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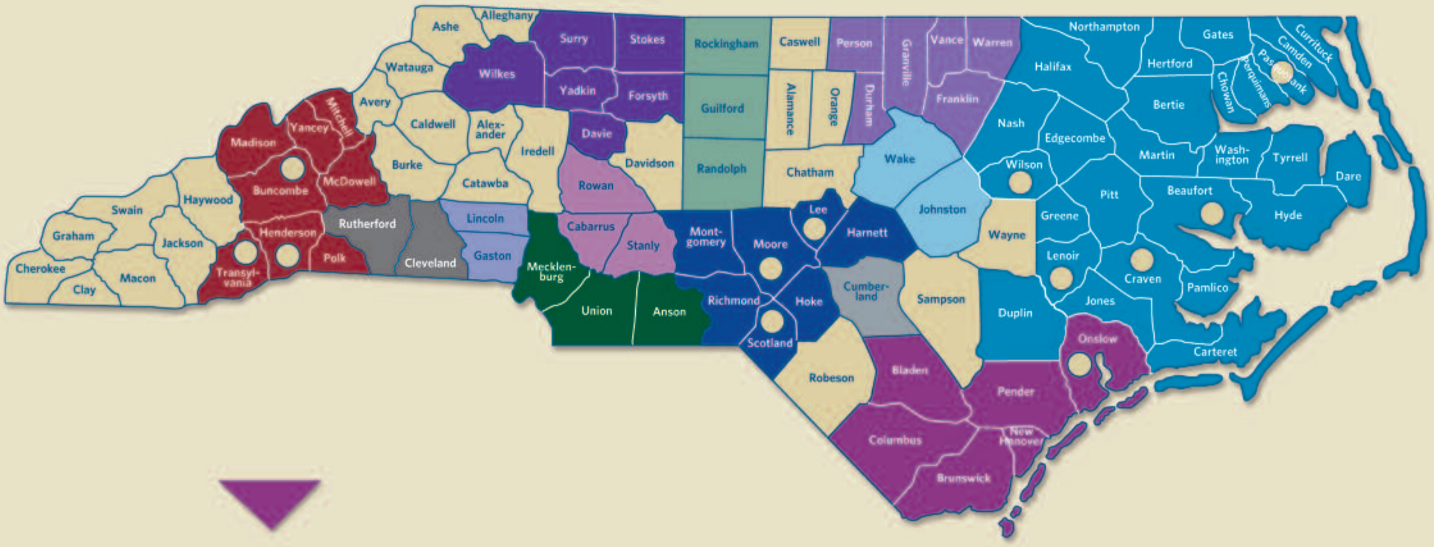
a journal of health policy analysis and debate



Community Care of North Carolina:
Building Medical Homes

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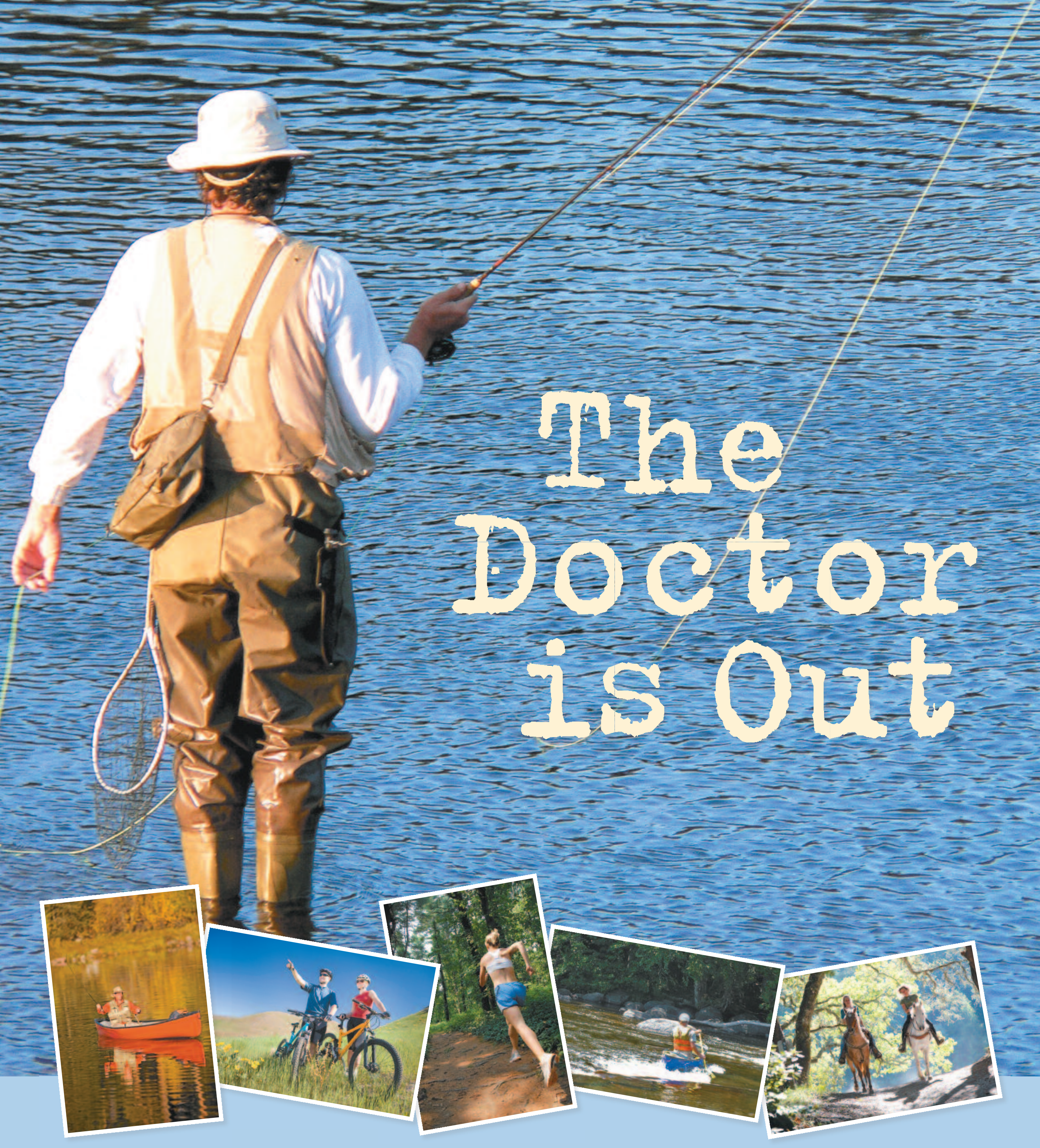
The Doctor is Out

Publishers of the *North Carolina Medical Journal*

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Tarheel Footprints in Health Care

Recognizing unusual and often unsung contributions of individual citizens who have made health care for North Carolinians more accessible and of higher quality

Anita Harrison, RN
CCNC Case Manager

The mom was clearly scared. Still a child herself, she was an unmarried teenager with a three-month-old son who had been born at 32 weeks gestation. After a fairly uneventful stay in the neonatal intensive care unit, he had been discharged from the hospital three weeks earlier. It was January, and he was coughing and wheezing. As recommended, he had been given palivizumab, an injection that provided antibodies against the dreaded respiratory syncytial virus (RSV), the cause of viral bronchiolitis. He was still feeding okay and although breathing rapidly, his oxygen saturation was good on room air. He didn't need to be admitted to the hospital, but he did need close follow-up. How would I give this mom the support she needed and assure follow-up the next day? I called Anita Harrison, a case manager with the Community Care Plan of Eastern Carolina. Anita would make a home visit, assess the baby, comfort the mom, and be sure there would be transportation back to our office the next afternoon. Without Anita's help, I would have admitted the child to the hospital so we could watch for signs of worsening.

Anita Harrison left the familiar and friendly walls of the Children's Hospital of Eastern Carolina to visit her patients at home. After 18 years as a staff and charge nurse on Pediatrics 2 West at Pitt Memorial Hospital, Anita joined the case managers of the Community Care Plan of Eastern Carolina (CCPEC). Her new job would take her into the homes of children covered by North Carolina Medicaid and would bring insight to why some children kept returning to the emergency department or hospital ward.

Anita saw firsthand the daily challenges that many low income families face in providing basic food and shelter for their children. Illness, especially chronic illness, can be the destabilizing factor that leads to family dysfunctions such as child abuse, divorce, and domestic violence.

Anita tells the story of one little girl (we'll call her Tiffany) who received a heart transplant at Duke before the age of one. When faced with the demands of feeding Tiffany by gastric tube and making follow-up visits to Duke, her mom became overwhelmed. She frequently visited our local ED despite having a primary care doctor at ECU Pediatrics. With Anita's help and support, her mother was able to get Tiffany to routine well-child visits for her baby. The frequent ED visits diminished as the mother's confidence grew.

Sometimes the mere uncertainty of a chronic medical problem leads to inappropriate use of the health care system. Anita recalls a mom who repeatedly took her mildly autistic child with asthma to the local ED for minor asthma-related illnesses. With education and support from Anita, the mom learned to control her child's asthma. The ED visits stopped, and the mother became compliant with routine well-child visits.

Many health care insurers provide a form of case management by telephone. According to Anita, this is not always the best way to ensure quality of care. "Disease management or case management by phone does not provide what our families need to overcome their challenges," she says. "You

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need to look at the whole person, their family, and where they live." An example of this was during one of Anita's home visits to a recently discharged asthmatic patient. While visiting the patient, Anita noticed the mother had a questionable arm fracture. After talking with the mother, Anita discovered that the fracture was the result of a domestic violence incident. She quickly examined the child and then assisted the mom to the emergency department.

National health care policymakers are becoming increasingly interested in case management and care coordination as a means to improve care and lower costs for chronically ill and economically disadvantaged children. When the North Carolina Division of Medical Assistance provided case managers the opportunity to work with primary care offices to assure continuity of care for these populations and improve compliance with the physician's care plan, according to Anita, "They got it right."

Anita grew up in the Vanceboro area and attended West Craven High School. Asked why she chose nursing as a career she responded, "I liked science but I wanted to be in contact with people that I might help." Following two years at Mount Olive College, Anita entered the undergraduate Bachelor of Nursing Science program at East Carolina University. Fortunately for the families and children of eastern North Carolina, she chose pediatrics as her field.

Although she is somewhat shy about public recognition, Anita Harrison is truly worthy of this recognition. The good news about case managers is that Community Care Plan of Eastern Carolina has 33 other case managers with similar stories to tell. This article could have just as easily been written about any one of them.

Contributed by Charles Willson, MD,
clinical professor of pediatrics at the Brody School of Medicine at East Carolina University.

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PEER-REVIEWED ARTICLES

POLICY FORUM
Community Care of North Carolina

COMMENTARIES

DEPARTMENTS

Also in this issue:

PEER-REVIEWED ARTICLE

Emergency Planning for Sudden Cardiac Events in North Carolina High Schools

Anna Monroe, MD; Daryl A. Rosenbaum, MD; Stephen Davis, MA

Abstract

Background: *This study evaluates the state of emergency planning for sudden cardiac arrest (SCA) in North Carolina high schools, primarily focusing on the existence and characteristics of written plans and the presence of automated external defibrillators (AEDs).*

Methods: *All athletic directors listed in the 2007-2008 North Carolina High School Athletic Association Directory were surveyed via an online survey to determine their level of planning and preparation for SCA.*

Results: *Completed surveys were received from 36.7% (138/376) of the schools. Emergency action plans (EAPs) existed in 55.8% (n = 77) of high schools and were significantly less likely to be present in Divisions 1 and 2 ($p < 0.01$) than in Divisions 3 and 4 which have higher enrollment. EAPs included aims to initiate CPR within one minute (80.5%), and targets to defibrillate within three-five minutes (66.2%) as recommended by recent guidelines from the National Athletic Trainers Association. AEDs were present in 72.5% (n = 100) of the responding schools, and the presence of an AED was related to the presence of an EAP ($p < 0.01$). Schools in Division 1 were less likely to possess an AED ($p < 0.01$) than schools in the larger divisions. Of schools without AEDs, 39.5% (n = 15) reported children or adults attending or working at the school who were at risk for heart disease. Lack of funding was the most commonly reported barrier to obtaining an AED.*

Limitations: *A low response rate and self-reported data may have biased results in favor of those who adopted plans or purchased an AED.*

Conclusions: *The majority of responding schools possessed both an EAP and an AED and reported that they met several current recommended guidelines for emergency preparedness for SCA. These results for North Carolina high schools are similar to reports from other states. Significant room for improvement exists, however, as the number of schools without an EAP or AED is still relatively large and some important components of emergency planning are lacking in the EAPs.*

Keywords: *sudden cardiac arrest; pre-hospital emergency care; automated external defibrillators; adolescents; sports.*

Sudden cardiac arrest (SCA) in high school athletics occurs at a rate of about one per 200,000 participants[1-3] although the exact incidence remains unknown and possibly underestimated due to the absence of a standardized and mandatory reporting system. A recent report from the National Center for Catastrophic Sports Injury Research (NCCSIR) mentions eight football fatalities from the 2006 season attributed primarily to cardiac causes.[4] While the data suggest the relative rarity of SCA in high school and college athletics, the death of a young and apparently healthy athlete can have a profound emotional impact on a community. Even with appropriate pre-participation screening SCA often cannot be prevented.[5] One study of sudden cardiac deaths among athletes notes that in only 3% of the athletes were there any potentially identifiable signs or symptoms of heart disease present at the pre-participation exam.[5]

In the United States, 500,000 people die each year from SCA.[6] The majority of usages of automated external defibrillators (AEDs) at high schools and colleges are actually for non-athletes such as athletic department staff, officials, teachers, event staff, or spectators, suggesting that these devices are important to overall public health as well.[7-9] SCA is fatal in individuals who do not receive immediate cardiopulmonary resuscitation (CPR) followed by defibrillation.[10] For each minute until defibrillation, survival rates decrease by between 7% and 10%; however, when CPR is started immediately survival

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rates decrease by 3% to 4% per minute.[2,11] Because recovery from SCA is a time-dependent phenomenon where even minutes can affect survival, it is unique from other traumatic sports-related injuries. Rapid and therefore effective response to a cardiac arrest requires planning and practice.[2,10]

A recent consensus statement produced by an interassociation task force convened by the National Athletic Trainers' Association (NATA) listed recommendations for essential elements of emergency planning for SCA which included the following elements: ensuring an efficient system for communicating within a school and with a local emergency medical services system (EMS); providing access to an automated external defibrillator and other necessary equipment to be utilized by trained responders; and practicing and perfecting a written action plan.[2] The NATA guidelines which build upon other previously published guidelines such as the Medical Emergency Response Plan Initiative from the American Heart Association (AHA) and the Guidelines for Emergency Medical Care in School from the American Academy of Pediatrics (AAP),[10,12] attempt to establish a standardized approach that all high schools and colleges should implement when preparing for cardiac emergencies.[2]

A study published in 2007 surveyed a random sample of middle and high school athletic directors across the United States in order to assess overall emergency preparedness as defined by a synthesis of recommendations from the recent NATA document, the AHA, and the AAP.[13] This study concluded that while a majority of responding schools (70%) possessed written emergency plans (WEP), emergency preparedness could be improved by attention to practicing the plans, improving communication with EMS, and increasing the numbers of AEDs in schools.[13] Previous studies have concluded that AED programs in high schools save lives and can be cost-effective.[7,14] Other studies have examined the numbers of devices that exist in schools in two other states without attention to their incorporation into a comprehensive emergency plan.[15,16] The NATA guidelines have set specific goals for emergency preparedness for SCA in athletic settings. The following study compares the SCA preparedness of high school athletic programs across the state of North Carolina with the recommendations published by NATA in order to identify potential areas for improvement.

Methods

A letter with a link to an electronic survey developed by the study authors using the online software Survey Monkey (http://www.surveymonkey.com) was emailed to all athletic directors in the state (n = 376) in 2007. Contact information was obtained from the North Carolina High School Athletic Association 2007-2008 Directory. Non-responders were emailed weekly over the course of the one-month study period during October 2007. The study was approved by the Wake Forest University School of Medicine Institutional Review Board and was funded by the Department of Family and Community Medicine at the Wake Forest University School of Medicine.

The 2007 NATA guidelines served as a theoretical gold standard with survey questions designed to assess both crucial and easily measured aspects of emergency planning: a documented, visible, and practiced plan that incorporates an AED (or meets guidelines for not needing one); time-based resuscitation goals; first responders training; and an efficient communication system across campus and with EMS. According to the AHA, the determinants for schools in need of AED programs are as follows: "reasonable probability" of AED use; children or adults at the school at risk for SCA; and inability to achieve an EMS call-to-shock interval of less than five minutes.[2] Time-based resuscitation goals consist of CPR initiation within one minute and defibrillation within three to five minutes of arrest. First responders consist of those people such as police and fire personnel or others who have basic CPR certification and provide assistance in the event of a medical emergency.

The data were analyzed with SPSS version 16.0. Simple descriptive statistics were used to determine the following: the proportion of responding schools reporting EAPs and the frequency that these plans met the NATA recommendations; the proportion of responding schools with AEDs and the frequency that the recommended device access, training, and maintenance guidelines were met; the presence of at-risk populations at schools without AEDs; and the frequency of reported barriers to obtaining an AED. Pearson chi-square testing was used to compare proportion of responders to non-responders by division and region to determine if possessing an AED was associated with the presence of an EAP. Logistic regression was used to determine if there was a trend for schools in smaller divisions to be less likely to report having an EAP or an AED than schools in larger divisions. Significance was set at the level $\alpha = 0.05$.

Results

Responses were obtained from 156 of 376 schools (41.5%). However, 18 surveys were rejected because they were incomplete leaving 138 (36.7%) in the final analysis. Responders and non-responders were similar with respect to athletic division (the level of athletic competition based on size of programs) ($p = 0.558$) and geographic location ($p = 0.627$).

Features of Emergency Action Plans

The majority of schools (55.8%) reported having written emergency action plans. EAPs were less likely to be present in schools from Division 1A ($p < 0.01$) and 2A ($p < 0.01$) than in

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[a] North Carolina is divided into eight geographic regions by the North Carolina Athletic Association. The regions are numbered and run east to west across the state, starting with Region 1 in the far east of the state, and ending with Region 8 in the west.

the larger schools from Divisions 3 and 4 (see Table 1). With the exception of one region (EAP present in only three of 30 schools in Region 1), EAP plans showed little variability across regions (range 51.9% to 68.8%).[a] Further details about the EAPs are presented in Table 2.

AEDs as Part of Emergency Planning

Most (72.5%) schools that responded to the survey reported having an AED. The presence of an AED was related to the presence of an EAP ($p < 0.01$). Schools in Division 1 were less likely to report possessing an AED ($p < 0.01$) than

Table 1.
Association Between School Division: Emergency Action Plans and Automated External Defibrillators

Division (number enrolled)	Schools with Emergency Action Plans (N = 77)		Schools with Automated External Defibrillators (N = 100)	
	n (% of respondents)[a]	Odds ratio (95% confidence interval)	n (% of respondents)[a]	Odds ratio (95% confidence interval)
1A (28-729)	9 (28.1)	0.112 (0.037, 0.336)	16 (50.0)	0.161 (0.050, 0.520)
2A (732-1,041)	14 (46.7)	0.250 (0.086, 0.724)	22 (73.3)	0.444 (0.128, 1.539)
3A (1,056-1,392)	26 (65.0)	0.531 (0.191, 1.471)	31 (77.5)	0.556 (0.167, 1.847)
4A (1,394-2,977)	28 (77.8)	reference	31 (86.1)	reference

a The percent of respondents was derived from the number of respondents in each division. The numbers of respondents are as follows: Division 1A = 32; Division 2A = 30; Division 3A = 40; and Division 4A = 36.

