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## Care Transitions



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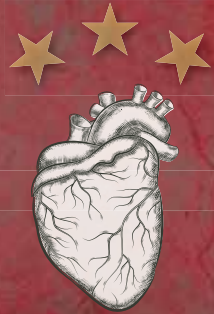
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# Tar Heel Footprints in Health Care

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*A periodic feature that recognizes individuals whose efforts—  
often unsung—enhance the health of North Carolinians*

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## **Brenda K. McCall, RN, BSN**



Throughout her career, Brenda McCall has demonstrated her commitment to ensuring coordinated care for patients in transition. McCall's combination of experience in public health, hospice, and the retirement community, in addition to her work in inpatient and outpatient clinics, has made clear to her the importance of care coordination and transitional supports. She has taken an active role to develop and coordinate comprehensive patient-centered discharge programs in UNC Health Care and in the community it serves. Dr. Laura Hanson, a geriatrician and colleague at University of North Carolina-Chapel Hill, says that McCall "is a great patient advocate and combines wisdom from experiences with the long-term care system and the hospital to provide unique and personalized attention to transitional care needs."

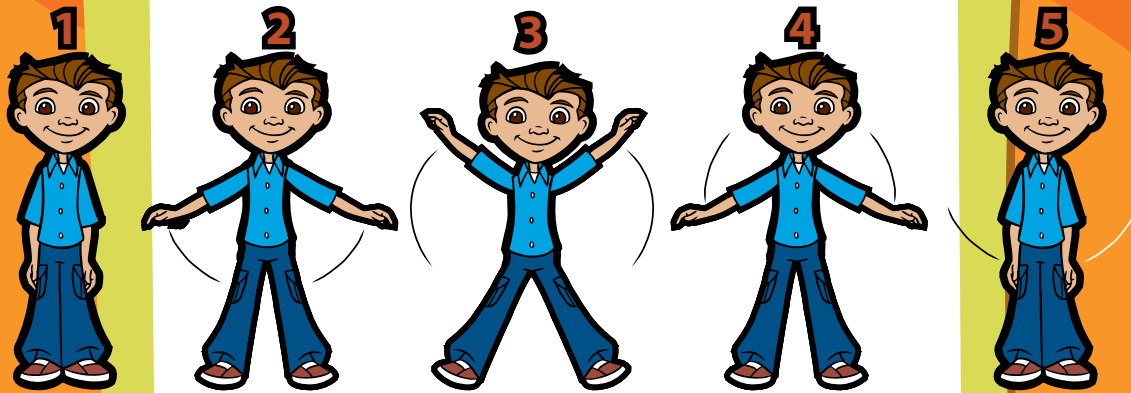
In 2007, McCall, then a clinical care coordinator, was asked to serve as a geriatric liaison for the Investments for the Future project. As part of the project, McCall piloted a phone call follow-up program in which she called older patients who had been discharged home from the UNC Hospitals emergency department to make sure they understood their discharge instructions, including medication and plans for follow-up appointments.

The success of the pilot program laid the foundation for the expansion of comprehensive transition supports for high- and moderate-risk individuals being discharged from UNC Hospitals. McCall and her colleagues on the high-risk transitions care team provide intensive case management to patients during their stays and during the weeks following their discharges, to make sure patients have the home or community support they require. McCall's team works to provide individualized, comprehensive support to the patient and to serve as a resource for patients on a broad range of issues, from arranging transportation to follow-up appointments, to medication management, placement in assisted living, and palliative care decisions.

McCall's efforts have been highly praised by her colleagues. Heather Altman, a colleague at Carol Woods Retirement Community, says, "Patients are so appreciative of her kind and compassionate help, providers rely on her clinical and programmatic experience and judgment, and her community partners adore working with her. She represents the best of what can be accomplished when we all work together to improve the quality of care and the quality of life for our community members in need."

McCall received a diploma of nursing degree at Greenville General Hospital and a bachelor of science in nursing degree from University of North Carolina-Chapel Hill. She serves on the University of North Carolina readmission taskforce and with the Chatham-Orange Community Resource Connections, and she has chaired the Patients at Transitions work group. In 2010, McCall was named a UNC Health Care Nurse of the Year. NCMJ

*Contributed by Anne M. Williams, research assistant, North Carolina Institute of Medicine,  
Morrisville, North Carolina (anne\_williams@nciom.org).*



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# Treating Pediatric Obesity in the Primary Care Setting to Prevent Chronic Disease: Perceptions and Knowledge of Providers and Staff

*Mina Silberberg, Lori Carter-Edwards, Gwen Murphy, Meghan Mayhew, Kathryn Kolasa, Eliana M. Perrin, Sarah Armstrong, Cameron Graham, Nidu Menon*

**BACKGROUND** The national and international epidemic of chronic disease, including among children, is largely fueled by increasing obesity. It is recommended that primary care play a key role in the treatment of pediatric obesity.

**METHODS** A written survey was administered to providers and staff at 13 primary care practices across North Carolina, assessing perceptions on multiple dimensions of pediatric obesity treatment and knowledge of dietitian services.

**RESULTS** The response rate for the survey was 66.9% ( $n = 273$ ). Although providers reported feeling comfortable and confident in many areas of childhood obesity, perceived effectiveness was low. Moreover, comfort and confidence were lower for non-primary care providers (PCPs) involved in obesity treatment than for PCPs, and PCP comfort and confidence levels were low for the ability to conduct motivational interviewing and for knowledge of billing for obesity as a diagnosis. Personnel perceived that there were benefits to having a registered dietitian (RD) in their practice and generally understood RD capacity. Survey results provided no evidence that integration of an RD into the practice changed perceptions or knowledge over the course of 1 year.

**LIMITATIONS** The present study included only 13 practices, mostly rural and all of at least moderate size.

**CONCLUSION** Significant change is required if primary care practices are to play the role envisioned for them in stemming childhood obesity and chronic disease. Change will require identifying and addressing specific knowledge and skill gaps, such as those identified in this study. Respondents' positive perceptions of the benefits of RD integration suggest the importance of exploring this clinical model.

The prevalence of diabetes, hypertension, and other obesity related comorbidities in the United States and internationally is growing at an alarming rate [1]. In the United States, approximately 16.9% of children and adolescents aged 2-19 years are obese, and 14.8% are overweight [2]. (Children are considered overweight when their body mass index [BMI] is equal to or greater than the 85th percentile, but less than the 95th percentile, for their age and sex; they are considered obese when their BMI equals or exceeds the 95th percentile [3].) Rates are even higher in North Carolina: 18.0% of the state's children and adolescents are obese, and 16.2% are overweight [4].

The Patient Protection and Affordable Care Act of 2010 emphasizes preventive health services, and national recommendations call on primary care providers (PCPs) to help stem childhood obesity [5]. The US Preventive Services Task Force specifically recommends screening children aged  $\geq 6$  years and providing or referring them for behavioral interventions, to improve weight [6]. While many evidence-based interventions for overweight children are highly resource intensive, practice-based interventions have the potential for large-scale replication, including in rural areas, where resources for overweight children are scarce [3]. Integration of nutritional counseling into primary care practices for adults has been promising, and experts say that the model merits further research [7-12]. Moreover, providing key treatment and prevention services on-site is essential

to the patient-centered medical home, which is increasingly the gold standard for primary care [13].

However, research shows that providers feel they are not qualified for and/or are ineffective at treating childhood overweight and often find treating overweight children frustrating [14-17]. These attitudes reflect, and possibly affect, provider capacity to address pediatric obesity. For example, for most providers, the choice to intervene with a patient is typically based on the provider's subjective level of concern with the patient's weight issue [18-21].

Perceived barriers underlying these perceptions include lack of time, lack of resources (including dietitians), lack of reimbursement, and perceived treatment failures [15-16, 19, 22-25]. These findings suggest the potential for the integration of a registered dietitian (RD) to enhance a practice's capacity to address pediatric overweight; indeed, lack of an on-site RD is associated with low levels of perceived efficacy in this area [17]. Moreover, the KIDPOWER pilot indicates that RD services delivered to overweight children in a rural primary care setting may improve eating and television-watching habits, as well as weight management [26].

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Potential reimbursement for nutritional counseling by PCPs and RDs has increased substantially in recent years. North Carolina Medicaid and Blue Cross and Blue Shield of North Carolina now cover medical nutrition therapy for overweight children.

This paper presents the results of a survey of North Carolina primary care practices, and it builds on the existing literature in 3 ways. First, new questions were developed that assess multiple aspects of treatment. Second, for areas relating to clinical practices, this paper presents the perceptions and knowledge of a range of clinic personnel, not just physicians. Physician assistants and nurse practitioners often serve as PCPs, and nurses, social workers, and others steer patients to nutritional counseling and support behavior change. Responsibility for the implementation of some practice guidelines, billing for services, scheduling, and interpretation falls to clinic staff. While there has been research on the attitudes of WIC staff who provide education on pediatric overweight [27], our paper presents the perceptions and knowledge of typical clinic personnel, using select questions from a common question set. Third, the survey addressed perceptions and knowledge of RD services.

## Methods

**Overview.** The survey discussed here was part of a larger study, IN4Kids, commissioned by the North Carolina Health and Wellness Trust Fund to assess the feasibility and effectiveness of integrating RDs into primary care practices to work with overweight children. Researchers from Duke's Community and Family Medicine Department administered the study, from July 2008 to December 2010, with data collection occurring between February 2009 and October 2010. The state's 4 academic medical centers were involved in the implementation, and an advisory panel commented on the study design and findings. Half-time RDs were integrated into 8 primary care practices, and a variety of data were collected about their use. IN4Kids was approved by the Duke institutional review board, under protocol 00012666.

**Sample.** The academic medical centers helped identify 8 intervention practices in their respective regions. Inclusion criteria were (1) a minimum of 2000 children served annually, allowing for financial viability of RD integration; (2) a suburban or rural setting, limiting access to specialty weight-loss clinics; (3) not staffed by medical residents; (4) and expressed commitment to study requirements.

To identify changes associated with the RDs' presence, the practice survey was administered at the beginning of IN4Kids and 1 year later, at the 8 intervention sites and at 5 control practices. The latter were selected to match the intervention sites in size, regional diversity, and mix of practice type. Of the 13 practices, 5 were in the western part of the state, 5 were in the Piedmont, and 3 were in the east. Ten were located in rural settings, and 2 were suburban. Nine were pediatric practices, and 4 were family practices, including 2 federally qualified health centers. At baseline, none

**TABLE 1.**  
Primary Care Providers' Comfort and Perceived Effectiveness With Treating Pediatric Obesity

Factor	Comfortable or very comfortable	Effective or highly effective
Raising the issue of overweight	47 (97.9)	29 (60.4)
Recommending nutritional resources	28 (58.3)	17 (35.4)
Ability to conduct motivational interviewing	9 (19.1)	...
Ability to bill for obesity	7 (15.2)	...
Advising parents on healthy foods	37 (77.1)	26 (54.2)
Changing practice's habits to address childhood obesity	32 (66.7)	...
Practice's current capacity to address childhood obesity	23 (47.9)	...
Practice's capacity to change to address childhood obesity	26 (55.3)	...

Note. Data are no. (%).

had an RD on-site half-time or more, but 3 had (or recently had) some RD presence. All 413 providers and staff across the 13 sites were eligible to complete the survey, which was distributed by the practice managers at a practice meeting.

**Instrument.** Survey domains were based on (1) elements of pediatric obesity treatment identified in the guidelines for preventing and treating childhood overweight and obesity, from the National Initiative for Child Healthcare Quality [28]; and (2) prior research [17, 27]. Survey questions (not validated) were developed by the study team and were refined with input from the advisory committee and after piloting with PCPs.

Comfort, confidence, and perceived-effectiveness questions used 5-point Likert scales, plus "not applicable." Dimensions assessed for comfort and confidence were as follows: raising the issue of overweight with parents, recommending nutritional resources, ability to conduct motivational interviewing, ability to bill for obesity as a diagnosis, advising parents on healthy foods, making changes to individual practice habits to better address childhood obesity, the practice's current capacity to address childhood obesity, and the practice's capacity to make changes to better address childhood obesity. Perceived effectiveness was assessed on action dimensions: raising the issue of overweight, recommending nutritional resources, and advising parents on healthy foods.

Four-point Likert scales, ranging from "strongly agree" to "strongly disagree" (and accompanied by a "don't know" option), were used to assess perceptions of the RD's ability to discuss food choices, create a physical activity plan, create a nutrition plan, independently bill for services, and conduct group nutrition sessions—all in the scope of RD practice. Four-point Likert scales, ranging from "greatly" to "not at all" (and accompanied by a "don't know" option), were used to assess the perceived extent of RD benefits, including increasing the provider's ability to serve patients,

improving the provider's ability to promote weight management, providing the practice with guidance and advice on nutrition, providing the practice with guidance on physical activity, providing billable visits, broadening support for patients, providing more time for nutritional counseling, increasing referrals to RD services, and increasing referrals to other specialty care.

**Analysis.** This paper addresses the following questions. The first 4 were answered using baseline data. (1) How comfortable, confident, and effective do PCPs feel with treating pediatric obesity? (2) What do PCPs know about what an RD can do, and what do they perceive to be the benefits of having an RD at a clinic? (3) How comfortable, confident, and effective do other clinic personnel feel with the dimensions of treating pediatric obesity that fall within their scope of practice? For nurses, social workers, and psychologists (described here as "other health care providers" or "non-PCP health care providers"), these include all dimensions of comfort, confidence, and effectiveness, excluding motivational interviewing and billing for obesity; for management staff, these include billing for obesity, changing individual practice, the practice's capacity to treat pediatric obesity, and the practice's capacity to change; for remaining personnel, these include the practice's capacity to treat pediatric obesity and the practice's capacity to change; for billing staff, these also include comfort and confidence with their knowledge of billing for obesity. (4) What is the management staff's knowledge of the RD's capacity, and what are their perceptions of the benefits of the integration of an RD into a practice? Do billing staff know that RDs can bill independently for services, and do they believe this to be a benefit of RD integration? (5) Did comfort, confidence, perceived effectiveness, and perceptions and knowledge of RD services change more in the intervention practices after the integration of the RDs than they did in the control practices during the same period? We assessed relative change for PCPs and other health care providers across domains, and relative change for all respondents in their comfort and confidence with the practice's current capacity and its capacity to change.

Data analysis was performed by use of SPSS (version 17.0). Missing responses and responses of "not applicable" were removed from analysis. "Don't know" was treated as a meaningful response. Change was categorized as improvement vs. no improvement (including deterioration), and logistic regression was used to assess whether being in the intervention or in the control group predicted this dichotomous outcome. Statistical significance was set at  $P < .05$ . Summary statistics presented in tables dichotomize responses into the 2 top categories vs. all other meaningful responses.

## Results

**Sample description.** Of the 413 clinic personnel surveyed, 278 (67.3%) responded. The minimum site-specific response rate was 52%. Five RDs, WIC nutritionists, or nutrition assis-

tants were excluded, because their perspectives would be unique. The resulting sample comprised 273 (66.9%) of a target population of 408 (413 minus the 5 removed).

One-third of the respondents were from family medicine practices, and two-thirds were from pediatric practices. PCPs accounted for 17.6% of respondents; 4 of 5 PCPs were medical doctors. The rest were divided between nurse practitioners and physician assistants. Other health care staff who can address weight issues accounted for 19% of the sample; this group included registered nurses and licensed practical nurses (who together compose most of the group), social workers, and psychologists. Practice managers, nurse managers, and other management staff accounted for 5% of respondents. All other clinic personnel—ranging from pharmacy technicians to dentists to receptionists—accounted for 59% of respondents; this included 14 billing staff.

Of the baseline sample, 231 (84.6%) responded to the posttest. The composition of this group was virtually the same as that for the baseline sample.

**Primary care provider perceptions and knowledge.** As seen in Table 1, comfort among PCPs ranged broadly: 15.2% were "comfortable" or "very comfortable" with their ability to bill for obesity, whereas 97.9% were "comfortable" or "very comfortable" with their practice's capacity to change. The small numbers prohibited our separating medical doctors, physician assistants, and nurse practitioners for analysis, but there was no obvious pattern of differences between these groups. On most dimensions, a majority of respondents were at least comfortable (billing and motivational interviewing were exceptions), although for no dimension were most respondents very comfortable. For most dimensions, confidence (not shown) was slightly lower than comfort. Personal perceived effectiveness was notably lower than both comfort and confidence, ranging from 35.4% to 60.4%.

Most PCPs were aware of each of the RD capabilities listed in the survey (data not shown). PCPs generally gave high ratings to the potential benefits of having an RD; only 1 potential benefit—the extent to which RDs increase a prac-

**TABLE 2.**  
**Non-Primary Care Provider Health Care Providers' Comfort and Perceived Effectiveness With Treating Pediatric Obesity**

Factor	Comfortable or very comfortable	Effective or highly effective
Raising the issue of overweight	19 (39.6)	9 (21.4)
Recommending nutritional resources	25 (53.2)	16 (37.2)
Advising parents on healthy foods	28 (59.6)	22 (52.4)
Changing practice's habits to address childhood obesity	23 (57.5)	...
Practice's current capacity to address childhood obesity	34 (69.4)	...
Practice's capacity to change to address childhood obesity	35 (76.1)	...

Note. Data are no. (%).

tice's referrals for other specialty services—was rated poorly.

**Other health care providers' perceptions and knowledge.**

While a majority of other health care providers reported feeling comfortable with the dimensions of obesity treatment relevant to their work, these majorities were in almost all cases notably lower than those for the PCPs (Table 2). The small numbers prohibited our separating nurses and behavioral specialists for analysis, but there was no obvious pattern of differences between these groups. Registered nurses and licensed practical nurses—the 2 largest groups—were similar in their distribution of responses. Strikingly, a minority of non-PCP health care providers reported feeling comfortable raising the issue of overweight with parents. As for PCPs, confidence was slightly lower than comfort, and perceived effectiveness was considerably lower.

As for PCPs, other health care providers were generally aware of the RD's scope of practice and gave high ratings to most potential benefits. In contrast to PCPs, other health care providers did not agree that RDs could independently bill for their services (41.2% in agreement), and they were unlikely to see billable visits as a potential benefit of having an RD in a practice (47.1%).

**Perceptions and knowledge of management staff.** Sixty percent of management staff (data not shown) expressed comfort with their knowledge of billing for obesity as a diagnosis. Similar percentages were comfortable with changing their individual practice habits to address childhood obesity and with the practice's capacity to address this issue; three-quarters were comfortable with their practice's capacity to change. As with other respondents, confidence was lower than comfort. Management staff were similar to other groups in their knowledge of RD capacity and their perception of RD benefits, although they were less sure than providers that RD integration would increase referrals for RD services (64.3%).

**Perceptions and knowledge of other clinic personnel.** One-quarter of remaining practice personnel declined to answer questions about their comfort with their practice's capacity

to address childhood obesity and to change. Among respondents, 69.9% expressed comfort with current capacity, and 79.1% expressed comfort with the practice's capacity to change. Confidence was slightly lower. Only half of billing staff were comfortable with their knowledge of billing for obesity. Two-thirds knew that RDs could bill independently for services; only one-third gave this potential benefit a high rating.

**Changes over the course of the study.** Table 3 presents findings on 1-year changes in comfort and effectiveness for PCPs and other health care providers. We also analyzed their changes in confidence and knowledge and their perceptions of RDs (data not shown). Table 4 presents changes for all respondents on the dimensions of comfort with practice capacity and with its capacity to change.

There is strikingly higher comfort and perceived effectiveness levels at baseline among respondents from intervention practices, compared with those from control practices. This may reflect selection bias, since intervention practices were required to be committed to RD integration and to addressing pediatric obesity. Alternatively, it may reflect the fact that intervention practices knew an RD would be joining their practice (or, in some cases, had just joined). Either situation could complicate the goal of conducting a meaningful pre-post, intervention-control comparison.

With some exceptions, intervention and control groups improved on the same dimensions—possibly because of increasing national attention to pediatric obesity or because of the effect of being studied. Comparative testing of the change in intervention and control groups, which was conducted to minimize these possible threats to internal validity, showed no statistically significant differences in changes for the 2 groups.

**Discussion**

For most dimensions of obesity treatment, most PCPs expressed comfort and confidence with their capacities. However, only a minority was very comfortable or confident.

**TABLE 3.**  
Change in Comfort and Perceived Effectiveness for Primary Care Providers and Other Health Care Providers, by Intervention and Control Groups

Factor	Comfortable or very comfortable				Effective or very effective			
	Intervention		Control		Intervention		Control	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Raising the issue of overweight	35 (62.5)	36 (64.3)	16 (80.0)	11 (55.0)	20 (38.5)	27 (51.9)	9 (42.9)	12 (57.1)
Recommending nutritional resources	31 (55.4)	43 (76.8)	9 (45.0)	12 (60.0)	19 (35.2)	30 (55.6)	7 (33.3)	12 (57.1)
Advising parents on healthy foods	40 (70.2)	42 (73.7)	14 (70.0)	17 (85.0)	27 (51.9)	30 (57.7)	12 (57.1)	16 (76.2)
Changing practice's habits to address childhood obesity	35 (68.6)	33 (64.7)	11 (57.9)	11 (57.9)	...	...	...	...
Practice's current capacity to address childhood obesity	38 (66.7)	46 (80.7)	8 (40.0)	11 (55.0)	...	...	...	...
Practice's capacity to change to address childhood obesity	41 (73.2)	44 (78.6)	8 (44.4)	10 (55.6)	...	...	...	...

Note. Data are no. (%).

**TABLE 4.**  
**Change in Comfort With Practice Capacity and Practice's Capacity to Change for All Respondent Types, by Intervention and Control Groups**

Factor	Comfortable or very comfortable			
	Intervention		Control	
	Pre	Post	Pre	Post
Practice's current capacity to address childhood obesity	85 (72.6)	98 (83.8)	20 (46.5)	26 (60.5)
Practice's capacity to change to address childhood obesity	88 (77.2)	91 (79.8)	25 (64.1)	24 (61.5)

Note. Data are no. (%).

Moreover, PCP comfort and confidence were low for the ability to conduct motivational interviewing and for knowledge of billing for obesity. Also striking were the low levels of comfort and confidence for raising the issue of overweight among nurses, social workers, and psychologists and the relatively low levels of comfort and confidence for other dimensions. As in similar studies, most PCPs and other health care providers did not perceive themselves as effective at raising the issue of overweight, at recommending nutritional resources, or at advising parents on healthy foods [14-17].

While most management staff reported being comfortable and confident with their knowledge of billing for a diagnosis, some were not, and comfort and confidence were low among billing staff. Many respondents were unaware that RDs can bill independently and/or did not perceive RDs to be an important source of billable visits or referrals to specialists.

These data suggest that significant change is required if primary care practices are to play the role envisioned for them in stemming childhood obesity and chronic disease. Four knowledge/skill gaps were highlighted in the present study: (1) perceived effectiveness of providers with raising the issue of overweight, recommending nutritional resources, and advising parents on healthy foods; (2) comfort and confidence among non-PCP health care providers with treating pediatric obesity; (3) knowledge of billing for obesity and RD services; and (4) providers' ability to conduct motivational interviewing. Respondents' positive perceptions of the benefits of having an RD in a practice suggest the importance of exploring this model as one approach to improving clinical capacity to address pediatric obesity. While respondents generally understood the scope of RD practice, addressing gaps in this area (such as knowledge of billing) will promote integration success.

There was no evidence that having an RD on-site for 1 year led to improvements in perceptions and knowledge. This analysis may have been weakened by selection criteria for the intervention group or by the fact that, at baseline, they were already aware of or had already embarked on a course of RD integration.

Confidence was consistently lower than comfort. Inclusion of both constructs in the survey was premised on the idea that they were different. This appears to be some-

what true; confidence may more closely reflect perceived abilities, whereas comfort may more closely reflect attitude.

## Limitations

The present study included only 13 practices, mostly rural and all of at least moderate size. The study sample is not representative of the state's practices overall, nor was this the study goal. Practices vary, and this study was not designed to make generalizable comparisons of practice types (eg, pediatrics vs family medicine). We did conduct a number of exploratory comparisons of these 2 groups. These showed some differences between the groups, but "take home" messages were generally the same as those for the total sample.

Study strengths include the broad range of concerns and respondent types covered. The sample was geographically diverse, and it included both pediatric and family medicine practices, as well as 2 federally qualified health centers. Findings on perceived effectiveness were consistent with those from other studies.

## Conclusion

The results of the present study suggest that enhancing the role of primary care in the treatment of pediatric obesity requires attention to (1) strengthening provider skills, particularly for non-PCP providers; (2) strengthening PCP skills in motivational interviewing; and (3) training practices in billing for obesity as a diagnosis and, where relevant, for RD services. Survey findings support the exploration of the integration of an RD into primary care. *NCMJ*

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# State Medicaid Policies and the Health Care Access of Low-Income Children With Special Health Care Needs Living in the American South

Susan L. Parish, Roderick A. Rose, Joan Yoo, Jamie G. Swaine

**BACKGROUND** The policy correlates that improve or impede the health care access of children with special health care needs (CSHCN), and particularly children living in the South, are not well understood.

**METHODS** We analyzed data from the 2005-2006 National Survey of CSHCN ( $n = 4560$  Southern children and 8788 non-Southern children). State Medicaid policy predictors included the frequency of Medicaid eligibility renewals (6 or 12 months) and the level of reimbursement provided for high-complexity and moderate-complexity pediatric office visits. Hierarchical generalized linear modeling was used to examine the association between state Medicaid policy features and 5 indicators of health care access (delayed or foregone care, difficulty using services, difficulty getting referrals, unmet routine care needs, and unmet specialty care needs), after controlling for child, family, and state factors.

**RESULTS** Low-income Southern CSHCN who lived in states with less-frequent Medicaid eligibility renewal requirements and higher health care provider reimbursement rates had significantly better health care access than did their Southern counterparts in states with more-frequent Medicaid eligibility renewals and lower reimbursement rates.

**LIMITATIONS** These data are cross-sectional, and causality cannot be inferred.

**CONCLUSION** Policymakers interested in addressing state budget gaps should be concerned that doing so by increasing the frequency of Medicaid eligibility renewals or by cutting health care provider reimbursement rates may well result in adverse health care access for low-income Southern CSHCN.

Children with special health care needs (CSHCN) have or are at an increased risk of developing chronic conditions that require health services beyond those needed by their counterparts without special health care needs [1]. An estimated 14% of children, or approximately 10.2 million, in the United States have special health care needs [2]. CSHCN have increased needs for physician and emergency department visits, hospitalizations, prescription medications, medical procedures, therapies, and ancillary care [3-6]. CSHCN are also at greater risk for having unmet health care needs [7, 8] and have more problems securing needed health services, compared with children without special health care needs [9].

**Geographic disparities in health and health care among children living in the South.** Living in the South is associated with increased risk of childhood obesity, childhood stroke mortality, low birth weight, and childhood mortality [10-13]. Several studies have examined residential region and found that people living in Southern states are particularly vulnerable to health care access problems [14-16]. The need to better understand the health care access of Southern children, as well as the predictors of child health outcomes, is clear [13]; little is known about why such regional disparities exist. The current body of research has used region as a covariate in regression analyses but has typically not examined the interaction effects of living in the South and key health policy variables [13, 15, 16].

To understand the geographic disparities in health and

health care among CSHCN, several studies have examined interstate variability in health care access for CSHCN. Policy features may explain interstate variability in health care access for CSHCN [17-19]. For example, CSHCN living in states with higher income eligibility thresholds were less likely to experience delayed care and were more likely to have personal doctors [17-19].

**Variations in state health care policy and access to health care services.** In particular, state Medicaid policy features may drive part of the interstate variability in children's health care access. For example, children living in Southern states have the highest uninsurance rates (18% in the South, compared with 11% in the Northeast or Midwest, in 2009) [20]. States have extensive latitude to control Medicaid eligibility guidelines, reimbursement rates, cost sharing, and benefit packages [21, 22]. However, the extant research has not explored whether state variability in children's health care access can be explained by state variability in the design of states' public health insurance programs.

