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Children's Health Systems – The Benefits of Scale

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Introduction

Many of the country's top children's health systems are facing stronger industry headwinds, resulting from declining birth rates, clinician shortages, changing reimbursement models, and inconsistent federal and state funding. It has become more difficult for children's health systems to sustain a "Switzerland-like" model where they are viewed in the market as the default provider of pediatric care. In addition to these macro-level changes, an increasing number of adult systems and physician groups, once serving as predictable referral sources to children's health systems, are consolidating and beginning to offer more pediatric services in-house as they build up their integrated health networks.

While demand for pediatric sub-specialty volume remains stable in the majority of US metropolitan statistical areas (MSAs), changing market dynamics and increased competition have resulted in greater fragmentation of pediatric services and made it more difficult for children's health systems to continue to provide high quality care to our nation's youngest people.

Children's health systems wanting to remain relevant and successful will need to take steps to continue to scale up, expand their care network, maintain strong sub-specialty service offerings, and ensure their core service offerings provide strong financial performance. It is our observation that children's health systems best positioned to thrive in the new environment will maintain their focus on the following priorities --- all requiring certain scale thresholds to be successful:

Priority #1: Physician Recruitment

While birth rates have continued to decline, there has been a steady increase in the number of children diagnosed with chronic disease in the United States – spanning conditions that vary from obesity to autism. This has created a significant increase in the demand for sub-specialty trained physicians who are devoted to caring for children. And yet, largely because of compensation differences compared to the adult specialties, many of the training programs for pediatric specialties across the country have gone unfilled as seen in Table 1 below:

Table 1: Pediatric Training Programs with Unfilled Positions by Specialty (2018)[i]

Pediatric Training Program	# of Training Programs Nationally	Unfilled Programs (2018 Match)	% Unfilled
Adolescent Medicine	24	9	37.5%
Child & Adolescent Psychiatry	112	55	49.1%
Child Abuse	25	13	52.0%
Developmental & Behavioral Peds	35	14	40.0%

Neonatal-Perinatal Medicine	96	22	22.9%
Pediatric Anesthesiology	55	18	32.7%
Pediatric Cardiology	57	4	7.0%
Pediatric Critical Care Medicine	65	6	9.2%
Pediatric Emergency Medicine	77	2	2.6%
Pediatric Endocrinology	64	29	45.3%
Pediatric Gastroenterology	59	7	11.9%
Pediatric Hematology/Oncology	71	15	21.1%
Pediatric Hospital Medicine	35	2	5.7%
Pediatric Infectious Diseases	52	25	48.1%
Pediatric Nephrology	40	19	47.5%
Pediatric Pulmonology	46	21	45.7%
Pediatric Rehabilitation Med	18	1	5.6%
Pediatric Rheumatology	31	17	54.8%
Pediatric Sports Medicine	18	0	0.0%
Pediatric Surgery	42	1	2.4%

This dynamic has exacerbated the shortage of pediatric specialists across the country. As today's senior complement of pediatric specialists retire, there are insufficient numbers of new graduates to take their place. Trainees are far more likely to stay and practice at the place of their residency or fellowship, which would suggest that children's health systems with their own training programs are the most successful at recruiting and retaining talent over time.