Table 2.
Features of Emergency Action Plans; N=77

	Yes n (%)	No n (%)	Unsure n (%)			
CPR < 1 minute	62 (80.5)	6 (7.8)	9 (11.7)			
AED Shock 3-5 minutes	51 (66.2)	13 (16.9)	13 (16.9)			
Plan visible everywhere	10 (13.0)	60 (77.9)	7 (9.1)			
EMS has plan	17 (22.1)	38 (49.4)	22 (28.6)			
Plan practiced	> Once/Year n (%)	< Once/Year n (%)	Never n (%)	Unsure n (%)		
	14 (18.2)	18 (23.4)	31 (40.3)	14 (18.2)		
Medical oversight[a]	Trainer n (%)	First responder n (%)	EMS n (%)	Nurse n (%)	Team MD n (%)	Other n (%)
	62 (80.5)	29 (37.7)	16 (20.8)	14 (18.2)	9 (11.7)	6 (7.8)
Communication with EMS[a,b]	Cell phone n (%)	Walkie-talkie n (%)	Intercoms n (%)	Other n (%)	Alarm n (%)	Unsure n (%)
	122 (88.4)	90 (65.2)	55 (40.0)	10 (7.2)	5 (3.6)	2 (1.4)

a Respondents could select more than one.

b Respondents were asked to answer regardless of presence of EAP; therefore the denominator was 138 (total amount of people who responded to the survey).

schools in the three larger divisions (see Table 1). Features of AED programs are summarized in Table 3.

Characteristics of Schools Without AEDs

With respect to the AHA criteria for not needing an AED on site at a school, 89.5% of schools without AEDs were certain that no cardiac arrest had occurred on-site within five years, 7.9% reported having no one at risk for SCA, and 34.2% could achieve a call-to-shock interval of less than five minutes. The most commonly reported barrier to obtaining an AED was lack of funds (76.3%). See Table 4 for a complete summary of the responses from schools without AEDs.

Discussion

The majority of North Carolina high schools responding to the survey possessed emergency action plans, but the plans need polishing to improve compliance with published recommendations from the NATA. Appropriate time goals for resuscitation, the major determinant of survival after SCA, were targeted in the majority of plans. Other key measures, however, were lacking in the following areas: practicing the plans, displaying them visibly in all locations, and coordinating with EMS about the presence and details of emergency preparations. Plans were found more often in schools with AEDs, an encouraging result which suggests that schools with devices have incorporated them into a broader emergency plan. Higher divisions (and thus larger schools) were more likely to possess a plan, which indicates that smaller schools could be targeted for education and funding to improve emergency preparedness. As EMS was typically not informed of the presence of EAPs, schools should seek to include EMS in their planning.

The data for AEDs yielded encouraging results as the devices were found in the majority of schools and were reported to be accessible. There seemed to be good coordination with EMS with respect to knowledge of the presence of a defibrillator, and it is possible that in the event of a collapse, EMS personnel could direct school responders in the location and use of the AED. As the majority of schools listed less than 10 people trained in the use of an AED, schools that possess the device should consider training a larger number of people to use the defibrillators.

After surveying a random sample of NATA members from across the country, a 2007 study found that 70% of schools possessed written emergency action plans, a proportion higher than the 55.8% reported in this study.[13] However, a similar percentage of schools represented in both studies never practiced their plans (36% and 40% in the national study and present study respectively) and did not coordinate with EMS (51% and 49% in the national study and present study respectively).[13] The national survey study also reached the conclusion that increasing the number of AEDs in schools was indicated as only 61% of schools reported having the devices.[13] Although 72.5% of high schools in North Carolina possess AEDs, the large number of non-responders and the fact that there are at-risk adults and children at schools without AEDs imply that more devices may also be needed in North Carolina high schools. Data for written emergency plans as well as the number of AEDs in high schools exist for one other state (Tennessee), and data for either the number of written plans or the number of AEDs exist for several other states (Tennessee, Washington, Wisconsin, and Iowa).[13,15-18] Table 5 compares these results with the findings for North Carolina.

It is difficult to determine if schools without AEDs did not require an AED based on AHA guidelines, but most schools probably need a defibrillator based on previous research about response times and the fact that risk for SCA is hard to determine.[2,9,19] A meta-analysis of data for EMS systems and response to cardiac arrest showed that overall mean time from dispatch to defibrillation was 6.1 minutes.[19] The majority of responding schools did not know if EMS could arrive and defibrillate within five minutes. No school reported a cardiac arrest at the school within the last five years, but a substantial number (39.5%) felt there were people at the school at risk for SCA. The most commonly reported barrier to obtaining an AED in our study was cost, which is consistent with previous studies.[2,7,8,18] Schools in higher divisions (larger schools) with presumably greater resources reported possession of AEDs more frequently than schools in smaller divisions. If the estimated cost is $1,500 per AED,[2] can North Carolina schools and communities be convinced to make this investment?

Two studies analyzed comprehensive programs for establishing AED use in high schools.[7,14] In Boston, 35 AEDs were donated to schools who agreed to develop a plan for the use of the AED in accordance with American Heart Association protocols, train necessary people, and buy additional AEDs after assessing the needs of that particular school.[7] The majority of schools purchased more AEDs, and the program served as an impetus for AED training in the schools the community. AEDs were used in two cases, and both victims survived. A similar program, project ADAM, provides AEDs, education, and training for high schools in Milwaukee, Wisconsin.[14] In a study of this program, authors concluded that project ADAM was cost-effective.

Limitations

The primary limitation of this study is that only 36.7% of the high school athletic programs in North Carolina are represented. However, the total number of 138 usable responses from this study still provides substantial insight into the state of emergency preparedness of schools across the state. Representation of schools by division and geographic region was similar to the overall population.

Furthermore, although the survey was short and easily answered, those who took the time to respond likely already know the importance of emergency planning, leading to a possible selection bias. However there were no significant differences between the responders and non-responders by division or region, making a large selection bias less likely. The study also relies on honest subjective estimates for many

Table 3.
Characteristics of Plans for Use of Automated External Defibrillation (AED) N=100

	Yes n (%)	No n (%)	Unsure n (%)						
AED within 1-5 minutes walking	54 (54)	38 (38)	8 (8)						
EMS aware of AED	63 (63)	4 (4)	33 (33)						
AED used	1 (1)	99 (99)	n/a						
AED maintained	> Once per year n (%)	< Once per year n (%)	Never n (%)	Unsure n (%)					
	19 (19)	3 (3)	36 (36)	42 (42)					
Number of AEDs available	1 n (%)	2-5 n (%)	6-10 n (%)	> 11 n (%)	Unsure n (%)				
	49 (49)	50 (50)	0	0	1 (1)				
Trained to use AED	1-10 n (%)	11-20 n (%)	21-50 n (%)	> 51 n (%)	Unsure n (%)				
	64 (64)	15 (15)	12 (12)	1 (1)	8 (8)				
Who is trained[a]	Athletic trainer n (%)	School nurse n (%)	First responder n (%)	Athletic director n (%)	Coach n (%)	Teacher n (%)	Principal n (%)	Other n (%)	Unsure n (%)
	78 (78)	69 (69)	64 (64)	60 (60)	58 (58)	25 (25)	19 (19)	8 (8)	4 (4)

a Respondents could select more than one.

Table 4.
Characteristics of Schools Without AEDs (N=38)

	Yes n (%)	No n (%)	Unsure n (%)			
Cardiac arrest within past 5 years	0	34 (89.5)	4 (10.5)			
Adults working at or children attending who are at risk for sudden cardiac arrest (SCA)	15 (39.5)	3 (7.9)	20 (52.6)			
EMS can achieve call-to-shock interval < 5 minutes	13 (34.2)	9 (23.7)	16 (42.1)			
Barriers to obtaining AED[a]	I feel it is unnecessary n (%)	Lack of funds n (%)	Lack of ability to train people n (%)	Lack of familiarity with SCA n (%)	No barriers n (%)	Other n (%)
	0	29 (76.3)	4 (10.5)	4 (10.5)	4 (10.5)	7 (18.4)

a Respondents could select more than one.

Table 5.
Comparison Between Selected States and the Nation for the Presence of EAPs and AEDs in High Schools[13,15-18]

	Percentage of high schools with an EAP	Percentage of high schools with an AED
Nation	70	61
North Carolina	56	73
Tennessee	76	47
Washington	n/a[a]	54
Iowa	n/a	25
Wisconsin	73[b]	n/a

a "n/a" refers to the fact that this particular study did not address that data.
b This study dealt only with the presence of EAPs for football; it did not address whether other sports had adequate emergency planning.

values such as EMS response times and walking distance to the AEDs that were not otherwise verified.

Conclusion

When a family, an athletic team, and a school find themselves faced with an SCA event the results can be devastating. Having a planned approach based on current understanding of resuscitation physiology can help improve outcomes.[2] This study found that nearly three-quarters of the North Carolina high schools that responded possess AEDs, and this compares favorably with other states. Still, schools should consider increasing the number of people trained to use the devices. Fewer schools have a written an emergency plan, and only about two-thirds of these plans aim to achieve the recommended call-to-shock interval of less than five minutes, suggesting specific areas for improvement. Also, those schools with plans should consider practicing the plans more frequently and improving coordination with EMS. As smaller schools are deficient in both planning and possession of AEDs, efforts to improve emergency planning could be targeted towards these schools. **NCMJ**

Addendum:

Much has transpired since the data was collected for this study in October of 2007.

Through the AED Placement Project, initiated and funded by the North Carolina High School Athletic Association, over 100 high schools in need have received devices after completing required staff training and developing an appropriate cardiac emergency action plan.

During the fall of 2008, three high school students died as a result of athletic participation. The announced cause of death for one of the athletes was second impact syndrome head injury. One of the first responses by the North Carolina High School Athletic Association (NCHSAA) to these unfortunate tragedies was to mandate that by January 1, 2009 all member schools create a written Emergency Action Plan.

The NCHSAA also formed a safety task force in November of 2008. This group developed specific guidelines to help schools create an optimal EAP and also made several recommendations including: 1) mandate use of a single pre-participation examination form endorsed by leading sports medicine organizations; 2) standardized baseline and post-injury concussion assessment and return to play guidelines; 3) mandatory annual athletic safety education for all athletics personnel and participants similar to the annual eligibility rules review; and 4) ideally, all schools should hire a certified athletic trainer to lead the sports medicine team and coordinate health care of athletes.

Two additional high school athletes have died in 2009. The announced cause of death for one of the athletes was myocarditis.

— Daryl A. Rosenbaum, MD

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PEER-REVIEWED ARTICLE

Declining Tobacco Use Among North Carolina Middle and High School Students:
1999-2007

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Abstract

Background: *In 1999, North Carolina first conducted the Youth Tobacco Survey (YTS) among middle and high school students and found current smoking rates higher than the national average. In 2003, school and community grants across the state were funded to prevent and reduce youth tobacco use.*

Methods: *The North Carolina YTS has been conducted every other year since 1999 with high response rates by schools and students. The YTS is a written survey administered during the school day. It is voluntary and anonymous.*

Results: *In 2007, middle and high school student tobacco use rates reached their lowest point in the last decade. Nineteen percent of high school students reported current cigarette smoking, while 4.5% of middle school students said that they currently smoke. Almost every type of tobacco product use (cigarette, cigar, pipe, and bidi) has decreased since the 1999 YTS, with increasing rates of decline in cigarette use from 2003-2007 compared to 1999-2003.*

Limitations: *This is a cross-sectional survey conducted every other year where students self-report use, attitudes, and perceptions.*

Conclusions: *North Carolina's youth tobacco use rates have declined more steeply since 2003 when the tobacco initiatives started by the North Carolina Health and Wellness Trust Fund (HWTF) began to mobilize communities statewide. Continuing to fund and expand evidence-based tobacco prevention strategies is likely necessary in order to sustain steady declines in youth smoking rates.*

Keywords: *adolescent; tobacco; cross-sectional study; prevalence.*

Each day in the United States, approximately 6,600 youths ages 12-17 try their first cigarette.[1] An estimated one-third of these young smokers are expected to die from a smoking-related disease if they continue to smoke into adulthood.[2] Recent data suggest that youth nicotine addiction occurs more rapidly than previously thought, even with very limited use.[3]

In order to better understand the scope of the problem and to help evaluate youth tobacco control programs, North Carolina has collected extensive data among middle and high school students since 1999[4] using the Youth Tobacco Survey (YTS) in coordination with the Centers for Disease Control and Prevention (CDC). The North Carolina YTS, conducted by the North Carolina Tobacco Prevention and Control Branch and the North Carolina Department of Public Instruction, provides estimates of usage among middle and high school students for various tobacco products (i.e., cigarettes, cigars, smokeless or spit tobacco, pipes, and bidis—leaf wrapped, flavored cigarettes from Asia) as well as information about tobacco-related beliefs, attitudes, media awareness, and exposure to secondhand smoke. This article summarizes tobacco use prevalence estimates from the 2007 North Carolina YTS and describes changes in prevalence from 1999 to 2007.

Methods

The sampling frame for the YTS consists of all North Carolina public and charter schools that include at least one grade between 6th and 12th for the survey year. The YTS is

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coordinated with the North Carolina Youth Risk Behavior Survey (YRBS) in order to minimize the burden placed on any given school, so that a school could be selected to participate in either survey but not both.

Since 1999, survey statisticians have used sampling methods to capture a representative sample of middle and high school students across the state. Every other year, in the first stage of the survey, Local Education Areas (school districts) are selected within three geographic regions of the state (west, central, and east). A school's probability for selection is proportional to its enrollment size. In the second stage, researchers choose second-period classes in each school based on a systematic equal probability sampling scheme. An average of two second-period classes are sampled from each school per YTS cycle. All students in the sampled classes are eligible to participate in the survey except those who are routinely exempt from written tests because of language or learning barriers. Nonparticipation was primarily due to absenteeism.

In 1999, statisticians selected a total of 87 primary sampling units (PSUs) in the first stage of sampling based on Local Education Areas in the three distinct geographic regions and then selected 272 schools from these PSUs in the second stage of sampling. Of these 272 eligible schools, 266 (97.8%) participated in the 1999 YTS. Classes were then randomly selected proportional to overall school enrollment for each school. Participation was voluntary and anonymous, and researchers followed district and school parental permission procedures. Students recorded their responses on computer-scannable sheets which were then returned to the state for processing. A similar process occurred for each year the survey was administered.

In 1999, among the students attending the 266 participating schools, 12,576 students (6,016 middle and 6,560 high school) completed the survey, resulting in an overall response rate of 87.1%. Analysts at RTI International and the CDC processed survey data and calculated summary statistics at 95% confidence intervals using SAS-callable SUDAAN to adjust for the sampling design. Analysts weighted the data to be representative of students statewide and by region. In each corresponding year a similar pattern emerged (see Table 1).

Table 1.
YTS Schools Sampled and Response Rates by Year: YTS 1999, 2001, 2003, 2005, and 2007

	1999	2001	2003	2005	2007
Number of schools sampled (MS & HS)	272	208	216	180	197
Number of schools participating	266	177	200	178	191
School response rate	97.8%	85.1%	92.6	98.9%	97.0%
Number of students sampled	14,112	13,000	7,589	7,930	8,922
Number of students participating	12,576	10,950	6,334	6,405	7,431
Student response rate	89.1%	84.2%	83.5%	80.8%	83.3%
Overall response rate	87.1%	71.7%	77.3%	79.9%	80.8%

Results

Current Prevalence

In 2007, 9.1% of middle school students reported current use of any tobacco product (see Table 2). Current use of a specific tobacco product was defined as having used that product one or more times during the 30 days preceding the survey. Cigarettes (4.5%) were the most commonly used tobacco product, with no statistically significant difference in usage by sex. Cigars (3.9%) were the second most commonly used tobacco product, followed by smokeless tobacco (2.3%), bidis[a] (2.8%), and pipes (2.2%). African American middle school students (11.7%) were slightly more likely than whites (7.2%) to use any tobacco. No other statistically significant differences were found for any type of tobacco use by race/ethnicity among middle school students.

Among high school students, 26.6% reported current use of any tobacco product (see Table 3). Cigarettes (19.0%) were the most commonly used tobacco product, with no differences by sex. Cigars (13.0%) were the second most commonly used tobacco product, followed by smokeless tobacco (8.6%), bidis (3.4%), and pipes (3.1%). Males were more likely than females to use cigars, smokeless tobacco, bidis, pipes, or any tobacco at all. Whites (31.4%) were much more likely to use any tobacco product than African Americans (17.3%). Moreover, white students were much more likely to use cigarettes than African American students (23.2% vs. 11.0%), and white students were almost four times more likely to use smokeless tobacco than African American and Latino students (12.0% vs. 3.3% and 3.1%).

Trends from 1999 to 2007

From 1999 to 2007, statistically significant changes were found among middle school students' tobacco use in several categories (see Table 2 and Figure 1). The overall "any tobacco" use declined from 18.4% in 1999 to 9.1% in 2007. Significant decreases occurred among males (from 21.0% to 10.4%), females (from 15.7% to 7.9%), whites (from 16.8% to 7.2%), African Americans (from 19.8% to 11.7%), and Latinos (from 20.5% to 9.3%).

Significant declines also occurred in overall middle school student current cigarette use (from 15.0% in 1999 to 4.5% in 2007). Males, females, whites, African Americans, and

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[a] Bidis are Indian-style cigarettes that deliver more nicotine, CO2, and tar than other tobacco products.

Table 2.
Percentage of Students in Middle School[a] Who Were Current Users[b] of any Tobacco Product, by Product Type, Sex, and Race/Ethnicity—Youth Tobacco Survey, North Carolina, 1999-2007

	Any tobacco[c]	Cigarettes	Cigars	Smokeless tobacco	Pipes	Bidis
Characteristic	**% (95% CI)[d]**	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**
Middle school, 2007						
Sex						
Male	10.4 (+/-1.5)	4.2 (+/-1.1)	4.4 (+/-1.1)	3.3 (+/-0.9)	2.7 (+/-1.1)	3.1 (+/-1.0)
Female	7.9 (+/-1.8)	4.8 (+/-1.4)	3.3 (+/-1.1)	1.3 (+/-0.6)	1.8 (+/-0.8)	2.5 (+/-1.2)
Race/Ethnicity						
White	7.2 (+/-1.8)	3.9 (+/-1.3)	2.6 (+/-0.9)	2.7 (+/-0.8)	1.3 (+/-0.7)	1.3 (+/-0.4)
African American	11.7 (+/-2.7)	4.7 (+/-2.1)	5.1 (+/-2.2)	1.5 (+/-0.7)	3.5 (+/-2.3)	4.8 (+/-2.5)
Latino	9.3 (+/-3.5)	4.6 (+/-3.8)	4.8 (+/-3.2)	1.4 (+/-0.9)	3.8 (+/-1.6)	3.8 (+/-2.0)
Total	**9.1 (+/-2.3)**	**4.5 (+/-1.1)**	**3.9 (+/-0.9)**	**2.3 (+/-0.6)**	**2.2 (+/-0.8)**	**2.8 (+/-0.8)**
Middle school, 2005						
Sex						
Male	13.6 (+/-3.5)	7.1 (+/-2.3)	6.9 (+/-2.1)	4.1 (+/-1.9)	2.4 (+/-1.3)	3.8 (+/-1.8)
Female	7.3 (+/-1.9)	4.4 (+/-1.2)	3.0 (+/-1.2)	1.3 (+/-0.4)	1.0 (+/-0.6)	1.6 (+/-0.8)
Race/Ethnicity						
White	9.5 (+/-2.3)	6.0 (+/-1.9)	3.6 (+/-1.2)	3.4 (+/-1.3)	1.6 (+/-1.1)	1.8 (+/-0.9)
African American	11.6 (+/-3.5)	5.3 (+/-2.1)	6.6 (+/-1.9)	1.6 (+/-1.1)	1.8 (+/-1.0)	4.3 (+/-2.3)
Latino	12.8 (+/-5.1)	5.7 (+/-2.8)	8.6 (+/-5.1)	2.9 (+/-2.8)	2.1 (+/-1.6)	2.6 (+/-2.3)
Total	**10.5 (+/-2.3)**	**5.8 (+/-1.4)**	**5.0 (+/-1.3)**	**2.7 (+/-1.0)**	**1.7 (+/-0.8)**	**2.7 (+/-1.0)**
Middle school, 2003						
Sex						
Male	17.4 (+/-3.1)	9.8 (+/-1.8)	7.9 (+/-1.8)	7.2 (+/-1.7)	3.6 (+/-1.3)	4.4 (+/-1.6)
Female	11.0 (+/-2.2)	8.9 (+/-2.1)	2.8 (+/-1.1)	1.5 (+/-0.7)	0.8 (+/-0.5)	1.6 (+/-0.9)
Race/Ethnicity						
White	14.1 (+/-2.7)	9.1 (+/-2.2)	5.2 (+/-1.3)	5.9 (+/-1.3)	2.2 (+/-0.7)	2.2 (+/-1.1)
African American	13.7 (+/-3.7)	8.8 (+/-2.4)	5.5 (+/-2.5)	1.7 (+/-1.2)	2.1 (+/-1.2)	3.7 (+/-2.1)
Latino	17.7 (+/-9.9)	13.5 (+/-9.7)	6.7 (+/-6.3)	5.7 (+/-5.9)	2.9 (+/-4.0)	5.0 (+/-5.3)
Total	**14.3 (+/-2.4)**	**9.3 (+/-1.6)**	**5.4 (+/-1.2)**	**4.5 (+/-1.0)**	**2.2 (+/-0.7)**	**3.0 (+/-1.1)**
Middle School, 2001						
Sex						
Male	18.3 (+/-2.7)	10.5 (+/-1.8)	8.3 (+/-1.7)	5.7 (+/-1.4)	4.6 (+/-1.8)	5.1 (+/-1.2)
Female	15.9 (+/-2.7)	11.8 (+/-2.4)	5.4 (+/-1.5)	2.3 (+/-0.9)	2.4 (+/-0.9)	3.3 (+/-1.0)
Race/Ethnicity						
White	15.6 (+/-3.3)	10.4 (+/-2.5)	5.7 (+/-1.9)	4.3 (+/-1.4)	3.1 (+/-1.0)	2.9 (+/-1.0)
African American	18.0 (+/-2.7)	10.7 (+/-2.2)	8.0 (+/-2.1)	3.5 (+/-1.2)	3.2 (+/-1.4)	5.4 (+/-1.3)
Latino	15.6 (+/-5.8)	9.5 (+/-5.5)	7.3 (+/-4.6)	3.7 (+/-2.7)	5.3 (+/-3.6)	5.0 (+/-3.7)
Total	**17.4 (+/-2.6)**	**11.3 (+/-1.9)**	**7.1 (+/-1.5)**	**4.1 (+/-1.0)**	**3.7 (+/-1.1)**	**4.5 (+/-0.9)**
Middle School, 1999						
Sex						
Male	21.0 (+/-3.1)	16.0 (+/-2.8)	10.6 (+/-1.9)	6.3 (+/-1.6)	5.2 (+/-1.3)	NA
Female	15.7 (+/-2.1)	14.0 (+/-2.1)	5.1 (+/-1.1)	1.4 (+/-0.5)	1.5 (+/-0.5)	NA
Race/Ethnicity						
White	16.8 (+/-2.4)	14.1 (+/-2.2)	6.3 (+/-1.2)	4.0 (+/-1.1)	2.4 (+/-0.7)	NA
African American	19.8 (+/-3.5)	15.7 (+/-3.5)	9.7 (+/-1.8)	2.6 (+/-1.1)	3.9 (+/-1.3)	NA
Latino	20.5 (+/-4.6)	16.0 (+/-4.7)	9.1 (+/-3.3)	4.7 (+/-2.7)	6.1 (+/-2.7)	NA
Total	**18.4 (+/-2.3)**	**15.0 (+/-2.2)**	**7.9 (+/-1.3)**	**3.9 (+/-0.9)**	**3.4 (+/-0.7)**	**NA**

a Grades 6-8.