State renewal policies are associated with Medicaid retention [23, 24]. While most children eventually reen-

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roll [25], cumbersome renewal processes increase the risk of Medicaid dropout and reduce continuity of care [26]. Interrupted continuity of care poses greater health risks to vulnerable CSHCN, who have greater care needs, than to children without special health care needs.

At present, it is unclear whether it is the region of residence, state Medicaid policy factors, or the combination of the two that explains the health care access of Southern children. We were unable to find any research that reports on the interaction between region and state Medicaid characteristics. While we cannot predict this effect from previous research, the existing evidence of adverse health effects for Southern children [10-13] warrants investigating how these policies work in the South. Thus, the specific research questions addressed in this study were as follows: (1) How do low-income CSHCN living in Southern states compare to their counterparts in non-Southern states, in terms of health care access? (2) What is the relationship between the health care access of low-income CSHCN living in the South and state Medicaid policies related to the frequency of eligibility renewals and Medicaid reimbursement rates for

health care providers? And (3) How does the relationship between the health care access of low-income CSHCN and state Medicaid policies differ by region?

## Methods

### Data and Sample

**Children and families.** We used the child and family data from the 2005-2006 wave of the National Survey of CSHCN, a random-digit-dialed telephone survey conducted by the National Center for Health Statistics between April 2005 and February 2007 [2]. The data consist of a stratified random sample that is representative of the US noninstitutionalized population of CSHCN; the sample amounts to approximately 750 families per state. Details about the survey methods and the identification of CSHCN are available elsewhere [27, 28].

**State variables.** Medicaid renewal rules were obtained from the Kaiser Commission on Medicaid and the Uninsured [29]. State median income values for families with children were obtained from the Annie E. Casey Foundation [30]. State population estimates and proportions of the popula-

**TABLE 1.**  
Description of the Sample of Low-Income Children With Special Health Care Needs in the South and Elsewhere in the United States, 2005

Characteristic of child or family	In a Southern state, no. (%)	Outside the South, no. (%)	$\chi^2$	P		
Total household income <100% FPL	2111 (48)	3466 (45)	4.25	.039 <sup>a</sup>		
Child's race						
Black	1138 (32)	1166 (21)	60.4	0 <sup>b</sup>		
Hispanic	460 (14)	1601 (21)	28.27	0 <sup>b</sup>		
White	2597 (47)	5049 (50)	4.39	.036 <sup>a</sup>		
Child is female	1839 (41)	3558 (41)	0.03	.855		
Parent did not graduate high school	574 (15)	806 (13)	2.69	.101		
Child's health care needs are not stable	429 (10)	767 (10)	0.01	.913		
Condition or problem is severe	568 (13)	1016 (13)	0.23	.632		
Parent is single mother	2100 (50)	3921 (49)	0.95	.33		
Child's insurance type						
Private only	1010 (20)	2358 (24)	6.52	0 <sup>b</sup>		
Public only	2723 (62)	4620 (56)				
Both private and public	479 (11)	1049 (13)				
Other comprehensive insurance	65 (1)	206 (2)				
None (uninsured)	271 (6)	539 (5)				
Health care delayed or foregone	522 (11)	1214 (14)	7.7	.006 <sup>c</sup>		
Difficulty using health care services	612 (14)	1331 (15)	0.98	.322		
Problems getting referrals for health care	373 (24)	815 (26)	1.13	.288		
Unmet routine health care needs	150 (5)	306 (4)	0.5	.481		
Unmet specialty care needs	173 (8)	409 (10)	1.05	.305		
	Mean	SD	Mean	SD	t statistic	p value
Age of child	9.4	6.8	9.9	8.8	2.99	0.003 <sup>b</sup>

Note. FPL, federal poverty level.

<sup>a</sup>P < .05.

<sup>b</sup>P < .001.

<sup>c</sup>P < .01.

**TABLE 2.**  
**Unadjusted Percentages of Low-Income Children With Special Health Care Needs With Health Care Access Problems, by State and Region**

State/region	Problems obtaining specialty referrals	Unmet routine care needs	Unmet specialist care needs	Delayed care	Difficulty receiving services
Alaska	25.4	4.6	13.6	13	14.5
Alabama	18.8	1.8	3.1	5.7	10.2
Arkansas	16.6	3.0	8.0	8.4	15.2
Arizona	35.5	8.7	10.2	18.1	17.3
California	34.4	6.7	9.8	14.1	20.7
Colorado	28.1	9.2	11.7	20.3	17.7
Connecticut	42.6	1.4	17.3	10.3	16.9
Dist Col	25.2	5.5	9.8	5.8	14.0
Delaware	28.3	2.4	1.1	11.6	19.4
Florida	27.4	4.9	10.0	13.1	17.0
Georgia	20.4	6.0	9.7	11.6	12.7
Hawaii	26.8	2.5	13.8	10.3	14.5
Iowa	16.2	3.2	6.0	5.9	8.1
Idaho	25.7	6.0	11.7	15.7	19.1
Illinois	18.3	3.1	5.7	13.6	12.8
Indiana	29.3	5.2	3.6	13.9	5.7
Kansas	8.6	5.0	11.6	11.4	9.5
Kentucky	14.6	2.1	2	7.6	10.1
Louisiana	10.7	2.2	2.9	5.8	9.9
Massachusetts	10.8	1.1	9.4	10.5	12.7
Maryland	22.2	4.1	6.3	6.5	10.9
Maine	15.7	0.9	7.2	11.1	13.5
Michigan	26.0	4.5	10.9	12.7	12.6
Minnesota	31.3	5.8	9.3	17.2	17.5
Missouri	23.0	5.9	8.6	12.5	11.0
Mississippi	20.8	6.6	7.9	7.6	11.6
Montana	22.7	9.1	14.6	20.1	14.4
North Carolina	16.9	2.6	7.1	6.7	12.1
North Dakota	19.8	4.9	4.7	13.2	10.4
Nebraska	25.2	1.3	4.2	10.9	12.9
New Hampshire	19.4	2.1	10.0	12.5	18.8
New Jersey	22.2	4.6	14.3	11.6	17.4
New Mexico	28.2	3.5	12.3	16.1	16.7
Nevada	37.6	13	17.5	19.9	26.1
New York	25.0	2.7	12	11.4	11.8
Ohio	19.5	2.0	6.4	15.9	11.7
Oklahoma	22.8	4.1	10.5	13.8	13.0
Oregon	30.1	8.7	16.6	23.6	16.3
Pennsylvania	28.6	0.4	9.6	8.8	13.8
Rhode Island	12.1	2.1	6.2	8.3	14.0
South Carolina	17.3	6.4	9.6	11.3	7.9
South Dakota	22.9	3.9	5.6	11.0	13.2
Tennessee	17.8	1.9	3.5	9.4	10.6
Texas	40.3	8.8	14.3	17.1	19.1
Utah	20.7	8.5	13.7	19.1	17.0
Virginia	18.2	3.2	4.9	10.4	14.1
Vermont	22.6	3.7	12.4	8.2	13.0
Washington	24.7	5.5	10.1	15.3	17.6
Wisconsin	25.0	4.3	6.5	19.7	15.1
West Virginia	20.0	2.6	4.7	10.1	11.1
Wyoming	28.1	4.2	5.9	13.7	17.7
Non-South	26.0	4.3	9.6	13.7	14.7
South	23.7	4.8	8.3	11.1	13.7
US average	25.0	4.5	9.1	12.6	14.2

tion residing in nonmetropolitan areas were obtained from the US Census, to adjust for barriers to health care that are commonly faced by rural families. Provider reimbursement rates were obtained from the American Academy of Pediatrics [31].

**Sample description.** The sample included 4,560 low-income CSHCN living in Southern states and 8,788 CSHCN living outside of the South. According to the Kaiser Commission on Medicaid and the Uninsured, there is wide variability in income eligibility, mostly ranging from 100% of the federal poverty level to 200% of the federal poverty level, for children's Medicaid coverage [29]. Thus, children who are living in households with similar income levels may be eligible for Medicaid in some states but not in others. To fully understand the impact of state Medicaid policy features on access to health care among CSHCN, we analyzed low-income children, rather than children who were Medicaid recipients. In addition, to reflect the variability in income eligibility for Medicaid, children were determined to be low-income if they lived in households with aggregate income from all sources that was less than twice the federal poverty level. Table 1 describes the sample and compares Southern children to those living elsewhere in the United States. Southern children were more likely to be younger, to live in a household with an income below the federal poverty line, to be black, and to have public health insurance. Southern CSHCN were less likely to be Hispanic, compared with those living in other parts of the United States. Regional differences were not found for parental education, for the severity of the child's health condition, or for the child's sex.

## Measures

**Dependent variables.** The Institute of Medicine defined "health care access" as the timely utilization of services to achieve the best possible health [32]. Access includes both the potential for obtaining appropriate health care services and the actual use of services [33, 34]. An array of indicators have been employed to measure the multidimensional construct of access (eg, insurance coverage, receipt of appropriate preventive care, having a usual care provider) [35]. We estimated models for 5 binary-dependent variables describing common health care access difficulties: (1) delayed or foregone care, (2) difficulty using services, (3) problems getting referrals, (4) unmet preventive or routine care needs, and (5) unmet specialist care needs.

**Policy characteristics.** There were 3 independent state policy variables: (1) frequency of Medicaid eligibility renewal (6 or 12 months; a dummy variable with states with 12 months was coded "1" and with 6 months was coded "0"), (2) Medicaid health care provider reimbursement rates for high-complexity office visits (in \$10 increments), and (3) Medicaid health care provider reimbursement rates for moderate-complexity office visits (in \$10 increments).

**Region indicator and interaction.** When 2 variables were

interacted, the main effect for 1 of the variables (eg, a policy variable such as renewal frequency) was interpreted at the reference condition for the other [36]. All of the policy variables here were interacted with a regional indicator. To examine the total effect of the policy for children who lived in 1 of the 16 Southern states as defined by the Southern Legislative Conference (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia), the region indicator was oriented such that 0 represented Southern states and 1 represented all other states. While this seems unusual, given our focus on Southern states, it facilitates an easy interpretation of the odds ratio for each policy variable as the effect of the policy for children living in the South. The odds ratio for the interaction term was then interpreted as a "difference in difference" term that measured the difference in the effect of the policy for children living in non-Southern states, compared with those for children living in the South.

**Covariates.** Child- and family-level covariates included family income below 100% of the federal poverty level, child's race/ethnicity, child's sex and age, highest parental education level, stability and severity of the child's condition (severe or mild/moderate), parental marital status, and child's insurance type.

State-level covariates, including median income for families with children, were included as an indicator of relative state wealth. The proportion of nonmetropolitan population was added, to account for the challenges that rural populations face in accessing health care (one unit difference = 1 percentage point). The state average unemployment rate (percentage of the labor force) controlled for relative economic conditions (one unit difference = 1 percentage point).

**Analysis method.** With multilevel data and binary outcomes, we used hierarchical generalized linear modeling [37], which accommodates logistic regression. Multilevel models of families nested within states were used because they concurrently partition the variance in the outcome into individual-level and state-level components in the same single model. These models ensure that state-level variables explain between-state variation only (eg, that the proportion of the population that lives in nonmetropolitan areas cannot explain differences between persons living in the same state). Further, they correctly estimate inflated standard errors for state policy characteristics. Data were missing for both dependent variables and covariates. Missing data for dependent variables were conditionally missing (missingness corresponds to respondents who were ineligible to respond to the question), and no further action was taken on these missing values. For covariates, missingness ranged from 0 to 1,186 (parent marital status, 7% of the data). Multiple imputation was used to address the limited missing values throughout the National Survey of CSHCN. As recommended by Graham and colleagues [38], a sufficiently large number of versions of the data set (in this case, pre-

analysis suggested that 15 imputations were sufficient) were imputed, with the procedure filling in the missing values by use of random draws from conditional probability distributions generated using a model containing 70 variables. Mplus was used to estimate the models for each imputed data set and to combine the results into the estimates reported in the results tables [39]. All data reported here were weighted to the US Census population estimates.

## Results

Table 1 describes the sample and reports the unadjusted comparison, with other children, of health care access for low-income CSHCN living in the South. Southern children were somewhat less likely to have delayed or foregone care, compared with non-Southern children. However, statistically significant differences were not found for the other 4 measures of health care access. Table 2 presents, by state, the percentage of low-income CSHCN who have health care

access problems. There is considerable state variability in the percentage of low-income CSHCN with health care access problems, and there is variability in the percentage of children within states who have different health care access problems.

Table 3 presents the results for the frequency of Medicaid eligibility renewals, in the form of odds ratios for the policy effect and as an indicator of statistical significance. Low-income Southern children who lived in states with a 12-month renewal frequency (compared with Southern children who lived in states with a 6-month renewal frequency) had a lower odds of delayed care (28%), unmet specialty care (28%), difficulty using services (14%), referral problems (32%), and unmet routine care (31%). Table 3 also reports the difference in health care access between low-income CSHCN living in the South and low-income non-Southern CSHN.

Table 4 presents the findings for Medicaid reimburse-

**TABLE 3.**  
**Odds Ratios (95% Confidence Intervals) for Multilevel Regression: Medicaid Eligibility Renewal Frequency**

Characteristic	Delayed care	Difficulty using services	Difficulty getting referrals	Unmet routine care needs	Unmet specialist care needs
Intercept	0.11 (0.09-0.14)	0.10 (0.08-0.13)	0.27 (0.17-0.42)	0.03 (0.02-0.05)	0.06 (0.04-0.09)
Income <100% FPL <sup>a</sup>	1.37 (1.26-1.50) <sup>b</sup>	1.06 (0.95-1.18)	0.98 (0.85-1.13)	1.63 (1.32-2.01) <sup>b</sup>	1.35 (1.14-1.59) <sup>b</sup>
Black race <sup>a</sup>	0.59 (0.48-0.74) <sup>b</sup>	0.69 (0.61-0.79) <sup>b</sup>	0.82 (0.72-0.94) <sup>c</sup>	0.61 (0.41-0.90) <sup>d</sup>	0.90 (0.68-1.18)
Hispanic ethnicity <sup>a</sup>	0.96 (0.78-1.17)	1.20 (0.93-1.54)	1.57 (1.32-1.87) <sup>b</sup>	1.09 (0.76-1.54)	0.82 (0.53-1.25)
Sex <sup>a</sup>	0.98 (0.86-1.11)	0.91 (0.79-1.07)	0.88 (0.73-1.06)	0.90 (0.74-1.10)	1.03 (0.89-1.18)
Age of child <sup>e</sup>	1.05 (1.04-1.07) <sup>b</sup>	1.03 (1.01-1.04) <sup>b</sup>	1.01 (0.99-1.03)	1.07 (1.04-1.10) <sup>b</sup>	1.04 (1.03-1.06) <sup>b</sup>
Highest grade level among parents <sup>a</sup>	0.87 (0.76-1.01)	0.82 (0.69-0.98) <sup>d</sup>	1.13 (1.00-1.27) <sup>d</sup>	0.94 (0.68-1.32)	0.73 (0.56-0.97) <sup>d</sup>
Child's health care needs are not stable <sup>a</sup>	1.28 (1.05-1.55) <sup>d</sup>	1.83 (1.60-2.09) <sup>b</sup>	1.23 (0.94-1.61)	1.23 (0.86-.77)	0.96 (0.65-1.42)
Condition or problem is severe <sup>a</sup>	1.48 (1.26-1.73) <sup>b</sup>	2.99 (2.61-3.43) <sup>b</sup>	1.60 (1.29-1.99) <sup>b</sup>	2.00 (1.39-2.87) <sup>b</sup>	2.16 (1.90-2.47) <sup>b</sup>
Parent is single mother <sup>a</sup>	1.12 (0.96-1.30)	1.27 (1.03-1.56) <sup>d</sup>	1.09 (0.93-1.28)	1.34 (0.99-1.81)	1.04 (0.84-1.28)
Child has public health insurance <sup>a</sup>	0.83 (0.70-0.99) <sup>d</sup>	1.14 (0.99-1.31)	1.09 (0.87-1.36)	0.69 (0.46-1.03)	1.02 (0.73-1.43)
Child is uninsured <sup>a</sup>	7.05 (5.55-8.95) <sup>b</sup>	3.22 (2.55-4.05) <sup>b</sup>	2.32 (1.78-3.04) <sup>b</sup>	8.68 (5.98-12.60) <sup>b</sup>	7.35 (5.06-10.69) <sup>b</sup>
State covariates					
Median income for families with children (\$10,000s) <sup>e</sup>	0.89 (0.82-0.96) <sup>c</sup>	0.92 (0.87-0.97) <sup>c</sup>	0.84 (0.76-0.92) <sup>b</sup>	0.83 (0.68-1.01)	0.93 (0.84-1.04)
Proportion nonmetropolitan population <sup>e</sup>	0.99 (0.99-1.00) <sup>d</sup>	0.99 (0.99-0.99) <sup>b</sup>	0.99 (0.98-0.99) <sup>b</sup>	0.99 (0.98-1.00) <sup>d</sup>	0.99 (0.98-0.99) <sup>b</sup>
Unemployment rate (% of labor force) <sup>e</sup>	0.96 (0.90-1.01)	0.89 (0.86-0.94) <sup>b</sup>	0.92 (0.87-0.99) <sup>d</sup>	1.01 (0.91-1.12)	0.94 (0.84-1.04)
State independent variables					
Not a Southern state	1.50 (1.29-1.74) <sup>b</sup>	1.13 (1.02-1.25) <sup>d</sup>	1.31 (1.15-1.50) <sup>b</sup>	1.10 (0.80-1.51)	1.40 (1.11-1.77) <sup>c</sup>
Frequency of Medicaid renewal is 12 months	0.72 (0.62-0.84) <sup>b</sup>	0.86 (0.77-0.97) <sup>d</sup>	0.68 (0.51-0.91) <sup>c</sup>	0.69 (0.53-0.90) <sup>c</sup>	0.72 (0.58-0.90) <sup>c</sup>
Interactions of region with policy variable					
Frequency of Medicaid renewal is 12 months	1.07 (1.00-1.14)	1.00 (0.97-1.04)	1.01 (0.96-1.07)	1.14 (0.93-1.40)	1.01 (0.95-1.07)

<sup>a</sup>Reference categories include: income 100%-199% federal poverty level, white race, non-Hispanic, boys, graduated high school, health care needs are stable, condition is moderate or minor, 2-parent or single-father household, child has private insurance.

<sup>b</sup>P < .001.

<sup>c</sup>P < .01.

<sup>d</sup>P < .05.

<sup>e</sup>Continuous variables are mean-centered.

**TABLE 4.**  
**Odds Ratios (95% Confidence Intervals) for Multilevel Regression: Medicaid Reimbursement Rates for High-Complexity Pediatric Office Visit**

Characteristic	Delayed care	Difficulty using services	Difficulty getting referrals	Unmet routine care needs	Unmet specialist care needs
Intercept	0.09 (0.08-0.10)	0.09 (0.07-0.11)	0.20 (0.14-0.28)	0.03 (0.02-0.03)	0.05 (0.03-0.07)
Income < 100% FPL <sup>a</sup>	1.37 (1.26-1.50) <sup>b</sup>	1.05 (0.94-1.18)	0.95 (0.82-1.10)	1.66 (1.36-2.03) <sup>b</sup>	1.34 (1.13-1.58) <sup>b</sup>
Black race <sup>a</sup>	0.59 (0.47-0.73) <sup>b</sup>	0.72 (0.63-0.81) <sup>b</sup>	0.86 (0.74-0.99) <sup>c</sup>	0.60 (0.40-0.90) <sup>c</sup>	0.90 (0.67-1.20)
Hispanic ethnicity <sup>a</sup>	0.96 (0.79-1.17)	1.22 (0.95-1.56)	1.56 (1.33-1.84) <sup>b</sup>	1.09 (0.77-1.55)	0.82 (0.54-1.25)
Sex <sup>a</sup>	0.97 (0.85-1.11)	0.92 (0.79-1.07)	0.89 (0.73-1.07)	0.90 (0.74-1.11)	1.03 (0.89-1.19)
Age of child <sup>d</sup>	1.05 (1.04-1.07) <sup>b</sup>	1.03 (1.01-1.04) <sup>b</sup>	1.01 (0.99-1.03)	1.07 (1.04-1.10) <sup>b</sup>	1.05 (1.03-1.06) <sup>b</sup>
Highest grade level among parents <sup>a</sup>	0.88 (0.76-1.01)	0.82 (0.68-0.98) <sup>c</sup>	1.18 (1.05-1.32) <sup>e</sup>	0.96 (0.68-1.35)	0.77 (0.58-1.02)
Child's health care needs are not stable <sup>a</sup>	1.29 (1.05-1.57) <sup>c</sup>	1.80 (1.57-2.06) <sup>b</sup>	1.23 (0.93-1.62)	1.17 (0.81-1.68)	0.99 (0.68-1.44)
Condition or problem is severe <sup>a</sup>	1.51 (1.29-.77) <sup>b</sup>	3.08 (2.70-3.52) <sup>b</sup>	1.64 (1.31-2.04) <sup>b</sup>	2.03 (1.43-2.89) <sup>b</sup>	2.12 (1.85-2.43) <sup>b</sup>
Parent is single mother <sup>a</sup>	1.12 (0.96-1.30)	1.26 (1.02-1.57) <sup>c</sup>	1.07 (0.90-1.26)	1.36 (1.01-1.83) <sup>c</sup>	1.02 (0.81-1.29)
Child has public health insurance <sup>a</sup>	0.84 (0.71-1.00) <sup>c</sup>	1.12 (0.97-1.28)	1.13 (0.90-1.41)	0.68 (0.46-1.01)	1.02 (0.73-1.44)
Child is uninsured <sup>d</sup>	7.16 (5.62-9.11) <sup>b</sup>	3.20 (2.54-4.03) <sup>b</sup>	2.43 (1.85-3.18) <sup>b</sup>	8.66 (5.96-12.60) <sup>b</sup>	7.51 (5.11-11.02) <sup>b</sup>
State covariates					
Median income for families with children (\$10,000s) <sup>d</sup>	0.90 (0.83-0.98) <sup>c</sup>	0.92 (0.87-0.98) <sup>c</sup>	0.85 (0.78-0.93) <sup>b</sup>	0.84 (0.69-1.03)	0.92 (0.83-1.03)
Proportion nonmetropolitan population <sup>d</sup>	0.99 (0.99-1.00) <sup>e</sup>	0.99 (0.99-0.99) <sup>b</sup>	0.99 (0.98-0.99) <sup>b</sup>	0.99 (0.98-0.99) <sup>b</sup>	0.99 (0.98-0.99) <sup>b</sup>
Unemployment rate (% of labor force) <sup>d</sup>	1.00 (0.94-1.07)	0.91 (0.87-0.96) <sup>b</sup>	0.95 (0.88-1.03)	1.09 (0.97-1.23)	0.96 (0.87-1.05)
State independent variables					
Not a Southern state	1.47 (1.29-1.67) <sup>b</sup>	1.14 (1.03-1.26) <sup>c</sup>	1.24 (1.06-1.45) <sup>e</sup>	1.06 (0.84-1.34)	1.30 (1.05-1.63) <sup>c</sup>
Reimbursement rate: high-complexity office visit	0.93 (0.90-0.97) <sup>e</sup>	0.98 (0.96-1.00)	0.92 (0.89-0.96) <sup>b</sup>	0.98 (0.91-1.06)	1.00 (0.92-1.08)
Interactions of region with policy variable					
Reimbursement rate: high-complexity office visit	1.01 (1.01-1.02) <sup>b</sup>	1.01 (1.00-1.01) <sup>e</sup>	1.01 (1.00-1.01) <sup>e</sup>	1.01 (1.00-1.02) <sup>c</sup>	1.00 (0.99-1.01)

<sup>a</sup>Reference categories include: income 100%-199% federal poverty level, white race, non-Hispanic, boys, graduated high school, health care needs are stable, condition is moderate or minor, 2-parent or single-father household, child has private insurance.

<sup>b</sup>P < .001.

<sup>c</sup>P < .05.

<sup>d</sup>Continuous variables are mean-centered.

<sup>e</sup>P < .01.

ment rates for high-complexity pediatric office visits. For low-income Southern CSHCN, a \$10 increase in the Medicaid reimbursement rate for high-complexity office visits was associated with 7% lower odds of delayed or foregone care and 8% lower odds of having referral problems (Table 4). The regional comparison reported in Table 4 indicates that there was a minor, statistically significant difference between Southern and non-Southern children. For every \$10 increase in Medicaid reimbursement rates for high-complexity office visits, non-Southern children had a 1% greater likelihood of having delayed care, difficulty using services, difficulty getting referrals, and having unmet routine care needs, compared with their Southern counterparts. Statistically significant regional differences were not found for unmet specialty care.

The findings related to the Medicaid reimbursement rates for moderate-complexity office visits are reported in Table 5. Among low-income Southern CSHCN, a \$10 increase in the

reimbursement rate for moderate-complexity office visits was associated with lower odds of having delayed or foregone care (10%), experiencing difficulty using health care services (5%), and having referral problems (12%).

There was a small difference between Southern and non-Southern children in the reduction in odds associated with more-generous reimbursement rates for moderate-complexity office visits. For every \$10 increase in reimbursement rates, non-Southern children had 2% higher odds of having delayed care and 1% higher odds of having difficulty using services and difficulty getting referrals, compared with their Southern counterparts. Statistically significant regional differences were not found for either unmet routine care needs or the likelihood of having unmet specialist care needs.