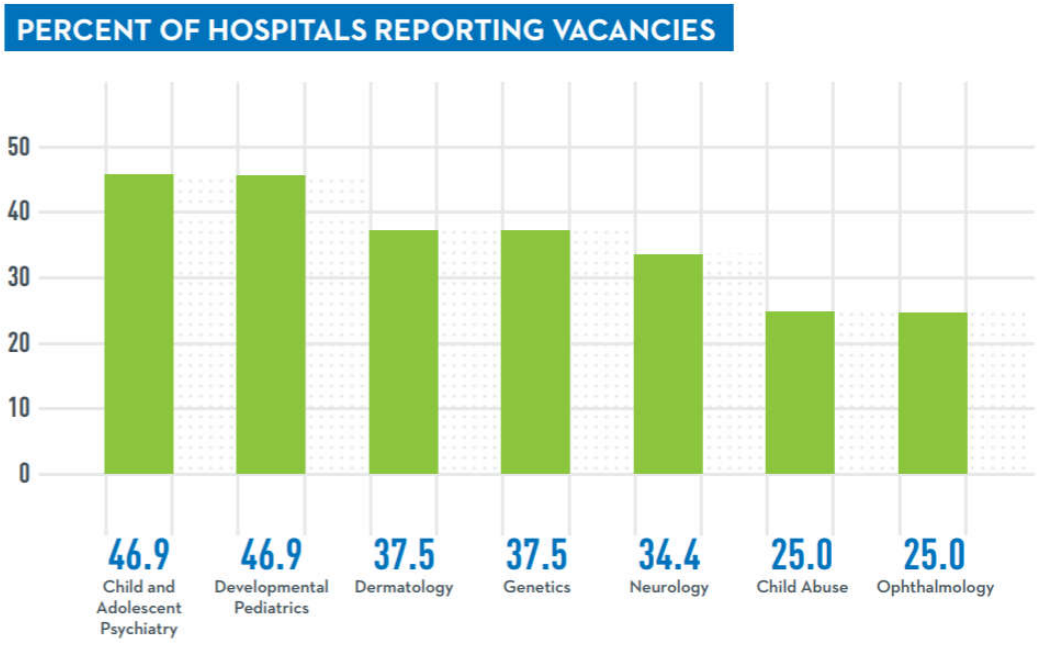
Unfortunately, children's health systems receive little to no support from the traditional graduate medical education (GME) funding mechanism in this country because that funding is tied to Medicare volumes. The Children's GME (CHGME) program was enacted in 1999 to address this disparity – but unlike traditional GME funding, Congress must regularly appropriate funding for the CHGME program, which creates more uncertainty regarding its sustainability and makes smaller children's hospitals more reluctant to develop new training programs or expand existing ones. Children's health systems need sufficient funding (generally coming from clinical operations and/or philanthropy) to support their training programs.

Feature #2: Physician Retention

Need for pediatric specialists exists across all specialties but is most acute in some of the behavioral health and cognitive specialties as shown in Table 2. And yet, given the complex nature of children's illnesses, these are often the specialties that are most critical to developing a true multi-disciplinary program. Average wait times for many of these pediatric specialties across the country are in the months, not days – with the problem exacerbated in specialties at smaller children's hospitals without the scale to keep more than 1 or 2 specialists busy.

Larger children's health systems are more likely to have the resources to recruit and retain the subspecialty talent needed to provide niche service offerings and develop multi-disciplinary programs that provide best-in-class care for patients and families.

Table 2: Pediatrician Vacancies by Specialty as Reported by Hospitals[ii]



Feature #3: Maintaining Quality through High Volume Service Offerings

Children's health systems have historically discussed their value proposition in terms of quality (e.g., clinical outcomes, patient safety) and service (e.g., access to specialty care, wraparound programs).

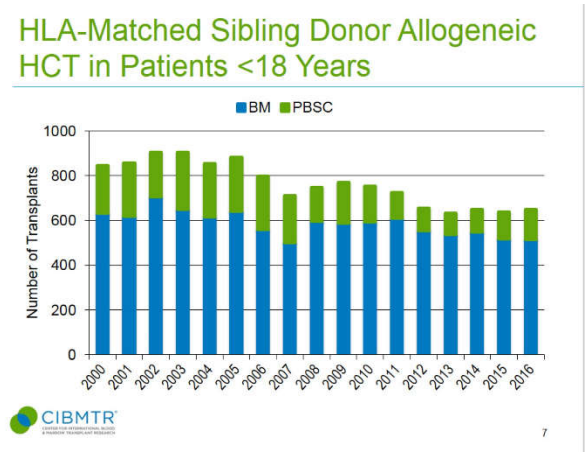
Several studies have shown a direct correlation between clinical volumes and quality outcomes. The association between improved outcomes at sites that perform a procedure has often been the focus of payor-driven proposals to regionalize care to high-volume centers. And for a variety of reasons, the correlation between scale and outcomes disproportionately favors children's health systems with the scale necessary to support larger clinical programs and services. Other benefits include:

