



# Enhancing Resident Education and Optimizing Care for Children With Special Health Care Needs in Resident Continuity Clinics

*Julie M. Linton, MD; Elizabeth Reichard, MD; Abby Peters, MD; Laurie W. Albertini, MD; Anna Miller-Fitzwater, MD, MPH; Katherine Poehling, MD, MPH*

From the Department of Pediatrics (Drs Linton, Reichard, Peters, Albertini, Miller-Fitzwater, and Poehling); Clinical and Translational Science Institute Program in Community Engagement (Dr Linton); Maya Angelou Center for Health Equity (Dr Linton); and Epidemiology and Prevention (Dr Poehling), Wake Forest School of Medicine, Winston-Salem, NC

The authors have no conflicts of interest to disclose.

Address correspondence to Julie M. Linton, MD, Department of Pediatrics, Wake Forest Baptist Health, 3 Meads, Medical Center Blvd, Winston-Salem, NC 27157 (e-mail: [jlinton@wakehealth.edu](mailto:jlinton@wakehealth.edu)).

**ACADEMIC PEDIATRICS** 2018;18:366–369

CHILDREN WITH SPECIAL health care needs (CSHCN) are at increased risk for chronic physical and emotional conditions and require services beyond those required by other children.<sup>1</sup> The principles of the medical home emphasize care that is family-centered, comprehensive, coordinated, and culturally effective.<sup>2</sup> For CSHCN, medical home and care coordination are essential for improving health care access and outcomes.<sup>3,4</sup> Children receiving care within the medical home are more likely to have annual preventive visits and less likely to have unmet medical and dental needs.<sup>5</sup> Care coordination in a medical home has been associated with decreased unmet subspecialty care needs and positive parental perceptions of primary care service.<sup>6,7</sup> CSHCN, as well as black and Latino children, are significantly less likely to receive family-centered care and more likely to have unmet care coordination needs.<sup>3</sup> Furthermore, CSHCN who are foreign born or whose parents are foreign born are less likely to have a medical home than CSHCN with US-born parents.<sup>8</sup> Because resident continuity clinics typically offer care to disadvantaged populations, improved care of CSHCN in this setting may offer an opportunity to mitigate health disparities.

Continuity clinics are a core component of the educational curriculum of each pediatric residency program. The Accreditation Council for Graduate Medical Education expects pediatric residents to apply the medical home model to the care of CSHCN within their continuity clinics.<sup>9</sup> The Pediatric Milestones Project offers a framework to evaluate the progression of pediatricians across this domain from novice to expert.<sup>10</sup>

Residents value formal opportunities to learn about care of CSHCN in the community.<sup>11</sup> Residency programs, including ours, have proposed strategies to teach residents to care for CSHCN,<sup>12–15</sup> but data regarding enhancing medical education and clinical care of these children are limited. Our residency program has a long-standing chronic care rotation that incor-

porates hospital- and community-based site visits, online education, individual faculty meetings, and clinical care experiences.<sup>13</sup> Because primary care providers (PCPs) report difficulty in caring for CSHCN,<sup>16</sup> resident education incorporating enhanced care of CSHCN may better prepare the future pediatric workforce to address these challenges.

The goal of our resident-led, faculty-mentored initiative was to develop a clinical and educational model to integrate care of CSHCN more effectively into the resident continuity clinic.

## PROJECT DEVELOPMENT AND IMPLEMENTATION

Our resident-run clinic serves one of the largest pediatric Medicaid populations in North Carolina. A total of 92% of children have Medicaid, 2% have private insurance, and 6% of patients are self-pay/charity care. The clinic is a level 3 patient-centered medical home (PCMH). The racial/ethnic composition is 62% Hispanic/Latino, 30% African American, 5% white, and 3% other/unknown. There are approximately 7400 unique pediatric patients with 20,000 pediatric visits per year. The residency program includes 13 categorical pediatric residents per training level and 2 combined pediatric neurology residents. Our residents remain with the same continuity clinic team and faculty preceptors throughout all 3 years of training.