Notably, the regional comparisons (Tables 4 and 5) do not mean that a \$10 increase in reimbursement rates makes non-Southern children worse off; it indicates they do not

**TABLE 5.**  
**Odds Ratios (95% Confidence Intervals) for Multilevel Regression: Medicaid Reimbursement Rates for Moderate-Complexity Pediatric Office Visit**

Characteristic	Delayed care	Difficulty using services	Difficulty getting referrals	Unmet routine care needs	Unmet specialist care needs
Intercept	0.09 (0.08-0.10)	0.09 (0.07-0.11)	0.20 (0.14-0.27)	0.03 (0.02-0.03)	0.05 (0.03-0.07)
Income < 100% FPL <sup>a</sup>	1.37 (1.26-1.49) <sup>b</sup>	1.05 (0.93-1.18)	0.95 (0.82-1.10)	1.65 (1.34-2.04) <sup>b</sup>	1.34 (1.13-1.58) <sup>b</sup>
Black race <sup>a</sup>	0.59 (0.47-0.73) <sup>b</sup>	0.72 (0.63-0.81) <sup>b</sup>	0.86 (0.75-0.99) <sup>c</sup>	0.59 (0.39-0.90) <sup>c</sup>	0.90 (0.67-1.20)
Hispanic ethnicity <sup>a</sup>	0.96 (0.78-1.17)	1.21 (0.95-1.55)	1.56 (1.32-1.83) <sup>b</sup>	1.09 (0.77-1.54)	0.82 (0.54-1.25)
Sex <sup>a</sup>	0.97 (0.85-1.11)	0.92 (0.79-1.07)	0.89 (0.73-1.07)	0.90 (0.74-1.11)	1.03 (0.89-1.19)
Age of child <sup>d</sup>	1.05 (1.04-1.07) <sup>b</sup>	1.03 (1.01-1.04) <sup>b</sup>	1.01 (0.99-1.03)	1.07 (1.04-1.10) <sup>b</sup>	1.05 (1.03-1.07) <sup>b</sup>
Highest grade level among parents <sup>a</sup>	0.88 (0.76-1.02)	0.82 (0.68-0.98) <sup>c</sup>	1.18 (1.06-1.32) <sup>e</sup>	0.96 (0.68-1.35)	0.77 (0.58-1.03)
Child's health care needs are not stable <sup>a</sup>	1.29 (1.05-1.57) <sup>c</sup>	1.80 (1.57-2.06) <sup>b</sup>	1.23 (0.93-1.62)	1.17 (0.82-1.69)	0.99 (0.68-1.44)
Condition or problem is severe <sup>a</sup>	1.51 (1.29-1.77) <sup>b</sup>	3.08 (2.70-3.52) <sup>b</sup>	1.63 (1.31-2.04) <sup>b</sup>	2.03 (1.42-2.89) <sup>b</sup>	2.12 (1.85-2.43) <sup>b</sup>
Parent is single mother <sup>a</sup>	1.12 (0.96-1.30)	1.26 (1.02-1.57) <sup>c</sup>	1.07 (0.91-1.26)	1.37 (1.02-1.83) <sup>c</sup>	1.02 (0.81-1.29)
Child has public health insurance <sup>a</sup>	0.84 (0.70-1.00)	1.12 (0.97-1.29)	1.13 (0.90-1.41)	0.68 (0.46-1.01)	1.03 (0.73-1.44)
Child is uninsured <sup>d</sup>	7.17 (5.63-9.13) <sup>b</sup>	3.20 (2.54-4.04) <sup>b</sup>	2.43 (1.85-3.19) <sup>b</sup>	8.71 (6.01-12.65) <sup>b</sup>	7.51 (5.12-11.00) <sup>b</sup>
State covariates					
Median Income for families with children (\$10,000s) <sup>b</sup>	0.90 (0.83-0.97) <sup>e</sup>	0.92 (0.87-0.98) <sup>e</sup>	0.85 (0.78-0.94) <sup>b</sup>	0.83 (0.69-1.01)	0.92 (0.83-1.03)
Proportion nonmetropolitan population <sup>d</sup>	0.99 (0.99-1.00) <sup>e</sup>	0.99 (0.99-0.99) <sup>b</sup>	0.99 (0.98-0.99) <sup>b</sup>	0.99 (0.98-0.99) <sup>b</sup>	0.99 (0.98-0.99) <sup>b</sup>
Unemployment rate (% of labor force) <sup>d</sup>	1.00 (0.94-1.07)	0.91 (0.87-0.96) <sup>b</sup>	0.95 (0.87-1.03)	1.09 (0.97-1.23)	0.96 (0.87-1.05)
State independent variables					
Not a Southern state	1.49 (1.31-1.70) <sup>b</sup>	1.15 (1.04-1.26) <sup>e</sup>	1.25 (1.09-1.44) <sup>e</sup>	1.07 (0.84-1.35)	1.32 (1.06-1.64) <sup>c</sup>
Reimbursement: moderate-complexity	0.90 (0.84-0.98) <sup>c</sup>	0.95 (0.91-0.99) <sup>c</sup>	0.88 (0.81-0.95) <sup>b</sup>	0.97 (0.86-1.09)	1.01 (0.90-1.14)
Interactions of region with policy variable					
Reimbursement: moderate-complexity	1.02 (1.01-1.03) <sup>b</sup>	1.01 (1.00-1.02) <sup>b</sup>	1.01 (1.00-1.02) <sup>e</sup>	1.02 (1.00-1.03)	1.00 (0.99-1.02)

<sup>a</sup>Reference categories include: income 100%-199% federal poverty level, white race, non-Hispanic, boys, graduated high school, health care needs are stable, condition is moderate or minor, 2-parent or single-father household, child has private insurance.

<sup>b</sup>P < .001.

<sup>c</sup>P < .05.

<sup>d</sup>Continuous variables are mean-centered.

<sup>e</sup>P < .01.

benefit from increased Medicaid reimbursement rates as much as Southern children do.

## Discussion

We examined state Medicaid characteristics and the health care of low-income CSHCN living in the South. We found consistent evidence that lower renewal frequency and higher Medicaid reimbursement rates were both independently associated with better health care access for low-income CSHCN. However, for Southern children these policies were associated with outcomes that were either better than or no different from those for children not living in the South.

## Limitations

The National Survey of CSHCN is cross-sectional, and the multilevel modeling approach used in the present study, although appropriately adjusting the standard errors of the

policy effects, is not by itself an adequate means of adjusting for all confounders. We therefore cannot infer causality from these analyses. The National Survey of CSHCN does not provide detailed information about parental employment, which would be useful to fully understand patterns of health care access for these children.

## Implications

The present study contributes new information with regard to the relationship between state policy characteristics and the health care access of low-income Southern CSHCN. We were surprised to find that, compared with those living elsewhere in the United States, Southern children fared as well or better on indicators of health care access, when other key factors were held constant. In addition, the impact of more-generous Medicaid policy features was similar or slightly better at improving health care access for Southern children than it was for their non-Southern counterparts.

This exploratory study does not provide a complete understanding of why a deleterious effect of Southern health care access was not found, contrary to the extant public health research [10-13]. Further research should explore these relationships.

Our major contribution is the identification of the consistent, robust relationship between 2 types of state Medicaid policies and the health care access of low-income CSHCN living in the American South. We consider each in turn.

First, low-income CSHCN living in Southern states that require renewal of Medicaid eligibility every 6 months experience remarkable reductions in the adequacy of their health care access. All 5 indicators of health care access showed large effect sizes here (with reduced likelihoods of not getting needed care ranging from 14% to 32%). The magnitude of these care reductions is thus quite large.

We are unable to determine the mechanisms that explain the relationship between health care and Medicaid renewal frequency. However, it is plausible that families who must renew their child's health insurance every 6 months experience this step as a burden that results in gaps in continuity of care. States have used renewal processes to address budget difficulties [26].

Second, provider reimbursement rates are robustly associated with 3 indicators of health care access: delayed or foregone care, difficulty getting health care services, and difficulty obtaining referrals for health care services. In all of these cases, a \$10 increase in the per office visit reimbursement rate was associated with a decrease of access problems by approximately 10%. These findings are consistent with those of previous studies that linked lower Medicaid reimbursement rates and children's unmet health care needs [40-42]. These findings may partly be explained by low physician Medicaid participation [43], but further research is warranted to fully understand these relationships.

The Balanced Budget Act of 1997 induced states to streamline Medicaid eligibility and renewal requirements, which greatly expanded program participation [44]. As of September 2011, a majority of states have made substantial Medicaid program cuts, including unanticipated midyear cuts [45]. States have entertained numerous approaches to control costs in the face of ongoing budget crises [45], including reducing provider reimbursement rates and tightening eligibility.

These findings importantly indicate that policymakers who opt to control Medicaid costs with these types of eligibility restrictions and supply-side cuts may worsen health care access for low-income CSHCN. And unmet health care needs can translate into more-expensive conditions, including the development of preventable secondary conditions, for children with compromised health care access. These findings may signal particularly dire consequences for low-income CSHCN in the South, if federal deficit reduction measures result in significant cuts to federal aid to the states.

It is estimated that such cuts will have a larger effect on Southern states than on those in other regions of the nation [46]. State and federal policymakers should find ways to address budget shortfalls without enacting these Medicaid cuts, which reduce the health care access for CSHCN.

## Conclusion

Low-income Southern CSHCN had improved health care access when they lived in states with less-frequent Medicaid renewal requirements and higher Medicaid reimbursement rates for both moderate- and high-complexity pediatric office visits. These relationships persisted after controlling for a host of child, family, and state characteristics. Policymakers interested in ensuring adequate health care access for these vulnerable children should consider the likely deleterious effects of increasing the frequency of eligibility renewals and of cutting provider reimbursement rates. *NCMJ*

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# Physical Therapy Services Utilization and Length of Stay for Obese Patients Following Traumatic Leg Fracture

Stephanie Slayton, D.S. Blaise Williams, Glen Newman

**BACKGROUND** Obesity is an increasing epidemic that can complicate the treatment of simple injuries and can increase health care costs. The purpose of the present study was to determine whether obesity is a factor in the utilization of inpatient physical therapy services and length of stay following a traumatic lower leg fracture.

**METHODS** A retrospective study of patients admitted to the hospital in 2005 and 2006 with a primary discharge diagnosis of lower leg or ankle fracture was conducted. Inclusion criteria were age  $\geq 18$  years, only 1 involved lower extremity, and nonweight-bearing on the affected extremity per physician orders. Patients were excluded from the study if they had a fibular fracture only, pathological fractures, multiple trauma, severe cardiac or vascular comorbidities, or cognitive impairments. Data were compiled into 3 categories on the basis of body mass index (BMI):  $<30$ , 30-35,  $>35$ . Physical therapy services were measured in 15-minute units of time. These data were analyzed by within-group and between-group comparisons and with regression analysis.

**RESULTS** A total of 181 patients with a primary discharge diagnosis of distal lower extremity or ankle fracture were included in the study. Patients with a BMI  $>35$  used more physical therapy services (mean services, 9.8 units) than did patients with a BMI of 30-35 (mean services, 6.2 units) or a BMI  $<30$  (mean services, 5.6 units) ( $P = .001$ ). Length of stay was also highest among patients with a BMI  $>35$ .

**LIMITATIONS** Factors other than BMI may be associated with length of stay and physical therapy use and may confound the association.

**CONCLUSION** Previous studies have shown that there is an increase in health care utilization among the bariatric population. The present study demonstrates similar findings for physical therapy services. Increased length of stay and physical therapy utilization among the bariatric population also result in increased staff utilization and equipment costs.

The Centers for Disease Control and Prevention report that an estimated 66% of US adults are either overweight or obese [1]. In the 10 years from 1999 to 2008, there was a 22.9% increase in the prevalence of obesity in the United States [2]. In 2009, 29.3% of the people in North Carolina were considered obese [1]. An adult who has a body mass index (BMI) of 25-29.9 is considered overweight, and an adult who has a BMI  $\geq 30$  is considered obese [1]. Health care costs for the obese population total \$78.8 billion annually, which is 37% higher than the costs for the healthy weight population [3]. Cost increases often result in policy changes that can have significant effects on many aspects of patient care.

Obesity is often thought to be an important factor for postoperative complications [4-7]. Obese patients (BMI  $\geq 30$ ) are more likely than patients of healthy weight to have postoperative complications following surgery for acetabular fracture [7], ankle fracture [4], total hip [5], and general lower extremity trauma [6]. Further, morbidly obese patients (BMI  $\geq 40$ ) undergoing elective surgery have a significant increase in postoperative wound dehiscence, wound hematoma, and pulmonary atelectasis [8]. Finally, significantly longer operative times are reported for intramedullary nailing of femoral fractures in obese patients [8, 9]. All of these factors likely account for a more demanding rehabilitation of the postoperative obese patient.

Rehabilitation of obese patients can be more challenging because of the interaction of multiple comorbidities with the primary condition. While it is recommended that standard rehabilitation protocols apply, regardless of weight status [10], obese patients may not be able to fully participate in these protocols. Following surgery, patients with lower extremity fractures often have lower extremity weight-bearing restrictions. Partial weight bearing with crutches or walkers is challenging because of increased demands on the upper extremities and because of potential instability related to task novelty. These challenges are extremely difficult in the obese patient because of increased mass and differing distribution of the mass [8]. On the basis of these challenges, in addition to challenges regarding surgical management, hospital length of stay may be increased. Previous studies examining the effect of obesity on length of stay demonstrate increases [11, 12] and decreases [13] for various populations. Understanding the relationship in a population with specific postoperative gait restrictions (lower leg

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fractures) is important for understanding staff and resource utilization in the hospital immediately after surgery.

Hospitals are reimbursed for patient services on the basis of diagnosis related groups. In a hospital, regardless of the length of stay or treatment requirements, the reimbursement will be based solely on the diagnosis related group. Diagnosis related groups are assigned to a patient on the basis of the coding of their principal diagnosis, secondary diagnosis, any surgical procedure, age, sex, and discharge status. Obesity and obesity related *International Classification of Diseases, Ninth Revision* (ICD-9) codes exist, but these codes are often poorly reimbursed, improperly utilized, or underutilized. At present, only morbid obesity is recognized as a code that can increase payment, and only for patients who receive Medicare benefits [14]. While morbid obesity is almost certainly a complicating factor for treatment, it is likely that BMI levels <40 may account for complications and increased need for health care services.

A BMI of 30-35 has been associated with a 25% increase in health care expenditures, compared with costs for patients with a healthy BMI [11]. Additionally, a BMI of 35-40 has been associated with a doubling of health care expenditures, compared with those for patients with a healthy BMI [15]. While these BMI levels result in increased health care costs, they are not subsequently properly reimbursed. Further investigation of patients with a BMI of 35-40, for use of specific services such as physical therapy, may help justify the inclusion of modifiers for these patients. Increased health care expenditures among this population can specifically result from bariatric equipment needs and increased staff utilization. For example, most facilities own standard hospital beds but rent bariatric beds. Additionally, bariatric equipment—such as crutches, walkers, and wheelchairs—can cost 2-3 times more than nonbariatric equipment. In addition to the cost of the equipment, lifting-related low back injury in health care workers is a prominent problem worldwide [16-18]. Current health care guidelines do not allow reimbursement for a secondary diagnosis of obesity in patients with a BMI <40.

The purpose of the present study was to determine whether obesity is a factor in the utilization of health care services following a common lower extremity long bone fracture: traumatic lower leg fracture. We hypothesize that patients with a BMI >35 will have longer length of stay and increased need for physical therapy services. In addition, the discharge needs of these patients will be examined.

## Methods

**Study design.** A retrospective analysis was conducted that included patients admitted to Pitt County Memorial Hospital, in Greenville, North Carolina, during the calendar years of 2005 and 2006. The study was approved by the East Carolina University and Medical Center institutional review board.

**Sample.** All patients included in the study had a primary

**TABLE 1.**  
*International Classification of Diseases, Ninth Revision (ICD-9) Codes*

ICD-9 codes	Disease/injury
823.00-823.9	Fracture of tibia and fibula
823.00-823.02	Upper end, closed
823.10-823.12	Upper end, open
823.20-823.22	Shaft, closed
823.80-823.82	Unspecified part, close
823.90-823.92	Unspecified part, open
824.0-824.9	Fracture of ankle
824.0	Medial malleolus, close
824.1	Medial malleolus, open
824.2	Lateral malleolus, closed
824.3	Lateral malleolus, open
824.4	Bimalleolar, closed
824.5	Bimalleolar, open
824.6	Trimalleolar, closed
824.7	Trimalleolar, open
824.8	Unspecified, closed
824.9	Unspecified, open
733.00-733.9	Other disorders of bone and cartilage
733.16	Pathologic fracture

discharge diagnosis of distal lower extremity or ankle fracture, on the basis of ICD-9 codes [14] (Table 1).

**Data collection/reduction.** Charts with the appropriate ICD-9 codes were obtained from Health Information Management Systems and were reviewed for inclusion and exclusion criteria. All charts were hard copies (paper) and were reviewed by a single investigator. Inclusion criteria included age ≥18 years, involvement of only 1 lower extremity, and nonweight-bearing on the affected extremity per physician orders. Nonweight-bearing patients were chosen to reduce variability based on weight-bearing status and in an attempt to compare the same task across groups. Patients were excluded from the study if they had a fibular fracture only, pathological fractures, multiple trauma, severe cardiac or vascular comorbidities (eg, myocardial infarction, pulmonary embolism, or stroke), or documented cognitive impairments that prevented or delayed normal physical therapy services. Exclusion criteria were designed to minimize variability in factors (other than obesity) that typically prevent or delay physical therapy services. Individuals with fibular fractures only were excluded because these are usually less severe and have more variability in weight-bearing status following fracture.

**Data source.** Information collected included patient age, sex, BMI, length of stay (in days), surgical intervention, physical therapy consultation and utilization, discharge destination, and utilization of assistive device at discharge. After patients were identified by discharge diagnoses, charts were manually reviewed (S.S. and G.N.). All patients received an

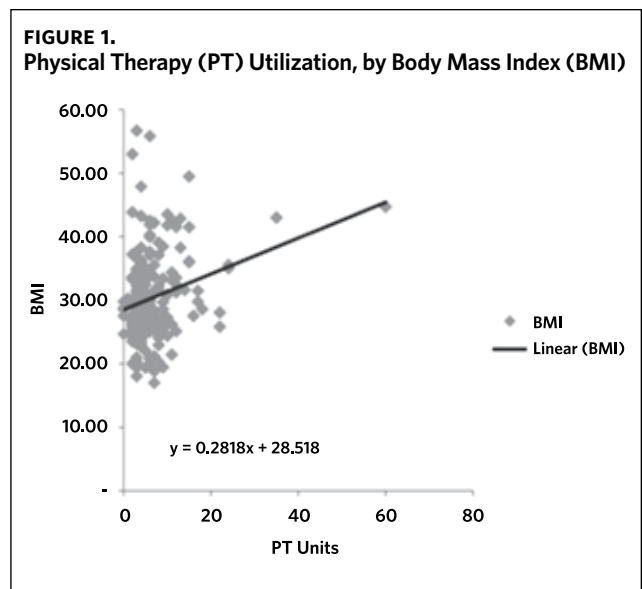
initial evaluation (current procedural terminology [CPT] code 97001). Additional treatments were generally billed under therapeutic procedures (CPT codes 97110 and 97116). Physical therapy use was documented in both number of visits (a single encounter with a patient) and number of units (15-minute increments of time with patients). Physical therapy units were recorded in the patient's chart for each visit. BMI was calculated from the patient's height and weight. Surgical interventions were defined by type of reduction (open or closed) and by type of fixation (internal or external). Assistive devices consisted of crutches, rolling walkers, and wheelchairs.

**Data analyses.** Data were divided into 3 subcategories on the basis of the subject's BMI (<30, 30-35, >35). Within-group and between-group (independent variable, BMI category) comparisons were made on the dependent variables of interest (length of stay and physical therapy services), by use of single-factor analyses of covariance that included age and sex as covariates. Post hoc Student's t tests for pairwise comparisons were performed. Finally, regression analyses were performed across all subjects, for length of stay and for utilization of physical therapy services. All analyses were completed using SPSS (version 18.0).

## Results

During the period of 2 calendar years (2005-2006), 745 patients were admitted to the acute hospital setting with an ICD-9 code indicating lower extremity fracture. From the charts of these patients, 181 patients (24.3%) were identified as meeting the inclusion and exclusion criteria (Table 2).

When covariates were corrected for, a statistically significant difference between groups was found for physical therapy utilization. Post hoc evaluation demonstrated specific differences in utilization of physical therapy services between the BMI >35 group and the other 2 groups (Table 2). There was also a significant ( $P = .01$ ) predictive  $r$  value of 0.20 between BMI and physical therapy utilization across all subjects (Figure 1). There was a statistically significant difference in length of stay between groups, when covariates were corrected for. Post hoc evaluation demonstrated specific differences in length of stay between the BMI >35 group and the other 2 groups (Table 2). There was also a sig-



nificant ( $P = .02$ ) predictive  $r$  value of 0.18 between BMI and length of stay (Figure 2). A lack of fit analysis was also performed and showed no significant lack of fit for either length of stay or physical therapy units. We conducted a sensitivity analysis, excluding 4 patients with length of stay >20 days. The results were essentially unchanged for length of stay, for which a significant ( $P = .04$ ) predictive  $r$  value of 0.16 existed. Three of these patients had a BMI >35.

Patients in all 3 BMI groups were most commonly managed medically with an open reduction internal fixation procedure. Discharge destinations across all groups were similar, with the most common destination after discharge from the hospital being home. All subjects were most commonly discharged with a rolling walker (Table 3).

## Discussion

On the basis of the results of this retrospective study, patients with a BMI >35 had longer length of stay and higher physical therapy utilization, compared with patients with a BMI <35. While these differences were significant, it appears that BMI plays only a partial role in these variables, as correlation values for both length of stay and physical therapy utilization were relatively low.

The values for length of stay in the present study are consistent with what has been reported previously. Specifically, the average length of stay for 77,000 individuals with lower leg fractures was reported as 7.4 days [19]. The difference between groups for length of stay can be explained only partially by BMI. A large number of comorbidities often accompany the diagnosis of morbid obesity, and many of these were not addressed by the exclusion criteria in the present study. Future studies that use a multivariate regression that is inclusive of common comorbidities may help identify specific patients who may be at risk for increased length of stay. In the present study, 4 subjects had a length of stay >20 days; they appear to skew the data for length of stay (Figure

**TABLE 2.**  
Patient Demographic Characteristics

Characteristic	BMI <30 (n = 103)	BMI 30-35 (n = 40)	BMI >35 (n = 38)
BMI, kg/m <sup>2</sup>	25.58 (3.10)	32.54 (1.47)	41.09 (5.50)
Age, years	45.94 (17.47)	52.00 (14.27)	48.03 (17.02)
LOS, days	6.05 (3.90)	6.10 (3.89)	8.37 (6.65) <sup>a</sup>
PT units	5.58 (4.37)	6.15 (3.81)	9.89 (10.87) <sup>a</sup>

Note. Data are mean (standard deviation). Physical therapy (PT) services were measured in 15-minute units of time. BMI, body mass index; LOS, length of stay.

<sup>a</sup> $P \leq .05$ , by post hoc Student's t test.

1), and potentially for physical therapy utilization (Figure 2). Subsequent analysis with the exclusion of these subjects still demonstrates a significant correlation with length of stay.

Physical therapy utilization in the hospital can assist not only in returning patients to a functional state but also in shortening length of stay. Patients who remain in bed for multiple days typically have decreased musculoskeletal, respiratory, and cardiac functions, to name a few. Providing patients physical therapy can maintain their physiological functions while teaching them to perform within their new limitations. We found that patients with a BMI >35 had a statistically significant greater utilization of physical therapy services, compared with the other groups. It is likely that length of stay increases as a result of the increased need for physical therapy among this population. Because return to function is more difficult for these patients, safe transfers and ambulation are delayed, thus delaying discharge.

While both increased length of stay and increased physical therapy utilization result in increased costs, equipment utilization can also reflect increased costs to the hospital and to the health care system. Patient use of bariatric equipment during hospitalization and at the time of discharge resulted in increased costs, which are not consistently covered. In addition, physical therapy services are increased for the population with a BMI >35, and these increased units are billed and reimbursed. However, these increased units account for contact time between the patient and the therapist. These patients often require increased setup time and documentation time and use of additional staff to manage the patient. These are additional costs that are not reimbursed under the current coding parameters. Addition of the obesity code for patients with a BMI >35 will offset a portion of these costs.

The most common discharge destination for all groups was home (76% to 88% across groups). There was a smaller number of subjects that were discharged to nursing homes,

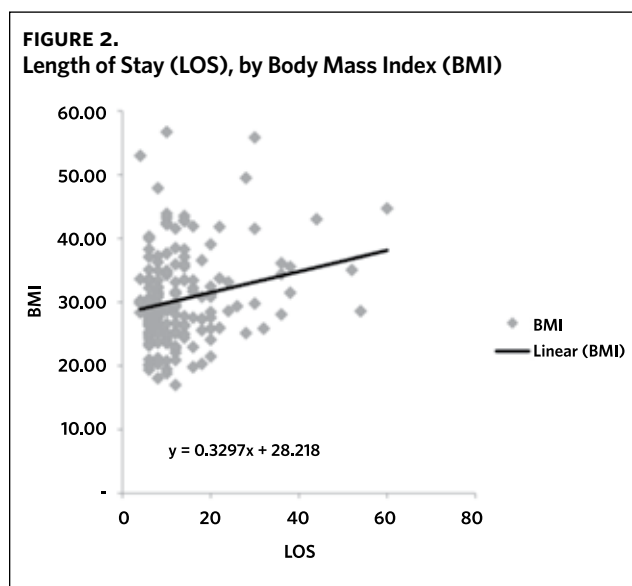
inpatient rehabilitation, assisted living, or other facilities. A slightly higher percentage of patients with BMI>35 were discharged to a nursing home/skilled nursing facility. The present study did not investigate whether patients who were discharged home received either home health or outpatient services. Whereas continuing therapy in the home, in an outpatient rehabilitation setting, or in a skilled nursing facility may not affect hospital costs, it does represent a continued cost to the health care system. In addition, the time it takes to locate a facility that is willing to take a bariatric patient may increase hospital length of stay.

Several limitations should be considered with regard to the present study. The retrospective chart review presents inherent problems. We relied on the accuracy of the charting by medical professionals. In a minimal number of cases, data were not available. When data were not available, the subject was excluded from the study. Most subjects were excluded according to the specific exclusion criteria outlined in the Methods section, not because of missing data. Since subject comparisons were made on the basis of BMI alone, other confounding variables (eg, number and severity of comorbidities) may have further affected length of stay and physical therapy utilization. Although we attempted to reduce these variables through the exclusion criteria, not all comorbidities could be eliminated while maintaining a significant subject sample. Finally, the present study was conducted at a single location with adequate means to manage obese patients. Results regarding length of stay, physical therapy and staff utilization, and equipment costs will likely differ at other facilities. A multisite study that includes hospitals of varying sizes and populations may give a more valid representation of length of stay and physical therapy utilization.

## Conclusion

On the basis of the results of the present study, increased BMI in a patient increases the utilization of health care services. As the obesity epidemic worsens, hospitals and other medical facilities need to accommodate these patients through adequate equipment, staffing adjustments, and policy changes, which will be potentially expensive and time-consuming. Proper coding and reimbursement for the services rendered to these patients are crucial.

For a noncomplex medical diagnosis, such as lower leg or ankle fracture, length of stay and physical therapy utilization are significantly higher in patients with a BMI >35. It is expected that these findings can be extrapolated to other diagnoses, but further investigation of obese patients with specific diagnoses is necessary. With the recent changes to the ICD-9 coding and with the additional utilization of V codes, it is important for hospitals to correctly code their patients. As the results of the present study demonstrate, patients with a BMI >35 have a longer length of stay, increased utilization of physical therapy services, and utilization of more-expensive equipment. Although it is not included in the ICD-9 codes for hospital reimbursement,



**TABLE 3.**  
**Equipment Used by Patients at Time of Discharge**

Equipment	BMI <30	BMI 30-35	BMI >35
RW	55 (53.40)	20 (50)	18 (47.37)
WC	4 (3.88)	2 (5)	6 (15.79)
Crutches	33 (32.04)	14 (35)	3 (7.89)
RW and Crutches	3 (2.91)	2 (5)	1 (2.63)
RW and WC	4 (3.88)	1 (2.50)	8 (21.05)
Standard walker	2 (1.94)	0 (0)	0 (0)
WC and lift	0 (0)	1 (2.50)	1 (2.63)
EOB only	0 (0)	0 (0)	1 (2.63)
Unknown	2 (1.94)	0 (0)	0 (0)

Note. Data are no. (%). BMI, body mass index; EOB, edge of bed; RW, rolling walker; WC, wheelchair.

discharge destination is important for its potential costs to the extended health care community. Data from the present study demonstrate that obese patients use more health care services after discharge from the hospital, compared with overweight and healthy weight patients.

It is suggested that, while patients with a BMI  $\geq 35$  have longer length of stay and increased utilization of physical therapy services, hospitals can enhance patient care by providing adequate equipment to support rehabilitation and by allocating resources to promote patient recovery. Hospitals can also capture more of their costs by ensuring that patients are properly coded for the secondary diagnosis of obesity, to maximize reimbursement through the utilization of V codes. **NCMJ**

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# POLICY FORUM

## *Care Transitions*

### Introduction

An 82-year-old patient with a combination of problems lies uneasily in a hospital bed. The object of concern of a team of specialists and supporting clinicians and therapists, she is due to be transferred to a nursing care facility for what is hoped to be rehabilitation and eventual discharge. Meanwhile, the thoracic surgeon, who has replaced one of her heart valves, argues for a specific drug regimen, to reduce the risk of clots; a pulmonologist worried about the regimen's effects on breathing suggests a different drug for the clotting; a nephrologist sees problems arising because of the multiple drug therapies that have been administered during the previous weeks; a palliative care specialist is concerned that the potential for another valve replacement will be considered; the nursing staff sees problems with bed sores emerging, as well as the potential for infections; and the discharge planner is concerned that an opening in a nearby facility will be missed. This scenario was played out in much the same way a week before, as a different team considered the transfer. At one point during this week's discussion, a chief resident watching it all was heard to mumble, "What this patient needs is a doctor."