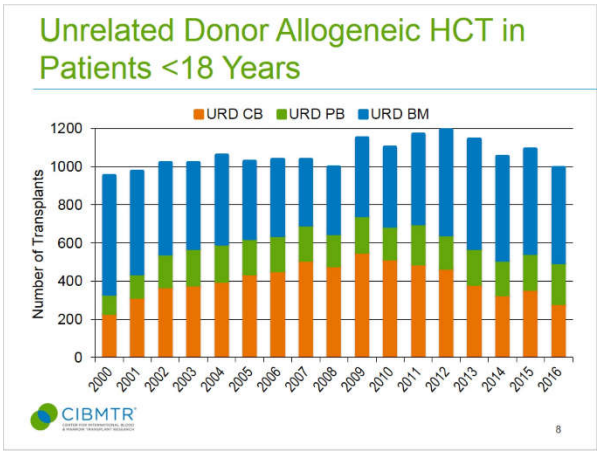
- **Sub-Specialty Physician Depth**: Larger patient bases provide an economic justification to recruit more than one or two specialists in support of a given program. This both attracts better talent and provides the health system with continuity in the event of one physician departing/retiring, which supports more consistent clinical outcomes.
- **Specialty Care Team**: For specialty children's programs, the capabilities of the care team are just as critical as the individual skill level of the physician. To ensure that pediatric anesthesia, imaging, nursing, etc. all have the competency to care for these very complex children, these professionals need to have regular exposure to a large volume of cases.
- **Support Staff**: Larger children's health systems tend to have greater ability to invest in quality improvement and monitoring programs, and have dedicated resources to staff, systems and programs that smaller facilities cannot justify. Medical directors, patient navigators, chart abstraction, quality analysts and other personnel are all more common in programs with larger platforms since their costs can be spread over a larger base of patients.

- **Research Funding and Support**: Pediatric clinical research funding (both NIH and industry) tends to go to clinical programs with a large patient base, since that ensures that there are enough enrolled participants to make the study statistically valid. And since the largest children's health systems attract the most funding, they are on the cutting-edge of treatment, which in turn attracts the specialty talent necessary to drive the best clinical outcomes.

The reality is that for many pediatric specialty clinical programs, there just isn't enough incidence of disease to justify multiple program offerings. For example, there are fewer than 2,000 hematopoietic cell transplantations (HCT) provided to children annually across the country – and yet there are more than 80 children's programs vying for that volume.

Table 3: Number of Pediatric Hematopoietic Cell Transplantations from 2000 – 2016[iii]





Based on the data, the average children's HCT program does fewer than 30 transplants all year. And there is significant variability in the scale of these programs, with some children's centers doing well over 100 annually, while many others performing fewer than 20 per year. Not surprisingly, the largest children's centers tend to have superior outcomes.

Table 4: Pediatric HCT Programs by Case and Adjusted 1-Year Survival Rate[iv]

Pediatric HCT Program	# of Cases (2014 + 2015)	Adjusted 1-Year Survival
Larger Programs		
Cincinnati Children's (OH)	221	83.0%
Texas Children's (TX)	194	80.1%
Children's – Philadelphia (PA)	176	83.2%
Smaller Programs		
Cohen Children's (NY)	37	71.1%
Akron Children's (OH)	24	64.3%
Children's New Orleans (LA)	24	58.8%
A. I. duPont (DE)	20	72.0%

This trend can also be found in congenital heart surgery, where many of the larger programs have adjusted mortality rates less than 3.5% while some smaller programs have adjusted mortality rates that are considerably higher.

Table 5: Select Congenital Heart Surgery Programs by Number of Cases and Adjusted Mortality Rates[v]

Congenital Heart Surgery	# of Surgeons	# of Cases (2013 + 2016)	Adjusted Mortality Rate*
Larger Programs			
Boston Children's (MA)	10	3,782	2.8%
Texas Children's (TX)	6	2,646	1.7%
Children's – Philadelphia (PA)	4	2,525	3.2%
Cincinnati Children's (OH)	4	1,305	3.0%
Smaller Programs			
Children's Kings Daughter (VA)	4	315	6.0%
St. Christopher's (PA)	3	301	4.7%
Maine Medical Center (ME)	1	177	9.1%

At a macro-level, the largest children's health systems tend to have the best scores when looking at overall hospital quality. The category "Outcomes and Experience" makes up 44.2% of the total scoring for the U.S. News & World Report Top Children's Hospitals rankings. In each of the ten clinical specialties that U.S. News tracks, the best "outcomes and experience" scores are typically linked to the largest hospitals and health systems.