b Used tobacco on one or more occasions during the 30 days preceding the survey.

c Cigarettes, cigars, smokeless tobacco, pipes, or bidis (leaf-wrapped, flavored cigarettes from India).

d Confidence interval.

Table 3.
Percentage of Students in High School[a] Who Were Current Users[b] of any Tobacco Product, by Product Type, Sex, and Race/Ethnicity—Youth Tobacco Survey, North Carolina, 1999-2007

	Any tobacco[c]	Cigarettes	Cigars	Smokeless tobacco	Pipes	Bidis
Characteristic	**% (95% CI)[d]**	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**
High school, 2007						
Sex						
Male	32.4 (+/-4.5)	20.9 (+/-3.4)	17.4 (+/-3.3)	14.5 (+/-3.3)	4.5 (+/-1.2)	4.8 (+/-1.6)
Female	20.5 (+/-3.8)	16.8 (+/-3.7)	8.3 (+/-2.0)	2.4 (+/-0.7)	1.5 (+/-0.6)	1.8 (+/-0.6)
Race/Ethnicity						
White	31.4 (+/-4.7)	23.2 (+/-3.8)	14.1 (+/-2.8)	12.0 (+/-3.3)	3.5 (+/-0.9)	3.2 (+/-1.1)
African American	17.3 (+/-4.1)	11.0 (+/-3.0)	11.2 (+/-2.7)	3.3 (+/-1.0)	2.8 (+/-1.2)	3.2 (+/-1.6)
Latino	25.6 (+/-7.2)	18.7 (+/-7.5)	14.7 (+/-5.0)	3.1 (+/-2.2)	1.3 (+/-1.3)	2.2 (+/-2.0)
Total	**26.6 (+/-3.5)**	**19.0 (+/-3.0)**	**13.0 (+/-2.1)**	**8.6 (+/-2.0)**	**3.1 (+/-0.6)**	**3.4 (+/-0.9)**
High school, 2005						
Sex						
Male	33.9 (+/-4.4)	20.7 (+/-3.8)	16.6 (+/-2.4)	15.9 (+/-3.7)	4.7 (+/-1.2)	5.1 (+/-1.6)
Female	22.8 (+/-3.6)	19.8 (+/-3.6)	9.8 (+/-2.5)	2.3 (+/-1.8)	3.4 (+/-2.0)	3.8 (+/-2.1)
Race/Ethnicity						
White	32.1 (+/-4.6)	23.8 (+/-3.6)	15.5 (+/-2.6)	12.1 (+/-3.4)	4.1 (+/-1.4)	4.5 (+/-1.2)
African American	20.0 (+/-4.0)	12.8 (+/-3.1)	8.1 (+/-2.9)	3.4 (+/-3.0)	3.2 (+/-1.7)	3.3 (+/-1.7)
Latino	31.3 (+/-6.6)	19.9 (+/-8.7)	14.9 (+/-6.4)	8.5 (+/-7.1)	7.7 (+/-4.3)	8.6 (+/-6.0)
Total	**28.5 (+/-3.4)**	**20.3 (+/-2.8)**	**13.3 (+/-1.9)**	**9.2 (+/-2.6)**	**4.1 (+/-1.0)**	**4.6 (+/-1.1)**
High school, 2003						
Sex						
Male	39.2 (+/-4.0)	28.7 (+/-3.8)	18.5 (+/-2.9)	17.3 (+/-4.2)	6.6 (+/-1.6)	4.8 (+/-1.2)
Female	27.9 (+/-3.9)	25.7 (+/-3.9)	8.2 (+/-1.9)	1.8 (+/-0.7)	1.5 (+/-0.9)	2.4 (+/-1.1)
Race/Ethnicity						
White	37.9 (+/-4.5)	30.8 (+/-4.3)	14.5 (+/-2.8)	13.1 (+/-2.9)	4.4 (+/-1.4)	3.9 (+/-1.1)
African American	25.5 (+/-5.1)	20.1 (+/-3.6)	10.3 (+/-3.4)	3.0 (+/-2.2)	2.9 (+/-1.5)	2.7 (+/-1.4)
Latino	22.6 (+/-7.5)	18.0 (+/-6.6)	12.9 (+/-5.2)	3.9 (+/-3.2)	6.1 (+/-4.8)	3.0 (+/-2.9)
Total	**33.7 (+/-3.6)**	**27.3 (+/-3.3)**	**13.4 (+/-2.1)**	**9.5 (+/-2.3)**	**4.1 (+/-1.1)**	**3.6 (+/-0.8)**
High school, 2001						
Sex						
Male	42.3 (+/-4.7)	29.8 (+/-4.6)	22.5 (+/-3.8)	15.2 (+/-2.6)	8.2 (+/-2.0)	9.9 (+/-2.3)
Female	29.0 (+/-2.3)	25.7 (+/-2.6)	10.1 (+/-1.3)	2.5 (+/-0.5)	3.5 (+/-1.4)	4.6 (+/-1.5)
Race/Ethnicity						
White	37.4 (+/-4.1)	30.5 (+/-3.8)	15.3 (+/-2.7)	10.7 (+/-1.9)	4.3 (+/-0.9)	5.0 (+/-1.4)
African American	28.2 (+/-4.3)	18.1 (+/-4.2)	14.8 (+/-2.5)	3.6 (+/-1.7)	5.8 (+/-2.5)	9.7 (+/-4.1)
Latino	38.3 (+/-5.9)	30.2 (+/-5.1)	19.3 (+/-6.1)	11.5 (+/-3.4)	10.6 (+/-4.2)	13.0 (+/-4.9)
Total	**35.8 (+/-3.3)**	**27.8 (+/-3.5)**	**16.4 (+/-2.1)**	**8.9 (+/-1.4)**	**5.9 (+/-1.3)**	**7.4 (+/-1.8)**
High school, 1999						
Sex						
Male	44.0 (+/-2.6)	33.4 (+/-2.6)	26.8 (+/-2.0)	14.0 (+/-2.6)	8.7 (+/-1.8)	NA
Female	32.4 (+/-2.6)	29.7 (+/-2.6)	12.5 (+/-1.6)	1.8 (+/-0.5)	1.7 (+/-0.7)	NA
Race/Ethnicity						
White	42.5 (+/-2.7)	36.5 (+/-2.8)	19.8 (+/-2.2)	9.7 (+/-1.7)	4.6 (+/-1.1)	NA
African American	28.7 (+/-3.5)	20.2 (+/-3.1)	17.9 (+/-2.5)	2.6 (+/-1.1)	3.7 (+/-1.3)	NA
Latino	33.9 (+/-6.6)	26.3 (+/-6.0)	18.2 (+/-4.8)	8.7 (+/-4.2)	11.1 (+/-4.6)	NA
Total	**38.3 (+/-2.2)**	**31.6 (+/-2.2)**	**19.7 (+/-1.5)**	**7.9 (+/-1.5)**	**5.3 (+/-1.1)**	**NA**

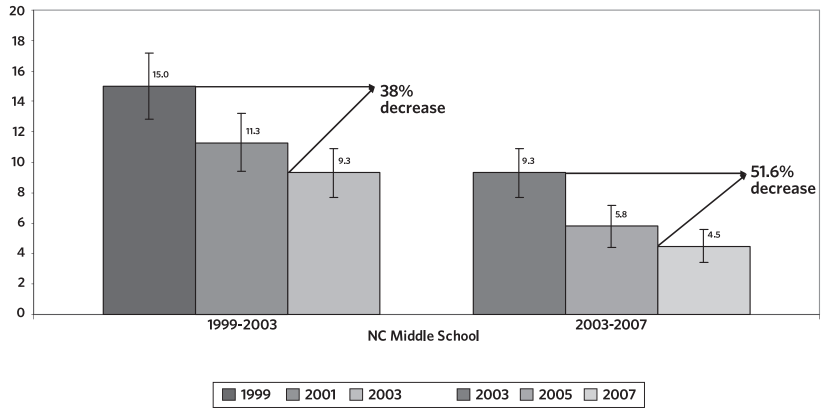
a Grades 9-12.

b Used tobacco on one or more occasions during the 30 days preceding the survey.

c Cigarettes, cigars, smokeless tobacco, pipes, or bidis (leaf-wrapped, flavored cigarettes from India).

d Confidence interval.

Figure 1.
Rate of Decline of Current Middle School Student Smokers by Group Years, YTS 1999-2007



The 2003-2007 rate of decline is significantly higher than the 1999-2003 rate of decline ($p < 0.001$).

Latinos all had statistically significant declines in cigarette use. Cigar smoking decreased overall and specifically among males, whites, and African Americans. Smokeless tobacco decreased (from 3.9% in 1999 to 2.3% in 2007), with a significant decline only among males (from 6.3% in 1999 to 3.3% in 2007). Pipe use had a statistically significant decline only among males. While the question on bidi use was not included in 1999, an overall significant decline was noted from 4.5% in 2001 to 2.8% in 2007. No other statistically significant differences were noted.

From 1999 to 2007, statistically significant changes were found among high school students in several categories (see Table 3 and Figure 2). The overall "any tobacco" use declined (from 38.3% in 1999 to 26.6% in 2007). There were significant decreases among males (from 44.0% to 32.4%), females (from 32.4% to 20.5%), whites (from 42.5% to 31.4%), and African Americans (from 28.7% to 17.3%). No significant changes were found among Latinos for this category.

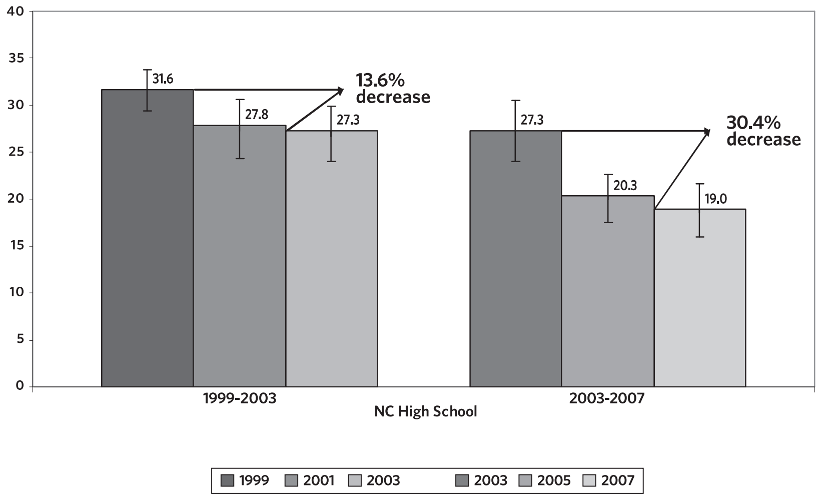
Statistically significant decreases also occurred in high school student overall cigarette use (from 31.6% in 1999 to 19.0% in 2007). Males, females, whites, and African Americans all had significant decreases in cigarette use. Cigar smoking significantly decreased overall and specifically among males, females, whites, and African Americans. Smokeless tobacco had no statistically significant changes among any subgroup. Pipe use had statistically significant declines among males and Latinos. Bidi use from 2001 had an overall significant decline (from 7.4% in 2001 to 3.4% in 2007). Bidi use also had statistically significant declines among males, females, African Americans, and Latinos.

Declines in tobacco use appear to have accelerated over time. Analysts divided the North Carolina YTS results into two cohorts: 1999-2003 and 2003-2007. From 1999-2003 the rate of decline among current smokers in middle school was 38%, whereas from 2003-2007 the decline was 51.6% (see Figure 1). Similarly, the rate of decline among high school students was 13.6% from 1999-2003 compared to 30.4% from 2003-2007 (see Figure 2). In both cases, the 2003-2007 decline was significantly higher ($p < 0.001$) than the decline from 1999-2003.

Discussion

In 1999, North Carolina first conducted the YTS to assess the scope of the tobacco problem among middle and high school students across the state and provide a baseline of tobacco use prevalence. The results were higher than expected which, in part, led to the first dedicated state funding for a teen tobacco initiative. The North Carolina legislature voted in 1999 to divide the state's tobacco settlement money between three entities, with 25% of the money going to a trust fund established to focus on health. In 2000, the General Assembly voted to create the North Carolina Health and Wellness Trust Fund

Figure 2.
Rate of Decline of Current High School Student Smokers by Group Years, YTS 1999-2007



The 2003-2007 rate of decline is significantly higher than the 1999-2003 rate of decline ($p < 0.001$).

(HWTF), and members were appointed in 2001. Most school and community grants received funding and began working in 2003; thus the 2003 YTS is considered the baseline for the HWTF teen tobacco program. North Carolina's statewide tobacco prevention media campaign also launched in 2003 with the first television ads airing in 2004.

Since 2003, the HWTF has developed and expanded a statewide program that focuses on the four CDC recommended goal areas as they pertain to youth and tobacco: (1) preventing initiation of tobacco use among youth and young adults; (2) promoting quitting among youth, adults whose tobacco use influences youth, and young adults; (3) eliminating exposure to secondhand smoke; and (4) identifying and eliminating tobacco-related disparities among population groups. While the focus has been on cigarette smoking among youth, some efforts have been directed toward other tobacco products, particularly smokeless or spit tobacco, and recent efforts have included young adults in college as well as quitline assistance for adults who live with or take care of youth and who want to quit smoking.

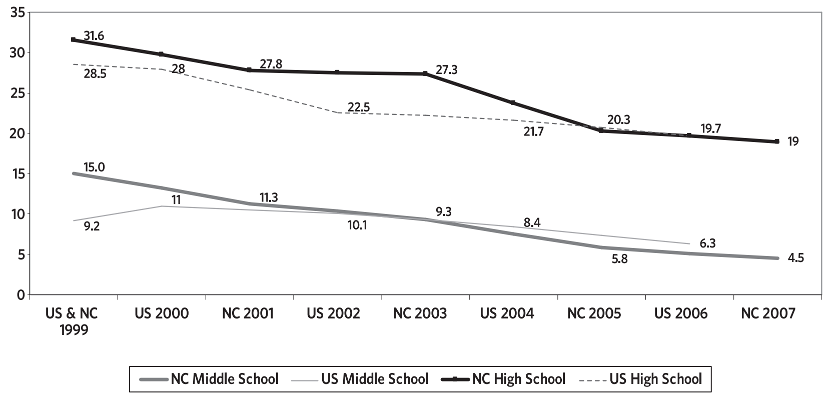
State efforts have included funding for programs falling under all of the overarching components described as part of the CDC's best practices for tobacco control programs.[5] State and local interventions include school and community programs focused on youth tobacco use prevention, passage of tobacco-free policies in public areas such as schools, programs to reduce youth access to tobacco, and increases in the excise tax on cigarettes. Health communication interventions include a statewide media campaign, Tobacco. Reality.Unfiltered. or TRU. TRU television ads feature North Carolinians who have suffered serious health consequences from tobacco use and direct viewers to a website to find out about interventions aimed at preventing teen tobacco use at the local level. A 2007 evaluation of the TRU campaign using a telephone survey with North Carolina youth ages 11-17 found 71% reporting awareness (confirmed through open-ended ad description) of the TRU campaign and over 95% reporting that the ads were convincing, attention-grabbing, and gave good reasons not to use tobacco.[6] Cessation interventions include support for the North Carolina Tobacco Use Quitline to cover tobacco cessation calls and proactive cessation services for tobacco users who want to quit and are either under 25, employees of a K-12 school system or child care center, or a primary caregiver of a child under 18 years of age living at home. Over the past two years, because of successful paid marketing campaigns, callers eligible for HWTF funds have comprised about one-half of all calls. Local cessation includes the Not on Tobacco (N-O-T) program in schools.

The YTS is part of the state's surveillance effort, along with tobacco-related questions on the Behavioral Risk Factor Surveillance System (BRFSS), which uses telephone surveys to measure tobacco use prevalence among adults. Another statewide survey is the Child Health Assessment and Monitoring Program (CHAMP), which is done with a subset of the BRFSS sample who have children under 18 living in their homes. The state also funds outcomes evaluation and provides funds for administration and management, which includes program oversight, technical assistance, and training.

Concurrent with funding of these programs, North Carolina seems to be experiencing a steeper decline in youth smoking from 2003 to the present than from 1999 to 2003. In comparison, national declines in current smoking among high school youth were most evident from 1999 to 2002, with only marginal changes from 2004 to 2006. High school current smoking in the United States dropped from 22.5% in 2002 to 19.7% in 2006 (12.4% decrease), compared with North Carolina high school rates declining from 27.3% in 2003 to 19.0% in 2007 (30.4% decrease). Similarly, US middle school rates went from 10.1% in 2002 to 6.3% in 2006 (37.6% decrease), whereas North Carolina middle school rates dropped from 9.3% in 2003 to 4.5% in 2007 (51.6% decrease) (see Figure 3).[7]

Although the rate of sales to minors in North Carolina decreased from 25% in 1999 to 11.5% in 2007, YTS data indicate that from 2003 to 2007 North Carolina youth reported no significant change in source of cigarettes (direct purchase vs. social sources) or in being refused by a merchant because of their age. Similarly, while youth exposure to tobacco advertising may have decreased after the Master Settlement Agreement in 1998, nearly 20% of high school youth and 13% of middle school youth surveyed in the 2007 YTS reported having received or bought something with a tobacco company name or picture on it in the previous year. Middle school youth in North Carolina also reported a significant decrease in practicing ways to say "no" to tobacco from 2003 to 2007, possibly indicating decreased classroom curriculum in North Carolina schools. Neither middle school nor high school youth reported any significant changes in how often their parents

Figure 3.
Percentage of Middle and High School Students Reporting Current Tobacco Use in North Carolina vs. National Rates: 1999-2007



had discussed the dangers of tobacco use with them during the previous year.

