to false savings and potentially limiting quality care.

Outcomes in any medical condition, including congenital cardiac disease, should follow several principles gearing toward the specific health circumstances most relevant to patients. They should cover the entire spectrum of near and long-term health condition to address and encompass the ultimate results of care. It should include three-tiered hierarchy measurement of health condition with the top tier the primary goal and the lower tier reflecting the progression of results contingent on success of the higher tiers. The first tier, survival and its sustainability over long term free from the disease with improved functional status is the most important aspect of a care delivery. The second tier is recovery to normal or best attainable function with reduced complications and readmission rates. And the third and final tier is sustainability of health. Each tier should have its own outcome measures based on specific metrics and should include sufficient measurement of risk factors to allow for risk adjustment. For any medical condition specifically highly complex and heterogeneous conditions like congenital heart diseases, no single outcome should differentiate or captures the results of care.

There is also a vast variability in cost of a given procedure across the centers providing congenital cardiac surgery [9]. Costs, like outcomes, should instead be measured around the patient. Measuring the total costs over a patient's entire care cycle and weighing them against outcomes will enable truly structural cost reduction, through steps such as reallocation of spending among types of services, elimination of non-value-adding services, better use of capacity, shortening of cycle time and provision of services in the appropriate settings. Measuring and reducing costs will

permit reform of the reimbursement system so that it rewards value by providing bundled payments covering the full care cycle. Aligning reimbursement with value in this way rewards providers for efficiency and innovation in achieving good outcomes while creating accountability for substandard care.

Coopetition

Coopetition is by definition a simultaneous pursuit of cooperation and competition among organizations providing a given product or service in a competitive landscape [10]. In a highly competitive market like healthcare, the primary *modus operandi* is to create barrier to entrance, monopolization and sustainability by generally relying on fierce competition, differentiation and innovation of the product and the brand. There has been a recent paradigm shift in organizational relationship through more efficient cross-collaboration by sharing purpose, knowledge, solutions and resources to accelerate innovation and service capabilities and capacities for their consumers. Cooperative inter-organizational relations as opposed to traditional pro-competitive healthcare reforms are salient to contemporary high value health care delivery. The essence of coopetition is that in order to gain more value through competition, one has to create more value through cooperation with the competitors who share the same goal, purpose and product in the market milieu. Many organizations are more adapting the notion of “coopetition” where there is a balance between competition and collaboration in the current price-competitive healthcare market. Coopetition is certainly a more practical and sustainable remedy than current competitive and profiteering structure in providing high value consistent care over regionalization in congenital cardiac surgery.

In 1996, Blue Cross Blue Shield of Michigan launch a collaborative initiative called BMC2 Cardiovascular Consortium with the sole mission dedicated to improving quality of care and outcomes for cardiovascular patients through collaboration between surgeons, interventional cardiologists, and patients across the state of Michigan [11]. The essence of this collaborative effort is to work together to make the best treatment choice for the patient’s lifetime cardiovascular care management. This is accomplished through statewide meetings and quarterly quality reports from all the sites to share, learn and benchmark management with each other to improve care delivery across the participating centers. This transparency enabled these hospitals to identify previously invisible performance gaps, develop new solutions and change practices. Rather than trying to outcompete each other, they started learning from each other. This collaboration has improved the quality of care and reduced cardiovascular complications, hospital readmissions, costs of care and death across the state [12]. The collaboration also enabled Michigan health systems to better respond in times of crisis during Covid-19 pandemic.

Collaboration across healthcare industry is not a new concept and has existed for several decades where clinicians, departments, or even the hospitals have come to share information, identify performance gaps, and develop solutions to improve care. This process fundamentally has relied on transparency than proprietary

by sharing performance with each other and re-evaluating where they stand relative to their peers. The stakeholders have the fiduciary duty to their patients by putting performance in context, reassessing the performance with the benchmark, and taking ownership of solutions with the collaborators to stay relevant and leaders in the discipline.

The concept of coopetition views opportunities and collaboration as synergistic and additive than exclusive and cannibalistic. It defies the general dogma that business in general and specially in healthcare is a zero-sum game that depends on having a competitive advantage and monopolistic force in the market. This has historically been the model in healthcare where hospitals outcompete and acquire the competitors to a point of killing innovation from the acquired entities. Through coopetition there is only winners and no losers as the result of increasing the market share and patients access with every hospital and program improving simultaneously. The collaborative mindset assures quality improvement when our greatest talents work together for a common goal of providing the best possible care and services for our deserving patients.

Conclusion

Regionalization in congenital cardiac service is a daring proposal in the United States given the complexity of our healthcare, political, economic and geographic structures superimposed with vast variability in population density, socioeconomic status and access to care. We need to have a good grasp of the feasibility and possible adverse ramification of the initiative and understanding of uncertainties of the evidence before implementing it across the practices. We have decades worth of evidence regarding cross collaboration as a reliable and sustainable mean of delivering high quality care across the spectrum of healthcare. The concept of coopetition where the combination of competition to create more value and cooperation to acquire more value across the collaborating centers is becoming the future of a sustainable value-based healthcare delivery in our country. We need to pass beyond mortality as single indicator of outcome and differentiator of program performance and look also at morbidity and quality of life across the healthcare continuum as our ultimate performance and care delivery goal. We should also take active role and initiative of reaching out to and collaborating with the other colleagues and centers in the region and reassess our performance for quality improvement and better care delivery based on benchmark outcomes and best practice in congenital cardiac surgery. Perhaps more collaboration than regionalization in congenital cardiac surgery may be just all we need to fulfill our mission.

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