That may be true. And it may have, at one time, been normal for the patient's primary care doctor to have orchestrated the processes and resolved the conflicts. But for many patients, there is no single doctor who can coordinate the complex processes of health care that, more and more, are necessary to address the multiple acute care episodes experienced by patients with chronic illness, who are often fragile. The options for promoting, preserving, or restoring health have become so numerous that many parts of our nonsystem have little idea of what the other parts are doing. The answer to this emerging problem is to focus on these transitions of care as the weakest links in our health care delivery system—to see them as the critical connections that are necessary to allow us to reap the benefits of the complex technological advances we have seen in medicine.

We want to think that, amid this complexity, the individual patient and his or her illness are the focus of all the technology and knowledge, and that the normal course of action cooperatively builds on each special element to produce the best possible outcome. But that is not necessarily the case. The growing complexity has created real problems. The more complicated the care, the more each element needs to communicate with the others, to assure that what is done or not done for a patient in one place or by one specialist or caregiver does not interfere with what is done elsewhere.

The reality is that we have learned so much about how to treat so many different illnesses and how to extend life so far that we necessarily have generated a multidimensional lattice of specialty services that somehow must be managed for the benefit of the patient. Patients come to doctors' offices and get referred to hospital clinics or are admitted for surgeries or for care of severe illnesses; they arrive in emergency departments with life-threatening illnesses or injuries that require hospitalization or transfer to a specialty care center; they enter long-term care facilities, then go into a hospital for a procedure or a spell of intense care, when a disease manifests itself, then go back to that or another facility or home, to recuperate or to die. The multiple levels of care mean that patients move between and among them, with all possible combinations of origin and destination. Each transition requires that the patient be handed off from one set of practitioners to another. Without a coordinating primary care doctor there to help manage

that transition, we must focus on systems to make the transitions safe. This issue of the NCMJ describes some but not all of the efforts underway to make these handoffs effective and efficient and harmless. These efforts are bringing us to the point where the transition is seen as a normal part of the overall care process, not as an interruption. This change is only just happening. There is a need to make sure that different organizational and professional cultures and patterns are made to work in concert, and not at odds—so that communications are complete and interpretable—even to the point where the words one caregiver uses need to be “translated” effectively to another.

We talk constantly about centering the system on the patient. One of the biggest tests of this philosophy comes during the process of shifting the patient’s care from one place or team to another. It is easy to lose our sense of patient centeredness when institutional boundaries are crossed and the emphasis shifts to the negotiation between them. Retaining that patient focus is possible if we recognize the dangers of the transitions and if we develop conscious and planned procedures to not just hand off, but to trade one set of caring hands for another. NCMJ

*Thomas C. Ricketts III, PhD, MPH*  
*Editor in Chief*



# Improving Care Transitions Means More Than Reducing Hospital Readmissions

Samuel Cykert

Hospital readmissions are not only expensive, avoidable, and dangerous, but are also indicative of the most dysfunctional elements of US health care. The Patient Protection and Affordable Care Act places great emphasis on reducing preventable readmissions by building care systems that are patient-centered and that remove arbitrary silos of care. Hospitals that perform poorly on this measure will experience significant financial penalties beginning this fiscal year. In the short term, decreasing readmission rates will eliminate waste and enhance patient recovery from major illness. However the real vision is to ensure that vulnerable patients, particularly the chronically ill, benefit from coordinated, patient-centered systems that maintain functional independence, improve quality of life, and provide comfort without the trauma, expense, and displacement that unnecessary hospitalization often entails. The commentaries published in this issue of the NCMJ portray some of the most significant barriers to smooth transitions and reducing readmission rates and describe some of the nascent North Carolina and national solutions that demonstrate promise in real world situations.

*HB is a 76-year-old man who was admitted to the hospital because of weakness and shortness of breath. He has a long history of atrial fibrillation and his heart rate had been well controlled on a high dose of diltiazem combined with metoprolol and digoxin. He was on warfarin (the blood thinner) to prevent a stroke. It was discovered during this hospitalization that his heart rate was falling into the 20s, causing his severe weakness and leading to a gathering of fluid in his lungs. As a result, his diltiazem medication was cut in half and the digoxin was stopped. HB's heart rate came back to normal and he felt well. When he went home, he thought his warfarin was the medicine stopped rather than the digoxin, even though it was written down, so within 3 days he came back to the hospital, weak with a heart rate of 36 and unable to speak or move his right hand. Without the warfarin, he had had a small stroke. Warfarin was restarted and the digoxin was stopped and his condition improved. He went home, where he lives alone, but he had some persisting weakness and he fell. His daughter knew of a good assisted living facility and arranged for HB to stay there until he felt stronger. The facility called HB's outpatient doctor who put him on the medicines he was on before his 2 hospitalizations, as he hadn't been informed of the hospital admissions during*

*or after. HB passed out during his 3rd day at assisted living and was readmitted to the hospital with a heart rate of 24 and fluid in his lungs.*

One of the first nationwide payment initiatives established by the Patient Protection and Affordable Care Act (PPACA) is the Hospital Readmissions Reduction Program. Starting this fiscal year, all hospitals in the US that accept Medicare payment will be evaluated using 30 day readmission rates after an index admission for the primary diagnoses of heart attack, pneumonia, or congestive heart failure [1]. Poorly performing hospitals—those who have higher readmission rates among comparable patients—will receive cuts in Medicare reimbursement for all diagnostic related groupings at a rate of 1% for the first year of unsatisfactory performance, a number that will escalate to 3% by the third year of the program. Why would the most comprehensive health care bill enacted in 50 years place such major emphasis on a simple trip back to the hospital? Because readmissions are not only expensive, avoidable, and dangerous but are also indicative of the most dysfunctional elements of our health care systems. As the story of HB illustrates, many readmissions are the direct result of the silos that institutions have built that separate inpatient, outpatient, and intermediate care settings (eg, nursing homes and rehabilitation facilities). In the context of major illness, we have allowed this divided approach to isolate patients as they traverse the care continuum and we have failed to make patient safety and well-being the paramount goal when locations and levels of care change. It has been estimated that as many as one half to two-thirds of all hospital readmissions are avoidable [2-5]. Thus, by creating substantial financial incentives to prevent readmissions, the framers of the PPACA have determined that from the outset of its implementation, patient centeredness, care coordination, and smooth transitions across all health care settings are

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extremely high priorities for a nurturing, modern, and safe health care system.

What are some important elements of excellent care transitions known to reduce readmissions, reduce emergency room utilization, and improve patient safety? Naylor's Transitional Care Model, Coleman's Care Transition Intervention, Jack's Project RED, Hopkins Guided Care Model, and several disease specific programs have identified strategies that help frail and at-risk patients achieve these goals [6-12]. On the inpatient side before the hospital discharge, patients and receiving caregivers need to be thoroughly educated about medications, warning signs of clinical worsening, and self-management skills. This teaching needs to be appropriate and understandable and should incorporate techniques such as "teach-back" to assess adequate understanding. Care managers, who are usually skilled nurses or other highly trained personnel, bridge transitions between settings. Tasks for the care managers include outpatient medication reconciliation, reaffirmation of warning signs, and extended telephone contact for 1 to 2 months after discharge. The effect of the care manager is enhanced by facilitating and assuring that outpatient services arrive, by making at least one home visit to assess the situation, and by providing some after-hours access to help patients cope with fear and uncertainty. On the ambulatory care side, other important factors include timely outpatient follow-up during which the primary care provider resumes guidance of the patient's care in a medical home setting. This visit should include prompt receipt of the patient's personal health record either electronically or through the patient, clear presentation of urgent contact options, and assiduous coordination with the care manager to avail the patient of the community services necessary to recover and attain the best possible quality of life.

The commentaries published in this issue of the NCMJ describe early applications of many of the above solutions in real world environs. Nelson and colleagues show how a community engagement approach brought several key organizations and stakeholders together to build an effective transitions program [13]. This Community Connections initiative managed to align health system goals of decreased utilization with client goals of improved quality of life by listening carefully to the ideas of community participants, and then creating an infrastructure for mutually reinforcing activities to meet the needs identified by Connections' constituents. An important element of this program is the realization that readmissions and emergency room use were symptoms of patient frailty and lack of resources. The emphasis on quality of life and maintaining independence demonstrates that this group fully embraces the true value of an excellent community transitions program. Future data are likely to confirm the aspired goals. Watkins describes Forsyth Medical Center's Hospital to Home Program and documents components of the program as well as improved outcomes in the 2.5 years since inception [14]. Important observations in this com-

mentary include superior physical and mental functioning in the intervention group and a one-third decrease in hospital admissions. By providing an average of 2.7 navigator visits, 3.5 telephone calls, and 16 hours of home care assistance per client over an average enrollment of 63 days, the program reached the triple aim of patient satisfaction, higher quality, and lower cost. Finally, DuBard and colleagues describe the transition efforts of Community Care of North Carolina, the state's flagship medical home program designed to optimize quality and reduce costs for 1.2 million Medicaid patients. In this piece, the authors give a sense of the mammoth scope needed to create a statewide transitions program and demonstrate the strengths and challenges attributable to variance in regional roll-outs, resources, and methodologies. It is both impressive and hopeful that a perceptible decrease in admissions has already been achieved [15]. Trygstad's accompanying sidebar clearly describes the gaps in medication reconciliation and adherence related to transitions and aptly points out adherence inconsistencies among high-risk, frail patients that don't necessarily abate in the post-transition interval. He also explains the emerging role of network-based pharmacists in combating these gaps in medication adherence [16]. Lattimer's commentary lists many of the resources available through the National Transitions of Care Coalition. Many of these materials were used to design the early efforts featured here [17].

Despite the many hopeful programs dotting the North Carolina health care landscape, complex transition problems for extremely vulnerable patient groups remain. Goins describes the unique conditions and administrative barriers in nursing homes that often fuel high readmission rates and failed transitions [18]. Poole sheds light on the particular difficulties of those who suffer severe and persistent mental illness and Lin illustrates the obstacles in primary care and specialty provider relationships [19-20]. However, even among difficult special populations, there is a ray of hope. Noel's article about the MemoryCare Program shows us how the transition needs of chronically ill patients change over time. Designed as a community support program for patients with Alzheimer's disease, MemoryCare teams participate in disease management planning, caregiver training, counseling, and support for each enrolled family. They also provide guidance and medical assistance in managing difficult behaviors, coordination of available community resources, and counsel families regarding end of life decision making. Particularly notable is the acknowledgment and support of caregivers and the recognition that geographic transitions, aggressive hospital care, and polypharmacy are often harmful rather than helpful in advanced disease [21].

On face value, the Hospital Readmission Reduction Program of the PPACA alerts us to the necessity for transitions to reliably include better discharge planning while avoiding overuse of acute care settings. However, the overarching goal of this law is to demolish health care silos and institute patient-centered care, regardless of health care

setting. For the literal among us, the short-term prospects of reduced admissions, elimination of waste, and enhanced recovery may suffice. But the real vision is to ensure that vulnerable patients, particularly the chronically ill, benefit from systems that maintain functional independence, enhance quality of life, and provide comfort without the trauma, expense, and displacement that unnecessary hospitalization so commonly entails. **NCMJ**

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# Collaborative Accountability for Care Transitions: The Community Care of North Carolina Transitions Program

*C. Annette DuBard, Jennifer Cockerham, Carlos Jackson*

**Community Care of North Carolina initiated efforts to improve care transitions for North Carolina Medicaid recipients in 2008. The transitions program is now statewide, serving more than 4,000 patients every month, virtually every North Carolina hospital, and more than 1,400 primary care practices. This commentary describes program components, early outcomes, and future challenges.**

**O**n Labor Day weekend 2011, a 62-year-old man with a developmental disability was discharged from a North Carolina hospital. Multiple unstable medical conditions and a complicated, nonhealing wound had resulted in a 2-month hospitalization. During that time, several team meetings were held to coordinate discharge plans, and he was set up to receive a number of postdischarge services, including home health, palliative care, durable medical equipment supplies, follow-up appointments with multiple specialists, and additional Medicaid-funded in-home personal care support (as an alternative to nursing home placement). When a nurse care manager from the Community Care of North Carolina (CCNC) Transitions Program visited him 2 days after discharge, however, she found a patient who was on the brink of needing hospital readmission: the home health agency had not yet initiated the twice-daily dressing changes, he had no wound care supplies, in-home personal care services had not yet begun, and the pain medication that had been prescribed in the hospital had been denied at the pharmacy, leaving him without pain control. Despite the best efforts of the hospital team, and despite Medicaid coverage for needed postdischarge services, his transition from the hospital would have failed without the timely attention of someone with the primary responsibility of coordinating all the distinct aspects of care and assuring a safe return home.

CCNC is a statewide, community-based, physician-led program committed to establishing access to a primary care medical home for vulnerable populations and to equipping those medical homes with the multidisciplinary support needed to assure comprehensive, coordinated, high-quality care. Fourteen regional CCNC networks, with 1,568 participating primary care practices statewide, manage the care of 1.2 million Medicaid and North Carolina Health Choice

enrollees in a nationally acclaimed model that has demonstrated substantial cost savings through community collaboration and quality improvement [1-3].

In North Carolina, 190,000 Medicaid recipients are admitted to the hospital every year, and 31,000 have multiple hospital admissions. Nearly 1 in 10 admissions represents a readmission within 30 days of a previous discharge. An additional complicating factor is the frequency of cross-hospital traffic: 23% of readmissions within 30 days of discharge occur in a different facility. Cross-region traffic is also common for Medicaid recipients in North Carolina. In large referral centers such as Duke and the University of North Carolina-Chapel Hill, as many as half of all patients come from communities outside of the locally affiliated CCNC network of primary care medical homes.

CCNC began tackling transitional care in earnest in October 2008, when it was charged by the legislature to improve quality of care and control excess spending for the elderly and the disabled Medicaid populations. This subset of Medicaid enrollees is characterized by a high prevalence of multiple chronic physical and behavioral health conditions, polypharmacy, low health literacy, socioeconomic stress, and the involvement of multiple physicians in their care. While elderly and disabled enrollees represent only a quarter of all North Carolina Medicaid recipients, they contribute disproportionately to health care spending, incurring more than 40% of all inpatient admissions, two-thirds of all potentially preventable readmissions, and 80% of total Medicaid costs. CCNC recognized that ensuring coordination and continuity of care for these highest-risk Medicaid recipients at times of transition would be key to achieving better outcomes and lower costs of care.

When CCNC began its transitional care program, a handful of studies had previously demonstrated that providing additional support to patients with complex health care needs at the time of hospital discharge can successfully reduce

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# A Series of Well-Coordinated Dismounts

Troy Trygstad

In November of 2010, Dr. Darren DeWalt [1] wrote an editorial in the *Journal of the American Medical Association* likening a dismount in a gymnastics routine to completing patient encounters by ensuring that patients can self manage their medications. Without a proper dismount, the routine's effectiveness is lost. The underlying premise of the piece was that even if the health care system perfects patient evaluation and treatment within its own setting/s, the encounter frequently ends in failure without a well-developed medication use plan in which the patient is willing and able to engage. It was an apt analogy that has broad application across many of our systems of care. In this edition of the *North Carolina Medical Journal*, Dubard and colleagues [2] describe Community Care of North Carolina's (CCNC) Transitions of Care Program, which emphasizes the need to extend patient support activities outside of the hospital and into the community. In this model, transitional care encompasses a series of well-coordinated dismounts involving numerous providers, extenders, and surrogates that reach far beyond the walls of the hospital.

The conventional implementation of Medication Reconciliation (Med Rec) at hospital discharge involves a cursory review of drug regimens (medication lists) for duplications and discrepancies. This occurs either within a single medication list or against another reference list, sometimes with an assessment of need for individual medications based on known diagnoses. Rare is the implementation of more comprehensive and patient-centered activities that involve educating patients at discharge and supporting medication use following discharge in a manner coordinated with the rest of the care team. Beginning

in late 2009, CCNC began implementing a Med Rec Plus program for high-risk Medicaid recipients having a hospitalization. The "Plus" denotes an additional set of activities that are added to the conventional deployment of Med Rec.

The majority of CCNC Med Rec Plus deployments involve multiple types of professionals and paraprofessionals (social workers, nurses, pharmacists, pharmacist assistants, and others) gathering information about both actual and intended medication use from multiple settings following discharge. It is common for a hospital-embedded CCNC care manager to meet and interview a patient about his or her medication use at the bedside, then hand off care to a pharmacist who reconciles the discharge medication list against the prescription fill history from the pharmacy. At that point, the pharmacist may hand off care to a yet another care manager doing a home visit to observe actual use of medications in the home, and then receive back the findings and compare those findings against the active medication list in outpatient provider's records prior to the first scheduled encounter post-discharge. This process involves a series of encounters that puts the patient at the center of the effort to harmonize and execute his or her individual medication use plan.

The Plus version of Medication Reconciliation has yielded some instructive findings. A convenience sample of 6,927 patient discharges subjected to the Med Rec Plus process reveals 2 general themes across 19,022 identified drug therapy problems/discrepancies. About one-third of identified problems/discrepancies were of the types that are typically associated with Med Rec (discrepancies in medication dose/frequency/duration (20.7%);

rehospitalization rates. Such interventions had typically been tested in small cohorts in a single health system setting, often emphasizing the role of the hospital to implement better discharge planning processes. CCNC's challenge was to rapidly adapt promising models and to "take to scale" best transitional care practices for the statewide Medicaid population, which would mean the creation of a transitional care system that could effectively connect more than 120 hospitals, more than 1,500 primary care medical homes, and countless specialist and ancillary service providers across the state.

## Core Components of the CCNC Transitions Program

The CCNC approach to transitional care incorporates elements from the work of Eric Coleman, Mary Naylor, Guided Care, Project RED, Project BOOST, and others [4-8], while adding greater emphasis on closing the loop with the primary care medical home. Local processes are tailored to local circumstances, but each network's approach includes the following core components.

**Face-to-face patient encounters.** All CCNC networks have embedded care managers in large-volume hospitals to interact with the hospital team (including hospitalists, nursing and discharge planning staff, pharmacy, and palliative care teams), to begin planning for discharge as early as possible during the hospital stay. Care managers visit patients at the bedside when possible, to begin engagement with the patient and the family and to ensure that discharge instructions and medications are available. Patients at high risk for a failed transition because of medical complexity, frailty, or social circumstances receive a home visit within 3 days of discharge. Additional visits with the patient and the family—in the home, in the community, or in conjunction with a primary care visit—are often needed to facilitate optimal care management.

**Timely outpatient follow-up.** Care managers ensure that patients have a follow-up appointment with the primary care provider (PCP) medical home and/or specialist quickly after discharge, they assess for potential barriers to the patient's ability to attend the appointment, and they assist with

therapeutic duplications (5.9%); contraindications and interactions (4.6%); transcription errors (2.0%); and allergies-adverse events-side effects (1.5%). The remaining two-thirds of problems were associated with patient self-management and/or lack of a coordinated medication use plan (poor adherence prior to and following the hospitalization (22.8%); failure to take a discharge medication following the hospitalization (new initiation) (22.8%); medication discontinuations by the patient without confirmation to stop (15.4%); and failure to stop taking a medication discontinued at discharge (2.7%). The takeaway is clear: without continuing Med Rec activities and associated patient supports that extend into the community following discharge, fully two-thirds of drug therapy related problems and discrepancies related to the hospitalization go either unidentified or unaddressed.

The Plus version is also meant to address both acute and chronic problems/discrepancies that are likely to affect patient outcomes over a longer period of time. Rather than focusing solely on those problems/discrepancies that are more problematic in the 30 days following discharge, Plus requires plans of action for all identified problems, including lack of patient understanding and non-adherence. Among the sample of 6,927 patient discharges undergoing Med Rec Plus, chronic and non-urgent problems were far more prevalent than acute and urgent problems. Urgent problems, defined as "creating a high likelihood of imminent re-hospitalization" by the reconciler, comprised only 6% of all problems/discrepancies and were represented in roughly one-sixth of patient discharges. The remaining 94% of problems/discrepancies varied greatly in severity and type, but were nonetheless important to the patients' likelihood of positive outcomes over a longer time horizon.

The finding by DuBard and colleagues of increased survival to next admission for CCNC enrollees is encouraging, especially since greater curve separation seems

to occur after the first month following hospitalization. Certainly, urgent problems and discrepancies such as mistranslated insulin doses or grossly duplicative anticoagulants need immediate resolution upon discharge, but non-urgent problems and discrepancies such as failure of hospital staff to continue a statin, patient non-adherence to a beta-blocker, or lack of a well-instructed and coordinated titration of an anti-depressant are also key barriers to improved patient outcomes that go beyond the 30 day period following discharge. The latter problems are best addressed by a system of transitional care that places emphasis on longitudinal patient outcomes and involves multi-provider, multi-setting coordination with particular emphasis on patient self-management of medications. In short, a series of well-coordinated dismounts. **NCMJ**

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scheduling or transportation as needed to facilitate completion of the appointment. Care managers also provide timely information to the PCP about the hospitalization, social, and environmental concerns and about the involvement of other services and providers (such as durable medical equipment or personal care, home health, and mental health services). In addition, care managers help patients prepare for their follow-up appointments by coaching them to develop a list of questions in advance, to gather all medications, and to bring their personal health record, to facilitate an optimal encounter between provider and patient.

**Medication management.** Medication management for patients receiving CCNC transitional care management services goes far beyond the traditional concept of simply documenting a comprehensive list of medications. Serious medication discrepancies are extremely prevalent for the high-risk Medicaid population after hospital discharge, as discussed in the sidebar to this article. Transitional care managers work closely with network clinical pharmacy

staff to identify discrepancies between the admission and discharge medication lists in the hospital record, the medications listed in the PCP record, the fill history available through Medicaid pharmacy claims data, the "brown bag review," and the patient/family interview during the home visit. Network staff are able to summarize for the PCP the gathered information and identified issues, to facilitate resolution of the discrepancies, and to circulate back to the patient and other providers a consolidated and cohesive medication plan.

**Patient and family education.** Patients and their caregivers often receive an overwhelming amount of complex information at the time of hospital discharge, and they may not be able to fully comprehend or prioritize crucial information. CCNC care managers are able to distill the information and guide the patient's focus to the most immediate items to know. Care managers identify red flags for patients and families, which are signs, symptoms, or circumstances that could indicate a complication or exacerbation. This educa-

**Table 1.**  
**Hospitals Contributing Live Admission, Discharge, and Transfer Data to Support Community Care of North Carolina Transitional Care Coordination for Medicaid Recipients**

This table is available in its entirety in the online edition of the *NCMJ*.

Note. The percentage of cumulative Medicaid discharges is based on hospital discharges for North Carolina Medicaid recipients, calendar year 2010, as observed in Medicaid paid claims.

tion includes not only what to watch for, but specifically what to do about it, including whom to call and what steps to take to prevent an adverse outcome or a return to the hospital. Care managers use motivational interviewing techniques, teach-back, and other evidence-based health coaching strategies to optimize outcomes.

**CCNC self-management notebook.** Patients are provided with a personalized CCNC self-management notebook to use as a personal health record, educational resource, and tracking system for disease self-management, such as the recording of daily weight for heart failure or glucose monitoring for diabetes. The notebook also serves as a communication tool to enhance continuity of care as the patient interacts with the PCP, specialty providers, and other health care services.

**Data support and information exchange.** Each CCNC network has an information-sharing relationship with virtually all hospitals that serve Medicaid patients in the region. Locally this may include CCNC care managers having direct access to the hospital medical record, as a fully incorporated member of the hospital care team, or it may consist of no more than a faxed census of Medicaid inpatients to the network office for manual review. Through a joint initiative of the North Carolina Department of Health and Human Services, CCNC, and the North Carolina Hospital Association—which was launched in the summer of 2010—hospitals have been encouraged to facilitate CCNC transitional care efforts through the electronic exchange of real-time hospital admission, discharge, and transfer data for Medicaid recipients. By centrally receiving electronic notification of a patient’s admission status, diagnosis, and provider information, the CCNC Informatics Center can more efficiently sort the information and alert the appropriate transitional care management team and PCP about the patient’s admission. Historical claims data are used to further risk-stratify the Medicaid population. Risk indicators generated through historical claims review are linked to the real-time hospital alerts, to automate part of the screening process and to aid in triaging limited care management resources for the highest-risk patients. At the time of this writing, 51 hospitals were participating in twice-daily data exchange with the CCNC Informatics Center, representing 55% of Medicaid

discharges statewide (Table 1, available only online), with additional hospital connections underway.

**Cultivation of cross-agency partnerships.** A core premise of the CCNC approach to care management has been the cultivation of strong relationships at the state and local levels among primary care and specialty professional groups, hospitals, the Division of Public Health and local health departments, the Division of Social Services, the Division of Aging, home health and hospices, palliative care teams, local management entities and mental health providers, the area health education centers, and community- and faith-based organizations. These relationships allow for cross-organizational team approaches to transitional care for certain populations, such as pregnant women and infants, patients receiving community mental health services, and seniors eligible for area aging services. The overarching goal of these partnerships is to better meet patient needs without duplicating services and to ensure the delivery of high-quality, cost-effective care across settings.

**Flexibility to innovate and leverage local partnerships.** Several innovative models that leverage hospital- or practice-based resources toward common goals are emerging from local collaborations. In one example, the CCNC care manager meets regularly with the hospitalist physician group and multidisciplinary hospital team to develop a coordinated longitudinal care plan for patients with frequent admissions. Hospital-employed pharmacists or pharmacy students in several hospitals now use CCNC information systems to access medication fill history and preferred drug information, to decrease medication reconciliation errors and to establish accurate medication instructions at the time of hospital discharge. A number of community clinics have reserved appointment availability or provided funding or space for embedded care management staff, to assure that CCNC patients can be assessed within a week of hospital discharge. Several PCPs are working with their networks to pilot novel home visit models for high-risk patients who reside in assisted living facilities or who cluster in low-income residential complexes. CCNC encourages local flexibility in the allocation of transitional care resources to foster such collaborations, to develop and test innovations, and to spread best practices.

### Three-Year Experience: Statewide Rollout

CCNC’s presence was well-established in all 100 North

**Figure 1.**  
**Rapid Scale of Care Management Interventions During 3 Years: Count of Home Visits and Medication Reviews, by Quarter**

This figure is available in its entirety in the online edition of the *NCMJ*.

**TABLE 2.**  
**Selected Transitional Care Interventions, May to October 2011**

Postdischarge intervention	Distinct patients, no.
Any transitional care intervention	25,420
Follow-up contact or appointment made	21,784
Phone call	18,058
Medication reconciliation by nurse care manager	11,047
Hospital visit to patient bedside	10,196
Patient education	9986
Service coordination	9912
Correspondence with patient or provider	7282
Home visit	6185
Medication review by clinical pharmacist	6170
Patient provided with self-management tool kit	5970
Encounter with health care professional on patient's behalf	4095
Face-to-face visit with patient at provider office	1706
Face-to-face visit with patient in community setting	244

Carolina counties before the rollout of the transitional care program, with high penetration of primary care practice participation in the CCNC medical home model statewide, existing infrastructure for staff recruitment and training, and local network governance in place that included major hospitals and key community partners. This allowed for a rapid rollout of the transitional care efforts statewide, beginning in late 2008 (Figure 1, available only online). Transitional care resources were further augmented by Medicaid, in April 2010, through an increase in the per-member, per-month management fee for elderly and disabled enrollees, earmarked to embed care management and pharmacy support resources in large-volume hospitals and practices. By spring 2011, 50 full-time equivalent care manager positions embedded in 48 hospitals and 91 full-time equivalent care managers embedded in 118 primary care practices were dedicated to hospital transitions and care coordination for complex patients. The care managers were dedicated to hospital transitions and care coordination for complex patients. Additional care management supports were shared among the remaining North Carolina hospitals and participating practices.

At its current capacity, CCNC is providing some degree of transitional care support to more than 4,000 Medicaid recipients every month. Table 2 details various components of the postdischarge support provided to 25,420 individual patients during a recent 6-month period (May 2011 to October 2011). Less resource-intensive interventions, such as assurance of follow-up appointment or telephone contact between the patient and the care manager after discharge, were provided to more than 21,000 and more than 18,000 patients, respectively, during this period. Medium-intensity interventions, such as hospital visits, medication reconciliation by a nurse care manager, and service coordination, were

received by approximately 10,000 patients. Higher-intensity transitional care management services, such as home visits, medication reviews by a clinical pharmacist, and customized patient self-management notebooks, were delivered to approximately 6,000 patients. These 25,420 individuals were discharged from 153 hospitals and 56 nursing facilities, were returned to 1,420 different primary care medical homes, and resided throughout the state (Figure 2).