While it is difficult to pinpoint the exact cause for the large declines in tobacco use and their acceleration since 2003, data on potential contributing factors such as youth access to tobacco, youth exposure to industry advertising, parental involvement, and school curricula suggest that these factors did not have a large impact on reductions in youth tobacco use in North Carolina. Decreases have likely occurred for other reasons. Most national efforts that would explain the decreases occurred prior to 2003. For instance, the price of tobacco products increased as a result of the Master Settlement Agreement in the late 1990s and an increase in the federal excise tax on tobacco in 2000 and 2002. The national truth® campaign of the American Legacy Foundation launched in 2000, but the major national roll-out of the truth® campaign ended in 2003.

State efforts in North Carolina started in earnest around 2003. The tobacco initiatives started by the HWTF began to mobilize communities statewide. Statewide policies creating comprehensive tobacco-free areas (schools, hospitals, state buildings, prisons, etc.) occurred along with greatly expanded youth empowerment programs and the statewide TRU media campaign, all of which are evidence-based tobacco control initiatives. The increases in North Carolina's tobacco excise tax in 2005 and 2006 (from $0.05 to $0.35) likely also contributed to these declines above and beyond local program interventions.

The dramatic declines from 1999 to 2007 in all types of youth tobacco use are particularly exciting given North Carolina's long history with tobacco production. North Carolina has moved from current youth cigarette smoking rates higher than the national average in 1999 to being at the national average in 2007 (see Figure 3). However, in order for North Carolina to reach the 2010 Healthy People objective goal of a high school current smoking rate of 16%, much more needs to be done.

There are some limitations to this study. Data are self-report, and the study is not longitudinal and does not necessarily include the same schools or students from year to year. However, written surveys are a reliable and cost-effective method for gathering prevalence estimates from large populations. While declines in youth tobacco use are occurring concurrently with state-funded efforts to decrease use, a definitive causal link cannot be made between declines in use and state funding.

The CDC recommends that North Carolina spend $106.8 million per year on tobacco control programs annually.[5] The HWTF budgeted approximately $17 million annually (for FYs 2007-2008 and 2008-2009) for programs targeting youth tobacco prevention and cessation with a total of $75.1 million allocated through 2007.[8] In January 2002, prior to HWTF funding, North Carolina ranked 51st[b] in the country in state funding for tobacco prevention;[9] North Carolina currently ranks 28th.[10]

Continuation of North Carolina's historic results in youth tobacco use reduction could be jeopardized if funding were decreased. Maintaining and increasing tobacco prevention funding is critically important. An economic analysis examining state-level tobacco control expenditures and youth smoking prevalence estimated that states spending at least the minimum amount recommended by the CDC would have seen youth smoking prevalence rates 3.3% to 13.5% lower than their current rates.[11] Funding is threatened in North Carolina because the North Carolina General Assembly passed legislation in 2004 mandating that up to 65% of the annual monies distributed to the HWTF beginning in 2007 would pay the debt service on construction of several major health-related facilities in North Carolina. This decision dramatically reduces the amount of potential funding for HWTF's preventive health programs. The HWTF is currently scheduled to pay $350 million in debt service over the next 25 years.

Increased funding should go toward additional evidence-based strategies such as advocating for smoke-free policies in all public, indoor places; advocating for further increases in the North Carolina excise tax (currently the 7th lowest in the US[12]); expanding the statewide tobacco prevention media campaign; and increasing adult-focused programs since adult smoking influences youth smoking behavior.[13] Continuation and expansion of state efforts to decrease youth smoking will ensure that tobacco remains more a part of North Carolina's history than its future. **NCMJ**

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Disclaimer: *Any opinion, finding, conclusion, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view and policies of the North Carolina Health and Wellness Trust Fund Commission.*

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[b] Washington DC is included, along with the 50 states, for a total of 51.

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HEALTH REFORM IN NORTH CAROLINA

The Missing Piece in Health Reform: Long-Term Care

J. Craig Souza; Polly G. Welsh, RN-C; Gordon H. DeFriese, PhD

As the intensity of discussion increases around the prospect for significant change in the structure and function of US health care, it is interesting to note that so little of this discussion gives focus to long-term care and rehabilitative services, especially care provided in skilled nursing facilities, such as nursing homes. Lamenting the enormity of total US investment in health care is meaningless without considering the nearly $130 billion spent annually on nursing home care, or more than 42% of national Medicaid expenditures and 51% of the $42 billion spent by Medicare for long-term care (despite the very limited number of days of care available to Medicare beneficiaries following an in-hospital stay).[1]

President Obama's recent efforts to bring all elements of the nation's health care industry into the discussion of options for health care system reform are laudable. But the focus of these deliberations seems to have overlooked the large and growing need for specialized services offering long-term medical, nursing, and rehabilitative care, especially for America's increasing numbers of older adults.

There are four aspects of long-term care needing attention as the nation undertakes what may be the most important health care system reform in a generation. These are:

Long-Term Care Insurance Coverage in the United States is Very Low

North Carolina, like 29 other states and the District of Columbia, once offered tax incentives (as a tax credit) for the purchase of long-term care insurance. Yet a very small proportion of adults older than age 50 have insurance for their long-term care needs other than the 100 days of post-hospitalization care that is covered under the Medicare program for persons older than age 65. Therefore, when the need for such care arises, most people are faced with the necessity of covering the cost of such care out-of-pocket or establishing their eligibility for coverage under the state's Medicaid program.

Efforts to increase the extent of long-term care insurance coverage have proven to be relatively ineffective when compared to other forms of health insurance. For example, when the North Carolina State Employees and Teachers Health Plan offered such coverage as an elective benefit, only about 3,000 out of some 750,000 employees chose to exercise this option. The initial vendor for this coverage withdrew from the North Carolina market after a five-year period, necessitating arrangements with another third-party carrier.

The financial implications of long-term care for most families, when extended periods of long-term care are required, make attention to this gap in personal insurance for health care a serious matter of both personal and policy significance. It would be wise for policymakers who are now engaged in considering the restructuring of American health care to consider an approach like that introduced in Israel following the major reform of that national system in which a small incremental payment for future long-term care was added to conventional health insurance premiums assessed through one's employer. As a consequence, approximately 80% of Israel's population has long-term care insurance (for covering services in either public or private sector nursing facilities), even though a large proportion of the Israeli population report not knowing that they have such coverage until such time as it is required. Having such a significant segment of the US population entering the years when long-term care is so much more likely to be needed is a matter of considerable importance to the effort to reduce the possibility of health care financial risk to individuals and families, underlying the effort to restructure and reform the nation's health care system. Thus, employer incentives to offer such coverage should be considered as part of any national health reform proposals.

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Long-Term Care Physical Facilities are in Need of Modernization
Many of the physical facilities now providing skilled nursing care in this country were built in the 1980s or early 1990s. While they have stood the test of time, the design concepts embedded in the physical plant of many nursing homes are not consistent with current needs or the preferences of the older adults now being served. Prospective residents of these facilities will expect single rooms, in most cases with in-suite bathrooms, and many will be resistant to eating every meal in a large dining room some distance from their residential unit.

In recognition of these changes in expectations, and out of a conviction that residential life in long-term care facilities need not be so sterile and divergent from living accommodations older adult clients have been accustomed to prior to nursing home admission, there are a number of innovative designs for residential living in long-term care. We need a cadre of architects who are attuned to the need for new concepts in facility design for long-term care and who are willing to work in tandem with leaders in this field to create a vision of a new generation of such facilities.

One of the impediments to these movements toward better physical facility design in America's long-term care field are certain rules and regulations that make significant changes in the way nursing homes are constructed or operated more difficult than necessary. This industry could benefit from the services and insights of professionals in the legal profession who can assist with future efforts to simplify these rules and regulations, while at the same time facilitating the attention of this industry to the needs and desires of those who seek these services.

An Increase in the Professional Workforce Supply is Needed to Serve the Nation's Growing Population of Older Adults
This includes geriatric medicine, dentistry, and nursing; use of mid-level practitioners; long-term care administration; and physiatry and physical therapy. Despite the growing number of older adults in this country and the coming numbers of persons born just after World War II (the so-called "baby boomers"), there is a continuing problem of too few professionals being trained with special expertise in treating the health and medical care issues among the older adult population. Health reform that focuses almost entirely on reimbursements and insurance coverage will be only a partial solution to our future health care issues in this country if there are inadequate numbers of professionals trained and prepared to focus some significant portion of their practices on service to older adults. We already have serious shortages of specialists in geriatric medicine, physiatry and rehabilitative medicine, dentistry, nursing, and physical therapy, but there are also too few young people who are choosing careers in the field of long-term care administration. A national health reform effort that leaves out provisions for increasing the supply of persons with training in these fields or incentives for entering practice in service to older adults will have missed the mark.

Here in North Carolina we have seen the benefit of employing nurse practitioners in long-term care. Recent demonstrations in our state have shown that nurse practitioners can save money in acute care management, while enhancing the quality of overall nursing and medical care in long-term care facilities.[2] Emerging policies for health reform, at the state and federal levels, should offer incentives for nursing homes to hire nurse practitioners to complement their current clinical staffing.

Organized Approaches to Transitional Care are Needed
One of the major shortcomings of our current health care delivery system is the fragmentation that currently exists and the tendency of categories of health care service providers to function in and through a number of virtual "silos" with little or no integration. Among the most important facets of the current system of care that needs some attention as "reform" takes place is this lack of system integration. The current situation, depending on where one lives and seeks care, can seem anything but "patient-centered."

As policymakers contemplate the kind of health care system we would want to have in the future, it will be important to consider the mechanisms through which we might assure that providers of care at any level are forced (or incentivized) to work in tandem with providers operating at other levels of care.

Nowhere is the need for this type of incentive more evident than in the transitions of patients from hospitals to long-term care, be it home and community-based services or skilled nursing facilities such as nursing homes and rehabilitation facilities. Because there are, and will increasingly be, pressures to reduce the length of hospital stays, nursing homes and rehabilitation facilities are being asked to take responsibility for phases of overall care that might have remained within the clinical purview of hospitals, but still require highly complex types of care as patients recover from surgery or other conditions for which a prior hospitalization experience occurred. The coordination of care between the hospital and skilled nursing facility is one aspect of the coordination that should occur, but there are also complexities of reimbursement that must be addressed as well. Hospitalization itself is a risk factor for some conditions, like decubitus ulcers, especially for frail elders. So, it is not unexpected that many patients transferred from hospital to nursing home will arrive with these conditions. Working out the collaborative and shared funding of this continuing care in an equitable way between different levels of care providers will be an important element of system reform as we move forward.

The nation is now embarking on a most important set of policy deliberations, with the implications of this process being significant for every level of our health care system. Long-term care, whether explicitly included or not in these deliberations, will be consequential to the overall impact and outcome of this policy development process. Including long-term care as a critical element of national health care systems at the outset of these discussions will assure that appropriate and effective provision is made for both the inputs as well as the long-term outputs of the health care system as a whole.

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POLICY FORUM

Community Care of North Carolina

> ***The most significant achievement of the Community Care program is taking community-based medicine... and spreading it statewide.***

Introduction

POLICY FORUM:
Community Care of North Carolina

Health reform is on the minds of most policymakers and virtually every individual involved in the United States health care system. In a way, North Carolina has already reformed its health care delivery system and continues to lead in the development of a coordinated system of care. We have done this with several major initiatives dating back to the 1970s when the state embraced a form of regional communication and training for health care workers in the Area Health Educations Center (AHEC) program. We then developed a mechanism to improve access to care through rural health clinics and increased support for community health centers. In subsequent years, the state regionalized specialty care in perinatal and trauma services. Most recently, we have created a prototype of an "accountable care organization" (ACO) in Community Care of North Carolina (CCNC) which some call a "medical home" system of care. This issue of the *North Carolina Medical Journal* focuses on this last innovation, CCNC; but to understand how it has emerged and why it works, we must first understand its context and background as well as recognize its limitations and its promises.

We can trace North Carolina's medical home movement back to the 1960s when Jim Bernstein, the founding director of the North Carolina Office of Rural Health, developed a vision for coordinated, community-based primary care in the form of rural health clinics that made use of underutilized nurse practitioners. The clinics were incorporated into networks of practitioners through the Office of Rural Health and the new AHEC system. The training of physicians, nurse practitioners, physician assistants, and other health professionals for these clinics was facilitated by the AHEC that linked professional schools to communities and community practices. North Carolina also tried to incorporate a staff model managed care system to broaden the coordination of care beyond rural and low income populations. At the same time this structure was emerging, we began to hear about a new form of practice, the medical home. The term medical home was initially used by pediatricians, and Dave Tayloe of Goldsboro, now president of the American Academy of Pediatrics, was one of its earliest and most ardent promoters.

All of these elements created fertile ground for a new way for the state to pay for the care of Medicaid recipients using a combination of capitated payment among linked clinics that could depend on community-based support to train clinical staff. The Access projects, which are discussed in detail in this issue of the *Journal*, were the initial result. Systems of care were created based on a coordinating clinical function financed by a small per-enrollee fee. The prior conditions of vision, network, communications, and willingness of practitioners to participate were matched with political will to support this evolutionary change.

That political support became an increasingly important stimulus when the promise of costs savings was tied to the enlargement of the Access program into a statewide Community Care program for all Medicaid patients. The idea of statewide coordinated care was an evolution in the work of Bernstein and others. Their initial task was to create the clinical capacity to ensure access, and the development of rural health clinics and community health center networks did that. Nonetheless, the measures of population health status continued to lag behind those in wealthier, more urban communities. Costs savings and improved care were part of a promise made by Jim Bernstein and his staff that the program would deliver superior care at lower costs—in other words, to be an "accountable care organization," the very thing we now hear being promised as part of national health reform.

When that promise is made for the nation, we have to caution the architects of reform that the long process of development must include the regional framework that facilitates communication, training, and coordination; that the leaders must have a vision of a systematic approach to medical care; and that health care professionals have the experience of working together and understanding the various roles and relationships that can make medical homes work. This has been a 40-year process in North Carolina, and the conditions that prevail in this state which have made health reform possible are not found everywhere in the nation.

The CCNC program has received deserved praise but, equally important, it has had to prove its merit and effects in a context of learning of what does and does not work. The tone of the articles in this issue of the *Journal* is largely positive, speaking to the successes of the program. But the program came into being because the outcomes of many prior programs were not advancing toward improvement. CCNC took as its charge the improvement of population health and the realization of population-based health care costs because that was the next step in the process of improving access while ensuring quality. The program must continue to benchmark itself against the best care available and the most optimistic population health improvements, a task that the founders of the system would not shrink from.

The CCNC program is being held up as a model for the nation. However, it should be viewed more as an example of what can be accomplished rather than as a template for change. The elements that were brought together to create the conditions that can make a medical home system work are much broader than just the change in payment—there is an entire mindset that has to be built. The CCNC program enjoyed strong initial success due, in large part, to the efforts of enthusiastic early adopters. Many of the estimates of the cost-savings for the program are based on those early and optimistic results. The bottom line cost-savings are harder to estimate and may not be of the magnitude that are often publicized.

The true test of the medical home in North Carolina is yet to come as it expands to take on more complex and costly patients. These "dual eligible" patients—those people who are eligible for both Medicare and Medicaid—will test the resilience of the network and its participants if the system does receive final permission to fold these people in. We also need to understand how we are affecting the entire life course of care for patients through specialty and long-term care. The unfortunate "hydraulics" of medical costs, where pressure to reduce in one sector only creates expansion in another, is a real concern, and we need to be aware of that potential and be able to understand it if it occurs.

It is difficult to write cautionary words about the CCNC program when it is so popular and so apparently successful. But past success was built by learning both the positive and negative lessons as we moved forward.

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ISSUE BRIEF

Community Care of North Carolina—
An Enhanced Medical Home Model

L. Allen Dobson Jr, MD, FAAFP; Denise Levis Hewson, RN, BSN, MSPH

Like many states, North Carolina is challenged with the ongoing pressure to provide cost-effective and high quality health care to its Medicaid population. And, like our national government, North Carolina is trying to stop the rapid rise in health care costs while assuring that health outcomes are improved and needed health care is provided to all our citizens. In states like North Carolina, the challenge in funding an innovative approach to address the quality and cost problem is that much greater. North Carolina has a diffused population, with a significant percentage still living in rural, even remote, areas; its medical services infrastructure remains dominated by small physician practices and loosely-connected health organizations; and managed care penetration is low. Through its Community Care of North Carolina program (Community Care), North Carolina has built a statewide infrastructure that has substantially improved care for Medicaid recipients and has also provided the vehicle for improving care for all patients. In his commentary, Charles Willson discusses the creation and evolution of Community Care of North Carolina in more detail.

At the heart of the Community Care program is the "medical home," a concept more fully described by C. Annette DuBard in this issue of the *Journal*. North Carolina has historically been committed to establishing a primary care medical home for Medicaid recipients, with our first initiative, Carolina Access, beginning in 1991. Carolina Access was a Medicaid primary care case management (PCCM) model aimed at improving access to primary care and reducing unnecessary emergency department visits and hospitalizations by requiring Medicaid recipients to choose a primary care provider (PCP). The primary goal of Carolina Access was to make sure each Medicaid enrollee had a primary care physician and to ensure access to primary and preventive care and referrals to needed specialty care. PCPs included family physicians, pediatricians, internists, obstetrician/gynecologists, physician assistants, family nurse practitioners, federally qualified health centers, rural health clinics, and some specialists. In this model, PCPs provided conventional diagnostic and therapeutic services, as well as coordinated care for their enrollees that required services outside of the primary care delivery settings. The PCP aimed to provide necessary and appropriate care while avoiding unnecessary tests, procedures, emergency department visits, and hospital admissions.

Through its Community Care of North Carolina program, North Carolina has built a statewide infrastructure that has substantially improved care for Medicaid recipients and has also provided the vehicle for improving care for all patients.

The Carolina Access program laid the essential foundation for what has now become the Community Care program. North Carolina state leadership recognized the importance of having a solid primary care foundation upon which to build the Community Care program. The Carolina Access program

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created statewide access to primary care providers and these providers became willing partners with the state in managing the Medicaid population. By the mid-1990s, Carolina Access was statewide and had become the predominant vehicle for providing care to Medicaid enrollees. Although Carolina Access was very popular with enrollees and providers, and was moderately effective in reducing inappropriate emergency department (ED) use, this program could not achieve significant improvements in the quality and cost-effectiveness of care without creating a community-based infrastructure that could support the physicians and the Medicaid patients they served. Community Care is an exemplary model of a state/local and public/private partnership. In their commentary, Dr. Steven Wegner and colleagues describe how the Medicaid agency has partnered with providers in the creation of the North Carolina Physician Advisory Group and describe the value of their collaboration.

When severe budget pressures emerged in the mid-1990s, North Carolina's administration and legislature began looking for ways to control Medicaid expenditures. The Secretary of the North Carolina Department of Health and Human Services established a team in 1996 to develop a transformation plan that would retain the Carolina Access "medical home" as the foundation but would also include enhancements that could further address quality and cost. The transformation plan that was eventually adopted by the Secretary introduced four new components that were designed to strengthen the ability of the primary care provider to manage patient care and to improve patient outcomes. The four components were:

1. ***Formation of community networks:*** To strengthen the ability of physicians to manage care, the primary care physicians would be encouraged to work together and with other community health providers in community networks to cooperatively plan for meeting the care needs of recipients, particularly those with chronic conditions.
2. ***Population management tools:*** To provide the physicians and other network partners with the tools needed to improve care, the new program would include such population management approaches as evidence-based programs and protocols, disease management, pharmacy management, care management, and practice-based improvements. Dr. Troy Trygstad discusses pharmacy management and the role of the CCNC pharmacist in more detail in this issue of the *Journal*.
3. ***Case management and clinical support:*** To provide the support and coordination needed by physicians to care for complex chronic care patients who see many providers. The perspective of two case managers is presented by Elizabeth St. Martin and Lori Harris-Stevens in their commentary.
4. ***Data and feedback:*** To provide physicians (and network partners) with relevant information on how their patients are faring and to point out opportunities for improvement in quality, utilization, cost, and core processes by collecting, analyzing, and regularly reporting performance metrics back to physicians and networks. A critical element of this is health information technology and electronic medical records. In his commentary, Dr. Steven Crane explores how HIT has been instrumental in providing quality care to CCNC clients in rural North Carolina.