Table 6: Large, Freestanding Children's Hospital Rankings in US News & World Report[vi]

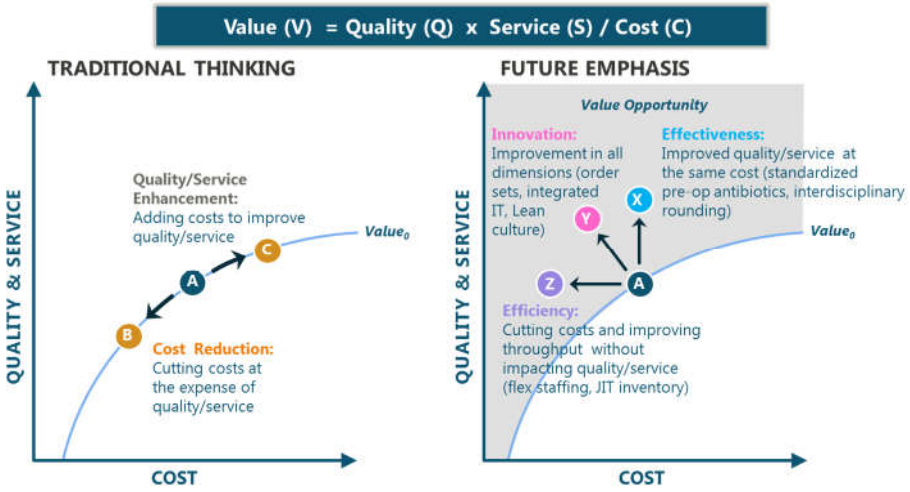
US News & World Report Clinical Specialties Evaluated	Number of Top 10 that are Standalone (Freestanding)
Neonatology	8
Pediatric Cancer	8
Pediatric Cardiology/Heart Surgery	9
Pediatric Diabetes/Endocrinology	7
Pediatric GI/GI Surgery	9
Pediatric Nephrology	10
Pediatric Neurology/Neurosurgery	9
Pediatric Orthopedics	8
Pediatric Pulmonology	8
Pediatric Urology	8

Feature #4: Focus on Value and Cost Reduction

Top children's health systems have historically focused on providing the highest quality care to patients and their families, while increasing access to specialty programs that aren't available elsewhere in the region. But the value equation identifies three components of value – quality, service and cost. Value is only increased if children's health systems can either increase quality and service at the same cost per case or provide the same level of quality and service at a reduced cost per case. With the recent emphasis on rising healthcare costs at both the federal and state levels, children's health systems across the country are becoming much more deliberate in terms of their focus on costs.

Minimizing excess resource utilization while simultaneously allowing for economies of scale in both clinical care and back-office functions allow the larger children's health systems to support more efficient cost structures, which in turn allows for greater investment in access, specialty programs and infrastructure that creates value for patients and their families.

Table 7: The Value Equation and Focus on Cost



Of course, there is a difference between cost and price, and one of the biggest arguments against health system scale/consolidation is that larger health systems do not pass on the value associated with economies of scale to the communities they serve, but instead use their leverage to extract higher reimbursement rates. But as markets continue to evolve towards value-based payment models and patients become increasingly responsible for a greater percentage of their healthcare dollars, health systems and insurers are taking additional steps to ensure value generated is getting passed to patients and families.

Feature #5: Maximizing Philanthropic Giving

As the evolving healthcare paradigm continues to put downward reimbursement pressure on health systems, it has become increasingly important for children's health systems to diversify their sources of funding. One key area of focus has been a commitment to philanthropy. In 2016, American individuals, estates, foundations and corporations contributed nearly $400B to US causes[vii]. Health organizations

represent the fifth largest recipient of annual philanthropic funding (after religion, education, human services and foundations), with total giving exceeding $30B. Children's care and cancer care are traditionally the largest drivers of philanthropic funding in the healthcare sector.

From 2016 to mid-2018, there were 18 donations of $5M or more to children's healthcare, almost all of which went to leading, freestanding children's health systems.