After a review of the relevant literature, this study received expedited approval from Wake Forest School of Medicine institutional review board. Project development included a multistep process, with methodology that mirrored the 6-step approach to curriculum development of Kern et al.<sup>17</sup>

## PROBLEM IDENTIFICATION AND GENERAL NEEDS ASSESSMENT

We developed a resident-led, multidisciplinary group of pediatric faculty, pediatric resident leaders, the clinic nurse

manager, public health care coordinators, hospital-based care coordinators for CSHCN, and representatives from the local Medicaid care management organization. During multiple group meetings, participants identified the need for enhanced education for residents and nurses regarding benefits of the medical home model and utilization of care coordination services. We also held 3 focus groups with parents/caregivers of CSHCN to discuss knowledge, barriers, and perspectives of quality of a PCMH. Caregiver focus groups identified needs for transparency regarding the structure of resident continuity clinic and opportunities to ask medical questions outside of office visits.

### TARGETED NEEDS ASSESSMENT

Using the information above, we developed surveys for pediatric residents, clinic nurses, and parents/caregivers of patients to assess perceptions of and knowledge about the medical home offered in the resident continuity clinic. Baseline data were obtained through anonymous surveys of parents/caregivers ( $n = 187$ ), residents ( $n = 31$ ), and nurses ( $n = 6$ ) in December 2013. Residents identified a need to improve care for CSHCN and desired further training regarding implementation of the medical home model in a resident clinic, nurses reported limited understanding of the benefits of a medical home model, and parents/caregivers responded that they often did not know the names of their children's doctors and that they would appreciate assistance with care coordination.

### GOALS AND OBJECTIVES

Specific goals included development of mechanisms to identify CSHCN and monitor their care, improved team-based care, initiation of integrated care coordination, enhanced education of providers regarding opportunities to improve primary care of CSHCN using the medical home model (both within continuity clinic and via the chronic care rotation<sup>13</sup>), and education of parents and caregivers regarding the medical home. Objectives included improving perceptions of residents, nurses, and parents/caregivers regarding care of CSHCN in our resident clinic.

### EDUCATIONAL STRATEGIES AND CLINIC MODEL DEVELOPMENT

Specific interventions focused on resident and nurse education and on systems-level planning, including development of a registry for CSHCN and team-based care for these patients, and modification of the electronic medical record (EMR) workflow. Educational strategies incorporated multiple modalities, including independent study with individualized discussion, traditional lecture, case-based small group learning, and group discussion. Clinic model development included regular multidisciplinary meetings comprising pediatric faculty, resident leaders, nursing staff, and care coordinators to identify and adjust specific interventions as well as to provide informal opportunities to build relationships.

### IMPLEMENTATION

Implementation included practical training for residents, nurses, and patients that incorporated the aforementioned strategies and systems-level changes (Figure). For resident training, we used a broad definition of CSHCN whereby patients qualified for the registry if they had one or more chronic medical, developmental, or behavioral conditions that require the patient to have more frequent medical care than is typical for a child their age, as defined by the PCP. Resident educational interventions included noon conferences focused on the care of CSHCN, quarterly team-based conferences during continuity clinic educational sessions to emphasize core principles of the PCMH and share experiences regarding care of CSHCN, and resident-led grand rounds. For nurses, project leaders developed an educational conference to teach the concepts of the PCMH and held a follow-up feedback session. For parents/caregivers, we developed bilingual (English/Spanish) PCMH brochures, team-based resident business cards, and a bilingual waiting room video with information about the PCMH. At the systems level, all CSHCN were assigned a resident PCP in the EMR to facilitate continuity of appointment scheduling. All CSHCN were added to the team registries, and the team was decided by the day of the week when the resident was assigned the continuity clinic. Enhanced documentation and faculty preceptor supervision were expected for all patients on these panels to improve continuity of care. Additionally, care management services were integrated into our continuity clinic.