Community Care grew from this transformation plan, and in 1998 we began with nine pilot networks in nine counties, including a network of large pediatric practices and a little over 120,000 enrollees. The initial structure of these pilot networks varied. After several years of operation, the state incorporated the key lessons learned from each network into a state strategy for a required structure for expansion. The Community Care program is now a robust statewide system of community health networks that are organized and operated by local physicians, hospitals, health departments, and departments of social services as required partners. Networks are also encouraged to include other health care providers and health support agencies in order to build local system coordination. Through these private, not-for-profit provider networks, the state is putting in place the local systems that are needed to achieve long-term quality, cost, access, and utilization objectives in the management of care for the entire Medicaid population.

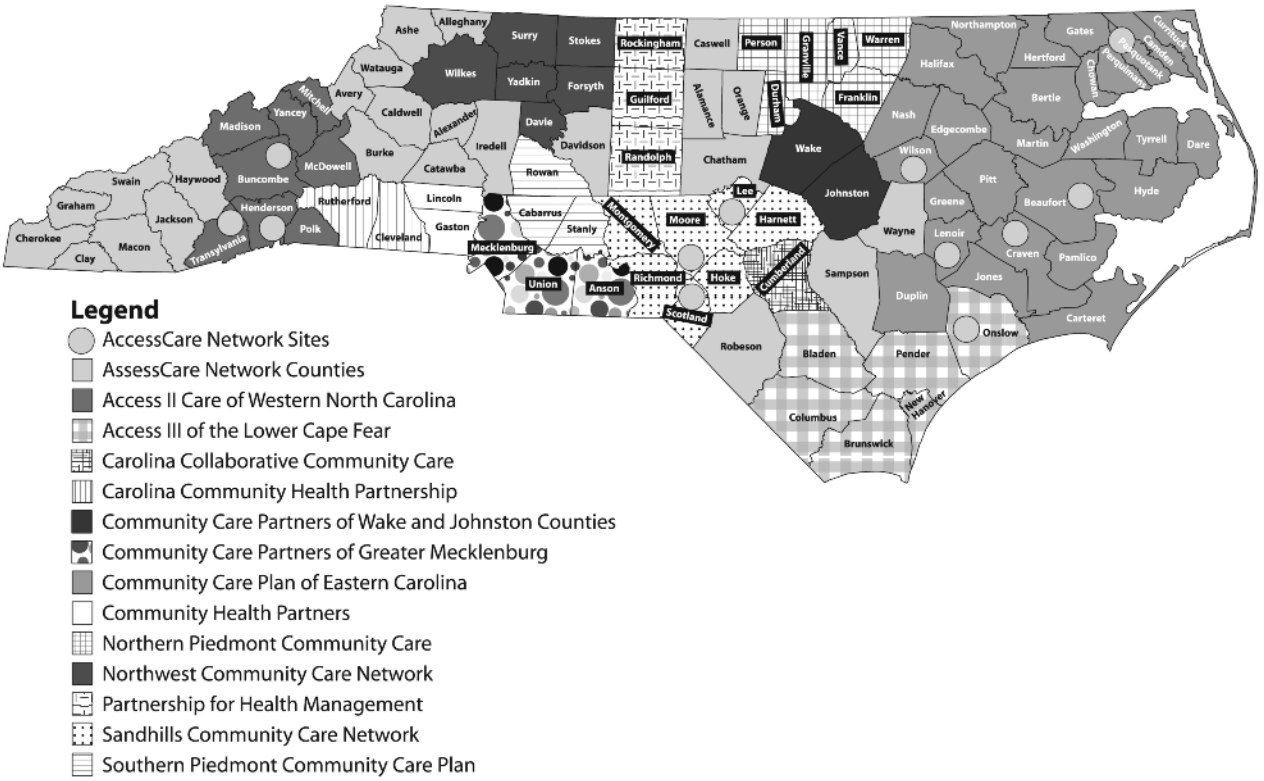
This public-private partnership has changed the relationship of the state payer from a regulatory model to that of an active manager of a health program utilizing a shared accountability model with local Community Care networks for the cost and quality of the services provided. Under the federal Medicaid regulations, the Community Care program is structured through the North Carolina state plan as an enhanced primary care case management model, with designated medical homes receiving a fee-for-service payment and $2.50 pmpm (per member/per month) to compensate for key access and population management (including acute and preventive care and disease and care management) activities. The Community Care networks also receive $3.00 pmpm to support the medical home in the population management activities. These payments are for the Temporary Assistance for Needy Families (TANF for women and children) populations managed by the program. As Community Care has expanded to other Medicaid eligibility groups such as the aged, blind, and disabled populations, the medical home per member per month payment and network per member per month are higher due to the increased complexities of managing this population ($5.00 and $8.00 respectively). The network payments provide resources for networks to hire case managers/care coordinators to work with primary care physicians and patients; to provide reimbursement for a part-time medical director and medical management committee meetings of key physician leaders from participating practices; to hire a local clinical pharmacist to assist with complex medication problems; and to obtain other shared resources needed to improve the care of patients locally. The state, through its relationship with networks, has a willing and able partner to tackle complex issues at the local level. Using the networks, North Carolina has been able to pilot multiple interventions that can later be expanded to the rest of the state if successful.

There are currently 14 Community Care networks, with more than 3,500 physicians and 1,200 practices, serving over 913,000 Medicaid enrollees (as of May 2009) and covering all 100 counties in our state (see Figure 1).

As of May 2009, the 14 networks and their coverage area and enrollees include:

- ***AccessCare*** (24 counties with 150 provider sites including UNC—Alamance, Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Caswell, Catawba, Chatham, Cherokee, Clay, Davidson, Graham, Haywood, Iredell, Jackson, Macon, Orange, Robeson, Sampson, Swain, Watauga, and Wayne); 220,864 enrollees
- ***Access II Care of Western North Carolina*** (8 counties—Buncombe, Henderson, Madison, McDowell, Mitchell, Polk, Transylania, and Yancey); 36,492 enrollees
- ***Access III of the Lower Cape Fear*** (6 counties—Bladen, Brunswick, Columbus, New Hanover, Onslow, and Pender); 48,027 enrollees
- ***Carolina Collaborative Community Care*** (1 county—Cumberland); 40,473 enrollees
- ***Carolina Community Health Partnership*** (2 counties—Cleveland and Rutherford); 20,386 enrollees
- ***Community Care of Wake and Johnston Counties*** (2 counties—Wake and Johnston); 65,555 enrollees
- ***Community Care Partners of Greater Mecklenburg*** (3 counties—Anson, Mecklenburg, and Union); 103,053 enrollees
- ***Community Care Plan of Eastern Carolina*** (27 counties—Beaufort, Bertie, Camden, Carteret, Chowan, Craven, Currituck, Dare, Duplin, Edgecombe, Gates, Greene, Halifax, Hertford, Hyde, Jones, Lenoir, Martin, Nash, Northampton, Pamlico, Pasquotank, Perquimans, Pitt, Tyrrell, Washington, and Wilson); 109,103 enrollees
- ***Community Health Partners*** (2 counties—Gaston and Lincoln); 27,687 enrollees
- ***Northern Piedmont Community Care*** (6 counties—Durham, Franklin, Granville, Person, Vance, and Warren); 43,279 enrollees
- ***Northwest Community Care Network*** (6 counties—Davie, Forsyth, Stokes, Surry, Wilkes, and Yadkin); 63,728 enrollees
- ***Partnership for Health Management*** (3 counties—Guilford, Randolph, and Rockingham); 38,229 enrollees
- ***Sandhills Community Care Network*** (7 counties—Harnett, Hoke, Lee, Montgomery, Moore, Richmond, and Scotland); 36,134 enrollees
- ***Southern Piedmont Community Care Plan*** (3 counties—Cabarrus, Rowan, and Stanly); 38,846 enrollees

Figure 1.
Community Care of North Carolina Networks



Each network is unique and has different lessons to share. In this issue of the *Journal*, leaders in three distinct networks offer their perspective about the creation and management of their network. Paul Harrison provides an urban point of view by writing about his network, Community Care of Wake and Johnston Counties. Lydia Faulkner Newman contrasts this with a rural perspective as she describes the experiences of Access III of the Lower Cape Fear. Finally, Dr. Elizabeth Gamble and colleagues share their thoughts on how their network, the Northwest Community Care Network, has benefited from the ability to maintain flexibility. This issue of the *Journal* also presents the viewpoint of a practicing CCNC physician, Dr. Rueben Rivers, as well as the perspective of a CCNC client named Adrienne presented by Lindsey Haynes.

The Community Care networks use population-based health care management tools, providing an enrollee with a medical home, implementing evidence-based practice guidelines, providing targeted case and disease management, coordinating the delivery of care, helping physician practices improve how they manage chronic patients, and getting community providers to work together in managing care of the enrollee. Through this collaborative the networks have developed a community-based health care delivery system available nowhere else in the US. This model provides quality and efficient care in the most appropriate setting and has strengthened local systems for all patients.

The importance of the patient-centered medical home, as recently described by the Patient-Centered Primary Care Collaborative[1] (PCPCC) and the Chronic Care Model[2] as described by Dr. Ed Wagner, is supported by two emerging trends—the growing shortage of primary care physicians and the increasing prevalence of chronic diseases. If built correctly, networks of medical homes connected to the larger local health care system will result in improved quality and coordination of care and increased support to primary care physicians, while the cost of care will decrease. Community Care is creating the infrastructure needed to blend the important components of both the patient-centered primary care medical home (see Figure 2) and the Chronic Care Model. Community Care is the best example of a large scale implementation of such a system and is creating the system changes needed to support quality improvement and disease management for chronic illness care and a solid primary care platform.

In addition to the elements listed above, the Chronic Care Model includes patient self-management, delivery system redesign, health care organization integration, adequate decision

Figure 2.
Components of the Primary Care Medical Home[3]

Accessible

- Care is provided in the community.
- All insurance, including Medicaid, is accepted and changes are accommodated.

Family-Centered

- Mutual responsibility and trust exist between the patient, family, and the medical home.

Comprehensive

- Provides or ensures necessary services are provided, such as acute, chronic, and preventive care.
- Coordinates care across providers and delivery settings.

Continuous

- Same primary pediatric health care professionals are available from infancy through adolescence and young adulthood.
- The medical home provider participates to the fullest extent allowed in care and discharge planning when the child is hospitalized or care is provided in another facility or by another provider.

Coordinated

- Assistance with transitions (to school, home, and/or adult services) is provided.
- A plan of care is developed by the physician, child or youth, and family and is shared with other providers, agencies, and organizations involved with the care of the patient.
- A central record or database containing all pertinent medical information, including hospitalizations and specialty care, is maintained at the practice. The record is accessible, but confidentiality is preserved.

Compassionate

- Concern for the well-being of child and family is expressed and demonstrated in verbal and nonverbal interactions.

Culturally Effective

- All efforts are made to ensure that the child or youth and family understand the results of the medical encounter and the care plan, including the provision of professional translators and interpreters, as needed.
- Written materials are provided in the family's primary language.

support, transitional support across delivery settings, enhanced population stratification techniques, clinical information systems, and community resources.

Community Care physicians have selected and adopted evidence-based practice guidelines for asthma, diabetes, congestive heart failure, depression, and chronic obstructive pulmonary disease. The networks have integrated targeted case management initiatives to help physicians manage and care for the most frail and costly patients. Case managers are hired locally by the networks and work with primary care physicians and patients to implement care and disease management interventions. Community Care produces and distributes reports to physicians and practices that highlight their effectiveness in meeting performance measures and goals and offers tools to improve outcomes. In addition to these core initiatives, networks have piloted innovative programs that have been replicated across the state. Dr. Marian Earls in her commentary on the Assuring Better Child Health and Development (ABCD) project describes the power and innovation of one network driven pilot that was expanded and replicated across other networks.

The most significant achievement of the Community Care program is taking community-based medicine, a well-understood idea but one rarely implemented on a grand scale, and spreading it statewide. The principle is that by partnering with those who care for Medicaid recipients—community primary care physicians and other community providers—a state can build a provider-led system that uses best medical standards, care coordination, and other population management programs to improve patient care and outcomes. Community Care has greatly improved care for its targeted population and has produced significant savings that can be reinvested in health care. Improvements in care reach beyond the Medicaid population because standards of care adopted by physicians are applied to all patients, not just those in the Medicaid program. Community Care has demonstrated that if you engage those community providers who care for the patients and provide them with a system and support, community-based health care is effective in improving quality of care and helping preserve limited health care resources. In her commentary, Denise Levis Hewson discusses in more detail how the CCNC model increases the quality of health care.

Community Care has demonstrated quality improvement, cost savings, and phenomenal growth. Community Care physicians develop and agree upon measures of quality care and desired outcomes whether for local initiatives or statewide projects. The results are monitored and reported to networks and practices. Many networks have shown significant improvements in asthma care that have resulted in a 35% decrease in hospitalizations, a 55% increase in staging the severity of the disease, and 95% of those patients staged were on appropriate medications.[4] Quality performance measures for diabetes care also increased by 15%. These types of improvements in quality have also helped to drive cost savings. From July 1, 2003 through June 30, 2006, actuarial studies conducted by Mercer Government Human Services Consulting estimated that Community Care saved over $473 million, and statistically reliable cost comparisons have shown savings exceeding $100 million every year since 2003.[5] In this issue of the *Journal*, Alice Fortune-Greeley and Sandra Greene highlight additional information on the Community Care program evaluation.

The importance to North Carolina of having a statewide provider network in place cannot be overstated. Not only is the Community Care system achieving documented improvements in the quality, utilization, and cost-effectiveness of care for Medicaid enrollees, it also has given North Carolina a community-based infrastructure that can be used to tackle a range of problems. By providing a structure for community providers to work together, by providing the tools and supports for networks to design and develop programs, and by providing the resources to implement programs, North Carolina has created a system that, if nurtured, can continue to grow and respond to state and local health needs. Because of Community Care's success with improving the care and outcomes for women and children enrolled in the Medicaid program, the administration and legislature have turned to Community Care for help with other health priorities including:

- In 2004, the North Carolina General Assembly requested and provided funds for Community Care to extend its community-based model to aged, blind, and disabled recipients.
- As North Carolina moves toward a community-based mental health and substance abuse system, the administration requested in 2005 that Community Care work with the Division of Mental Health to develop community-based models that can address access and coordination issues and that can improve the ability of primary care physicians to care for mental health and substance abuse patients. Chris Collins explores the issue of behavioral health within the context of CCNC in her commentary in this issue of the *Journal*.
- In 2006, the Governor began work on a statewide public-private quality improvement initiative that will bring together the state's largest insurers (Blue Cross and Blue Shield, State Health Plan, and Medicaid) and providers (North Carolina Medical Society, Pediatric Society, North Carolina Academy of Family Physicians, and the UNC School of Medicine to name a few) to work collaboratively to develop and implement a common set of best medical quality standards and measures for five diseases and/or conditions (asthma, diabetes, congestive heart failure, hypertension, and post myocardial infarction care). This initiative builds on the Community Care platform and utilizes existing resources, such as the North Carolina Area Health Education Centers (AHEC) system, as partners to provide practice improvement resources to individual practices.

The Community Care program has the potential to be replicated in other states and health care delivery systems. It has demonstrated capability to be effective in both urban and rural areas. The Community Care organizational system, which features strong provider buy-in and engagement, local community leadership and ownership, and organizational collaboration with multiple agencies involved in caring for the target population, has created synergy for change in the local health care delivery systems. The Community Care infrastructure enabled the networks to apply for a 646 waiver to serve the Medicare population as described in more detail by Torlen Wade's commentary on the Medicare Health Care Quality Demonstration Program.

On a large scale, North Carolina's program can serve as an enhanced medical home model where an enhanced primary care case management system can be a catalyst and vehicle for basic health care system redesign. On a smaller scale, there are processes within our program that can be replicated and expanded to other systems of care, such as:

- The approach of developing regional provider networks able to support and enhance the medical home model.
- The private-public partnership where the community providers are able and willing to assume responsibility and accountability for a target population and/or initiative.
- The successful management of the program allows for reinvestment of savings into the community.
- The manner of partnering with local physicians "in the field" to develop and implement quality improvement strategies.
- The community-based approaches to care and disease management and quality improvement.
- The state and local partnership where initiatives, performance measures, and benchmarks are chosen collaboratively.

The Community Care program has demonstrated that a public/private partnership aimed at better managing the Medicaid population can successfully create a community-based infrastructure that not only supports primary care practices in managing chronic illness(es) but positively impacts the quality and efficiency of care being delivered to some of the most vulnerable residents in North Carolina. The program continues to demonstrate that the Medicaid agency, in concert with community providers, can be a catalyst to support a health care system that delivers high quality patient-centered care in a cost-effective manner. During these tough fiscal times when the Medicaid budget draws a lot of attention, it is important for local communities to take responsibility for better managing their patient population and to be part of the solution. The Community Care networks, with strong local physician leadership and community partnerships, have continued to explore new opportunities to achieve these goals and have risen to the challenge of demonstrating improvement in both the quality and cost of health care. **NCMJ**

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Moving Forward with the Medical Home:

Evidence, Expectations, and Insights from CCNC

C. Annette DuBard, MD, MPH

Abundant evidence suggests that the existing US health care system is not meeting the needs of the population. Half of Americans with diabetes do not receive recommended services; one-third of women for whom mammography would be recommended have not been screened; one in five children under the age of three have not received recommended immunizations.[1] Preventable hospitalizations for conditions like asthma, heart failure, and diabetes are more than twice as common among blacks compared to whites and among low-income Americans compared to the wealthy.[2] US per capita health care spending far exceeds that of other countries for care that is less equitable, less effective, less efficient, and less safe.[3-5] While policy proposals frequently emphasize the need to address high uninsurance rates, it is clear that universal health care coverage alone would not remedy these issues. Even among commercially insured individuals, over one in three receive inadequate management of acute depression, inadequate cholesterol management after an acute cardiovascular event, and inadequate blood pressure treatment.[6]

Aging of the population, rising prevalence of chronic disease, and advances in medical diagnosis and treatment have changed the face of medicine. The predominant model of primary care delivery today, however, differs little from the design of primary care offices five decades ago when brief, isolated physician visits were well-suited to meet the need for well care or acute care of episodic infectious disease and injury.[7] Now large numbers of patients are living for decades in the community with chronic medical conditions and/or chronic mental illness; conditions for which ongoing self-management support and care coordination are critical. Among Americans 65 and older, almost two-thirds have multiple chronic conditions.[8] On average, family physicians now manage more than three problems per patient encounter.[9,10] For a typical patient panel, it has been estimated that a primary care physician would need to spend 7.4 hours per working day to provide all recommended preventive services, plus 10.6 hours per day to provide high quality care for chronic conditions.[11,12] There is simply not enough time in the day. Medicare patients see a median of two primary care physicians and five specialists, among four different practice locations, over the course of a year,[13] and the typical primary care physician must coordinate care with 229 other physicians working in 117 practices.[14] Widespread failures in the coordination of care among multiple providers and across care settings are well documented.[15-17] Payment mechanisms, primary care office systems, and communication mechanisms between providers and patients, and among providers across care settings, have largely failed to adapt to the changing needs of the population. Increasingly it is argued that improving the health of the population will require nothing less than a structural transformation of our health care delivery system.

> ***…CCNC has transformed the relationship between the North Carolina Medicaid agency and North Carolina's primary care provider community from that of a traditional gatekeeper model to a thriving network of public-private partnerships…***

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Is the Medical Home the Cure to What Ails Us?