## Results

The CCNC transitional care program reached its current staffing capacity by early 2011, but it continues to gain efficiencies through new partnerships and refined workflow processes. The impact of current transitional care efforts at full scale cannot be fully measured until more time has elapsed for claims data processing, but effects on time to rehospitalization are already discernable. With regard to hospital discharges during 2010, discharged individuals enrolled in a CCNC medical home were statistically significantly less likely to be readmitted to a hospital, compared with those not enrolled in a CCNC medical home, even when readmission rates were considered as far as 12 months after discharge (Figure 3). Compared with non-CCNC-enrolled individuals, our results suggest a 6% and a 4% absolute difference, or a 22% and an 8% relative reduction for the non-ABD (Wilcoxon-Gehan statistic = 57.10,  $P < .0001$ ) and ABD groups (Wilcoxon-Gehan statistic = 33.76,  $P < .0001$ ), respectively, during the year after discharge. This finding is consistent with the effects of transitional care reported elsewhere [4], and this effect is likely underestimated, since only a fraction of the discharged individuals eligible for care coordination actually received transitional care, because of limited resources. When these results are extrapolated, for every 100,000 admissions, CCNC will prevent more than 6000 additional admissions for the non-ABD group and more than 4000 additional admissions for the ABD group, up to a year after the initial admission.

More broadly, the transitional care program and other population management efforts are successfully bending

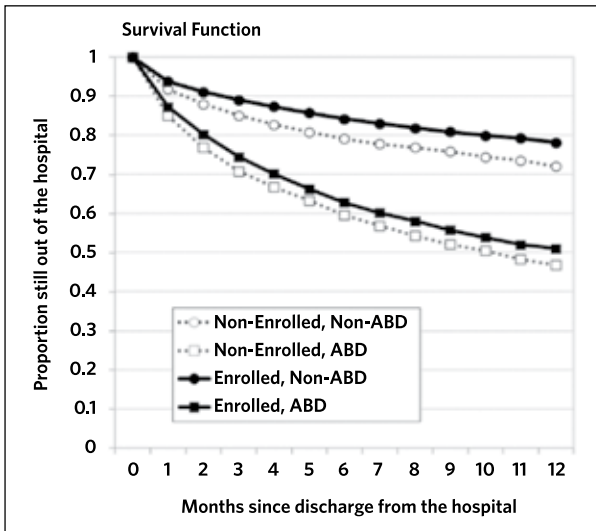
**FIGURE 2.**  
**Geographical Reach of Community Care of North Carolina (CCNC) Transitional Care Interventions, May to October 2011**



Note. The map illustrates the reach of the statewide CCNC transitional care program. Each dot represents the home address of a client who received transitional care services between May 2011 and October 2011.



**FIGURE 3.**  
Time From Hospital Discharge to Next Hospital Admission



Note. The figure includes data from 52,474 unique nondual Medicaid enrollees who were discharged from a hospital during calendar year 2010 (sample sizes: nonenrolled/non-aged, blind, and disabled [ABD], 4351; enrolled/non-ABD, 22,801; nonenrolled/ABD, 7591; enrolled/ABD, 17,731). It excludes admissions and discharges related to obstetrics, newborns, malignancies, burns and traumas; it also excludes same-day transfers. All individuals were enrolled in Medicaid as of December 2010. Individuals enrolled in Community Care of North Carolina (CCNC) were statistically significantly less likely to be readmitted to the hospital during the year after a discharge, compared with those who were not enrolled in CCNC (ABD group: Wilcoxon-Gehan test = 33.76,  $P < .0001$ ; non-ABD group: Wilcoxon-Gehan test = 57.10,  $P < .0001$ ). At 12 months after discharge, 21.8% of the non-ABD individuals enrolled in CCNC were readmitted to the hospital, compared with 27.9% of the non-ABD individuals not enrolled in CCNC. Among the ABD group, 49.0% of those enrolled in CCNC were readmitted, compared with 53.2% of those not enrolled in CCNC.

the cost curve for North Carolina Medicaid recipients with complex care needs. Medicaid spending for ABD eligibility (nondual) beneficiaries enrolled in CCNC decreased by \$122 per member, per month from state fiscal year 2009 (year ending June 2009) to state fiscal year 2011 (year ending June 2011), despite the enrollment of higher-risk patients into the CCNC program during that period.

### Challenges Ahead

Not all Medicaid recipients have access to the benefits of care coordination through CCNC. Although 1.2 million of North Carolina's 1.6 million Medicaid recipients are now enrolled in the CCNC program, those who are not enrolled contribute disproportionately to avoidable hospital use. During 2010, these unenrolled recipients represented 13% of the nondual Medicaid population but accounted for 48% of all potentially preventable readmissions. Extending CCNC benefits to all Medicaid recipients will be critical to achieving near-term quality and cost objectives, and doing so will require concerted outreach and enrollment efforts at the state and local levels, as well as federal approval of regulatory changes, in some cases.

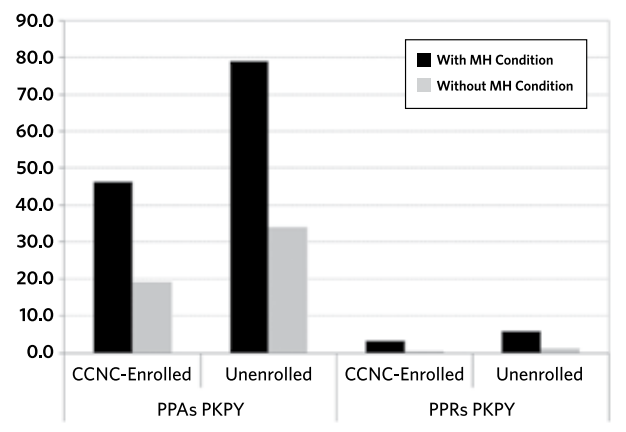
Medicaid recipients with mental illness also experience a disproportionate share of avoidable hospitalizations and

readmissions (Figure 4). Failed transitions are more common for patients with mental health comorbidity, regardless of the primary reason for hospitalization. For example, among CCNC-enrolled patients with diabetes, those with a mental health or substance abuse condition have twice the inpatient admission rate as those without a mental health or substance abuse condition. At present, behavioral health integration is a priority initiative across all CCNC networks, with the aim of establishing better local systems for assuring both communication between physical and mental health care providers and a coordinated plan of care across service agencies and settings of care.

More than 700 Medicaid recipients are discharged from North Carolina hospitals every day, and approximately half of those discharged individuals might be considered candidates for potentially preventable readmissions. Given the volume of need and the limited resource capacity, a third challenge is to continue to refine our risk stratification methods and transitional care management processes, to achieve greater efficiencies. With the promise of greater statewide capacity for electronic exchange of health information over time, opportunities for alerting outpatient providers and the community care team about specific patient risks and care needs will become even more robust.

Finally, the promise of better patient experiences, better outcomes, and lower costs through collaborative approaches to transitional care will never be fully realized without a truly population-wide approach to systems change. Ultimately, provider organizations—whether hospitals or primary care medical homes—cannot effectively implement process changes differentially on the basis of payment source of individual patients. Routinization of systematic improvements in transitional care processes, spanning multiple provider organizations and settings of care, will require support from payers beyond Medicaid for maximum impact and sus-

**FIGURE 4.**  
Potentially Preventable Admissions (PPAs) and Potentially Preventable Readmissions (PPRs) per Thousand Medicaid Recipients per Year (PKPY), by Community Care of North Carolina (CCNC) Enrollment and Presence of a Mental Health Condition, State Fiscal Year 2010



tainability. The transition from hospital to home is a dangerous passage for many patients, and it is a prime opportunity for costly and adverse events. It is a problem that cannot be solved by individuals or organizations working in isolation; rather, it can be solved only through accountability at the community level. During the course of 3 years, CCNC has deployed a care coordination infrastructure that assures safer transitions for Medicaid recipients throughout the state, to the benefit of more than 4000 patients and families every month, and to the mutual benefit of hospitals, taxpayers, and primary care practices. **NCMJ**

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# Organizing Communities Around Care Transitions: The Community Connections Experience

Gary M. Nelson, Mary Anne P. Salmon, Heather K. Altman, Patricia E. Sprigg

**The Community Connections initiative provides an example of building collaboration and partnerships across traditional boundaries—public-private, medical home, and community-based services—to improve care transitions and support for older adults and adults with disabilities. This approach was inspired by the self-governance and community engagement model, with the knowledge, experience, and participation of community stakeholders.**

The community leaders and stakeholders in Chatham and Orange Counties who enacted the Community Connections initiative may not have used, or even heard of, the terms “wicked problems,” “complexity theory,” and “collective impact.” However, they knew that the old approach of taking a problem apart and trying to fix one piece at a time, using classical, “scientific” methods, had not really worked in finding a way to provide adequate community supports and services for older adults and adults with disabilities—especially at times of transition. They knew that organizations cannot work in isolation, that neither medical nor social service providers can develop solutions alone, and that both private and public entities have roles and responsibilities. The Community Connections project, which champions collaboration, embodies aspects of those 3 theoretical concepts—wicked problems, complexity theory, and collective impact—and it provides a dynamic example, not a rigid model, of how diverse community organizations and interests, with varied ideas and approaches, can come together to begin to find answers.

This initiative, which was funded by The Duke Endowment and was facilitated by funding recipient Carol Woods (a not-for-profit continuing care retirement community in Chapel Hill), sought 6 key outcomes: to improve transitional care through increased community coordination, to use technology to support transitions, to create new health care partnerships, to support health care delivery in nontraditional settings, to decrease avoidable emergency department visits and rehospitalizations, and to increase individuals’ ability to remain in their homes. These outcomes emerged from 2 different planning processes held in Orange County, but they also reflected the thinking of aging stakeholders in neigh-

boring Chatham County. In fact, they might well have been identified by any stakeholder in the aging or disability communities anywhere. The lack of coordinated, adequate, and accessible supports for people moving between health and social support settings (hospital, home, and long-term care facilities) met the criteria for wicked problems, as defined by Churchman: complex interdependencies, incomplete information, and uncertainty about the effectiveness of potential solutions [1]. Different thinking was called for.

Leaders from the 2 counties, brought together by the project staff at Carol Woods, decided to pursue 2 courses of action simultaneously. The first was to take advantage of a call from the North Carolina Department of Health and Human Services to become a community resource connection (CRC; also called Aging and Disability Resource Centers or ADRCs nationally) for the aging and disability communities [2]. The second was to enlist the Center for Aging Research and Educational Services (CARES), of the Jordan Institute for Families, School of Social Work, University of North Carolina–Chapel Hill, to lead the community-engagement self-governance process developed by Nelson [3]. This process, which has been used in child welfare and in the development of the first CRCs, was championed by Community Connections and adopted by the North Carolina Division of Aging and Adult Services, to launch numerous additional community meetings.

The community engagement event facilitated by CARES, inspired in part by the complexity-theory work of Wheatley [4] and Holland [5], emphasized that there is not a single way of “knowing” and that the process of knowing is itself a dynamic, emergent process of discovery and creation. Valuable knowledge is gained from research and from the application of evidence-based practice. Equally compelling knowledge is gained from practice-based evidence—the accumulated life experiences of hands-on health and social

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service providers and observant and highly motivated family caregivers. Both of these sources of knowledge are in service to a third source, the shared values and collective impacts or outcomes sought by older adults and adults with disabilities, themselves [6, 7].

Using the community engagement framework (a change process that informs how complex problems are overcome), and piggybacking on the collaboration building that is required for CRCs, Community Connections began to work toward 4 of the 5 conditions identified by Kania and Kramer [8] for successful collective impact: a backbone support organization, a common agenda, mutually reinforcing activities, and continuous communication. One of the 5 conditions, shared measurement systems, remains to be further specified and developed.

### **Backbone Support Organization**

One condition of success in collective impact is a backbone support organization, defined as “a dedicated staff separate from the participating organizations who can plan, manage, and support the initiative through ongoing facilitation, technology and communications support, data collection and reporting, and handling the myriad logistical and administrative details needed for the initiative to function smoothly” [8]. To a large degree, Carol Woods served in this capacity, particularly excelling in communication, facilitation, and logistics. A second grant, from The Duke Endowment, is allowing them to continue to develop in this role.

### **A Common Agenda**

As Kania and Kramer point out, organizations that believe they are working on the same social issue often have slightly but meaningfully different perceptions of both the problem and the solution [8]. Members of the initiative understood this reality. Their first step toward creating a common agenda was to begin to understand and make more explicit the goals of all of these interested stakeholders. For example, AccessCare of Central Carolina’s (the local Community Care of North Carolina affiliate) and Piedmont Health Services’ community health centers were focused on preventing unnecessary hospitalizations and rehospitalizations. Initiatives at University of North Carolina Hospitals were aimed at preventing readmissions and unnecessary returns to the emergency department. Most of the community-based service organizations participating in the CRC were interested in improving quality of life and independence for older adults as well as younger adults with disabilities, and most of these organizations operated on the reasonable but not yet proven assumption that their services prevent or delay placement in residential facilities. Thus, the overlapping parts of their agendas appear to be reducing the number of transitions from home to any other setting, and they also appear to be supporting people at times of transition, when they are most vulnerable to repeated or cycling additional transitions.

### **Mutually Reinforcing Activities**

Working toward alignment among these stakeholders, Community Connections provided some combination of participation, leadership, and financial support to a number of these organizations’ initiatives that held promise of reinforcing the overall efforts to support people in transition and to reduce unnecessary transitions.

Community Connections has continued to provide financial support and participation in the leadership of the Chatham-Orange CRC, which has grown and expanded. At present, there are 25 organizations in the 2 counties that have signed memoranda of agreement.

The CRC, in turn, was chosen to participate in the North Carolina implementation of a federal person-centered hospital-discharge planning grant that brings together hospitals and community resources to reduce preventable readmissions.

A transitions performance team that grew directly out of the community-engagement/self-governance event facilitated by CARES developed 2 active subcommittees: the patient advocacy at transitions committee and the outreach network. The former collaborates with University of North Carolina Hospitals, recommending ways to improve the emergency department and hospital discharge experience; the latter focuses on educating the community about available resources.

With the understanding that falls are often a first step in a downward spiral for older adults, the initiative funded a physical therapist to expand falls-prevention programs. This led to balance and falls workshops, health-fair balance classes, and balance and falls in-service education for health and fitness providers and their students, as well as materials developed for use by providers in the community.

The Community Connections grant also funded and assisted University of North Carolina emergency and geriatrics staff in designing a small, randomized, controlled trial ( $n = 121$ ) at University of North Carolina Hospitals to study the impact of a phone call follow-up with elderly patients about their understanding of and compliance with discharge instructions after an emergency department visit.

Community Connections and Carol Woods staff members received training to become certified lay leaders for the evidence-based Living Healthy Chronic Disease Self-Management Program, developed by Stanford University and funded by the Administration on Aging. This national program has achieved fewer days in the hospital and a trend toward fewer outpatient visits and hospitalizations for participants [9].

Through support from the Community Connections grant, Piedmont Health Services was able to extend the service area of its Program for All-Inclusive Care for the Elderly (PACE) site into Orange County. This change provides a new community-based, long-term care option for people who are eligible for nursing home placement.

Recognizing that transportation to primary care services is a major obstacle for some vulnerable adults, particularly those in rural areas, Community Connections sponsored project health rides in Chatham County, to provide 2,748 rides to medical appointments and health screenings. Funds were used both for rides and as local matches to bring in \$260,000 in additional state and federal monies.

Piedmont Health Services, Roanoke Chowan Community Health Center, and Community Connections partnered to develop a telehealth program at Piedmont Health Services for older adults with cardiovascular disease. Community Connections provided the funding, and Roanoke Chowan Community Health Center provided the equipment, training, and initial monitoring for the project, on the basis of their previous successful pilots.

With the identification of adult day health care as a service needed both to delay residential placement and to help with transitions from hospital to community, Carol Woods and Community Connections helped to support the construction and the program development of a new site of the Central Orange Adult Day Health Program (recently renamed Florence Soltys Adult Day Health Program). They also ensured that program staff participated in networking groups in the 2 counties.

In addition to encouraging the expansion and coordination of services and supports, Community Connections contributed to the development of the workforce, to meet the growing needs in aging and long-term care services. To that end, they (1) helped fund A Helping Hand's prehealth/service learning internship program for university students; (2) helped Chatham County Council on Aging fund a scholarship program for nurse aide students at Central Carolina Community College and supported their certification examination expenses; and (3) collaborated with Carol Woods, Theater Delta, and University of North Carolina's Institute on Aging to create and deliver interactive theater performances for middle and high school students that were designed to facilitate positive relationships between young and old people.

## Continuous Communication

Networking and facilitating communication between parties have been the crowning strengths of the Community Connections initiative. Of the 36 stakeholder agencies in the 2 counties that responded to a survey conducted by CARES, a large majority reported that, through the Community Connections initiatives, they had learned about new programs or services (89%) and had increased their connections with their colleagues in other agencies (94%). In addition, a substantial minority—more than 40%—had taken further steps toward formalized collaboration by partnering with another agency to seek additional funding for a program or services. More than half had begun cross-training with other agencies. A total of 64% increased focus on transitions, and 66% increased partnerships to support transitions.

## Next Steps

The fifth condition for successful collective impact—shared measurement systems—has been more challenging. To make and demonstrate a collective impact on avoidable transitions, not only must the group complete the work of determining a common agenda, but it must also find a common way to measure the effect of their consolidated efforts. The specific “mutually reinforcing activities” might not each be measured, but there must be an agreed-on measure for the success of this effort as a whole. Finding this shared agenda and measurement is the only way to consolidate funding to achieve the scale of work that can really provide the evidence needed to change the face of transitional care in Orange and Chatham Counties.

University of North Carolina Hospitals' program of emergency department phone follow-up produced some statistically significant improvements. The patients in the intervention group were significantly more likely to follow up with a physician within 5 days after ED visit and had significantly improved comprehension of discharge instructions. They also were more likely (though not significantly) to understand medication instructions and manage their medications correctly (B. McCall, unpublished data). Other efforts focused on outputs (eg, clients served, resources obtained). Neither had a sufficient sample size with which to measure the impact on hospital admissions/readmissions or other transitions, but the programs provided the building blocks for other successful efforts.

## Conclusion

Community Connections has brought together stakeholders, has stimulated a number of pilot efforts to solve pieces of the transitions problem, and has begun to set the stage for a continuing collaboration that could have enormous collective impact on this vital issue for older adults and adults with disabilities. This is only a beginning, but it is a beginning that promises great things for the 2 counties and for the state. **NCMJ**

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# Practices to Improve Transitions of Care: A National Perspective

Cheri Lattimer

Improving transitions of care has significant importance to our health care system. While care transitions has been studied and researched by many individuals over the past 20 years, more work is needed to further improve the process. Those beginning to focus on transitions need not begin from scratch, but can use information and research from national and regional collaborative models, as well as other tools and resources to enhance the quality of transitions programs.

The National Transitions of Care Coalition (NTOCC) was organized nearly seven years ago with a goal of improving transitions of care in the health care industry. The Coalition is comprised of more than 30 national organizations and professional associations working together to address the gaps and barriers associated with poor transitions of care by providing tools and resources to providers and consumers to improve the transition of care process. NTOCC supports over 4,500 subscribers, 500 associate members, and 83 countries through its Web site and dissemination processes.

Over the past 7 years, NTOCC has developed and brought to the health care market extensive tools and resources for providers, consumers, legislators, and the media about transitions of care. These resources can be found on the NTOCC Web site (<http://www.ntocc.org>). To achieve the development and implementation of the resources offered through NTOCC, 5 major workgroups were developed that included providers, regulators, and consumers. All the work completed by the workgroups is presented to the Advisory Council and consensus among the members is required prior to posting the resources on the NTOCC Web site.

The work of NTOCC is provided to the industry at no cost, and to encourage its use the Coalition does not copyright or trademark any of it. Individuals and companies may adapt the work to address the specific critical health issues they are facing. Among those resources are publications including, a Patient Bill of Rights During Transitions, Taking Care of My Health Care, My Medicine List (for consumers and for providers), Transition of Care Checklist, and How to Evaluate and Implement a Plan. The most frequently used tools from the NTOCC website are How to Implement and Evaluate a Plan (with 148,000 downloads) and My Medicine List with

(76,000 downloads). Several hospitals have reported using the consumer tools and engaging patients in monitoring and tracking their medications.

The most recent resource published on the Web site is the Transition of Care Compendium. The Compendium contains a collection of white papers, journal articles, and Web sites that contain resources that both professionals and consumers might find useful in a practice or medical situation. Tools and resources developed by NTOCC are highlighted for each component of transition. Also included in the Compendium is the newly developed tool called the "Care Transition Bundle - Seven Essential Intervention Categories and Crosswalk," created to help meet the demand for essential elements and intervention data. The Care Transition Bundle identifies the following essential intervention categories to improve transitions of care: medication management, transition planning, patient and family engagement/education, information transfer, follow-up care, health care provider engagement, and shared accountability across providers and organizations. The Crosswalk brings together evidence-based models created by health care leaders from across the US and addresses personnel, setting and length, type of patient, interventions tools, findings/results/cost, and publication/author information. (The Compendium is available at: <http://www.NTOCC.org/Compendium>.)

Within the Compendium are journal articles on promising practices in transitions of care and reviews of tangible savings from transitions of care models. The following information is from the Improved Transitions of Patient Care Yield Tangible Savings document located on the NTOCC website: [1]

**The Care Transitions Intervention (CTI)**, developed by Dr. Eric Coleman, is a program that gives patients with complex care needs and family caregivers specific tools, and allows them to work with a transitions coach to learn transition-specific self-management skills. This investment in self-care pays dividends downstream as individuals who were involved in the CTI model were less likely to be readmitted

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within six months of hospitalization than those who did not receive the intervention. The anticipated cost savings of one transitions coach (responsible for 350 chronically ill adults), after an initial hospitalization and over a period of 12 months, is \$330,000 [2]. The total annual intervention costs an average of \$196 per patient. The CTI has been adopted by over 470 organizations in 37 states nationwide including hospitals, health plans, home health care agencies, Area Agencies on Aging, accountable care organizations, parish nurse programs, and large physician practices. The California HealthCare Foundation sponsored implementation of CTI, and saw that intervention patients experienced lower rehospitalization rates at 30 days and also at 90 days when compared to the control group [3]. In Rhode Island, the CTI reduced the hospital readmission rate from 20.0% to 12.8% [4].

**The Transitional Care Model (TCM)**, developed at the University of Pennsylvania and spearheaded by Mary Naylor, PhD, RN, establishes a multidisciplinary team, led by a master's prepared transitional care nurse (TCN), to treat chronically ill high-risk older patients before, during, and after discharge from the hospital. Significant reductions in total health care costs (ie, hospital, home health, physicians) after accounting for the additional costs of the intervention have been demonstrated in a number of multi-site, NIH-funded randomized clinical trials. In one study that tested the TCM with Medicare enrollees hospitalized with common medical and surgical conditions, total health care savings for intervention vs. control patients at 24 weeks were \$3,000 per patient (\$3,630 vs. \$6,661) [5]. In a second study targeting older adults hospitalized with heart failure, the average savings at 52 weeks for intervention vs. control patients were \$5,000 per patient (\$7,636 vs. \$12,481) program [6]. The improvements in quality demonstrated in these studies, coupled with health care savings, contributed to the selection of the TCM as a top-tiered evidence-based approach by the Coalition for Evidence-Based Policy [7].

**The Guided Care Model**, developed at Johns Hopkins University, is led by a highly-skilled guided care nurse (GCN) who coordinates care for chronically ill patients. After one year into a randomized controlled trial, Guided Care patients experienced, on average, 24% fewer days in hospital, 37% fewer skilled nursing facility days, 15% fewer emergency department visits, and 29% fewer home health care episodes, as well as 9% more specialist visits [8]. Although these reductions were not statistically significant, they are consistent with an annual net savings of \$75,000 per nurse or \$1,364 per patient [8]. After the second year of the trial, home health care episodes were significantly reduced (by 30%), but other differences were not statistically significant [9].

**Project Re-Engineered Discharge (RED)** was developed and launched by Dr. Brian Jack at Boston University Medical Center and further refined with the help of Dr. Timothy Bickmore at Northeastern University. Project RED focuses

on a standardized discharge process to ensure patients are prepared when leaving the hospital. In 2008, a randomized controlled trial found that patients who utilized Project RED experienced a 30% lower rate of hospital utilization 30 days post discharge and that readmission or emergency department visit was prevented for every 7.3 subjects receiving the intervention. Additionally, patients who received the intervention incurred 33.9% lower costs than those who did not receive intervention, translating into a savings of \$412 per person [10].

**Home-Based Primary Care (HBPC)**, a national program managed by the US Department of Veterans Affairs, provides primary care and care coordination in home for patients with complex, chronic, and progressive diseases. In 2002, veterans enrolled in HBPC experienced a 63% decrease in hospital spending, and in 2008 there was a nearly 24% reduction in 30-day readmission rates. Additionally, newly enrolled veterans had 68% fewer inpatient bed days of care, including 44% fewer hospital bed days of care [11].

**Geriatric Resources for Assessment and Care of Elders (GRACE)**, a program being piloted by Indiana University, is a physician/practice-based care coordination model conducted over the long-term that requires a nurse practitioner and social worker to offer in-home assessment and care management. A randomized controlled study of GRACE indicated the total annual intervention costs for high-risk patients to be \$315,040 (\$1,432 per patient) [12]. The study concluded the intervention to be cost-neutral for high-risk patients due to reductions in hospital costs.

**Project BOOST (Better Outcomes for Older Adults through Safe Transitions)**, developed by the Society of Hospital Medicine, provides hospitals with project management tools and expert mentoring to improve the discharge transition process and decrease readmissions. Entities that have implemented the BOOST program have seen significant decreases in patient readmission rates. For example, a hospital in St. Louis, Missouri decreased its 30-day readmission rates by nearly 42% after implementing BOOST [13]. Implementation of BOOST at a hospital in Atlanta, Georgia lead to lower rates of mortality, and 30-day readmissions rates dropped from 25.5% to 8.5% for those under age 70 [14].

NTOCC has continued to bring education and awareness within the industry about transitions of care through its speaker bureau that provides a significant number of presentations to practitioners, hospitals, payers, and community organizations throughout the continuum of care. The Coalition will continue to work on public policy issues regarding the improvement of transitions of care as defined in the provisions of the Patient Protection and Affordable Care Act on improving quality and reducing health care cost. NTOCC's work will address issues of reducing preventable hospital readmissions, creating community-based transition teams, and supporting the development and implementation of accountable care organizations and patient-centered



medical homes. Success in these programs is largely focused on improving care coordination and transitions for patients as they move through the continuum of care.