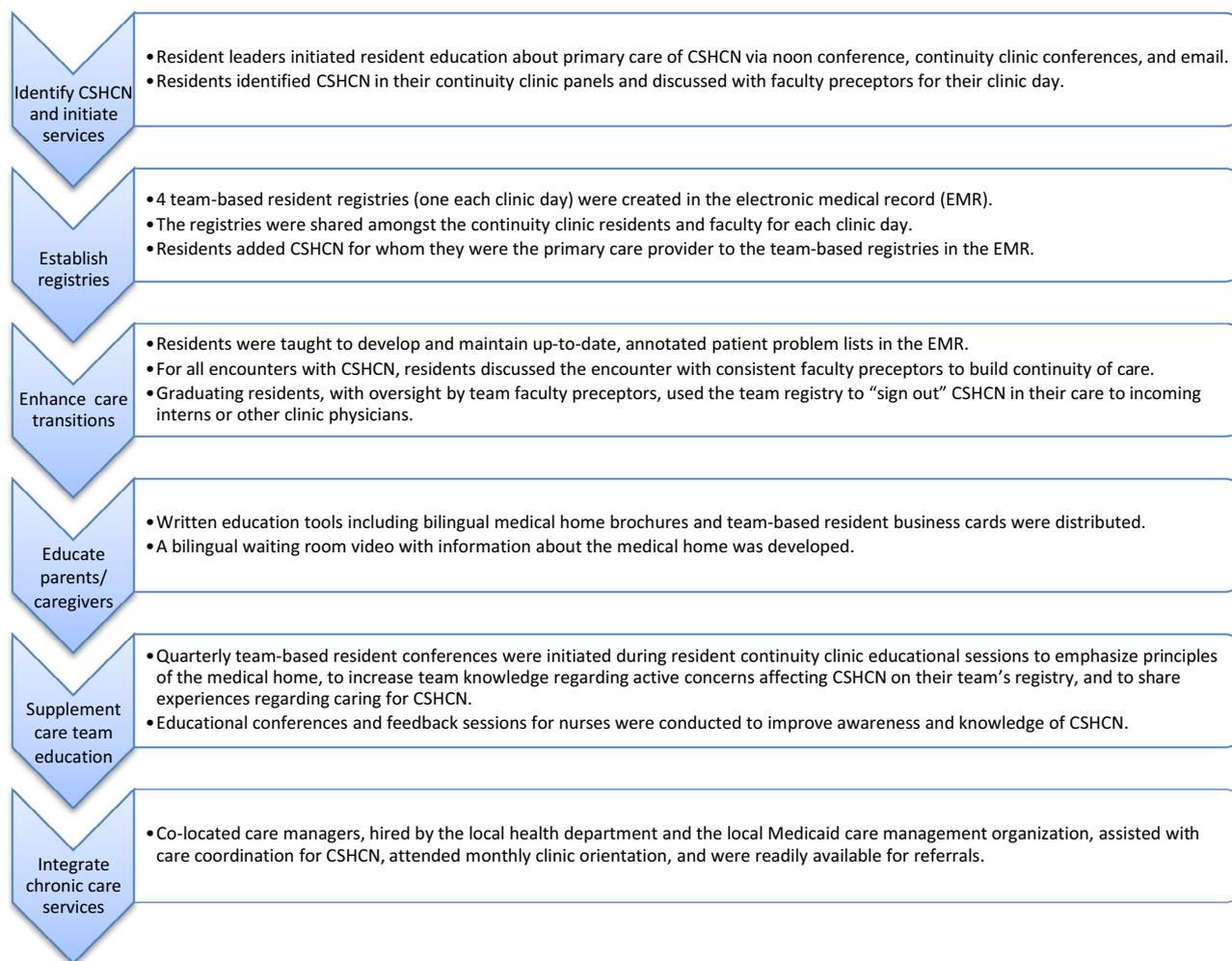
### FEEDBACK AND EVALUATION

We conducted follow-up surveys of residents, nurses, and parents/caregivers to determine the impact of our interventions and to evaluate changes in perceptions about the understanding and delivery of the medical home in our clinic. In November 2014, postintervention surveys of parents/caregivers ( $n = 190$ ), residents ( $n = 26$ ), and nurses ( $n = 7$ ) were obtained. Pre- and postintervention survey results were grouped into 3 categories of agree (strongly agree and agree), neutral, and disagree (disagree and strongly disagree). Results were analyzed using descriptive statistics and chi-square tests or Fisher's exact tests.

### RESULTS

The CSHCN registry ultimately included 232 pediatric patients, representing 3% of our 7400 pediatric patients. These 232 patients were evenly spread across each clinic team.

For parents/caregivers, preintervention response rates (December 2013) were 187 (78%) of 240, and postintervention response rates (November 2014) were 190 (66%) of 289. When comparing pre- and postintervention survey results, parents/caregivers were better able to identify their PCP by name (28% vs 44%,  $P = .004$ ), demonstrated better understanding of their PCP's particular clinic day (23% vs 34%,  $P = .04$ ), and thought it was easier to ask



**Figure.** Steps for implementation of enhanced resident education and optimization of care for children with special health care needs in resident continuity clinic.

the doctor questions regarding the child’s health (74% vs 84%,  $P = .03$ ). No statistical difference was observed for parent/caregiver understanding of a PCMH (73% vs 81%,  $P = .15$ ) or the overall understanding of the child’s medical problems (89% vs 93%,  $P = .26$ ).