The term "medical home" first came into use by the American Academy of Pediatrics (AAP) in 1967 to refer to a central location for archiving a child's medical record.[18] In 2002, the AAP described additional operational characteristics of the medical home: accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective.[18] The American Academy of Family Physicians (AAFP) and the American College of Physicians (ACP) subsequently developed their own models for improving patient care. In 2007, these professional societies, along with the American Osteopathic Society, released the Joint Principles of the Patient-Centered Medical Home, which emphasize accessibility; continuity; care coordination across settings; comprehensive care that includes acute, chronic, preventive, and end-of-life care; physician-directed interdisciplinary team-based approaches with collective responsibility for ongoing care; measurement and continuous improvement of quality and safety; and use of information technology to support optimal patient care and communication.[19]

In these Joint Principles, payment system reform is considered a critical component of the patient-centered medical home. Current payment systems, particularly the fee-for-service arrangements that prevail in areas like North Carolina with little managed care penetration, reward greater volume but not better quality, and thus reinforce the status quo of fragmented, siloed care. Fee-for-service payments provide little incentive and no resources for providers to invest in improving chronic illness care and are insufficient to fund the implementation of core medical home components. Now a broad range of payers, including Medicare and Medicaid programs, United HealthCare, Aetna, and the Blue Cross Blue Shield Association, are piloting medical home initiatives.[20] Proposed mechanisms of financial support to the medical home include: 1) retaining fee for service payments for face-to-face services, while perhaps expanding reimbursable services to include email communication or telecommunication; 2) incorporating a monthly management fee for medical home services (proposed monthly payments range from $3.00 for lower-risk North Carolina Medicaid recipients to $100 in some Medicare demonstrations[21]); and 3) providing additional bonuses for reporting on performance goals.[22,23] In this era of escalating health care costs, payers are placing a high priority on budget neutrality for medical home demonstration programs.[24]

Desired Outcomes

Implementing the medical home model and assessing its effectiveness is complicated by the many outcomes anticipated by multiple stakeholders. Although definitions of the medical home continue to evolve, the core concept is a commitment on the part of a physician practice to organize and coordinate care across conditions, providers, and settings based on the comprehensive needs of the patient, in consultation with the patient and family. Patient, family, and provider satisfaction, then, might logically be considered core outcomes of interest, but they receive little emphasis in the current literature or political dialogue. Public health advocates ascribe broader goals to the medical home: practices are to assure access and improve quality of care for a defined population which should lead to improvements in population health indicators and the elimination of health care disparities. As deliberation about medical home implementation matures among administrators and policymakers, we hear of additional goals including reducing unnecessary health care utilization, preventing the need for expensive medical services, controlling health care costs, and generating savings or profits for payers. Embedded in the desire for cost savings for public payers like Medicaid is the goal of maintaining patient enrollment and provider payment rates by generating budgetary savings elsewhere. Professional societies endorse the medical home concept with yet additional goals in mind: redirecting resources into primary care so as to make primary care practices financially viable again and resuscitating interest in primary care among health professionals in training.

Evidence in Support of a Medical Home Model

Availability of and receipt of primary care are associated with better health outcomes and lower mortality in cross-national studies[25] and in US communities.[26,27] Patients with a continuous relationship with a personal care provider are more likely to receive recommended preventive services,[28,29] achieve better care outcomes,[30] and benefit from provider awareness of psychosocial problems impacting health.[31] Continuity is associated with fewer emergency room visits[29,32,33] and lower costs in general.[34,35] Greater availability of generalist physicians is associated with lesser likelihood of multiple specialist referrals and less overuse of diagnostic and therapeutic modalities.[36-38]

Evidence of effectiveness for each specific component of the medical home model is less consistent. Team-based models have produced good results for the focal disease in disease-specific initiatives but have been less successful with comorbidities.[22,25] In a national survey of primary care physicians, however, 87% thought that an interdisciplinary team improves quality of care.[39] The majority of evidence for the benefit of electronic medical records (EMRs) comes from four large institutions with internally-developed information systems, and most positive outcomes in the outpatient setting involve the use of computer-generated clinical reminders or registries,[40-42] features that are not available in many commercially marketed EMRs.[43] Evidence of the effectiveness of commercial EMRs in primary care practices is mixed, and research on the quality and cost-effectiveness of email communication with patients, e-referral systems, and e-prescribing is still in its infancy.[43,44] Two well-tested models have provided strong evidence that care coordination can reduce readmissions after a hospital discharge.[45,46] Programs that intensively educate patients in how to self-manage chronic conditions have also been shown to reduce hospitalizations.[47,48]

Will We Know It When We See It?

To date, there is no perfect litmus test for when a medical practice becomes a medical home, or yardstick for measuring the extent to which a practice has put desired processes in place. The National Committee for Quality Assurance (NCQA) has developed a tool currently used in medical home demonstration programs to recognize practices that implement medical home capabilities.[49] The tool has nine standards: access and communication, patient tracking and registry functions, care management, patient self-management support, electronic prescribing, test tracking, referral tracking, performance reporting and improvement, and advanced electronic communication. These nine standards are reflected in a total of 166 measures within 30 elements, using a complex scoring algorithm. The tool has received criticism for placing too great a weight on information technology (IT) (addressed by 77 of the 166 measures), setting standards that smaller practices will be challenged to implement, without clear evidence of the relative importance of these IT components in such settings. The tool also requires extensive documentation of adherence to condition-specific treatment guidelines, an approach that incentivizes achieving condition-specific benchmarks but does not capture a more fundamental goal of the medical home: comprehensiveness and coordination of care across a patient's complex set of health conditions and needs.[43] Thus, the relationship between scoring well under the NCQA system and better outcomes for patients is not firmly established.

Indeed, some of the most important aspects of a medical home are the most difficult to evaluate, such as promoting patient self-management skills, addressing health literacy and quality of life issues, providing linkages to community resources, and developing skilled and cohesive interdisciplinary care teams. Other more "measurable" aspects may be difficult for a primary care practice to address in isolation. As an example, we are finding that while 93% of CCNC-enrolled Medicaid recipients with heart failure have had a paid claim for echocardiogram, the result of that test cannot be found in the primary care provider's chart for approximately one in five. Communication among providers involved in a patient's care cannot be the sole responsibility of the medical home.

Will It Work?

Despite a groundswell of energy and resources devoted to developing the medical home model and developing a measure of its implementation, relatively little empirical evidence exists to guide the move from theory to practice. Evidence of successful implementation, particularly outside of integrated health care delivery systems, is sparse to date. In the most comprehensive evaluation to date of programs designed to improve care coordination for Medicare beneficiaries, the Medicare Coordinated Care Demonstration (MCCD) found that only two of the 12 largest programs had a statistically significant effect on hospital admissions, and no programs reduced overall expenditures. Effects on clinical quality of care were not consistent, and effects on health behaviors, functional status, and health-related quality of life were minimal or none.[50] Several features emerged as most influential on the effectiveness of care coordination: 1) targeting interventions to patients at substantial risk of hospitalization, but not necessarily those with the highest costs; 2) in-person contact between care coordinators and patients; 3) close interaction between care coordinators and primary care physicians; 4) access to timely information on hospital and emergency department admissions; 5) self-management coaching, particular around how to take medications properly; and 6) availability of social supports such as assistance with transportation and activities of daily living.[51,52] Lessons learned from the MCCD will likely inform requirements for Medicare's forthcoming Patient-Centered Medical Home Demonstration.

Insights from the Community Care of North Carolina Program

Community Care of North Carolina (CCNC) evolved before the term "medical home" gained widespread use but provides a powerful real-world example of the fundamental promise of the medical home: redirecting health care resources in a way that supports and enhances our primary care infrastructure can indeed improve quality of care while reducing costs. Through community activism and physician leadership over the span of two decades, CCNC has transformed the relationship between the North Carolina Medicaid agency and North Carolina's primary care provider community from that of a traditional gatekeeper model to a thriving network of public-private partnerships equipped to leverage community resources toward local solutions for quality and cost issues. The CCNC experience offers several insights pertinent to the national discussion around development, implementation, and evaluation of the medical home model:

1. ***Scope matters.*** CCNC has over 1,250 participating primary care practices, caring for over 800,000 Medicaid recipients. A modest improvement in quality of care (blood pressure or glycemic control, for example) or a small percentage decrease in hospital or emergency department utilization across the CCNC program carries a far greater population impact than a more localized or selective intervention with isolated successes of greater magnitude.
2. ***One size does not fit all.*** The needs and resources of a rural solo practitioner differ from those of a primary care group within an urban integrated care system. Variability in practice infrastructure, motivation, resources, and readiness to change requires a flexible approach to quality improvement. The successful

movement of one practice from point A to point B is of as great a significance as another practice moving from point C to point D; no single threshold metric of "medical home capacity" can adequately capture those relative successes.

3. ***Small practices need not be left behind.*** Practices with five or fewer physicians constitute 95% of office-based medical practices in the US,[53] and the vast majority of North Carolina Medicaid recipients are seen in smaller practices. Many such practices lack the economies of scale to facilitate purchasing and maintaining core aspects of the medical home model. This is true not only for costly equipment such as electronic records and interoperable information systems, but also for employment of the full scope of medical home services (such as nutrition, social work, transportation, clinical pharmacy, behavioral health, and care coordination). Networking independent practices at the community level allows for the development of a shared care management infrastructure.
4. ***Flexibility complicates evaluation but may be necessary to optimize effectiveness.*** An intervention effect attributable to the CCNC program, or any other medical home initiative, cannot be easily isolated from key constituent factors, whose variability cannot be controlled in the real world. To name a few: the availability, commitment, and talents of local champions; fiscal and staffing stability of participating practices; accessibility and engagement of participating patients; availability of external resources and external data sources; strength of pre-existing interorganizational relationships; and symbiosis with concurrent initiatives with overlapping content. A tremendously successful intervention in one locality may readily fail elsewhere. CCNC has learned, then, the futility of being centrally prescriptive about specific intervention components. Standardization desirable for program evaluation and accountability must frequently be balanced by this need for flexibility in program design.
5. ***Evaluation is part of the intervention, and access to information is key.*** Data informs every phase of the continuous quality improvement process. The reporting of process and outcome measures identifies problem areas, motivates participants, and focuses further activity. Accurate, timely information is critical for efficient identification of patients in need of specific services and for optimal communication among all members of a patient's care team. Many successful CCNC initiatives have been able to fill information voids across care settings, by bridging information available from administrative and pharmacy data, hospitals, primary care providers, specialists, community service providers, patients, and their caregivers; and then developing mechanisms to get that information into the right hands at the right time to improve patient care. Optimizing the efficient communication of patient care information in the context of the local service area and customizing care management processes to make best use of locally available data is an ongoing effort.
6. ***Remember the long-term view.*** Cost savings have been achievable in a number of key CCNC program areas, such as emergency department and hospital utilization and pharmacy management. Those who work directly with patients, however, recognize many other critical areas in need of quality improvement that should not be expected to generate short-term cost savings. Childhood obesity, chronic pain management, depression screening, adult preventive services, and cardiovascular risk assessment are a few of many examples of local quality improvement initiatives that CCNC networks have been able to pursue at the request of participating providers for which the time horizon to payoff is much longer than the state fiscal year. A financing structure that allows local flexibility in applying resources to initiatives with both short-term and long-term benefits is critical for full engagement of the medical home.

What Is Needed to Improve the Effectiveness of the Medical Home?

Though consensus is growing that the US health care system is broken, and interest is building in the medical home model as a potential solution, many questions have yet to be answered. What is the right investment in the medical home? What is the most effective payment structure to deliver that investment? What is the critical mass of participating payer mix to motivate systematic changes in practices, and what is the responsibility of other payers to buy in? Who is responsible for financing practice redesign efforts that benefit the uninsured? How do we incentivize hospitals, specialists, mental health providers, pharmacies, and community service providers to develop optimal communication patterns with the medical home? Will the lessons learned from the early adapters who participate in demonstration programs convey accurately to the remaining majority of primary care practices? What's the right period of follow-up to assess effectiveness? What weight is to be given to outcomes of cost, quality, and provider and patient satisfaction? How strictly should specified medical home standards be enforced without stronger evidence of their relevance and with the risk of further marginalizing the small practices who serve the majority of the patient population?

For primary care practices and partnering entities charged with implementation of the medical home model, still other critical questions remain. How do we move past the condition-specific disease management programs, which have been the focus of quality improvement efforts to date, toward a more comprehensive, generalist, evidence-based approach for patients with multiple complex chronic conditions? What are the key elements of practice redesign and information systems for a primary care setting to facilitate the best care of the typical patient population with a full array of acute, preventive, and chronic health care needs? How do we efficiently identify patients who are most likely to benefit from targeted case management intervention or other medical home services? What mix of nurse-oriented interventions and social supports is most effective? What is the optimal staffing pattern for a primary care practice, and what are our workforce training needs to populate truly effective interdisciplinary health care teams in the medical home?

Finally, expectations must be realistic. Less than 3% of state Medicaid spending is spent in the primary care setting, but the state has looked to CCNC for progressively greater savings every year since 2000. Discussions among payers about funding for the medical home have typically started with the premise that any new payments for the medical home must be offset by cost savings, with little acknowledgement of the gross underfunding that has been crippling our primary care infrastructure for decades. In contrast, new developments in medical technology or pharmaceuticals are often reimbursed at much greater expense than prior care, with little scrutiny as to incremental effectiveness. When advances in medical technology do receive scrutiny, treatments that improve the quality or longevity of patient lives are not expected to cost less but rather are considered worth paying for.

Our current US health care system is failing to meet the primary and preventive care needs of the population, and the risk of doing nothing is great. The medical home concept is attractive, even compelling, but earnest efforts to delineate, measure, and price medical home services based on evidence of effectiveness may be premature. In the pursuit of high quality, comprehensive, patient-centered care, cost savings and even budget neutrality may be unrealistic short-term expectations. Adequate investment must be made in research and development of medical home elements, systems, and structures. As the CCNC experience teaches, moving from theory to application will require flexibility, not conformity; adaptation rather than strict adherence to a prescribed model. **NCMJ**

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Building Primary Care Medical Homes within the Community Care of North Carolina Program

Charles F. Willson, MD

Community Care of North Carolina (CCNC) is receiving much-deserved attention as our nation struggles to find a higher quality, affordable model for health care. CCNC is a statewide partnership between primary care physicians and the North Carolina Medicaid program that strives to deliver the right care at the right place in the most cost-effective manner. At the heart of the success of CCNC is the primary care medical home.

The medical home concept was first articulated by pediatricians in the late 1960s as a way to centralize health care information about a child and thereby have the ability to coordinate and direct care as needed.[1] Within CCNC, the model has worked best for pediatrics. Most children are well most of the time and need care for acute illnesses and preventive care such as immunizations, developmental screening, and anticipatory guidance. In fact, about 70% of North Carolina Medicaid patients are children. A model that blends fee-for-service at an adequate rate with a small monthly management fee works well for practices that have large numbers of patients who are mostly well. For practices with mostly complex patients, the management fee would need to be considerably larger than the $3.00 per member per month (pmpm) fee of CCNC. Acknowledging that chronically ill patients will need more intensive care management, CCNC has recently increased the pmpm fee to $5.00 for the aged, blind, and disabled patients within a practice.

The basis for the medical home is a continuous healing relationship.

Carolina Access: Basic Medical Homes

The partnership that became CCNC started as Carolina Access in the early 1990s when the cost of North Carolina Medicaid was increasing at double-digit inflationary growth every year. In order to continue to see Medicaid patients and to recruit new practices to take Medicaid patients, pediatricians needed improved reimbursement. The director of North Carolina Medicaid realized that the fastest growing costs were related to patients using the local emergency department for routine illnesses. She agreed to increase reimbursement to primary care doctors if they would agree to be on-call for their Medicaid patients around the clock. She also agreed to significantly increase reimbursement for preventive services and to provide a monthly incentive payment ($2.50 pmpm) to encourage more practices to open their doors to more Medicaid patients.

The result was a 10% decrease in emergency room use and decreased hospitalizations due, in part, to the fact that practices could be identified to follow-up on their patients. At this point, over 95% of pediatric practices in North Carolina signed on. While the phone calls from the emergency room late at night were occasionally irritating, we physicians were gratified to see that our North Carolina Medicaid patients were willing to work with us as a medical home. In fact, in the early writings on the medical home, Sia and colleagues[2] had proposed just such a partnership between pediatricians and their patients. The physicians would provide:

1. A commitment to the individual.
2. Primary care services.
3. Full time accessibility.
4. Service continuity.
5. Comprehensive record keeping.

In return, the parents/patients would agree to:

1. Continued acceptance and contact.
2. Conformance with the recommendations of prevention and promotion.
3. Adequate information flow.
4. Compliance with administrative requirements.

In my own practice, when I would discuss a recent unnecessary emergency room visit with a parent, the parent was usually

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grateful that I wanted to be there when they needed me (preferably not in the emergency room). As the largest pediatric practice in Greenville, North Carolina, a university town and regional commercial hub in the eastern part of the state, we had office hours on Saturdays and Sundays and would often meet patients at our office after hours at night and on holidays. In my opinion, availability is the most important characteristic of a primary care medical home.

As I read *Crossing the Quality Chasm*,[3] I was struck by the congruency of our medical home concept with the desired characteristics of the health care system of the future as envisioned by the National Institute of Health (NIH), notably that:

1. Care is based on continuous healing relationships.
2. Care is customized according to patient needs and values.
3. The patient is the source of control.
4. Knowledge is shared and information flows freely.
5. Decision-making is evidence-based.
6. Safety is a system priority.
7. Transparency is necessary.
8. Needs are anticipated.
9. Waste is continuously decreased.
10. Cooperation among clinicians is a priority.

The National Committee on Quality Assurance (NCQA)[4] has tried to define what the medical home of the future will look like. They have proposed a grading system on such functionalities as:

1. Access and communication
2. Patient tracking and registry functions
3. Care management
4. Patient self-management
5. Electronic prescribing
6. Test tracking
7. Referral tracking
8. Performance reporting and improvement
9. Advanced electronic communications

While these are all characteristics that have the potential to improve the effectiveness and safety of the care that physicians deliver, few practices in North Carolina can meet all the requirements at this time. The development of a primary care medical home has been an evolutionary process within CCNC. At this time, the stakes are high. Governmental and even private payers are offering to substantially increase reimbursement for documentation of improved quality.

Carolina Access II and III: Enhancing the Primary Care Medical Home

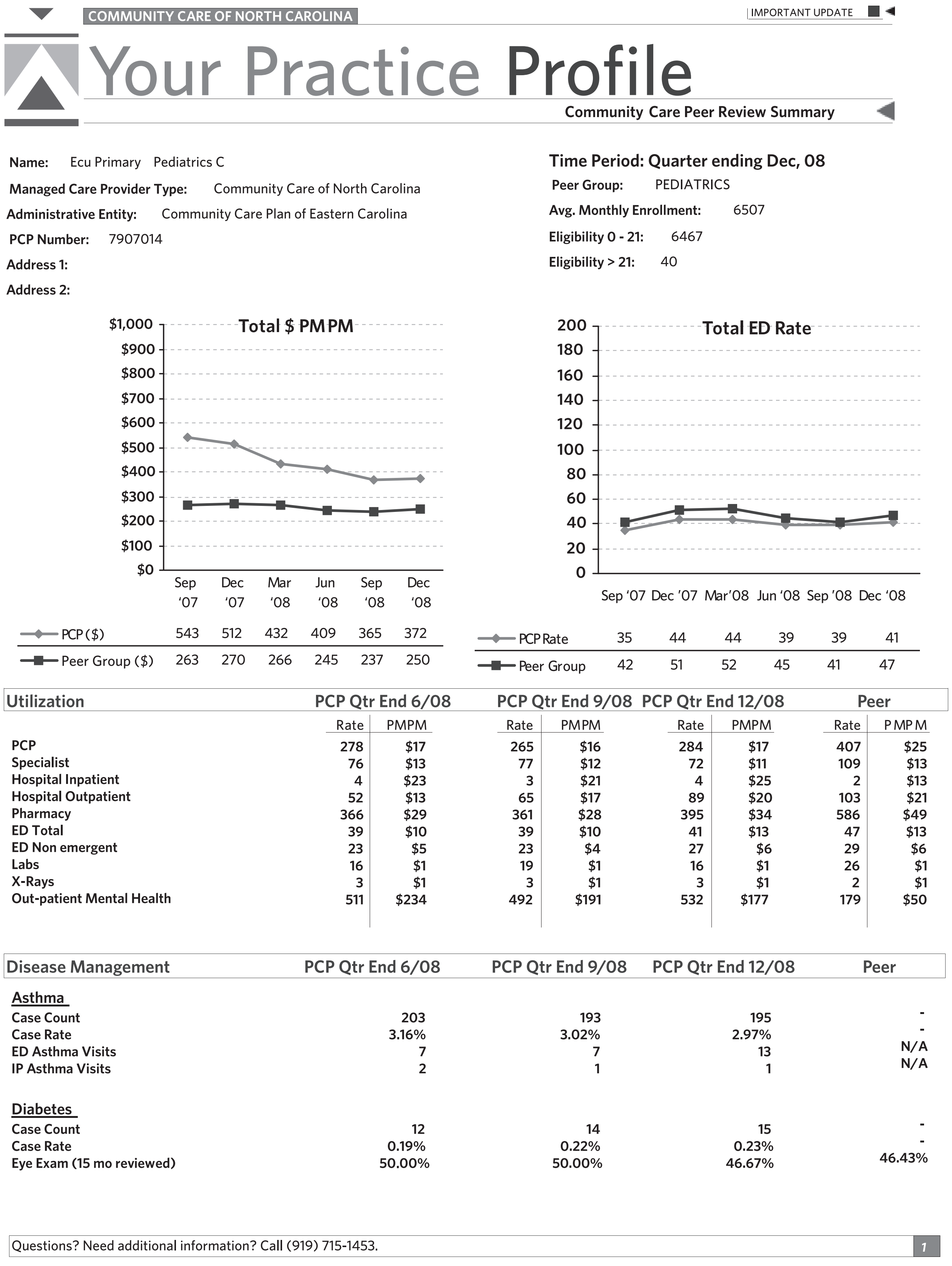
By requiring that primary care practices had around the clock availability, Carolina Access had established medical homes for children on Medicaid. The question then became, how do we assure that a patient received high quality care at the medical home? And, once the patient left the office, how could we track and improve patient compliance with the care plan? Carolina Access II/III provided evidence-based disease management tools for complex patients, and case managers contacted and even visited the patient as needed before or after the visit. The difference between Access II and Access III was that Access III embraced all the Medicaid patients within a county while Access II was more practice-specific. As pilots expanded to more counties, networks were formed, often reflecting tertiary care referral patterns. The medical home could now reach beyond its walls and better meet the needs of the more complex patients.