Changing and improving transitions of care is about delivering services and interventions in a patient-focused model of care that truly integrates the patient and family as part of the clinical team and demands accountability from providers for bidirectional communication and information transfer. Achieving this requires more than providing new tools and resources or better health information technology; it is a commitment to building strong care teams, changing cultures, and changing individual behaviors. Providers cannot accomplish this by themselves, but by working together as a team with other providers, payers, and community agencies they can and will make a difference for patients and family caregivers, improve the quality of care they deliver, and lower the cost of that care. NTOCC seeks to send that message clearly as we move forward in improving transitions of care. NCMJ

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# An Evidence-based Strategy for Transitioning Patients from the Hospital to the Community

Lynn Watkins

**Improving transitional care from hospital to home requires comprehensive and highly coordinated intervention during the immediate days following discharge. The Hospital to Home Program addresses both medical and social needs, prevents unnecessary readmissions, promotes improvements in patient perceptions of physical and mental health, and results in excellent patient satisfaction.**

**R**educing unnecessary readmissions is high on the list of concerns for hospitals as a measure of quality care. The Patient Protection and Affordable Care Act will change aspects of reimbursement and will penalize hospitals for having unnecessary readmissions. Hospital providers and staff can become very frustrated when they see many repeat admissions from patients who seemed ready for discharge. All these reasons make it important for hospitals to assess processes and community resources in order to find ways to decrease readmissions. Many issues have been identified as to why patients do not make a successful transition to home including, lack of understanding by the patient and/or caregiver of the patient's disease, lack of reliable transportation to medical appointments or even to pick up prescriptions and groceries, lack of understanding of medical and medication management, lack of financial resources to purchase medications or pay for adequate housing and nutrition, reduced functional capacity for activities of daily living (ADLs) and instrumental activities of daily living (IADLs), and inadequate social supports for independence in the home. Successful transitional care programs must be comprehensive, coordinated, and individualized to each person. The Hospital to Home Program at Forsyth Medical Center resulted from the passion and vision of the director of case management and a nursing director to create a transitional care safety-net for at-risk patients. While the community is rich in support services, most have a waiting list extending 2 or more months, the critical time for vulnerable patients to be readmitted to the hospital. The Heart Failure Society of America 2010 Comprehensive Heart Failure Practice Guideline recommends that patients with heart failure see a medical provider within 7-10 days after discharge [1]. Most transitional care models are designed to provide the first contact with the patient within 24-72 hours after discharge either by telephone or in person [2, 3, 4]. There is

limited research on how quickly community services should begin but any delay could put a newly discharged patient at increased risk of readmission due to poor nutrition, lack of medications, lack of transportation to medical appointments, or inadequate hygiene and safety in the home.

The Hospital to Home Program is designed to identify hospitalized patients at high risk for readmission, provide coordinated social and medical services for up to 4 months, and reinforce education provided in the hospital. Eligible patients are 65 years and older, reside in Forsyth County, enrolled in Medicare or Medicaid, and meet at least 2 of the following criteria: 2 or more chronic health conditions; physical disability, functional decline, or needing assistance with ADLs; history of falls requiring medical evaluation or treatment in past year; polypharmacy with greater than 8 medications at admission; cognitive decline or depression; 3 or more physician visits in the past 6 months; 3 or more emergency department visits in the past 6 months; 3 or more hospitalizations in the past year; nutritional impairment; history of or current hospitalization for hip fracture in the past year; limited social support; and lives alone. A computerized list is generated daily of patients who meet criteria from admission information gathered by nursing. Case managers, nurses, and physicians also may request consults. In the first 3 quarters of 2011, there were over 1,100 referrals from the computer list and other sources. Some patients may have been referred more than once (on both the computer list and through case managers). The referrals from physicians and case managers are given priority over the computer list referrals.

The referrals are received by the Hospital to Home Program navigator who performs a chart review and interviews patients during their hospital stay to verify that they meet program criteria. Not all people who are referred through the computerized list are seen in person, but all referrals from physicians and case managers are seen. The program is explained to patients and their consent to

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receive services is obtained before further steps are taken. Of the patients seen, over 15% did not meet criteria. About 30% declined although they met criteria. The navigator assesses patients' medical and social histories and identifies caregiver/s or sources of support. If the patient is determined to have non-skilled needs in the home at discharge, such as transportation, light housekeeping, or light meal preparation, a state-licensed home care agency is contacted to provide services within 24 hours of discharge at no cost to patients. The home care assistance staff is trained to watch for symptoms of health decline or safety concerns. A detailed visit note is made by the agency for every encounter with the participant. The manager notifies the navigator immediately if any concerns arise about the participant. The navigator also communicates by fax with the primary care physician to verify that the patient is enrolled in this program and to provide contact information.

The navigator makes an initial home visit within 24-72 hours of discharge. While in the home, the navigator does an assessment of the home environment for safety and reassesses the capabilities of the patient to be independent with medical and medication management. The discharge medication list is compared to medications available in the home, and physicians, pharmacists, or home health nurses are contacted if any discrepancies are discovered. In cooperation with the patient, caregiver, or family, further support services are arranged as needed. Teaching reinforcement is provided on discharge instructions, the importance of physician visits, and recognizing and addressing signs and symptoms of worsening health. Planning for long-term patient independence in the home with community supports in place continues and is modified as needed.

The navigator provides continuing follow-up by telephone or in-home visits for up to 4 months. Participants often call the navigator between contacts; however, a goal of the program is to empower them to be their own advocates with medical providers and to independently address their own medical and social issues by the time of discharge. In addition to the in-home care described, participants often utilize referrals for durable medical equipment, Meals on Wheels and other volunteer support, personal care services, and their local Department of Social Services. Some services have not been available through community agencies, such as appliance repair, pest extermination services, lymphedema sleeve purchases, and occasionally funds for medication co-payments. Philanthropic funds have been accessed to cover these needs.

Data analyzed during the first 2.5 years of the program document that these coordinated transitional care services have improved patient outcomes and quality of life among participants at high risk for readmission. The population served by the Hospital to Home Program is the older Medicare population, with an average age of 80. Among enrollees, 14% were covered by Medicaid, 45% met the 2008 federal poverty guidelines, 69% were not married,

and 28% required an emergency department visit after discharge from the hospital. The average length of participant enrollment is 63 days. On average, participants received 2.7 navigator visits, 3.5 telephone calls, and 16 hours of home care assistance.

Improvements in patient perceptions of physical and mental health are validated by changes in SF-36 scores. The SF-36, a widely accepted standardized survey tool, is given to patients at the first and last home visits. The physical and mental health scales and all subscales showed statistically significant improvement to at least the  $P < .002$  level. Overall, there was a high degree of patient and family satisfaction among participants, with 99% rating services as very good or excellent.

Based on the reductions in readmissions, cost savings are estimated to be more than 1.5 million dollars for 2.5 years of operation. During a 6-month period in 2010, enrollees were compared to those who met criteria but declined the service, demonstrating a 29% reduction in 30-day inpatient readmissions. In addition, average direct costs of readmissions were decreased 26% among the enrollees compared to their index admissions, whereas those who met criteria but declined enrollment had a 152% increase in average direct costs of readmissions.

Currently, this program serves only the county in which the hospital is located with 1 navigator. However, 1 navigator is not enough to meet the full needs of the hospital. Based on past volume, 5 navigators would be required to cover the immediate 6-county area from which the hospital draws patients. There are plans to expand the staff and geographic reach of this program in 2012.

Some of the most important lessons learned from this program include the value of case management, education, medication reconciliation, assessment, and plan of care revisions extending beyond the hospital stay. Home visits uncover many needs and risk factors that patients and their caregivers did not realize or did not describe during the hospitalization. Moreover, many patients and caregivers are unaware of their need for community-based support and do not know how to access available services.

For all services after discharge, a consistent point of contact is an important element. Having one coordinator for all questions and concerns relieves a lot of confusion and stress for caregivers and participants. The Hospital to Home Program navigator fulfills this function.

The stress of hospitalization and the transition home make patients and caregivers less able to retain education provided while in the hospital. Many patients and families believe they will be fine once they get home or they may have unrealistic expectations of what home health or hospice services will provide for them. Once home, they do not know who to contact for help. Having the initial navigator consult during the hospital stay is essential in establishing a highly coordinated effort. The close working relationship with the home care agency provides a presence in the home

to observe the participant and to notify the navigator of any concerns. Approximately half of all participants (51%) use the free home care agency services. The navigator's visits and telephone calls also provide access to a knowledgeable provider who can answer questions or listen to concerns.

Transportation issues often cause noncompliance with medical appointments. Many participants believe friends or family will take them to appointments but work schedules limit flexibility of transportation and often times appointments are missed or canceled. County transportation services require a multiple day notice and do not provide door-to-door assistance. Local volunteer agencies providing transportation will only transport one time a week and require a 5-day notice. With quickly arranged health care appointments to address medical changes these services may not meet patient needs. Providing a door-to-door transport service is often essential to promoting medical care compliance. Of those who use in-home support services, 38% also use transportation services. Transportation was most often used for physician office or other medical care visits until a more permanent solution could be worked out or the patient was strong enough to use other transportation options.

In some instances, essential home health services arranged by hospital case management prior to discharge may not be implemented without follow up. The navigator ensures that all necessary services and social support are initiated in a timely fashion.

Patients with mental illnesses pose additional challenges. Patients are screened for depression at admission to the hospital and when entering the Hospital to Home program. Sometimes symptoms worsen when a patient returns home and realizes he/she has less functional capacity. In-home care services assist in meeting these needs by providing the patient with a person to speak with on a regular basis. Additionally, a local nonprofit offers a volunteer companion program to provide visits. Other agencies offer a telephonic companion service. Forsyth Medical Center has a mobile crisis unit that responds to the homes of people in behavioral health crisis. At-risk patients are informed of this service and appropriate referrals are made to community treatment programs. The Hospital to Home Program utilizes effective navigation strategies to help patients and their families with a personalized plan for continued recovery.

Improving transitional care from hospital to home requires comprehensive intervention to address both medical and social needs. Care must be patient-centered and empowering to help patients direct their own medical care. For long-term independent living and safety, patients need ready access to community resources for social needs. In the short term, care must support the patient in the home with a single point of contact to help overcome barriers to health and address any unexpected issues as they arise. Quick medication reconciliation and disease process education are essential, as is reinforcing the need for continued medical follow-up with the primary physician. Since patients may not recognize their own needs, they may not be able to articulate their needs clearly to community agencies. The navigator is an advocate on their behalf. The Hospital to Home Program demonstrates that comprehensive and coordinated transitional care addresses the needs of patients with complex health issues, prevents hospital readmissions, improves patient perceptions of physical and mental health, and results in excellent patient satisfaction. **NCMJ**

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# Transitions to and From Nursing Facilities

*Ted W. Goins, Jr.*

Many nursing home transition barriers are manmade and avoidable. PPACA is encouraging improvement and reduced unnecessary hospitalizations through incentives and penalties. Providers are responding through a variety of internal and collaborative models. The resulting communication, technology, education, and emphasis can improve the quality of life for the people served.

Nursing facilities of 2011 are completely different from the old folk's homes of the 1960s. Modern nursing facilities have evolved into complex community health care providers. They care for "40-something" clients with 24-hour post-op double knee replacements, PICC lines, and porta-caths, and they use electronic medical records. People are calling in advance to schedule hip replacement rehabilitation. Memory or Alzheimer's-secure neighborhoods that didn't exist in the 60s are now commonplace.

Some changes have been person-centered and customer-driven, but many have been driven by regulatory and risk management requirements. That trend will continue with the Patient Protection and Affordable Care Act (PPACA). The PPACA encourages improving health care quality while reducing cost. Hospitals will be penalized for unnecessary readmissions. The PPACA is encouraging providers to cooperate and collaborate with the resulting savings being shared between the provider and government. We must make this challenge person-centered by using this opportunity to improve transitions.

Nursing facilities often stand at the crossroads between other health care providers such as hospitals and home health agencies, and are an essential component in the effort to reduce cost across all settings. Hospitals discharge a large number of people to nursing facilities, and because of the high acuity, complexity, and instability of those individual's conditions, many are readmitted from the nursing facility to the hospital. The impending PPACA penalties to hospitals strongly encourages collaboration to reduce unnecessary rehospitalizations and, more importantly, to improve care and safety for each person. Transition planning would improve services, reduce unnecessary hospitalizations, and assist nursing facilities in their multiple challenges related to admissions, transfers, and discharges.

## Challenges

Communications seems to top every list of health care delivery concerns, and health care transitions are no exceptions. Often times, providers in different segments of health care do not communicate with each other effectively. American health care is siloed, resulting in providers not effectively sharing information. Regulations and risk management concerns have hardened these silos.

Hospitals and nursing facilities transfer people back and forth accompanied by doctor's orders, medication records, medical histories, discharge summaries, advanced directives, and general information. That ever-increasing volume of documentation is sent with the person, which means receiving staff must wade through the information to assess and care for the person. Missing, inaccurate, and conflicting information can directly affect the quality and effectiveness of the care received. A prime example is the reconciliation of medication records during transitions, or the lack thereof. The Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill houses the Medication Error Quality Initiative to improve medication safety in North Carolina's nursing homes. In its latest annual report (2010), 1,549 errors or 10.2% of all errors, occurred in the transition from hospital to nursing facility [1].

Nursing facilities now receive the majority of their admissions from hospitals. For example, in one nursing facility reviewed over a 6-month period, 52 people were admitted from the hospital and 15 were admitted from other settings including home. There are many areas for improvements to be made in these transfers. Hospitals often don't have a choice but to discharge late in the day. This is not an uncommon event on late Friday afternoons as the weekend approaches. The accompanying paperwork is often conflicting and sometimes incomplete. Beneath all of that paperwork is a person waiting for quality care in the face of end of the week pressures on staff.

Late afternoon and off-hour admissions pose other challenges for the person and the nursing facility. These unusual

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admission times often mean a lengthy, sometimes uncomfortable wait for transportation services provided by local emergency management services, a transport company, or the nursing facility. Pharmacy is another major challenge with late and off-hour admissions, as late admissions miss institutional pharmacy deadlines. Every nursing facility has emergency medication boxes, Pyxis-type automated drug delivery machines, and back up pharmacy providers, but extra paperwork, availability, and quick delivery remain challenging.

Nursing facilities are not immune from creating some of the same issues when transporting to the hospital. However, hospitals are better equipped to handle incoming transfers. People are generally transported to the hospital emergency room for assessment and treatment, or to triage toward admission to the hospital. Incomplete or inaccurate paperwork from the nursing facility is a burden to the processes of assessment and treatment.

Nursing facility discharges to home health, hospice, or assisted living can usually be scheduled in advance with time for planning and implementation. Nursing facilities discharge people to other settings with physician's orders, paperwork, non-narcotic medications, and referrals to other providers as needed. Areas for improvement include accurate documentation and improved communication upon discharge.

Considering the silos, the admission, discharge, and transfer process works fairly well. In the case of the hospital to nursing facility transfer, the physician makes the decision to discharge the patient from the acute setting. The hospital discharge planner seeks nursing facility placement and the person is moved. The process works, but not well enough to satisfy our customers or providers of care, or to foster efficiencies.

## Strategies for Improvement

**Communication and education.** Just as communication is the primary problem, improved communication is the primary solution. Providers and the public need ever-improving communication and education. Every North Carolinian needs to better understand the health care system. Providers need to break down the silos to improve care and services through communication. Person-centered care eliminates the silos. Organizations and providers are still separate and independent, but all serving the person. For example, in a siloed system, a patient might be transferred after a hospital stay to a nursing home that they did not choose because of bed availability. In a person-centered culture, the resident and family would collaborate with an advocate to determine what is best for the person, which might be rehabilitation in a skilled nursing facility, further strengthening in that nursing facility or in assisted living, and then home with services set up and planned in advance.

As long-term care has changed, staff must change as well. Higher acuity demands higher education and com-

munication standards for nursing staff. Lutheran Services for the Aging (LSA) and similar organizations have adopted INTERACT (Interventions to Reduce Acute Care Transfers), developed through Florida Atlantic University as a CMS (Centers for Medicare and Medicaid Services) innovation project. INTERACT is "a quality improvement program designed to improve the early identification, assessment, documentation, and communication about changes in the status of residents in skilled nursing facilities. The goal of INTERACT is to improve care and reduce the frequency of potentially avoidable transfers to the acute hospital. Such transfers can result in numerous complications of hospitalization, and billions of dollars in unnecessary health care expenditures." [2]

INTERACT supports continuing education for nurses, raising standards, improving care, and reducing unnecessary transfers. LSA has also implemented the Just Culture model to further improve communications, investigate incidents, and improve performance. Just Culture encourages organizations to "console the mistake, counsel at-risk behavior, and punish the reckless." Most problems are process-related, and Just Culture encourages improvement of the process instead of irrational, subjective reaction.

The federal government's desire for electronic health records would be the ultimate solution for improved communications. The best outcome scenario for individualized care would be one in which providers upload all medical records from all sources into the person's electronic health record in a standard format, then that record is protected but available to all providers who serve that person. Privacy rights activists and economics render that a solution for the future. At this point nursing facilities are not included in federal incentives for developing health information technology and exchange, which means a major health care component is being ignored.

**Reduce unnecessary hospital readmissions.** Reducing avoidable transfers from nursing home to hospital eliminates a source of trauma for the resident (especially of the cognitively impaired), reduces costs, and meets PPACA mandates. Physician services are vital to the success of a strategy to reduce transfers from nursing facility to hospital. Nursing facilities do not have a physician on premises 24 hours a day. The attending physician for each person is on call 24/7. The attending physician is faced with a significant challenge when the nursing facility calls with a serious change in condition. Without the benefit of direct patient contact and with the fear of legal liability, the physician may feel inclined to order transfer to the hospital without considering other interventions. They simply cannot stop what they are doing to make an in-person visit.

Physician's extenders, such as nurse practitioners, have proven helpful in reducing transfers. A 2007 study in three Georgia nursing homes reduced hospitalizations by 50%. A key factor was the utilization of nurse practitioners [3]. They are often in the nursing facility for more extended periods

of time and often know the residents better. They are more likely to be present and, if not present, to be at least well-versed in the resident's condition if they are called by telephone. Nursing facilities have long advocated for the right to directly employ physician's extenders. Under current state law, insurers are not required to reimburse for services of nurse practitioners if they are employed by a nursing facility [4]. Further, reimbursement for physician assistants can only be made to the physician, clinic, agency, or institution employing the physician assistant. Regulations and reimbursement surrounding the utilization of physician extenders in nursing facilities is complex. Clarity around regulations and reimbursement would encourage the utilization of nursing facility employed physician extenders.

The Geisinger Health System in Pennsylvania created a skilled nursing facility staffing model called "SNFist", similar to a hospitalist model. The SNFist was to be in the nursing facility daily and improve communications with the patients, families, staff, and other care partners. When the program began, the nursing facility was readmitting one in three residents to the hospital, residents averaged 2-4 readmissions to the hospital annually, there were opportunities for improvement, and end of life care was poorly managed. In a skilled nursing facility pilot in 3 nursing facilities, the readmission rate was reduced in all 3 facilities, and reduced by over 50% in 2 of the 3 [5]. A physician extender could well fill that role with training and physician support. The public would be well served, both from a quality and cost standpoint, by a regulatory change to allow physician's extenders to be employed directly by nursing facilities.

Community Care of North Carolina (CCNC), after participating in the successful nursing facility nurse practitioner pilot, has proposed statewide improvements including the use of nurse practitioners tied to CCNC networks in nursing facilities to reduce unnecessary hospitalizations [6].

The federal government is supporting a number of innovative programs that apply to transitions and nursing facilities. Stanly Regional Medical Center received a Beacon grant to improve care transitions. Stanly has a physician leading the project and has utilized grant funds to hire a physician's extender to follow patients after discharge [7]. In addition, the Centers for Medicare and Medicaid Services has created a demonstration program, the Community Based Care Transitions Program (CTTP) to test models to improve care transitions for high risk Medicare beneficiaries. CCTP goals are: to reduce hospital readmissions, test sustainable funding streams for care transition services, maintain or improve quality of care, and document measurable savings to the Medicare program. The program will utilize case managers to work with hospital patients to ensure the most effective transitions after the patient leaves the hospital [8]. (Other innovation projects are available at <http://innovations.cms.gov/>.)

**Regulatory reform.** Regulatory reform can certainly improve care and transitions. One example of a needed

regulatory change involves dispensing narcotics. Narcotics prescriptions require the pharmacy to receive the original physician's signature prior to dispensing. Electronic prescribing and safety and security have progressed but regulatory reform has not kept pace, and often times the patient suffers.

Opinions vary on every regulation between public protection and ineffective governmental interference. Regardless, regulatory requirements and related legal liability concerns add significant cost to the price of health care in the US.

The CMS-required MDS (Minimum Data Set) form requires a highly trained registered nurse to assess a person and complete the 14-page form, a 3.5-hour process. The form is of nominal value to the nursing facility, and is a costly way for CMS to collect data and determine level of payment.

One positive regulatory change could be the adoption of a universal transfer form to be used by all providers. North Carolina providers and regulators have debated this for many years with no resolution. The state of New Jersey adopted a universal transfer form effective October 30, 2011. Positively, the form creates a standard. Negatively, the form duplicates much information, many attachments are required, and the form would take a great deal of staff time to complete when the patient needs the attention. The transfer form issue should be debated at least as an interim step until the adoption of a true electronic health record.

Barriers to improved and person-centered transfers and discharges exist, many being manmade and avoidable. Government is encouraging providers to improve using incentives and penalties. Providers are responding through a variety of internal and collaborative models. The resulting communication, technology, education, and emphasis can improve the quality of life for the people served. NCMJ

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Odds of a child becoming a professional athlete: 1 in 16,000

Odds of a child being diagnosed with autism: 1 in 110

**Some signs to look for:**

No big smiles or other joyful expressions by 6 months.	No babbling by 12 months.	No words by 16 months.
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**To learn more of the signs of autism, visit [autismspeaks.org](http://autismspeaks.org)**



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# Intentional Collaboration: Addressing Transitions in Care for People with Severe and Persistent Mental Illnesses

Jay Poole

This commentary explores transitions in care for people who have severe and persistent mental illnesses and reside in long-term care communities. Challenges and historical approaches as well as barriers to successful transitions are examined. Recent policy changes in North Carolina are discussed and contextualized in emerging evidence-based practices that emphasize intentional collaborative efforts.

Perhaps one of the greatest challenges in the deinstitutionalization of people with severe and persistent mental illnesses lies in creating and sustaining supports for those who cannot live independently. There are certainly people who have histories riddled with multiple or long-term hospitalizations who, upon discharge, seem to transition back into a living situation either with family or alone with some form of support. In these cases community-based services seem to be key in sustaining the ability to live independently and avoiding re-hospitalization. However, there are other people who, despite community-based services, are unable to live alone or with family because of the complexities of their mental illnesses. In many cases, these people are discharged from the hospital setting to assisted living facilities, nursing facilities, or group homes [1, 2]. In other cases, people end up in homeless shelters or on the streets. The legal system often becomes a another stop on the journey taken by many people who are struggling with mental illness, which can inhibit options for supported or independent living. The challenges are great for people whose mental illnesses stand in the way of independence, particularly as the system of care in North Carolina continues to struggle with redesign and shrinking budgets. Recent legal challenges have highlighted the fact that long-term care communities have been providing living environments for those who are mentally ill and there is much debate about whether or not this is effective or appropriate. What does seem evident is that an array of living environments is necessary and important for those citizens of North Carolina whose lives are challenged by mental illnesses. Further, it is vital to consider the gravity of planning for transitions between and among services that support those with mental illnesses. People simply cannot be passed from service to service without careful coordina-

tion and collaboration. Poor transitions in care often become the first step in the failure of the system to support people who depend on the expertise and professionalism of others.

Historically, the burden of planning for transitions in care involving long-term residential communities has fallen solely on the staff of the facility that is discharging the person in need of services (see 10A NCAC 13F/G .0902(d) (2)). For instance, if a person residing in an adult care facility experienced behavioral, mental, or emotional complications as a result of a documented or perceived mental illness (eg, the person becomes behaviorally disruptive), a determination about the person's ability to remain in the facility is made by facility staff persons who then have to plan for discharge to another setting. In best-case scenarios care coordination between and among service providers occurs voluntarily as a result of positive working relationships that have evolved over time. In other cases the director and staff of the assisted living care facility bear the sole responsibility for finding alternative placement, often with little to no input from providers that served the person affected by the transition in care. In many cases facility staff lack training or experience with people who have severe and persistent mental illnesses, and situations that may have been manageable with appropriate training and intervention instead result in the disruption of care. Such incidents often create the need for immediate discharge and the person in need of services finds him or herself being relocated to a new living environment or in the emergency department of the hospital. Often notification about the change in living environment to community-based mental health service providers is either delayed or does not occur at all, creating risks for the person in need of services to fall through the cracks of the service system. This risk is particularly great when the new living environment is located outside the service system currently working with the person, such as a new geographic location

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served by another system of care. Additionally, the incident that created the disruption may preclude other assisted living or long-term care communities from offering admission to the person in need of services, creating a period of service limbo as staff persons attempt to locate an alternative living situation. This unfortunate scenario often results in the person being lost in the service system, which creates further risk for exacerbation of his or her mental and/or physical illnesses.

People with mental illness face many challenges and this is certainly true for those who do not have families that can support their needs or for those who cannot live independently. People who have mental illnesses often experience more social isolation and financial hardship compared to people who have other disabilities or those who have no identified disabilities. Additionally, people with mental illnesses have higher demands for services and report unmet service needs compared to those with other disabilities or no identified disabilities [3]. Housing concerns regarding people with mental illnesses have become more prominent since deinstitutionalization began. In the past few years there has been a focus on independent housing options for those with mental illnesses and there seems to be a notion that the more independent the living arrangement the better. Some research related to the inference that independent living is best practice reveals the importance of supports from family, friends, and professionals and more traditional supported living options are preferred by some people with mental illnesses [4]. Not surprisingly there are calls for more research as housing options seem to shift toward independent supported housing models for people with mental illnesses [5]. Additionally, review of the literature reveals that a needed area of focus for future research is the array of appropriate housing options for people with mental illnesses [6].

A 2007 review of the literature regarding housing and supports for people with mental illnesses revealed that the best outcomes were realized when housing was combined with a mix of supports and services from family, friends, and professionals compared to housing with assertive community treatment team services only (that ranked as the next best outcomes), or housing combined with case management only [7]. Another study supports the notion that a broader range of service and housing options is necessary to reduce costs of repeated hospitalizations and to enhance recovery outcomes [3]. One of the existing and possible future housing options for people with mental illnesses is the adult care home or assisted living, including group homes. A recent, unpublished qualitative study completed by the author reveals that factors that support recovery models are present in adult care homes that intentionally train staff about mental illnesses and co-occurring disorders and engage residents in a mix of community provider-based service options that are co-located in facilities (J.P., M. Keever, J. Roberts, unpublished data). What seems to be

emerging as the research continues is the importance of a variety of supports and services including options for housing [8, 9]. Of course, as housing options are explored and people are transitioned from one option to another, it is vital to coordinate care.

Recent research indicates that best practices for transitioning people between and among housing and other service options rely on collaborative approaches. A recent British study asserts that close collaboration between all levels of service providers is necessary to enhance quality of care [10]. Care coordination seems to extend beyond working with those in the mental health system alone, as illustrated by a study based in Australia that emphasizes the need for care providers to work closely with general practitioners in the coordination of services in order to enhance quality and avoid gaps in clinical knowledge about the people being served [11]. An article by Latimer suggests that the greatest difference in terms of quality of care for people with mental illnesses and co-occurring disorders lies in effective communication, defined as collaborative and intentional efforts to coordinate care [12]. Further, the National Transitions of Care Coalition (NTCC) offers a wealth of information including best practice models that are based in empirical research. Of particular note are the seven essential elements in a successful transition of care [13] and interventions with very strong trial or evaluation data [14]. At this point, the evidence seems to support that intentional, collaborative efforts that focus on involvement of the person served, service providers, family, and others important to the case produce the best outcomes including reduction in hospitalizations and reduction in gaps in service. Recent policy changes reflect collaborative and intentional approaches in North Carolina.

As of October 1, 2011 local Departments of Social Services (DSS) and Local Management Entities (LME) must take lead roles when a person living in an assisted living community needs to be transitioned. The assisted living community administrator/s and staff are no longer solely responsible for locating options and coordinating transitions in care. Session Law 2011-272 (House Bill 677) requires that DSS or the LME (in the case of unmet needs being related to mental health, substance abuse, or developmental disabilities) establish a team that includes but is not limited to the Local Long-Term Care Ombudsmen, those who are knowledgeable about housing options, service provider representatives, and others who have a vested interest in the transition. The new policy specifically requires that the team have standing members and alternates who can meet on short notice once the adult care community staff make the request for a transition in care. Additionally, the actions of the team must be documented and kept confidential.