Table 8: Select Pediatric Giving by Year, Donor, Recipient, and Gift

Year	Donor	Recipient	Gift Value
2018	Bruce Leven	Seattle Children's	$60,000,000
2018	Robert Hale Jr. and Karen Hale	Boston Children's Hospital	$50,000,000
2017	Gordon and Betty Moore	Lucile Packard Children's Hospital	$50,000,000
2016	Brian L. and Aileen Roberts	Children's Hospital of Philadelphia	$25,000,000
2018	Tad Taube	Lucile Packard Children's Hospital Stanford	$20,000,000
2018	William and Nancy Thompson Family	Children's Hospital of Orange County	$20,000,000
2016	Nancy Blackburn Hamon	Children's Medical Center Foundation (Dallas)	$15,000,000
2016	Ann Wolfe	Nationwide Children's Hospital	$15,000,000
2017	Anonymous	Ann and Robert H. Lurie Children's	$12,000,000
2016	Pogue Family Foundation	Children's Medical Center Foundation (Dallas)	$10,000,000
2016	Joe F. & Kathy Sanderson	Children's of Mississippi (Jackson)	$10,000,000
2017	David and Julia Koch	Lucile Packard Children's Hospital Stanford (Calif.)	$10,000,000
2016	Joseph Clayes III Charitable Trust	Rady Children's Hospital-San Diego	$10,000,000
2017	Charif Souki	Texas Children's Hospital (Houston)	$10,000,000
2018	Willard and Pat Walker Foundation	Arkansas Children's Hospital (Little Rock)	$8,000,000
2017	John and Susan Herma	Children's Hospital of Wisconsin (Milwaukee)	$8,000,000
2017	T. Denny Sanford	Nicklaus Children's Hospital (Miami)	$7,000,000
2017	Norman and Irma Braman	Children's Hospital of Philadelphia	$5,000,000

This type of philanthropic support just doesn't happen. A strong children's foundation needs to be put in place with a compelling vision of institutional priorities across missions and a clear strategy outlining focused campaign efforts designed to connect with the donor community. Larger children's health systems tend to have the resources to secure these larger philanthropic donations.

Feature #6: Maintaining a Strong Academic Affiliation

Unlike adult specialists, where there is a far greater percentage practicing in the community hospital setting, pediatric specialists tend to continue to practice at institutions with an academic mission; however, the academic mission priorities are often subsidized by clinical operations. Those children's health systems tending to have the greater NIH funding also tend to be the biggest in size:

Table 9: Pediatric NIH Funding[viii]

Children's Hospital	Beds	NIH Funding (2017 Total Awards)
Boston Children's Hospital	415	$157,591,678
Children's Hospital of Philadelphia	520	$126,040,263
Cincinnati Children's Hospital	609	$121,343,846
St. Jude's Children's Research Hospital *(Cancer Only)*	68	$76,186,324
Seattle Children's Hospital	316	$43,676,764
Nationwide Children's Hospital	616	$34,664,371
National Children's Research Institute	313	$31,174,832
Children's Hospital of Los Angeles	357	$21,868,818

The highest ranked pediatric residency training programs also tend to be highly correlated with the larger children's hospitals and their affiliated universities.

Table 10: Pediatric Training Programs[ix]

Pediatric Training Programs	Ranking	Core Residency Positions
Harvard / Boston Children's Hospital	1	124
Univ. of Penn / Children's Hospital of Philadelphia	2	140
UC / Cincinnati Children's Hospital	3	125
Univ. of Colorado / Colorado Children's	4	96
Johns Hopkins	5	83
UCSF	6	84
Univ. of Pitt / UPMC	7	100
Univ. of Washington / Seattle Children's	8	121
Stanford / Lucy Packard	9	95
Baylor / Texas Children's	10	159

Final Considerations

As the healthcare industry evolves, children's health systems having the highest probability of success will be those with sufficient scale to effectively recruit and retain sub-specialty talent across all pediatric services and programs. In turn, these health systems will be able to provide higher quality outcomes and do so at more competitive prices. In addition, these children's health systems will be positioned to better connect with their donor communities, which will accelerate the implementation of key strategic initiatives. Finally, these children's health systems will be better suited to focus on building stronger academic partnerships to support cutting-edge research and train the next generation of pediatric sub-specialty talent.

[i] http://www.nrmp.org/wp-content/uploads/2018/04/Main-Match-Result-and-Data-2018.pdf
[ii] https://www.childrenshospitals.org/issues-and-advocacy/graduate-medical-education/fact-sheets/2018/pediatric-workforce-shortages-persist

[iii] https://www.cibmtr.org/Pages/index.aspx
[iv] https://www.cibmtr.org/Pages/index.aspx
v https://publicreporting.sts.org/chsd
[vi] https://health.usnews.com/best-hospitals/pediatric-rankings
[vii] https://givingusa.org/giving-usa-2018-americans-gave-410-02-billion-to-charity-in-2017-crossing-the-400-billion-mark-for-the-first-time/
[viii] https://report.nih.gov/nih_funding.aspx
[ix] https://www.acgme.org/