Another critical asset to enhance the medical home was the practice-specific profile. For the first time, I could compare the Medicaid utilization data from my practice with other similar practices across the state. In my role as medical director for a network, I noticed something remarkable as we presented these practice profiles to outlier practices. Despite complaining that their patients were sicker, more complex, and more likely to be non-compliant than patients in the comparison practices, these doctors over time would address excessive utilization and bring their data more in line with their peers. We physicians are a proud group of high achievers who aren't accustomed to being at the bottom of a peer group. Figure 1 shows a recent profile for a practice in my network (with permission from the practice).

As I explained to the practices, we are concerned about total costs per enrollee per month as well as ED use rates. We drill down on total costs by looking at 10 utilization parameters. Higher costs in the primary care provider (PCP) and specialist categories often parallel decreased ED utilization (especially non-emergent ED). That is the primary care medical home at work—seeing patients and making appropriate referrals. Practices with higher ED utilization often have higher lab and x-ray costs associated with those ED visits. Pharmacy costs often reflect the use of brand name versus generic drugs. While listed, mental health costs are mostly out of the control of the primary care medical home, especially since local mental health services were privatized. In Figure 1, the latest profile for my practice, the increased cost pmpm can be explained by the high costs of community support services for mental health patients. As the state audited some of these providers, you can see the decrease of costs for mental health services. We are proud of our use of generic medications where appropriate, resulting in decreased pharmacy costs for our practice. The after-hours pediatric clinic effect is seen in lower ED costs than our peers. The lesson learned: once armed with credible data, medical homes can bring efficiencies in care without sacrificing quality.

Access II/III was based at the community level, and innovation based on local needs was encouraged. In Greenville, as noted above, the pediatricians banded together to form a community after-hours clinic from 6:00-10:00 pm each evening to decrease non-emergent ED use and, frankly, to make our call nights easier for the practices. Initially, the medical school pediatric practice declined to participate. However, when it was pointed out that ECU pediatrics had four times the ED utilization rate

Figure 1.
A Pediatric Practice Profile



COMMUNITY CARE OF NORTH CAROLINA

IMPORTANT UPDATE

Your Practice Profile

Community Care Peer Review Summary

Name: Ecu Primary Pediatrics C
Managed Care Provider Type: Community Care of North Carolina
Administrative Entity: Community Care Plan of Eastern Carolina
PCP Number: 7907014
Address 1:
Address 2:

Time Period: Quarter ending Dec, 08
Peer Group: PEDIATRICS
Avg. Monthly Enrollment: 6507
Eligibility 0 - 21: 6467
Eligibility > 21: 40

Total $ PMPM

	Sep '07	Dec '07	Mar '08	Jun '08	Sep '08	Dec '08
PCP ($)	543	512	432	409	365	372
Peer Group ($)	263	270	266	245	237	250

Total ED Rate

	Sep '07	Dec '07	Mar'08	Jun '08	Sep '08	Dec '08
PCP Rate	35	44	44	39	39	41
Peer Group	42	51	52	45	41	47

Utilization	PCP Qtr End 6/08		PCP Qtr End 9/08		PCP Qtr End 12/08		Peer	
	Rate	PMPM	Rate	PMPM	Rate	PMPM	Rate	PMPM
PCP	278	$17	265	$16	284	$17	407	$25
Specialist	76	$13	77	$12	72	$11	109	$13
Hospital Inpatient	4	$23	3	$21	4	$25	2	$13
Hospital Outpatient	52	$13	65	$17	89	$20	103	$21
Pharmacy	366	$29	361	$28	395	$34	586	$49
ED Total	39	$10	39	$10	41	$13	47	$13
ED Non emergent	23	$5	23	$4	27	$6	29	$6
Labs	16	$1	19	$1	16	$1	26	$1
X-Rays	3	$1	3	$1	3	$1	2	$1
Out-patient Mental Health	511	$234	492	$191	532	$177	179	$50

Disease Management	PCP Qtr End 6/08	PCP Qtr End 9/08	PCP Qtr End 12/08	Peer
Asthma				
Case Count	203	193	195	-
Case Rate	3.16%	3.02%	2.97%	-
ED Asthma Visits	7	7	13	N/A
IP Asthma Visits	2	1	1	N/A
Diabetes				
Case Count	12	14	15	-
Case Rate	0.19%	0.22%	0.23%	-
Eye Exam (15 mo reviewed)	50.00%	50.00%	46.67%	46.43%

Questions? Need additional information? Call (919) 715-1453.

1

A Generalist's View of Community Care of North Carolina

Rueben N. Rivers, MD

Community Care of North Carolina (CCNC) and the ongoing efforts of the Division of Medical Assistance to provide for the citizens of North Carolina through the system that has evolved to date is the most practical and well thought-out public collaborative that I have been a party to in my almost 27 years of general internal medicine practice. The local, regional, and national acclaim it has received also bears testament to this fact.

The success of the statewide effort is due to the organization's understanding of the essential elements of a patient-centered system for delivering care. This fundamental understanding is what attracted me most to this effort. The limitations of small primary care practices are not a secret. The prohibition of cost makes it all but impossible for a small practice to hire a multidisciplinary team to include a quality improvement officer, practice case manager, social worker, mental health worker, pharmacist, information technology expert, and diversity coach.

CCNC recognized that health care is delivered where patients live and work and therefore focused on a model that could meet the needs of a patient-centered practice where the patient and the provider are in the community. With the collective will of the state legislature, the input of the providers of primary care, and a strong and responsive central office leadership team, I found an organization that was resourceful, resilient, innovative, and willing to extend itself to community providers. This support includes expertise and resources both technical and financial. Both are much needed.

CCNC's track record for improving quality along with both patient and provider satisfaction has been proven to me. Like so many of us in private practice, CCNC also wrestles with the fiscal constraints and realities encountered in the provision of health care in North Carolina. It has not, however, lost sight of the goal of very good, cost-effective, and value conscious health care. I will continue to participate and encourage others to do so as well.

Rueben N. Rivers, MD is a private practice physician in Fayetteville, NC at Cumberland Internal Medicine.

of the private practices, the medical school practice joined the night clinic and actually provided space and manpower for the expansion. In its first year, the after hours clinic led to a 17% decrease in pediatric emergency room utilization with a rough estimate of cost-savings to North Carolina Medicaid of $400,000 per year. In smaller towns with fewer pediatricians, this model will not be easy to replicate.

Telephone triage by trained nurses using evidence-based protocols also helped provide information to our parents when a child became sick or injured. Some networks financially supported these triage lines by funding a portion of the cost for the practice based on the numbers of North Carolina Medicaid patients in the practice.

Our network also looked at ancillary services for our Medicaid patients. North Carolina Medicaid requires that the primary care physician authorize these services, a task that we are not well prepared to do. Requests for payment for physical therapy, occupational therapy, and speech therapy were reviewed by a knowledgeable physician who recommended authorization or discontinuance to the pediatrician in the medical home. While we all felt this was a valuable service, the grant from the state funding this position was not renewed.

As pharmacy costs escalated, we developed a voluntary drug formulary called the prescription advantage list (PAL). For the first time, practicing physicians could know which drugs were more costly for their Medicaid patients. This was especially important for pediatric practices where there are no co-pays for prescriptions.

Carolina Access Becomes Community Care of North Carolina

In the year 2000, a new Governor and a new Secretary of North Carolina's Department of Health and Human Services arrived. By this time, internal audits of Carolina Access could show cost savings in the tens of millions of dollars. The new Secretary mandated that Carolina Access III become a statewide program, now called Community Care of North Carolina.

With CCNC, we realized that we have a truly unique asset in health care: a network of primary care medical homes statewide that can serve as a template for statewide innovation. We also have a strong partnership with our state leaders who are responsible for the North Carolina Medicaid program. The effectiveness of this partnership is exemplified by the over the counter (OTC) prescription program developed within a three month period of time when Prilosec and Claritin became available OTC. The doctor could now write a script for those OTC drugs for a Medicaid patient. Again, the state saved millions. We also exposed a weak link in our primary care based system; some specialists were not informed and continued to prescribe the more costly brand name products.

What about caring for children with special health care needs? These complex kids were a strong driver in the development of the pediatric medical home concept because of the fragmentation of care between PCPs and multiple specialists. A grant funded Improving Pediatric Access through Collaborative Care (IMPACC), a program that used two strategies to address these children's needs: 1) payment for telephone advice by the pediatric subspecialists; and 2) case managers based at the major pediatric medical centers to coordinate care with the child's primary care medical home. In Greenville, we have used these case managers in the development of the Center for Children with Complex and Chronic Conditions. By improving information flow between the pediatric specialist and the primary care medical home, we are improving the chances that a new illness or complication will be handled in the child's own community by the pediatric medical home rather than needing an emergent trip to the medical center. Each patient receives an updated care plan to carry with them to their many doctor visits. The payment for phone calls by the specialist has been shown to decrease the need for triage to the emergency room or a hospitalization at the medical center. An internal analysis of the program estimated that for every dollar spent on paying for the phone call, $40 are saved through decreased clinic visits and hospitalizations.[a]

What about quality improvement? Two years ago two CCNC networks were invited to participate in a grant from the Robert Wood Johnson Foundation in conjunction with the American Board of Medical Specialties. The Improving Performance in Practice (IPIP) grant looks at the care of chronically ill patients across all payers, leading to larger numbers with improved statistical significance. Physicians care for patients based on their medical needs and diagnoses, not based on payer type. Recognizing that practicing physicians of my generation were not taught how to implement and document quality improvement in their practices, IPIP provides a quality improvement consultant (QIC) to work with willing practices. These consultants analyze patient scheduling and work flow in the office, teach rapid cycle quality improvement techniques, and explain how to develop data registries that will generate reports on quality for payers. One participating physician claims that the scheduling advice alone increased his practice income significantly. Our AHECs (Area Health Education Centers) train and hire the QICs. With support from our previous governor, IPIP is now being extended statewide as the North Carolina Healthcare Quality Alliance. These quality improvement projects at the practice level will also help physicians acquire continuing education credits and maintenance of certification with their professional boards.

Discussion

Community Care of North Carolina is a group of networks of primary care medical homes that improve access to high quality care and bring cost savings to the North Carolina Medicaid program. In my opinion, improved access to care is the fundamental building block for a medical home. Physicians and staff must be there for our patients when they need us. In return, our patients must value our services.

Over time, the NIH vision for the future described above will become a reality. The basis for the medical home is a **continuous healing relationship.** As we get to know our patients, we can better **anticipate their needs** and **customize** our care to their **needs and values.** For the medical home to work, the patient must be **in control** and must want to utilize our services. Only by being available, can we **share our knowledge to facilitate optimum care.** The **free flow of information** must await better information technology, and enabling regulations which seem to be a priority of the Obama Administration. While we may say that our **decisions are evidence-based**, in truth, most of what we do everyday has not been thoroughly studied. The new movement toward comparative effectiveness research (CER) should be very helpful. Through CER we should also be able to better **eliminate waste** and **improve safety.** Our experience with the practice profiles has shown that physicians will accept more **transparency** if they trust the data. Finally, as the primary care medical home matures, I believe that our specialty colleagues will better appreciate our value and seek our help and **cooperation** in the care of our mutual patients.

Because Carolina Access and Community Care of North Carolina were designed and implemented as a platform for practical solutions to everyday medical care delivery problems, we cannot *prove* that the medical home concept has been responsible for our success. In fact, as Bodenheimer[5] points out, if Carolina Access and CCNC had been grant funded, they might not have lasted long enough to demonstrate their real value. However we now have over 12 years of experience with few complaints from patients (or physicians) and year after year of documented cost savings.

In a health care environment focused on decreasing costs, the medical home concept with its increased case management payment has many skeptics. Some physician leaders, mostly specialists, point out that the value of the primary care medical home has not been proven. They often point to anecdotal experiences where the primary care practice has dropped the ball or referred a patient unnecessarily. There is fear that the medical home is just another name for a "gatekeeper" that will decrease appropriate referrals. In fact, within CCNC, we believe that an appropriate referral to a specialist often facilitates the best care and have never discouraged such referrals. Indeed, for certain patients with complex medical issues, a specialty practice may be the best place for the medical home.

This is truly a critical time for primary care in America. With stagnant reimbursement from Medicaid and Medicare for the past eight years, it's not surprising that some of our practices have few resources to invest in technology and are struggling to meet the standards of the medical home. The potential for improved reimbursement and systems development will help the primary care practices of the future develop the functionalities envisioned by the NCQA.

Challenges for the future of the primary care medical home concept include financial viability, where payment does

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[a] Steven Wegner MD, president AccessCare Inc. Personal communication.

not cover the expanded functions needed (especially for the Aged, Blind, and Disabled category of Medicaid), increasing medical school debt load causing students to enter more lucrative medical fields leaving too few primary care physicians, and the hospitalist movement that removes the primary care physician from the picture during a patient's most important medical crises, including end-of-life care. All of these issues will have solutions if health care leaders and policymakers understand the value primary care medical homes may provide from cradle to grave.

Our experience with Community Care of North Carolina provides strong evidence that the medical home concept should be a major part of the health care system of the future. As a patient, a parent, and a grandparent, I would like to leave the legacy of a health care system where every patient has a primary care medical home to turn to for routine and complex issues. While the cost savings are impressive, we at CCNC believe that even more important is the improved quality of care and patient (and physician) satisfaction of a true medical home. **NCMJ**

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Health Reform: An Invitation to Contribute to the Discussion

The run up to the November election brought a lot of attention to health reform. Both major candidates presented relatively complete plans for major changes in the way we pay for health care and how we structure our health care delivery system. The appointments by President Obama point to a sustained effort to implement real change. This has prompted many experts and representatives of patients, providers, and payers to propose their own plans for reform. The *North Carolina Medical Journal* will be taking a part in this discussion with a section of the *Journal* devoted to articles and analyses that focus on reform. We would like to invite submissions that help the readership of the *Journal* understand why reform may be necessary, how the system should be changed, and how national reform will affect North Carolina. We invite scholarly discussions and analyses as well as commentaries that help illustrate the benefits as well as the problems that comprehensive change will bring to the costs, quality, and outcomes of health care and to the health of the people of North Carolina. The third installment of this new series starts on page 213 of this issue of the *Journal*.

North Carolina
MEDICAL JOURNAL

The Role of Community Care in Improving the Quality of Care

Denise Levis Hewson, RN, BSN, MSPH

The Community Care of North Carolina program has built community health networks that are organized and operated to support primary care providers and the medical home. Since its inception in 1998, Community Care has been marketed as a quality improvement program intended to improve the quality of care to all enrolled Medicaid recipients. One prominent physician leader arguing for the expansion of the original CCNC concept would often say: "quality health care will cost less." Community Care has developed quality improvement and care management initiatives that have been able to achieve both quality and cost objectives. The CCNC program follows a simple process: assess the needs and severity of the enrolled population in order to target care and disease management initiatives where they are most beneficial. In identifying core initiatives, the physicians look at quality and utilization data and take the lead in choosing quality and care management initiatives where there are opportunities for improving health processes and outcomes. They then help define the performance measures they are expected to achieve. This approach is key to obtaining local physician input and buy-in, and in spreading the initiative to peers.

Each network has at least one designated clinical director who takes the lead in championing quality improvement (QI) initiatives throughout their network. Over the past 10 years, the clinical directors have met regularly to review and assess meaningful data and information about their enrolled population, to share best practices, and to collectively choose initiatives, performance measures, and goals. An example: in August of 2008, nine clinical directors from the first nine pilot networks met with Community Care leadership and reviewed utilization data on their enrolled Medicaid population. They quickly chose asthma as the first disease management initiative since it was the number one reason for hospital admissions and emergency department visit. Each network has regular medical management committee meetings that are chaired by their clinical director, with clinical representation from participating practices. In networks that cover a large geographic area, the clinical directors may choose different strategies to engage their community providers and in some instances this may require going to all the practices for face-to-face time with participating physicians. These local meetings provide a forum to obtain provider input and buy-in and to implement a process for spreading quality improvement initiatives to all participating practices. Both the clinical director's meetings and the local medical management committee meetings serve as catalysts for this model of improvement.

> **The CCNC program follows a simple process: assess the needs and severity of the enrolled population in order to target care and disease management initiatives where they are most beneficial.**

The flow chart in Figure 1 depicts the clinical directors group at the top where they are responsible for selecting initiatives, determining the needed program components, and defining the performance measures.

Community Care's clinical directors have established the following guiding principles in selecting a quality improvement initiative:

- There are enough Medicaid enrollees with a disease to obtain a "return on investment."
- Evidence exists that best practices lead to predictable and improved outcomes.
- Appropriate evidence-based practice guidelines are available.
- Physicians will support the process.
- Patient education and support can improve outcomes.

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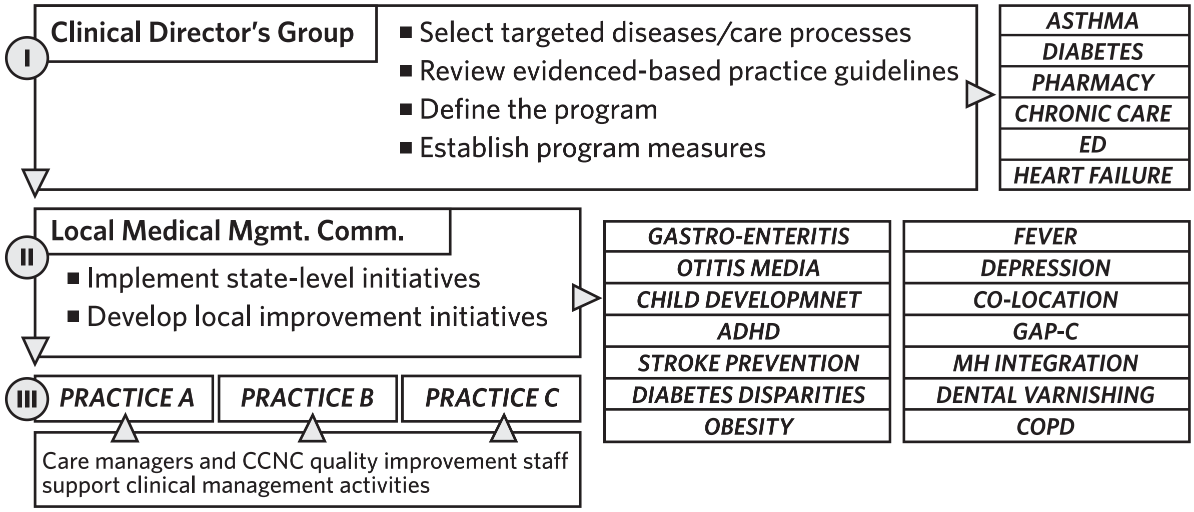
Figure 1.
Managing Clinical Care



- Best practices and outcomes are measurable, reliable, and relevant.
- Evidence exists that the quality measures themselves improve care.
- There is room for improvement—a gap exists between best practice and everyday practice.
- Baselines for need and performance can be measured and improvement can be measured longitudinally.