The following case example illustrates a comparison of the old policy on transitions in care and describes how the new policy should be implemented. The example also demonstrates what outcomes may be expected. Jane is a

48-year-old woman who has been living at the XYZ assisted living facility for the past 6 months. Prior to her admission, Jane had lived at home with her aging mother until her mother became ill and was admitted to a skilled nursing setting. Jane has a complex clinical resume that includes diagnoses of bipolar I disorder, polysubstance dependence, early onset dementia (possibly linked to her drug use), and borderline personality disorder. Jane's first psychiatric hospitalization was at age 20, secondary to a suicide attempt. She has been hospitalized 12 times during the course of her illnesses and, despite all efforts to engage her with community-based services including assertive community treatment and psychosocial rehabilitation, she is unable to live independently. Jane has a history of making threats to herself and others and, this has not abated since she has been residing in the assisted living facility. In her current living environment, she has made threats to other residents, striking one of the older residents on the arm. Despite efforts to better train staff and to continue frequent engagement with assertive community treatment, the administrator and staff have made the decision to discharge her due to volatility. If this situation had occurred prior to the implementation of the new policy, the assisted living facility would have been solely responsible for Jane's disposition.

Jane was admitted to her current residence with only a minimal plan for services. Now that she is being transitioned again, she and the staff members are faced with the challenges of coordinating services. Under the old system, it would be very difficult for the assisted living staff to develop a care transition plan for Jane because of the lack of involvement of other partners in her care. The focus of the transition plan would have been locating a placement as opposed to intentional collaborative efforts to support Jane. Under the new policy, the assisted living administration and staff would contact the transition team, led by the LME, and a planning meeting would be arranged. The team could include staff from the assisted living community, service providers in the mental health system, medical service providers, other appropriate stakeholders, and family members. Jane's mental health care would become a focus in planning her transition and, intentional coordination of services driven by outcomes focused on supporting Jane's recovery would occur (eg, establishing goals that reflect reduction of symptoms, improvement in functioning, and movement toward optimal levels of independence). Hopefully, Jane would be transitioned to a living environment that can support her in the achievement of her goals. The level of involvement of Jane's family in the past is unclear, but attempts would be made to re-engage her family in her service plan. The promise of the new policy lies in the evidence that intentional care coordination is a best-practice model.

This new policy clearly reflects collaboration and inten-

tional planning, which is in line with best practice models. Perhaps as this policy is put into practice, the experiences of people who are affected by mental illnesses and co-occurring disorders will be improved as they transition within the complex system of care on which they depend. After all, the goal is to enhance quality of life and, if intentional collaborative efforts related to transitions in care do this, we have all succeeded. **NCMJ**

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# Now Where Was I Going? The Challenge of Care Transitions for the Cognitively Impaired

Margaret A. Noel

**Transitions in care settings can be disconcerting to anyone, but they can be particularly difficult for people with cognitive impairment. MemoryCare's design of integrated clinical and care management services is well suited to minimizing the preventable morbidity that can accompany transitions in health care for cognitively impaired older adults at high risk for poor outcomes.**

**M**emory disorders are emerging as one of the greatest health and economic threats of the 21st century. As life expectancy has increased, so too has the prevalence of Alzheimer's disease and related dementias, which now affect 1 in 8 people over 65 and almost half of adults over the age of 85 in the United States [1]. As the average age of the population rises, this startling figure can only grow, making the development of effective systems of dementia care delivery a critical public health concern. The costs of Medicare and Medicaid are respectively 3 and 9 times more expensive for a person with dementia compared to an age-matched person without dementia [2]. North Carolina is ranked 10th among states in regard to the size of the population over age 65 with projected increases from 12.9% of our state's population to 18% over the next 20 years. Alzheimer's and related dementias are the fifth leading cause of death in North Carolina and the only cause of death among the top 10 that cannot be prevented, cured or, significantly slowed [2, 3]. While research has provided greater understanding of the pathological processes that may contribute to dementia, any successful intervention appears to be decades away. Absent a cure, we need to promote better models of care that minimize unnecessary and burdensome health care transitions for persons with dementia.

## MemoryCare

MemoryCare was founded as a community based non-profit charitable organization in 2000 as an alternative to the traditional medical approach to dementia care. Our goal is to enhance basic community services with a program that helps older adults and their families have the best possible quality of life in the face of a progressive memory disorder. MemoryCare is consultative and designed to work in concert with primary care providers. In our holistic approach,

physician and care manager (nurse or social worker) teams incorporate caregiver education, counseling, and support into the evaluation and medical management of the patient. The teams coordinate diagnostic work-up, disease management planning, caregiver training, counseling, and support for each enrolled family. They also provide guidance and medical assistance in managing difficult behaviors, coordination of available community resources, and counseling for families regarding end of life decision making. After the initial evaluation, families and referring physicians receive a written care plan that is amended over time as the patient's dementia progresses. Families have full access to our resource library, workshops, caregiver training program, and staff for educational materials and support. We accept Medicare payment for the care of the patient. Families share the cost of the services that are not covered by Medicare with an annual enrollment fee that is currently \$460, all inclusive. We use charitable funding to cover the difference in actual costs and reimbursements as well as to waive the caregiver fee for anyone who states it would be a financial hardship or barrier to enrollment.

In 2011, MemoryCare provided comprehensive services to 960 patients and 2,813 caregivers. Eighty-five percent of our patients are cared for in the home setting, one-third are dependent in 2 or more basic activities of daily living, and 53% are low-income, as defined by federal poverty guidelines. We conduct an annual caregiver impact survey among a random sample of caregivers who respond in anonymity. In our 2011 caregiver outcome survey ( $n = 235$ ), 97% of caregivers said their knowledge of memory disorders improved, 94% said their ability to manage their loved ones behavior improved, 82% reported a reduction in stress, 91% said they had benefited from assistance accessing community resources, 97% responded that our out of pocket caregiver fee was reasonable for services provided, and 90% of those still living in a home setting said that MemoryCare services helped keep their loved one at home longer.

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## Health Care Transitions

Transitions through the health care system are particularly bewildering for those with dementia and frustrating for their loved ones and professional caregivers. Depending on the stage of dementia, hospitalizations and assisted living and nursing home transfers are associated with heightened confusion, agitation, fall risk, use of inappropriate medications, and significant increases in costs for the person without a dementia diagnosis [4]. The health care system is poorly equipped to recognize diminishing capacity [5]. Providers presume that patients have adequate insight, judgment, and memory function when instructing them on how to self-manage their disease. Persons with dementia are often socially intact and often address medical questions with responses that could be false. This puts them at great risk of receiving inappropriate medical care without an involved caregiver to serve as their advocate. This also speaks to the value of early diagnosis; less than half of persons with mild to moderate dementia have any record of being diagnosed with cognitive impairment [6]. Medicare's new annual wellness visit includes assessment for possible cognitive impairment which may improve early detection rates. Earlier recognition of a cognitive disorder may allow the person with dementia more opportunity to participate in his or her plan of care. This can permit a longer period of supported independence for the patient and less stress for caregivers who are properly educated. Early awareness allows providers in the health care system to be alert to capacity issues and safety concerns (such as driving, medication management, nutritional issues, financial oversight, and protection from elder fraud) that might arise.

The cognitive and eventual physical tolls of most common types of dementia gradually render a person completely unable to participate in decisions and manage their own health related problems. In the final stages of progressive dementias, victims are incontinent, bedridden, and manifest the sequelae of failed motor control, swallowing mechanisms, and immune systems. But the path that any individual will take to this end may evolve over a decade or longer in singular patterns, as unique as the person bearing the dementia. There is no "one size fits all" care plan but there are common needs that, if better addressed, would ease health system transitions for those who suffer from dementia and their families.

MemoryCare's design of integrated clinical and care management services is well suited to minimize the preventable morbidity that can accompany transitions in health care for cognitively impaired older adults who are at high risk for poor outcomes. Upon entry into our program we research the medical history of each patient and provide a clearly communicated, detailed written summary which is also available in electronic format for each caregiver to utilize when interfacing with the health care system. Assessments include detailed baseline functional and

cognitive performance data on each patient to assist other providers in determining significant changes in status. The care plans address advance directives and we assist the patient, or their designated surrogate when capacity has waned, to establish goals of care that are consistent with the values of the patient. Caregivers are then encouraged to contact us via phone, email, or family conference for assistance in weighing risks and benefits of various interventions in context of the specific situation involving serious health care decisions. Health care choices are appropriately variable depending on the stage of dementia. Persons with mild cognitive impairment or mild dementia may benefit to the same degree as age-matched non-demented persons from various interventions. As dementia progresses into the advanced stage it is rarely in a patient's best interest to endure a hospital transition from their home or facility setting, as equally effective treatment tailored to comfort oriented goals can be offered through in home palliative care or facility medical staff [4, 7]. Two-thirds of persons with diagnosed dementia are projected to die in a nursing home. Unnecessary and burdensome transitions in advanced dementia could be greatly decreased by improved access to palliative and hospice care in facility settings. Family members who are well educated about advanced dementia chose interventions like emergency room or hospital transfer, feeding tubes, or intravenous therapies 27% of the time compared with 73% of the time for family members who did not understand the clinical course of dementia and related poor prognosis [8]. Currently Medicare and Medicaid financial incentives are perversely aligned to favor hospitalization of end-stage dementia patients [7, 9]. MemoryCare helps educate caregivers on risks and benefits of medical interventions and encourages utilization of hospice and palliative care services for our patients with advanced dementia when it is in alignment with patient and caregiver goals of care.

MemoryCare primarily addresses the needs of home based dementia patients. Eighty-five percent of our patients reside in the home setting and 15% reside in assisted living or skilled nursing facilities. Persons with dementia who are not in a facility setting must have an involved caregiver. MemoryCare recognizes that caregivers are the principle vector for the flow of information required to provide the best possible outcome for a person with dementia who lives in the home setting. Through individual and group sessions we train caregivers to assume that responsibility, equip them with tools needed to transition through the health care system, and to advocate for their loved one. We counsel caregivers that persons with cognitive impairment should never be left unaccompanied in medical settings. Caregivers come to understand the critical importance of being present to both provide essential medical history as well as to reassure the person with dementia who will become more anxious and agitated in strange environments. We are fortunate that our community hospital has a dementia response team

that we can alert to provide care coordination, guidance to hospital staff, and support for our patients and their families when they must be hospitalized. We provide community wide education for other health care professionals regarding the importance of engaging available caregivers in the care management process.

MemoryCare's model of integrated support of patient and caregiver successfully addresses the common complaints regarding dementia care in the US, including rushed practitioners without reimbursed time to follow established practice guidelines, lack of care coordination, lack of active follow-up to ensure the best outcomes, and poor communication with caregivers to train them in best practices of dementia management [10]. MemoryCare has developed a thriving community-based program that integrates the health care of the dementia patient with the education, training, and support of their caregivers. Widespread replication would depend on changes in federal and state funding mechanisms to support integrated caregiver support, a step that has potential to generate significant overall cost savings for this population.

MemoryCare focuses on preventing transitions when possible. We do this by engaging and training caregivers to provide a stable environment, reducing unnecessary medications, and managing challenging dementia related behaviors. If a transition is in the best interest of our patients, their caregivers are armed with an up to date medical record, defined goals of care, and the empowerment to be a well informed surrogate for making health related decisions. Essential to any transformation of dementia care is remembering the needs of the patient at the center of the transition

while also recognizing and respecting the role of the caregiver. **NCM**

**Margaret A. Noel, MD** founder and director emeritus, MemoryCare, Asheville, North Carolina.

#### Acknowledgments

I wish to thank my colleagues at MemoryCare. Their commitment and dedication to caring for families affected by dementia makes this model not only effective but also inspiring.

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# Improving Care Coordination in the Specialty Referral Process Between Primary and Specialty Care

Caroline Y. Lin

There is growing evidence of sub-optimal care coordination in the US. Care coordination includes the specialty referral process, which involves referral decision-making and information transfer between primary and specialty care. This article summarizes the evidence of sub-optimal care coordination in this process, as well as potential strategies to improve it.

## Referral Decision-Making

Despite spending \$8,086 per capita on health care in 2009, the US continues to do poorly on measures of health care delivery. In the 2011 National Scorecard on US Health System Performance, the US scored only 53% on measures of care coordination and efficiency. This includes growing evidence of sub-optimal care coordination in the specialty referral process between primary and specialty care in the ambulatory setting.

Specialty referrals are common. Up to 70% of patients are referred to specialists in a year and, among the elderly, an average of 2 new referrals are made yearly [1, 2]. Specialist visits account for more than half of all ambulatory visits [3]. Despite the frequency of specialist referrals, the referral process continues to present many challenges. The referral process involves referral decision-making followed by care coordination and information transfer to and from specialty care. Prior studies reveal substantial room for improvement in these steps, as well as potential strategies to improve them.

Up to 5-fold variation exists in referral rates among primary care physicians (PCPs) [3]. Such variation points to potential unnecessary referrals or missing referrals that may reduce appropriate use of specialty care, and may thus lead to delays in diagnosis, delays in treatment, or over treatment. Much of this variation may be attributed to physician factors such as years of experience, certainty in diagnosis, degree of risk aversion, technical orientation of care, and concerns about malpractice suits. Geographically, referrals are more frequently made by urban physicians and those in areas with more physicians per capita. Self-referrals are common, accounting for up to 50% of new specialist referrals, while specialist-to-specialist cross-referrals are uncommon, mak-

ing up only about 3% of referrals [3].

Efforts to improve referral decision-making include provision of feedback to providers, improved training, and the holding of regular meetings or joint consultations between providers [4-8]. Additionally, referral guidelines may help improve the process by clarifying which conditions should ideally be managed by PCPs, what type of communication is preferred by PCPs and specialists, and what tests should be ordered before a referral. Some specialty organization referral guidelines already exist for specific conditions. Another promising strategy involves specialist prescreening of referrals to detect those that may be unnecessary, require triage or referral to a more appropriate specialist, or require further tests prior to consultation [3].

Finally, payment reform may ultimately help promote more appropriate referrals by providing integrated primary-specialty care organizations with financial incentives for appropriate specialist care. For example, health policy experts have proposed a bundled payment to caregiving organizations to provide coordinated care for a specific condition (eg, congestive heart failure), rather than traditional fee-for-service payment. The costs of potential unnecessary referrals or specialist visits would be borne by the care organization, but a portion of any savings from more efficient care would pass back to the care organization [3].

## Care Coordination and Information Transfer to and from Specialty Care

Several studies reveal insufficient information transfer in the referral process, with no communication from referring providers to specialists in up to 50% of referrals, and no communication from specialists back to referring providers in up to 45% of referrals [9-13]. Information transfer of test results and records did not reach the other provider in time for an appointment in up to 25% of referrals. In one study,

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50% of referring providers were dissatisfied with timeliness of specialist feedback [3]. Information is often inadequate even when successfully transferred in a timely manner. Up to 70% of specialists rated background information received from referring providers as fair or poor, [11, 12, 14] while up to 50% of referring providers desired more feedback from specialists [13, 15, 16]. There is often misunderstanding about the role of the specialist (eg, single cognitive consultation, co-management, etc.), thus contributing to a large number of follow-up specialist visits (including patients with stable conditions who arguably do not need to see specialists routinely), which comprise up to 50% of specialist visits in the US [3]. Disagreement or misunderstanding of management plans also exist between referring providers and specialists in up to 26% of referrals [3].

Inadequate information transfer and care coordination between primary and specialty care has numerous consequences, including reduced continuity of care, delayed diagnosis or treatment, duplicate testing, follow-up testing, poly-pharmacy, hospitalization, increased risk of malpractice suits, and increased costs [11, 16]. Patients and family members often become information intermediaries, but many are not comfortable in this role [17]. Among malpractice claims for missed or delayed diagnoses, 20% involved communication deficits between providers, 17% involved failure to establish clear lines of responsibility, and 5% involved failure of a requested referral to occur [11].

Many strategies have been proposed to improve care coordination and information transfer. Information technology and shared electronic medical records allow better referral tracking, scheduling, and information transfer. Web-based referral systems have improved scheduling success, reduced wait times, and reduced re-referrals. Referral guidelines can also help clarify provider roles and necessary tests. Patient-centered medical homes may improve the referral process by incorporating many of the above strategies, though an early pilot study so far has not shown significant improvement in care coordination [18]. Other promising strategies involve co-location of generalists and specialists to facilitate information transfer and shared or group visits. Finally, virtual consultations are promising, and include e-mail, telephone, Web-based, and video-conference visits [3].

The current specialty referral process leaves much room for improvement in referral decision-making and care coordination between primary and specialty care providers. Information technology, payment reform, and new models of care delivery are among the more widely promoted strategies for improvement. However, most of these strategies require more rigorous large-scale multi-institution evaluations. Given the expected growth of the elderly population and potential shortage of all types of physicians by 2020, improving the specialty referral process deserves much greater attention. **NCMJ**

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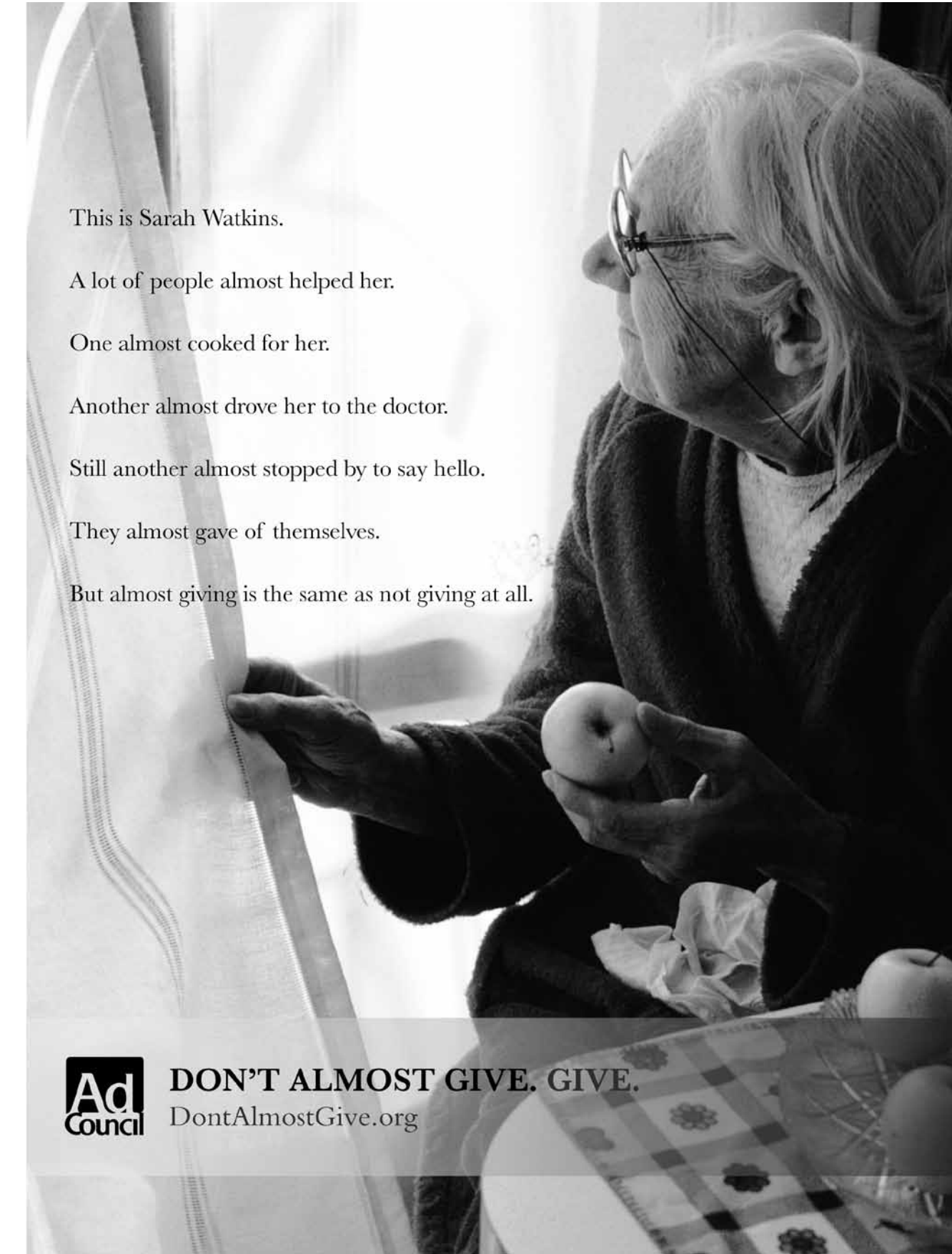


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# Philanthropy Profile

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## Care Transitions: An Essential Part of the Delivery of Health Care

The aging of the residents of the United States, the intensity of chronic illnesses, shorter hospital stays, and a situation with proportionately fewer caregivers will increasingly affect the ways that individuals receive care. Patients are no longer just “discharged” from the hospital; rather, they “transition” from one care setting to another, whether the transition is from the hospital to the home, to a subacute or postacute nursing center, or to a long-term care facility.

Care transitions is that key part of the process of care where extra effort needs to be expended to ensure the continuity of care as a patient moves through the system of care, “rest-stopping” at appropriate destinations on the health care journey. While ensuring continuity is important for all patients, it is particularly important for the elderly and individuals with disabilities, who often have complex medical needs and require access to the health care system more frequently.

Ineffective care transitions manifest themselves in unnecessary hospital utilization and associated expenses. The *New England Journal of Medicine* reported, in a study of Medicare beneficiaries, that almost 20% were readmitted within 30 days and that 34% were readmitted within 90 days [1]. Hospital costs for these unnecessary readmissions were estimated to be \$17.4 billion. These affect not only the individual, but also the entire system, including providers and payers.

The concept of care transitions is particularly relevant in this era of health care reform, as it relates to quality of care as well as cost. This practice will be increasingly important as health care reform redesigns how services and resources will comprehensively support the patient. As our nation seeks to provide patients with the appropriate services at the appropriate times, the concept of care transitions will be essential to establish accountable care systems, which will provide longitudinal support for patients. This will require great choreography between organizations to ensure optimal transition between settings, so that maximum stability is provided for patients as they pass from one provider to the next.

The Duke Endowment, which was established in 1924, has been dedicated to improving the health of the citizens of the Carolinas. Since 2008, when the endowment made its first grant in this area, the topic of care transitions has expanded nationally, as providers recognize the importance of optimal transition, so that patients do not have to begin over with each interaction, thus compromising any health gains they have achieved.

While this work is still relatively new, the endowment and its grantees have learned much in a short period.

First, there is no need to reinvent the wheel. A number of effective established models already exist. Examples include the Care Transitions program (<http://www.caretransitions.org>), the transitional care model ([http://innovativecaremodels.com/care\\_models/21/overview](http://innovativecaremodels.com/care_models/21/overview)), Project RED (Re-engineered Discharge; <http://www.bu.edu/fammed/projectred/>), and Project BOOST (Better Outcomes for Older Adults Through Safe Transitions; [http://www.hospitalmedicine.org/ResourceRoomRedesign/RR\\_CareTransitions/CT\\_Home.cfm](http://www.hospitalmedicine.org/ResourceRoomRedesign/RR_CareTransitions/CT_Home.cfm)). They provide recipes for implementation, as well as tools for application. In addition, the National Transitions of Care Organizations (<http://www.ntocc.org/Home/tabid/36/Home/tabid/36/Default.aspx>) and the Long Term Quality Alliance (<http://www.ltqa.org>) provide tremendous resources to assist organizations and communities.

Second, collaboration inside and out is important. While organizations are proficient in managing care while a patient is part of that organization, challenges ensue when patients are handed off to the next provider. It is critically important to ensure seamlessness from one setting to another.

Third, identifying at-risk patients is essential. Patients who are at greatest risk are likely to benefit most from participation in a formal care transitions program. Factors for organizations to consider in establishing criteria include excessive emergency department visits, excessive hospital readmissions, risk due to polypharmacy issues, and other factors that make patients vulnerable to potential readmissions.

Lastly, data collection and analysis are critical. In addition to the individual indicators measured by each collaborating organization, it is important for all transition partners to agree on universal indicators to track the success of the effort.

Care transitions will be increasingly important, particularly given the complex medical issues with which individuals contend, the growth of the elderly and the disabled populations, and the continued implementation of health reform. This nascent specialty will continue to expand to meet the needs of patients in the best possible way. There are many excellent resources for organizations and many opportunities as the health care industry continues its revolutionary evolution. **NCMJ**

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*Contributed by M. Tina Markanda, FACHE, MBA, MSPH, program officer,  
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# Spotlight on the Safety Net

*A Community Collaboration  
Kimberly Alexander-Bratcher*

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## **Transitions of Care: Blue Ridge Community Health Services**

Blue Ridge Community Health Services (BRCHS) is a Joint Commission-accredited community and migrant health center in Henderson County that has been working for almost 50 years to enhance the health of individuals and families in the region by improving access to health care. BRCHS offers a comprehensive scope of services to a wide range of clients and helps them transition from temporary, acute care settings to primary care and dental homes. In 2011, BRCHS provided more than 66,000 service encounters to 17,540 patients (10,921 of whom were uninsured, and 98% of whom lived below 200% of the federal poverty guidelines). BRCHS offers services through a provider staff consisting of 11 family medicine and pediatric providers, 4 dentists, 3 dental hygienists, a psychiatrist (also certified in addiction medicine), a psychiatric nurse practitioner, 4 licensed counselors (2 of whom are also licensed clinical addiction specialists), and a licensed dietitian. BRCHS also operates 4 school-based health centers, a dental outreach program, a 340B pharmacy and medication assistance program, and community and migrant-stream farmworker outreach and health education.

The overuse of emergency departments for primary dental care was a significant problem in Henderson County. One of the local hospitals, Margaret Pardee Memorial Hospital (Pardee), reported to BRCHS that in 2008, they had more than 600 emergency department visits for dental needs that would have been better served in a primary dental setting. Of those 600 dental visits, 430 were for uninsured individuals. Because emergency departments are ill-equipped to treat underlying dental issues, the treatment plans in this case addressed only pain relief with little treatment for the underlying dental care issue. Through a collaboration with Pardee, BRCHS is helping to streamline access to appropriate dental homes for patients who seek treatment through the emergency department. During BRCHS operating hours, dental patients who enter the hospital emergency department are assessed and immediately sent to BRCHS. After BRCHS hours or during the weekend, patients are given a limited amount of pain medication in the emergency department and referred to BRCHS. On the next business day, BRCHS staff follows up with patients to help them receive the dental care they need.

The BRCHS relationship with Pardee extends beyond helping patients with emergency dental problems. For several years, BRCHS has reserved at least 5 appointments each day for emergency department and hospital follow-up visits. Patients leaving the emergency department are guaranteed access to a follow-up visit at BRCHS. BRCHS appointment information is included in the hospital's discharge instructions. Knowing that patients will receive adequate and timely follow-up means emergency department physicians worry less about defensive medicine. The BRCHS chief medical officer and Pardee's physician leadership have regular meetings to ensure the transition of care system is working as efficiently as possible.

The relationship between BRCHS and Pardee continues to grow. The collaboration also includes care transitions for pregnant women moving from prenatal and perinatal care at BRCHS to Pardee for labor and delivery. *Clinica en el Campo* (Clinic in the Field) supports BRCHS physicians to work collaboratively with the Mountain Area Health Education Center - Hendersonville Family Practice Residency Program, sponsored by Pardee, to bring medical care to farmworkers in the fields and in housing camps. This program brings much-needed care to people and also extends the education of residents from beyond the traditional medical setting to the patient's environment, which creates a valuable learning experience.

BRCHS was awarded a grant through funds made available by the Affordable Care Act to construct a new 27,000-square-foot medical building, which opened in September 2011. The new building includes space for Pardee to provide laboratory and radiology services for BRCHS patients at the community health center so patients do not have to travel to the hospital for those services.

BRCHS also helps patients transition from acute specialty care with The Free Clinics of Henderson County to a primary care medical home at BRCHS. The Free Clinics focus on connecting patients with specialty care, providing acute care one night each week. Patients seen by the clinics are referred to BRCHS for continuing primary care. In return, patients at BRCHS are able to access specialty services through The Free Clinics.