For residents, pre- and postintervention response rates were 31 (75%) of 41 and 26 (63%) of 41, respectively. Over the study period, residents became more comfortable identifying ways to improve a medical home (45% vs 73%,  $P = .049$ ) and perceived increased quality of the medical home offered to CSHCN in our continuity clinic (10% vs 54%,  $P < .001$ ). No statistical difference was observed for resident understanding of a PCMH (87% vs 96%,  $P = .37$ ) and for ways to identify CSHCN (90% vs 100%,  $P = .10$ ).

For nurses, both pre- and postintervention response rates for nurses were 6 (100%) of 6 and 7 (100%) of 7, respectively. Over the study period, the nurses demonstrated similar improvements in understanding the benefits of a PCMH (33% vs 100%,  $P = .02$ ), perceived quality of our PCMH (50% vs 100%,  $P = .03$ ), and perceived improvement in quality of the PCMH for CSHCN (17% vs 100%,  $P = .005$ ).

## DISCUSSION

This pilot curriculum positively affected the perceptions of both residents and nurses who care for CSHCN as well as the perceptions of parents/caregivers. The interventions likely contributed to not only these improved perceptions but also to enhanced team-based care. For instance, when residents were not available to care for CSHCN in their continuity clinic as a result of schedule conflicts, the clinic team-based model allowed other team members to more smoothly provide care for the patients. Utilization of the EMR as the foundation for team-based registries had several benefits, including tracking PCPs and care teams for CSHCN, assessing care coordination needs, and supervising transition of care from graduating residents to current or incoming residents. The EMR annotated problem list facilitated rapid review of the medical record to further streamline their care.

Integrated resources, including care coordination services, met needs identified by parents/caregivers in focus groups and presurveys and also demonstrated the value of care coordination to residents and nurses. Collaboration with a local Medicaid care management network offered

essential resources and expertise to enhance care for CSHCN as well as an opportunity for residents to learn about population health. As such, some of the initiatives we used contributed to recognition of our resident continuity clinic as a level 3 PCMH.

Implementation and evaluation of our model included several limitations. An estimated 389,439 children in North Carolina have special health care needs, accounting for 17% of all children.<sup>18</sup> The overall percentage of CSHCN identified in our registry is lower than the overall percentage of CSHCN in North Carolina.<sup>18</sup> This discrepancy is likely due to the subjective methodology of selecting children for the registry as well as bias toward selecting children with the most complex chronic conditions. Upon postintervention review of the children selected for inclusion in this registry, most were found to have more complex conditions than the more broad definition of CSHCN in the National Survey of CSHCN. Furthermore, although several statistically significant improvements in understanding of medical home principles for CSHCN were evident, there were some areas that did not reach statistical significance. This may be in part due to the small sample size and survey methodology. Our findings may have limited generalizability as a result of the single site of implementation and the small sample size of residents and nurses. Finally, the outcomes of this study are self-reported and may not necessarily represent improved patient care.

Our model, now embedded into our residency curricula, has contributed to a culture of enhanced quality of care provided for CSHCN. We continue to identify new quality improvement opportunities regarding care of CSHCN. For example, we have added regular resident workshops, led by multidisciplinary professionals, demonstrating the operation of home care equipment for CSHCN. Additionally, residents attend team meetings discussing CSHCN who are receiving intensive care coordination services.

## CONCLUSIONS AND FUTURE DIRECTIONS

Resident continuity clinics offer an ideal setting to train the future pediatric workforce to use the medical home model and care for CSHCN in the community. The initiatives of this project demonstrate the unparalleled opportunity for continuity clinics to serve as the foundation for resident education regarding care of CSHCN. Future directions include increased utilization of our EMR to monitor health outcomes for our population of CSHCN. Enhancing education and care in resident continuity clinics, which often serve vulnerable populations, may help increase the number of children with access to a quality medical home and begin to mitigate health disparities among CSHCN.