In addition, BRCHS helps children transition from acute care within school-based health centers to a primary care medical home. Many children come to BRCHS for illness, minor injury, or sports physicals. If the child has a pediatrician, the records of the visit are shared with the child's medical provider to ensure the medical home is aware of the care received at the school-based health center. If the child does not have a medical home, they may receive comprehensive care from the school-based health center.

The safety net providers in Henderson County are working together to help transition patients to the most appropriate place for their care. The collaboration between the hospital, free clinic, and community health center is an illustrative model of using existing community resources to help patients receive the right care in the right place at the right time. NCMJ

*Kimberly Alexander-Bratcher, MPH, project director, North Carolina Institute of Medicine, Morrisville, North Carolina, with contributions from Jennifer Henderson, chief executive officer, Blue Ridge Community Health Services, Hendersonville, North Carolina.*

# Quality Forum

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## North Carolina Alliance for Effective Care Transitions

The North Carolina Quality Center for Hospital Quality and Patient Safety recognizes that there must be care coordination between multiple stakeholders to improve transitions across the continuum of care and preventing readmissions. To meet this goal, the Center has sought to gather information about and assess care coordination efforts in communities across the state. A diverse group of stakeholders has been assembled to examine statewide efforts to improve care transitions, to assess organizational willingness to partner on a statewide effort, and to identify best practices for improving care transitions and decreasing avoidable hospital readmissions. This group conducted its first meeting at the North Carolina Hospital Association in September 2011 and has met 4 subsequent times.

The first stakeholder meeting included a report from the transitions of care subcommittee that grew out of the North Carolina Institute of Medicine's Health Reform workgroups. This was followed by each stakeholder organization sharing a brief overview of their care transitions work, their efforts to reduce readmissions, their partnerships, challenges experienced, and lessons learned. In subsequent meetings, the group discussed gaps in care transitions, assessed the use of metrics and outcomes, and began the development of the vision, mission, and objectives for the stakeholder group.

To formalize the identity of the group, the members chose to call themselves the "North Carolina Alliance for Effective Care Transitions." The Alliance is a gathering of stakeholders who represent hospitals, long-term care, assisted living, home health, hospice, mental health, case management, insurance plans, community care networks, patients, and others, and who meet to coordinate efforts to improve care transitions across all settings for all North Carolinians. The organizing partners of the North Carolina Alliance for Effective Care Transitions are the North Carolina Quality Center and the North Carolina Department of Aging and Adult Services. The latter participates with support of their person-centered hospital-discharge planning model grant the Centers for Medicare and Medicaid Services. The mission of the North Carolina Alliance for Effective Care Transitions is to provide person-centered quality services and supports when North Carolinians transition from one health care setting to another. The organizations represented at the initial stakeholder meetings are listed in Table 1.

Coordinated by the North Carolina Alliance for Effective Care Transitions, 27 organizations have submitted detailed profiles of their work to improve care transitions. These profiles can be accessed at [www.ncqualitycenter.org/ncact/](http://www.ncqualitycenter.org/ncact/). Organizations wishing to share what they are doing to improve care transitions can find a blank form and submission instructions at the same link. The alliance is also working on developing a care transitions Web site that will serve as a clearinghouse of information related to improving care transitions, as well as provide a mechanism for providers to connect, coordinate, and share best practices and resources.

The work of the North Carolina Alliance for Effective Care Transitions was further defined during the January 13, 2012, North Carolina Partnership for Patients Summit. This meeting was held in Greensboro and co-sponsored by the North Carolina Division of Aging and Adult Services, Carol Woods Retirement Community: Community Connections for Seniors, the Carolinas Center for Medical Excellence, the North Carolina Hospital Association, and Community Care of North Carolina. The summit brought together hospital leaders, employers, physicians, nurses, patient advocates, home- and community-based long-term service providers, and other community organizations in a shared effort to improve health care outcomes and promote well-being for all citizens. The event also provided a forum to discuss issues, opportunities, and innovations for improving care transitions in North Carolina, as well as the next steps for the North

Carolina Alliance for Effective Care Transitions. A total of 276 providers and stakeholders participated in the summit. The next North Carolina Alliance for Effective Care Transitions meeting is scheduled for May 2012.

In partnership with the Carolinas Center for Medical Excellence, Community Care of North Carolina, and the North Carolina Alliance for Effective Care Transitions, the North Carolina Quality Center is also planning a 12-month collaborative program focused on reducing avoidable hospital readmissions. The North Carolina Quality Center was recently selected by the Centers for Medicare and Medicaid Services to be 1 of 26 hospital engagement networks, to help hospitals achieve the Partnership for Patients' goal of reducing harm by 40% and avoidable readmissions by 20%. The North Carolina Quality Center is partnering with the Virginia Hospital and Healthcare Association to form a regional hospital engagement network, the North Carolina-Virginia Hospital Engagement Network.

**TABLE 1.**  
**Organizations Represented at the North Carolina Alliance for Effective Care Transitions Stakeholder Meeting**

Organization
AARP North Carolina
North Carolina Center for Hospital Quality and Patient Safety
Area Agency on Aging: Triangle J
North Carolina Chapter of the American Case Management Association
Association of Home and Hospice Care of North Carolina
North Carolina Division of Aging and Adult Services
Care Partners Health Services
North Carolina Division of Mental Health
The Carolinas Center for Hospice and End of Life Care
North Carolina Health Care Facilities Association
The Carolinas Center for Medical Excellence
North Carolina Health Quality Alliance
Community Care of Western North Carolina
North Carolina State Health Plan for Teachers and State Employees
Community Care of North Carolina
Northern Piedmont Community Care Network
Carol Woods Retirement Community
Sanford Health and Rehabilitation
Cone Health
Southern Atlantic Healthcare Alliance
Duke Raleigh Hospital
University of North Carolina Pharmacy Representative
FirstHealth Home Care
University Health Systems of Eastern Carolina
Institute for Healthcare Improvement
WakeMed Health and Hospitals
North Carolina Area Health Education Centers
Western North Carolina Health Network
North Carolina Assisted Living Association
Blue Cross Blue Shield North Carolina
North Carolina Association, Long Term Care Facilities
ActiveHealth Management



The North Carolina–Virginia Hospital Engagement Network’s Prevent Avoidable Readmissions collaborative is scheduled to kick off in June 2012. The goals of this initiative will be to decrease all payer hospital-wide 30-day readmission rates by 20% and to provide medication reconciliation for 95% of individuals discharged from the hospital. Additional hospital-specific goals will be developed on the basis of hospital assessments of readmission patterns. Collaborative strategies will include: (1) utilizing the Institute for Healthcare Improvement’s Creating an Ideal Transition Home to Reduce Avoidable Rehospitalizations model, (2) performing hospital self-assessment and analysis of 5 readmissions, and (3) identifying and connecting with relevant community based organizations. Key areas for improvement are the following: enhancing the assessment of patient posthospital needs, achieving effective teaching and enhanced patient learning, ensuring posthospital care follow-up, and providing real-time hand-over communications.

Registration for the NC-Virginia meeting is scheduled to open March 2012. Organizations seeking more information can contact Dean Higgins, project manager, at [dhiggins@ncha.org](mailto:dhiggins@ncha.org) or 919.677.4212, or Laura Maynard, director, collaborative learning, at [lmaynard@ncha.org](mailto:lmaynard@ncha.org) or 919.677.4121. NCMJ

*Contributed by Dean Higgins, project manager, North Carolina Hospital Association, and  
Laura Maynard, director, collaborative learning, North Carolina Hospital Association, Cary, North Carolina.*



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# North Carolina

2011



2011

# Child Health Report Card

WITH FINANCIAL SUPPORT FROM:

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## Access to Care and Preventive Health

Access to preventive and primary care is critical to assuring the health and well-being of our children. Insured children are less likely to use the emergency room as their primary source of care, more likely to seek preventive care (in a primary care setting), and are better equipped for academic success. Despite a continuing decline in employer-sponsored health insurance in North Carolina, overall coverage rates among children have been sustained by expansions in Medicaid and Health Choice, the State Children's Health Insurance Program. Now, as one in four children in North Carolina lives in poverty and high rates of unemployment persist, public health insurance programs play an even more important role in protecting children's access to the care they need to achieve good health and remain healthy.

New legislation extends Community Care of North Carolina (CCNC), the state's nationally-recognized system of managed care, to children enrolled in Health Choice. This expansion will create cost savings for the state and improve health outcomes for children by connecting them with a medical home and improving the quality of care. Other investments in prevention and early intervention have strengthened child health. For example, preventive actions have led to sustained reductions in lead exposure, and serious chronic illnesses such as asthma are being identified earlier and managed more successfully due to CCNC. Recent cuts to the Early Intervention Branch of the Division of Public Health will negatively impact service delivery to children in the state's nationally acclaimed early intervention system in the coming data years.

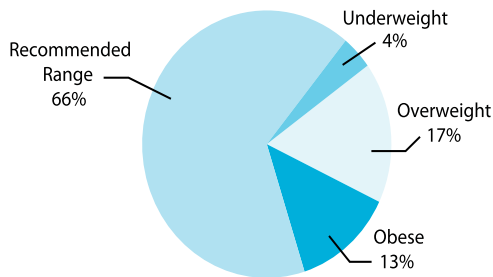
The data indicate areas that merit increased attention: North Carolina continues to lag behind the rest of the country in the initiation and duration of breastfeeding, a practice which can reduce both mortality and morbidity among infants. Although more than half of all Medicaid-enrolled children in North Carolina receive dental care, cuts to the state's oral health program and low reimbursement rates threaten children's access to treatment.

Grade	Health Indicator	Current Year	Benchmark Year	Percent Change	Trend
<b>Insurance Coverage</b>		<b>2010</b>	<b>2005</b>		
<b>B</b>	Percent of all children (ages 0-18) uninsured <sup>+</sup>	11.8%	12.4%	-4.8%	No Change
	Percent of children below 200% of poverty uninsured <sup>+</sup>	18.4%	21.1%	-12.8%	Better
	Number of children covered by public health insurance (Medicaid or Health Choice) (in December)	1,046,396	841,985	24.3%	Better
	Percent of Medicaid-enrolled children receiving preventive care <sup>+</sup>	55.9%	-	-	-
<b>Breastfeeding</b>		<b>2008</b>	<b>2003</b>		
<b>C</b>	Percent of infants ever breastfed	67.3%	71.7%	-6.1%	Worse
	Percent of infants breastfed at least six months	37.0%	32.1%	15.3%	Better
<b>Immunization Rates</b>		<b>2010</b>	<b>2005</b>		
<b>B</b>	Percent of children with appropriate immunizations:				
	Ages 19-35 months <sup>1</sup>	81.6%	81.6%	0.0%	No Change
	At school entry <sup>+</sup>	97.0%	98.0%	-1.0%	No Change
<b>Early Intervention</b>		<b>2010</b>	<b>2005</b>		
<b>A</b>	Number of children (ages 0-3) enrolled in early intervention services to reduce effects of developmental delay, emotional disturbance, and/or chronic illness <sup>+</sup>	18,271	12,436	46.9%	Better
<b>Environmental Health</b>		<b>2010</b>	<b>2005</b>		
<b>A</b>	Lead: Percent of children (ages 1-2): <sup>2</sup>				
	Screened for elevated blood levels	51.3%	40.6%	26.4%	Better
	Found to have elevated blood lead levels	0.4%	0.9%	-55.6%	Better
	Asthma:				
	Percent of children ever diagnosed	16.8%	17.8%	-5.6%	Better
	Hospital discharges per 100,000 children (ages 0-14) (2009, 2004)	175.0	180.2	-2.9%	No Change
<b>Dental Health</b>		<b>2009</b>	<b>2004</b>		
<b>C</b>	Percent of children: <sup>+</sup>				
	With untreated tooth decay (kindergarten)	17.0%	23.0%	-26.1%	Better
	With one or more sealants (grade 5)	44.0%	41.0%	7.3%	Better
	Percent of Medicaid-eligible children enrolled for at least 6 months who use dental services:				
	Ages 1-5	59.0%	42.0%	40.5%	Better
	Ages 6-14	64.0%	52.0%	23.1%	Better
	Ages 15-20	48.0%	39.0%	23.1%	Better

## Health Risk Behaviors

Although children in North Carolina are generally healthy, these data show our youth are developing habits that can lead to chronic diseases and other health problems in adulthood. Overweight and obesity, lack of physical activity, and tobacco use all contribute to adult cardiovascular disease as well as many other chronic diseases. Substance use can negatively affect school performance, lead to increased violence and injury, and cause physical and emotional health problems. Unprotected sexual activity increases the risk of unintended pregnancy and sexually transmitted diseases. These health problems are entirely preventable. If we provide youth with the information and skills they need to protect themselves, they, along with their families and the state, will benefit.

**Weight Status of North Carolina Children Ages 10-17**



Child and youth health behaviors and risk-taking are heavily influenced by the communities in which they live. State policies shape our schools, parks, neighborhoods, and other physical environments, afterschool options, access to healthy foods, supports for working families and other key factors. Communities, parents, state and local governments, foundations, and our schools can all provide strong positive influences to help youth make better decisions about their health behaviors.

Due to sustained investments in multi-faceted campaigns over the last decade, significant progress has been made in reducing youth cigarette use and teen pregnancy. A broad coalition of state agencies, foundations, and other organizations are supporting a similar multi-faceted effort to increase children's physical activity and improve nutrition. Today this progress is threatened by state budget cuts that have drastically reduced or eliminated many of the programs and services that facilitate positive changes in health behaviors.

Grade	Health Indicator	Current Year	Benchmark Year	Percent Change	Trend
	<b>Teen Pregnancy</b>	<b>2010</b>	<b>2005</b>		
<b>C</b>	Number of pregnancies per 1,000 girls (ages 15-17)	26.4	35.6	-25.8%	Better
	<b>Communicable Diseases</b>	<b>2010</b>	<b>2005</b>		
<b>A</b>	Number of newly reported cases:				
	Congenital syphilis at birth	10	13	-	-
	Perinatal HIV/AIDS at birth	0	1	-	-
	Tuberculosis (ages 0-14)	24	21	-	-
	<b>Weight-Related</b>	<b>2010</b>	<b>2005</b>		
<b>C</b>	Percent of children ages 10-17:				
	Meeting the recommended guidelines of 60 minutes or more of exercise daily	31.2%	-	-	-
	Meeting the recommended guidelines of no more than 2 hours of screen time daily <sup>3</sup>	45.8%	-	-	-
	Overweight or obese <sup>4</sup>	30.1%	32.0%	-5.9%	Better
	<b>Alcohol, Tobacco &amp; Substance Abuse</b>	<b>2009</b>	<b>2005</b>		
<b>D</b>	Percent of students (grades 9-12) who used the following in the past 30 days:				
	Cigarettes	16.7%	20.3%	-17.7%	Better
	Smokeless tobacco	8.5%	9.2%	-7.6%	Better
	Marijuana	19.8%	21.4%	-7.5%	Better
	Alcohol (beer)	35.0%	42.3%	-17.3%	Better
	Cocaine (lifetime)	5.5%	7.9%	-30.4%	Better
	Methamphetamines (lifetime)	3.4%	6.5%	-47.7%	Better
	Percent of students (grades 9-12) who have taken a prescription drug without a doctor's prescription one or more times in their life	20.5%	17.1%	19.9%	Worse

## Death and Injury

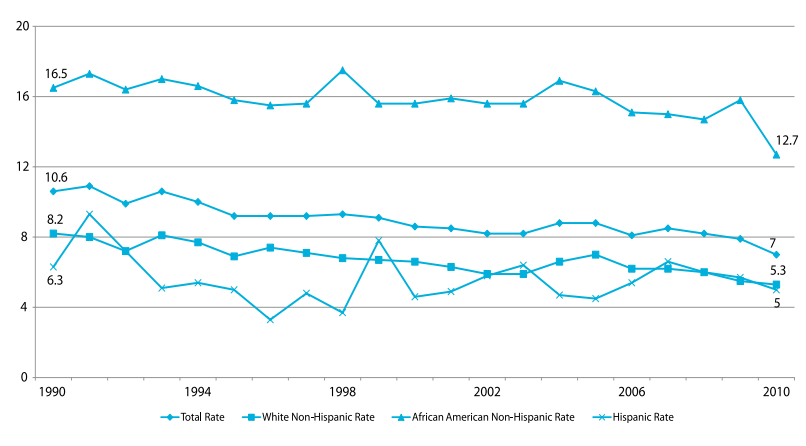
The sustained efforts over the past twenty years of the North Carolina Department of Health and Human Services, the North Carolina Child Fatality Task Force, the March of Dimes, and others to reduce infant mortality have helped North Carolina improve from having one of the highest infant mortality rates in the country in 1988, to approaching the national average in 2010. This gain reflects improvements in a number of factors such as maternal smoking, substance abuse, nutrition, access to prenatal care, medical problems, and chronic illness.

Child abuse is preventable, as are most child injuries and fatalities. Reviewing child injuries and fatalities can improve the health and safety of

children and prevent other children from being injured or dying. Our state and local communities have many of the necessary tools to change the circumstances that led to the injuries, deaths, abuse, and neglect highlighted below.

North Carolina has aggressively worked to improve motor vehicle safety through the passage of booster seat laws, seat belt laws, and the implementation of the graduated driver's licensing system. As a result of these efforts, North Carolina is a national leader in motor vehicle safety and has seen a dramatic decline in child motor vehicle fatalities. North Carolina's Multiple Response System allows the Division of Social Services to respond more quickly and effectively to child abuse and neglect allegations. The increase in the number of families receiving services, and the reduction in deaths due to child abuse, point to improved outcomes for North Carolina's children and families. The North Carolina Child Fatality Task Force continues to explore ways to prevent child deaths and make recommendations to the state to improve child safety.

**North Carolina Infant Mortality Rates by Race/Ethnicity, 1990-2010**



Grade	Health Indicator	Current Year	Benchmark Year	Percent Change	Trend
<b>Birth Outcomes</b>		<b>2010</b>	<b>2005</b>		
<b>B</b>	Number of infant deaths per 1,000 live births	7.0	8.8	-20.5%	Better
	Percent of infants born weighing less than 5 lbs., 8 ozs (2,500 grams)	9.1	9.2	-1.1%	No Change
<b>Child Fatality</b>		<b>2010</b>	<b>2005</b>		
<b>B</b>	Number of deaths (ages 0-17) per 100,000	57.5	76.9	-25.2%	Better
	Number of deaths:				
	Motor Vehicle-related	100	155	-	-
	Drowning	37	21	-	-
	Fire/Burn	6	13	-	-
	Bicycle	2	7	-	-
	Suicide	23	29	-	-
	Homicide	42	78	-	-
Firearm	39	61	-	-	
<b>Child Abuse and Neglect</b>		<b>2010</b>	<b>2005</b>		
<b>C</b>	Number of children: <sup>†</sup>				
	Receiving assessments for abuse and neglect	126,612	120,410	-	-
	Substantiated as victims of abuse or neglect <sup>‡</sup>	11,229	N/A	-	-
	Recommended services <sup>§</sup>	28,815	N/A	-	-
	Recurrence of Maltreatment	6.8%	6.9%	-1.4%	No Change
	Confirmed child deaths due to abuse	19	35	-	-

The purpose of the *North Carolina Child Health Report Card* is to heighten awareness – among policymakers, practitioners, the media, and the general public – of the health of children and youth across our state. All of the leading child health indicators are summarized in this easy-to-read document. This is the 17th annual Report Card, and we hope it will once again encourage everyone concerned about young North Carolinians to see the big picture and rededicate their efforts to improving the health and safety of children.

Statewide data are presented for the most current year available (usually 2010), with a comparison year (usually 2005) as a benchmark. The specific indicators were chosen not only because they are important, but also because data are available. As data systems expand and become more comprehensive, indicators are added to the Report Card so that over time the “picture” of child health and safety also expands.

The indicators have been grouped into three broad categories: Access to Care and Preventive Health, Health Risk Behaviors, and Death and Injury. However, it should be recognized that virtually all of the indicators are interrelated.

Because of space constraints, racial disparity is presented for only one indicator, infant mortality. Disparities data for other indicators can be found on Action for Children North Carolina’s website at [www.ncchild.org](http://www.ncchild.org).

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**“We worry about what a child will become tomorrow,  
yet we forget that he is someone today.”—Steve Tauscher**

As noted in the narratives of the three categories, the data for individual indicators provide reason for both encouragement and concern. Taken together, however, there are several important underlying messages:

- It is clear that North Carolina’s child health outcomes are not a matter of happenstance, nor are they inevitable. They mirror investments made by adults: the attentiveness of parents, the hard work and perseverance of community agencies and child advocates, and the fiscal and legislative investments made by the North Carolina General Assembly.
- While government can provide important supports, all adults have a role in affecting children’s health status and risk-taking behaviors as they shape the community and serve as role models.
- All children deserve a healthy start, and data (both in this Report Card and from many other sources) indicate that racial disparities in health outcomes remain disturbingly wide. Targeted health interventions must be made to narrow these gaps.
- While our greatest state-level fiscal investment is in the education of our children, we must recognize that this investment can be maximized only if our children are healthy and safe. Children cannot achieve their potential if they are frequently absent from school due to asthma and other chronic illnesses, are living with untreated developmental delays, are dealing with the pain of tooth decay, or do not feel safe in their homes, schools, or communities.
- The downturn in the economy means that more children than ever before are living in families under significant financial and social stress. This same downturn has led to state budget reductions in health, education and other services for children and families, creating the paradox of increasing needs and decreasing resources. It should be noted that health indicators frequently lag behind changes in the economic and support system. Thus, North Carolinians should brace for declines in the indicators of child health in *Report Cards* over the next few years.

Our leaders face the continuing challenge of improving the economy while protecting the most vulnerable portions of our population, especially our children. In virtually all surveys of “business friendliness,” North Carolina ranks among the top five states. However, on virtually all measures of child well-being, North Carolina ranks between 35th and 45th in the nation. The two—business climate and child well-being—are not independent. The future prosperity of our state depends on the health and well-being of our next generation. The challenge for all North Carolinians is to make our state the best place to raise a child, just as it is a great state to conduct business. Our children, and our future, deserve no less.

## Data Sources 2011 Child Health Report Card

### Access to Care and Preventive Health

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### Health Risk Behaviors

*Teen Pregnancy:* State Center for Health Statistics, North Carolina Department of Health and Human Services. North Carolina Reported Pregnancies. Available online at: <http://www.schs.state.nc.us/SCHS/data/vitalstats.cfm>. *Communicable Diseases:* Special data request to the HIV/STD Section, Division of Public Health, North Carolina Department of Health and Human Services, September 2011 and Special data request to the Division of Public Health/Epidemiology, NC DHHS, September 2011; *Weight Related:* State Center for Health Statistics, North Carolina Department of Health and Human Services. Child Health Assessment and Monitoring Program. Special data request in October 2011. Overweight and Obese available online at: <http://www.schs.state.nc.us/SCHS/champ/>; *Tobacco Use:* Tobacco Prevention Branch, Division of Public Health, North Carolina Department of Health and Human Services. North Carolina Youth Tobacco Survey. Available online at: <http://www.tobaccopreventionandcontrol.ncdhhs.gov/data/index.htm>; *Physical Activity, Alcohol and Substance Abuse:* North Carolina Department of Public Instruction. Youth Risk Behavior Survey, North Carolina High School Survey detailed tables. Available online at: <http://www.nchealthyschools.org/data/yrebs/>.

### Death and Injury

*Infant Mortality and Low Birth-Weight Infants:* State Center for Health Statistics, North Carolina Department of Health and Human Services. Infant Mortality Statistics, Tables 1 and 10. Available online at: <http://www.schs.state.nc.us/SCHS/data/vitalstats.cfm>; *Child Fatality and Deaths Due to Injury:* State Center for Health Statistics, North Carolina Department of Health and Human Services. Child Deaths in North Carolina. Available online at: <http://www.schs.state.nc.us/SCHS/data/vitalstats.cfm>. *Child Abuse and Neglect and Recurrence of Maltreatment:* Duncan, D.F., Kum, H.C., Flair, K.A., Stewart, C.J., and Weigensberg, E.C. (2010). NC Child Welfare Program. Retrieved October 26, 2010, from University of North Carolina at Chapel Hill Jordan Institute for Families website. URL: <http://ssw.unc.edu/cw/>; *Firearm Deaths and Child Abuse Homicide:* information was obtained from the North Carolina Child Fatality Prevention Team (Office of the Chief Medical Examiner) for this report. However, the analysis, conclusions, opinions and statements expressed by the author and the agency that funded this report are not necessarily those of the CFPT or OCME.

### Data Notes 2011 Child Health Report Card

1. Immunization is measured for children 19-35 months of age using the 4:3:1:3:3:1 measure. For 2010, the 4:3:1:3:3:1-S measure is used because it takes into account the Hib vaccine shortage, the required suspension of the booster dose, and the difference between types of Hib vaccines used by the states. More information is available online at: <http://www.cdc.gov/vaccines/stats-surv/imz-coverage.htm#nis>.
2. Elevated blood lead level is defined as 10 micrograms per deciliter or greater.
3. Screen time includes TV, videos, or DVDs OR playing video games, computer games or using the Internet.
4. Overweight is defined as a body mass index equal to or greater than the 85th percentile using federal guidelines; obese is defined as equal to or greater than the 95th percentile.
5. The number substantiated and recommended services findings are not exclusive, i.e., a child may be counted more than once within those categories and may be counted in both of those categories. This is the case because a child may have more than one report investigated in a state fiscal year. The number substantiated includes those substantiated of abuse, neglect, or abuse and neglect.

\* Data for indicators followed by a \* sign are fiscal or school year data ending in the year given. For example, immunization rates at school entry labeled 2010 are for the 2009-2010 school year.

### Grades and Trends

Grades are assigned by a group of health experts to bring attention to the current status of each indicator of child health and safety. Grades reflect the state of children in North Carolina and are not meant to judge the state agency or agencies providing the data or the service. Agencies like those responsible for child protection and dental health have made a great deal of progress in recent years that are not reflected in these grades. The grades reflect how well our children are doing, not agency performance. Grades are a subjective measure of how well children in North Carolina are faring in a particular area.

Data trends are described as "Better," "Worse," or "No Change." Indicators with trends described as "Better" or "Worse" experienced a change of more than 5% during the period. A percentage change of 5% or less is described as "No Change." Percent change and trends have not been given for population count data involving small numbers of cases. Due to data limitations, only the indicators for alcohol and drug use have been tested for statistical significance. Grades and trends are based on North Carolina's performance year-to-year and what level of child health and safety North Carolina should aspire to, regardless of how we compare nationally.

Laila A. Bell from Action for Children North Carolina and Berkeley Yorkery from the North Carolina Institute of Medicine led the development of this publication, with valuable input from the panel of health experts and from many staff members of the North Carolina Department of Health and Human Services.

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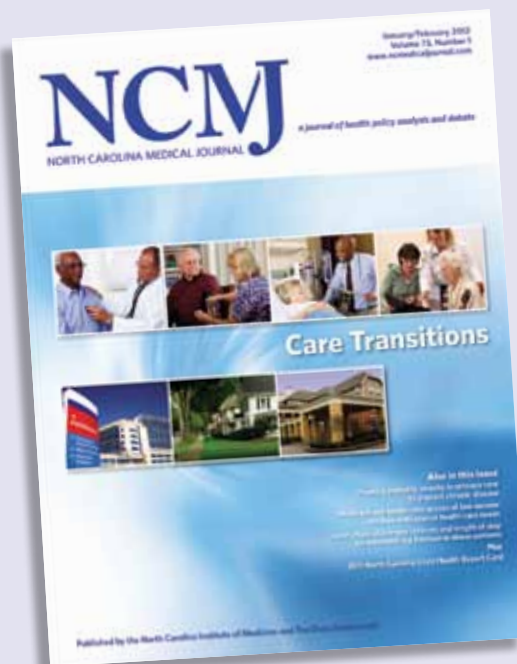
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