## ACKNOWLEDGMENTS

This project was generously supported as part of a 2013 American Academy of Pediatrics Resident CATCH grant. Dr Linton received salary support from the Wake Forest Clinical and Translational Science Institute (WF CTIS), which is supported by the National Center for Advancing Translational Sciences, National Institutes of Health, through grant UL1TR001420.

## REFERENCES

1. McPherson M, Arango P, Fox H, et al. A new definition of children with special health care needs. *Pediatrics*. 1998;102:137–139.
2. American Academy of Pediatrics Medical Home Initiatives for Children With Special Needs Project Advisory Committee. The medical home. *Pediatrics*. 2004;113:1545–1547.
3. Toomey S, Chien A, Elliott M, et al. Disparities in unmet need for care coordination: the National Survey of Children's Health. *Pediatrics*. 2013;131:217–224.
4. AAP Committee on Children With Disabilities. Care coordination: integrating health and related systems of care for children with special health care needs. *Pediatrics*. 1999;104:978–981.
5. Strickland B, Jones J, Ghandour R, et al. The medical home: health care access and impact for children and youth in the United States. *Pediatrics*. 2011;4:604–611.
6. Arauz Boudreau A, Goodman E, Kurowski D, et al. Care coordination and unmet specialty care among children with special health care needs. *Pediatrics*. 2014;133:1046–1053.
7. Hamilton L, Lerner C, Presson A, et al. Effects of a medical home program for children with special health care needs on parental perceptions of care in an ethnically diverse patient population. *Matern Child Health J*. 2013;17:463–469.
8. Kan K, Choi H, Davis M. Immigrant families, children with special health care needs, and the medical home. *Pediatrics*. 2016;137:e20153221.
9. Accreditation Council for Graduate Medical Education (ACGME). Program requirements for graduate medical education in pediatrics. 2017. Available at: [https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/320\\_pediatrics\\_2017-07-01.pdf](https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/320_pediatrics_2017-07-01.pdf). Accessed January 11, 2018.
10. Pediatric Milestone Working Group. The Pediatrics Milestone Project. 2012. Available at: [http://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/320\\_PedsMilestonesProject.pdf](http://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/320_PedsMilestonesProject.pdf). Accessed November 1, 2017.
11. Nazarian B, Glader L, Choueiri R, et al. Identifying what pediatric residents are taught about children and youth with special health care needs and the medical home. *Pediatrics*. 2010;126(suppl 3):S183–S189.
12. Butcher J, Wolraich M, Gillaspay S, et al. The impact of a medical home for children with developmental disability within a pediatric resident continuity clinic. *J Okla State Med Assoc*. 2014;107:632–638.
13. Jackson J, Albertini L. Caring for children with chronic health care needs: an introductory curriculum for pediatric residents. MedEdPORTAL Publications. 2012. Available at: <https://www.mededportal.org/publication/9172>; [http://dx.doi.org/10.15766/mep\\_2374-8265.9172](http://dx.doi.org/10.15766/mep_2374-8265.9172). Accessed February 18, 2016.
14. Bogetz J, Gabhart J, Rassbach C, et al. Outcomes of a randomized controlled educational intervention to train pediatric residents on caring for children with special health care needs. *Clin Pediatr (Phila)*. 2015;54:659–666.
15. Bogetz J, Gabhart J, Rassbach C, et al. Special care optimization for patients and education (SCOPE): training pediatric residents about children with special health care needs. MedEdPORTAL Publications. 2013. Available at: <https://www.mededportal.org/publication/9627>. Accessed November 1, 2017.
16. Murphy K, Kobayashi D, Golden S, et al. Rural and nonrural differences in providing care for children with complex chronic conditions. *Clin Pediatr (Phila)*. 2012;51:498–503.
17. Kern D, Thomas P, Hughes M. Curriculum Development for Medical Education: A Six-Step Approach. 2nd ed. Baltimore, Md: Johns Hopkins University Press; 2009.
18. Child and Adolescent Health Measurement Initiative. National Survey of Children with Special Health Care Needs. NS-CSHCN 2009/10. Data Resource Center, supported by Cooperative Agreement 1-U59-MC06980-01 from the US Department of Health and Human Services, Health Resources and Services Administration (HRSA), and Maternal and Child Health Bureau (MCHB). Available at: <http://www.childhealthdata.org>. Accessed February 18, 2016.