Each network designates clinical champions and QI team leaders to employ the model of rapid cycle quality improvement developed by the Institute for Healthcare Improvement (IHI).[1] This model stresses setting aims, establishing measures, and making system changes that remove barriers and support excellent care. The networks have joined together to do the following:

- Review initial data obtained from claims and chart audits.
- Choose disease management initiatives.
- Develop program expectations.
- Define goals, objectives, and performance measures.
- Identify methods of information collection.
- Create plans for implementation, assessment, and monitoring.
- Share best practices.
- Develop and implement an evaluation strategy for the initiative.

Community Care is designed to support the development of community care systems that can develop programs and processes to manage the care of an enrolled population. The local systems include, but are not limited to, enrollees linked to medical homes, medical and administrative committees that provide direction on care management activities, dedicated case managers to carry out population management activities in care and disease management, and coordination and collaboration with community resources. The Community Care model aims to integrate the most important elements from the various patient-centered medical home models, including the community-based features in Wagner's chronic care model.

Community Care has the following disease and care management initiatives in place in every network: asthma, diabetes, and congestive heart failure disease management; high cost and high risk care management; pharmacy management and prescribing initiatives; emergency room utilization; and transitional support and chronic care (managing the comorbid aged, blind, and disabled population). In addition, pilots are underway in several networks to create models of care relevant to the population that can be replicated and spread to other networks. Some of these pilots include, but are not limited to, chronic obstructive pulmonary disease (COPD), mental health integration/co-location, childhood obesity, stroke prevention, diabetes disparities, and depression. The value of networks taking the lead in pilot initiatives cannot be overstated. Local networks are able to understand the needs of their community and their patient population. When possible, grant funds are sought to support pilot initiatives and, as the network is developing and implementing new programs, they are sharing their processes and results with all network leadership. Several initiatives that have begun as pilots are spreading statewide. One such example is the Assuring Better Childhood Development (ABCD) program that began in one network with one clinical champion. It has since spread to almost every network in the program and has been recognized as a national child development model. There is value in one or two networks determining the best strategies to have a positive impact on the target population and then the model being spread to other networks. All the tools, processes, best practices, and lessons learned assist other networks desiring to adopt these pilot initiatives.

Community Care provides centralized support to the networks and the medical homes by providing the following:

- Clinical expertise and leadership to meet with physicians and practices on targeted QI initiatives. Clinical staff is available to go on-site and meet with physicians, practices, and staff to provide targeted education and technical assistance.
- Provider tool kits are created that summarize best practice guidelines and provide office-based tools for adoption and customization.
- Quarterly practice profiles on utilization, cost, and quality metrics are created and disseminated to all participating practices.
- A web-based case management information system that supports the case manager's effort and contains useful tools, such as uniform screenings and assessments.
- Provider and patient education materials that can be printed and customized for individual practices, such as a medical home brochure with the practice name and contact information.
- Population stratification and gaps in care reports.

Community Care uses the performance measures defined by the clinical directors to measure the ability of providers and networks to achieve quality outcomes and processes. The outcome indicators are typically gathered by claims data and the process indicators are gathered by external chart reviews. Community Care has partnered and contracted with Area Health Education Centers (AHECs) to perform randomized chart audits that provide practice-specific feedback and monitoring on process measures, such as performing annual foot exams, lipid management, and HbA1c (glycemic) control for patients with diabetes. A standardized chart audit tool is developed and a random representative sample of charts is identified for review at every medical home. These reviews are collated by AHEC and returned to Community Care's central office where they are distributed and made available to the networks through the Case Management Information System (CMIS). Having this information on CMIS enables networks and care managers to identify patients needing follow-up. For example, they will want to perform outreach and schedule appointments for their patients with diabetes who have not received an annual eye exam. The care managers can proactively identify "gaps in care" and initiate efforts to promote best practice in concert with the medical home.

A critical element to Community Care's success centers on the ability of the networks to locally implement system changes needed at the physician practices. The network clinical directors are instrumental in engaging community providers to implement the quality initiatives. Providing credible and provider-friendly reports of clinical outcomes are powerful tools, particularly when accompanied with benchmarks and comparisons to peers, helping to motivate providers to improve processes that will enable them to provide best care. The focus is on implementing evidence-based best practices in the medical home.

Currently Community Care uses information obtained from claims, electronic records, and chart reviews to establish baselines and to measure performance. Initial measurements are obtained prior to intervention to serve as the baseline from which to measure improvement. Chart reviews are conducted based on randomized representative samples. The results are broken down by individual practice, by network, and by Community Care as a whole. Practices are compared with like practices such as pediatrics, family practice, and multi-specialty. These summary reports are further broken down by age, utilization of services and cost of services (per member per month cost). In addition, Community Care provides each network with reports that help identify their enrolled Medicaid population (identification and stratification) that might benefit from targeted disease and care management interventions.

As Community Care of North Carolina has gained state and national recognition in its ability to improve quality, utilization, and access, and reduce cost, many leaders from other states and organizations have inquired about our methodology and our ability to engage primary care providers in this effort. Here are some of the lessons learned that we share with other states and programs:

- Community collaboration and local physician leadership is paramount to our model.
- Building a program that places the medical home and the patient's primary care provider in the center of the model is very important. This strong linkage with the medical home is key to our program's success.
- When primary care physicians are invited to partner and participate in identifying, developing, and implementing initiatives, they take that responsibility seriously and are willing to be held accountable to achieve outcomes.
- It is important to invite the primary care physicians to participate early in the process and best to include them in the development phase. The clinical directors can then work with their community physicians, even the late adopters, to implement best practices.
- Solutions to health access and quality issues are local and, if they are led by local clinical champions, the peer pressure is meaningful and will resonate with other community providers.
- Initiatives should be chosen that can demonstrate quality improvement and impact costs.
- Take the time to build confidence at the provider level in the data and reporting processes—build meaningful and provider-friendly reports.
- The primary care physician leaders are your program's best "ambassadors."

- Align with other provider and quality initiatives in the state.
- Recognize that primary care providers need help with some of the barriers in caring for the Medicaid population—such as connecting to local resources, working with the patient and family on social issues, and providing pharmacy support.
- Strength and encouragement is gained when the clinical directors come together and share best practices, strategies, and tools.

Community Care's approach to quality care helps support two emerging trends—the growing shortage of primary care providers and the increasing prevalence of chronic diseases. The community-based infrastructure, led by physicians in concert with other key community agencies, will enable North Carolina to implement and disseminate patient-centered care that is culturally appropriate and sensitive to the capacity of the patient's ability to accept and understand how to care for themselves as well as to navigate the care systems the medical home promotes. As a Medicaid program, CCNC is intended to improve the quality and lower the cost of health care for our most vulnerable citizens; but it is also meant to spread and influence the care of all the people in the state through its practitioners, most of whom care for people with other means to pay or the uninsured. **NCMJ**

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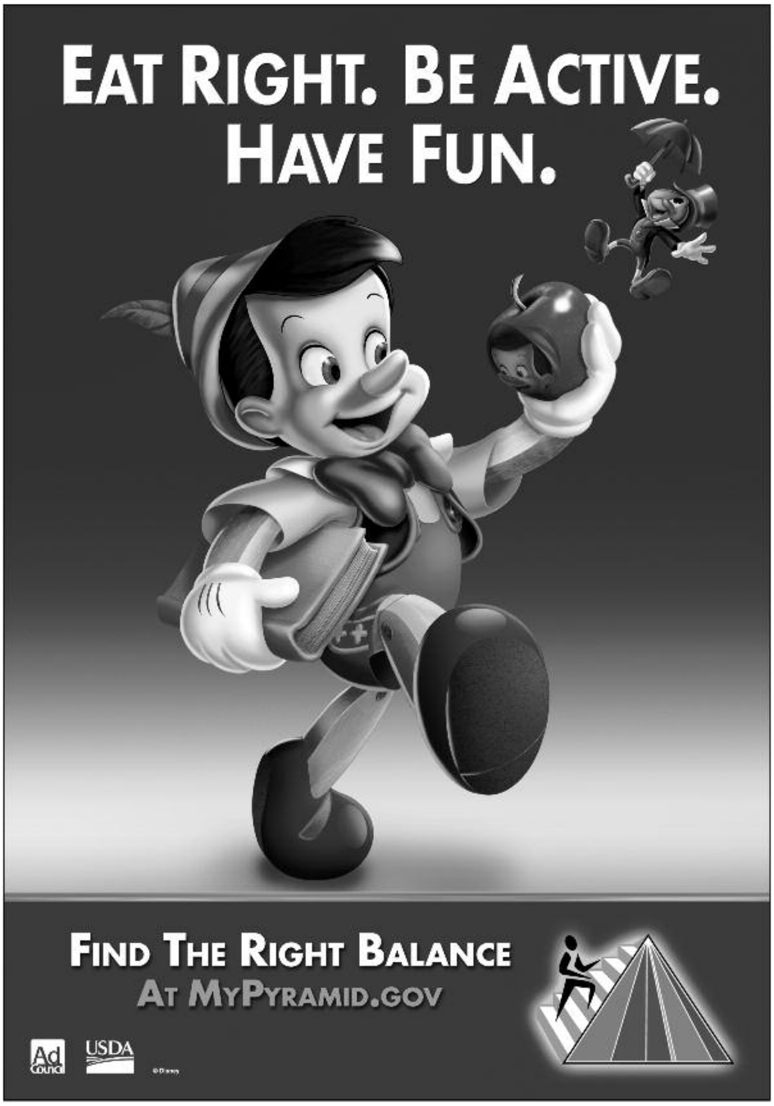

One Size Does Not Fit All:
Tailoring Case Management to a Community

Elizabeth St. Martin, RN, BSN; Lori Harris-Stevens, RN, MHA

The success and pride of the Community Care of North Carolina (CCNC) program is each unique network aligning the community needs of its Medicaid enrollees with resources within its own network. CCNC's community-based, patient-centered form of care coordination with the patient's "medical home" or primary care practitioner has led to estimated cost savings of $284-$318 million in fiscal year 2006 and is continuing to demonstrate cost containment while integrating quality initiatives.[1]

However, what happens when the needs and resources within the same network differ? What if case management and approach to medical home/care coordination with primary care practices is not a "one-size-fits-all" approach within the same network? This is the case with our network, Community Care Partners of Greater Mecklenburg (CCPGM). Comprised of Mecklenburg, Union, and Anson Counties, with over 100,000 Carolina Access Medicaid and HealthChoice enrollees, CCPGM is one of the most populous Medicaid networks within the state. Serving urban, suburban, and rural communities, CCPGM's approach to case management and provider relations is as diversified as the demographics within the three counties we serve.

Mecklenburg County is one of the largest and fastest growing urban communities in the state of North Carolina, with a 24% growth in population from 2000 to 2007.[2] As in any large urban community, Mecklenburg County, home of "Queen City" Charlotte, is plagued by increases in crime, substance abuse issues, homelessness, an overburdened public school system, and an increase in unemployment. Although smaller in population, Charlotte is in essence an East Coast city challenged with the same urban issues as Baltimore, Philadelphia, and Washington, DC.

CCPGM implemented Medicaid case management in Mecklenburg County in 2002. Mecklenburg is one of 14 urban counties in the state of North Carolina. To this day, due to population size, Mecklenburg County demands the largest percentage of CCPGM's case management resources. Mecklenburg County has a multitude of community resources available to assist case managers and provider practices in coordinating the health care needs of Medicaid clients in many other major metropolitan area—large clinics/hospitals, medical specialists, public transportation, homeless shelters, and accessible substance abuse/mental health services. These are basic constructs to assist CCPGM in the day-to-day management and care coordination of our Medicaid patients in this urban setting. CCPGM's Medicaid Program, which focuses on nurse case management and provider quality, was new to Mecklenburg County in 2002; however, many of the larger provider practices in Mecklenburg County were associated with large health care systems and these practices were very familiar with quality initiatives and following national practice guidelines in asthma, diabetes, and heart failure—three of CCNC's statewide quality initiatives. The vast majority of Mecklenburg County practices were also very familiar with quality oversight from health insurers, including patient chart audits and practice profiles implemented by CCNC for the Carolina ACCESS Medicaid Program.

> **Serving urban, suburban, and rural communities, CCPGM's approach to case management and provider relations is as diversified as the demographics within the three counties we serve.**

As similar as Mecklenburg County is to many other urban centers, it is unique in that it borders mostly rural communities. Outside the county lines of Mecklenburg, Medicaid patients

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One Mother's Experience with CCNC

Lindsey E. Haynes

In 2001, Adrienne from Concord, North Carolina, was introduced to Community Care of North Carolina (CCNC) and has continued to remain enrolled in the program. When asked about how she became involved, Adrienne says, "Once I got pregnant with my daughter, I realized that I needed health insurance. At that time I wasn't working, and as far as the economy was going there were no jobs, and I just wanted to have insurance all the time, so I went to DSS [Department of Social Services] for their assistance." DSS enrolled Adrienne in a new Medicaid program called CCNC, a system of care offering coordinated, high quality health care through a network of medical homes. Once Adrienne's daughter, Brianna, was born she was also enrolled in the program.

Currently, Adrienne's medical home is Northeast Primary Care, and her daughter goes to Piedmont Pediatrics. For Adrienne, her medical home helps her manage "everyday things" from colds to annual check-ups. Brianna's medical home helps manage her asthma, a disease that she has had since an early age. In North Carolina, asthma is one of the most common chronic diseases for children, with nearly one out of every 10 children having been diagnosed with the illness.[1] For Adrienne's daughter Brianna, Piedmont Pediatrics has become an integral part in managing her asthma. Adrienne says, "Once a year she sees the doctor, unless a problem occurs. If her asthma starts acting up, or the nebulizer doesn't work, then I'll take her to the doctor. However, her asthma has been doing pretty good for the past few years."

Another key component of CCNC's medical home model is linking case managers to each and every enrollee. For Adrienne and Brianna, their case manager is in contact with them often. "Every few months, the case manager contacts me if she runs across my daughter's name on a patient list; she calls to touch base with me to find out how she's doing or if there are any programs for her asthma that I should to talk to her doctor about." This regular contact between client and case manager increases patient wellness and saves the program money. Studies have shown that between 2000 and 2002 CCNC achieved approximately $3.3 million in cost savings for patients with asthma due to decreases in emergency room visits and inpatient hospital admissions.[2]

For Adrienne and Brianna, having a good relationship with their case manager has led to many positive outcomes. When asked what she has gained through her relationship with her case manager, Adrienne states, "I feel that she helps me manage my daughter's asthma, teaching me things that I didn't know about asthma, or programs or medicines that could help my daughter with her asthma. When I first found out that my daughter had asthma, it was all new to me. I didn't know anything about asthma."

Overall, Adrienne's experience with CCNC has made her a strong supporter of the program. Responding to the question of what could be improved about the system, Adrienne responds, "Nothing right now, I'm very pleased."

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living in Union and Anson Counties experience a very different lifestyle than those residing within the county lines of its urban neighbor. CCPGM began Medicaid case management in Union and Anson Counties in 2004. Less than 15 miles east from the busy and very metropolitan uptown area of Charlotte begin the rural communities of Union and Anson Counties. As a CCPGM nurse case manager who had performed case management in Mecklenburg County, I quickly learned that health care in these communities is very different and, as such, our approach to case management and working with the provider also had to be different. Medicaid enrollees in Union and Anson counties have small satellite community hospitals, limited public transportation, very few physician specialists or specialty clinics and, in general, fewer community resources. In addition to limited resources, practitioners in Union and Anson County also have a different approach to medicine and health care. In Union and Anson Counties, providers have established a long-term presence within the community and extensive relationships not just with their patients, but with the patient's entire family. This best practice reflects the warm, caring approach given to each individual client.

Another issue we considered when establishing our strategy for Union and Anson Counties was the changing demographics. The population in these counties has almost doubled in the past several years, and there is a growing Spanish-speaking population. However, due to funding issues, these communities have not been able to keep up with the growing demand for community resources. Providers have been overwhelmed with pressure to provide more and improved services to an increasingly diversified population with fewer resources.

In introducing our program in the rural settings of Union and Anson counties, we decided to begin with the most important and simplest approach—establish trust with our provider practices. This sounds straightforward; however, because most of our providers were community providers who had practiced in these rural settings for several years, they had already established intimate relationships with their clients and between each other. We were the outsiders, introducing the new concepts of case management and provider quality initiatives into their health care system. Our strategy was to approach our providers by first listening and identifying the most pressing Medicaid need within their practice. For example, if a provider was preparing for a state Medicaid asthma chart audit, I would first address their asthma audit needs with tools available in our program. Or, if they had Medicaid billing issues, I would ask our state Medicaid managed care regional consultant to visit the practice first. If certain Medicaid clients were routinely not showing-up for appointments, I would call the patients to discuss any possible barriers that made it difficult to go to their doctor's appointment. With time, by listening to, respecting, and addressing their concerns, we established positive provider relations with our Union and Anson County primary practices and in turn built trust for our new Medicaid program.

This relationship, built upon a partner/patient advocate role with the Union and Anson clinical care providers resulted in better outcomes for patient care. Practices viewed clinical resources such as asthma action plans and patient education materials as a benefit to their patients, not as an intrusion to their practice. Also, providers became open to quality feedback and reporting as I visited their practices to explain the quarterly state quality reports and helped them to prepare for state Medicaid chart audits. Providers also began proactively sharing with me concerns they had about Medicaid clients or changes to their practice. This allowed me to be more proactive in arranging for patient services and resulted in decreased time "putting out fires."

We also decided to draw on a key strength of a rural setting —a very strong sense of community—which is something that an urban setting often lacks. We collaborated with community leaders and primary stakeholders in the community to work more closely together and thus enhance the resources already in place. Instead of "recreating the wheel," over time we established partnerships in the community with existing programs and found the opportunities were endless. We also wanted to provide convenience for clients by incorporating parenting classes into existing parent meetings or holding classes in community church locations. Sensitive to the lack of public transportation in these communities, CCPGM often coordinates patient education classes in the evening to allow patients' family members to drive them to the classes. This is not necessarily the case in Mecklenburg County, where most patient education classes can be held during the day as patients can take public transportation.

CCPGM works with the Union County Local Interagency Coordination Council (LICC).The LICC's objective is to coordinate agencies within Union County serving children ages birth to five and ensure that care for children with special needs is well-coordinated. CCPGM is currently collaborating with the LICC to update the Union County Early Intervention Resource Manual for providers. The Resource Manual acts as a referral guide for physicians and their practice staff to assist them in identifying an appropriate agency that can assist a child with developmental delays. The efforts of the LICC support the coordination of care for children with special needs in the community.

Over the past several months, our program took the initiative to form the Union County Asthma Coalition in collaboration with the Clean Air Coalition, the Union County Health Department, Smoke Free Union, and the CMC Union Hospital Respiratory Care Unit. Although in its infancy stages of development, the Union County Asthma Coalition has participated in community health fairs and was successful in placing asthma articles in local community newsletters to increase asthma awareness. The Asthma Coalition has also been successful in implementing school programs focused on education and air quality. CCPGM also works in close collaboration with public school nurses, meeting with them on a regular basis to coordinate health services for school children receiving Medicaid or HealthChoice.

For several years, CCPGM has offered newborn parenting classes called "Healthy Beginnings," in partnership with the Parenting Coalition at Union County Health Department and the Help Crisis Pregnancy Center. One of the goals of this class is to improve parent education on issues related to the safety and welfare of the newborn child, while achieving the goal of reducing inappropriate emergency department (ED) visit utilization. In addition, CCPGM provides Healthy Beginnings classes at parent meetings for the Head Start program and, with a growing Latino population in Union and Anson Counties, CCPGM has partnered with the United Way Latino Outreach Specialist to provide Health Beginnings classes and health information in Spanish.

Just as we faced challenges with the network providers for our new Medicaid program, we were also challenged by our clients and the most appropriate approach regarding case management of chronic health problems, frequent ED visits, and hospital readmissions. In communities lacking in public transportation, community programs, support groups, and financial resources, this was very difficult. We decided to incorporate the same simple strategy of relationship building with our clients that we did with our providers. We were pleasantly surprised that our providers supported us in building strong client relationships by referring patients to our program. For example, children with frequent ED visits for asthma episodes were often referred to me by the primary care provider. I followed-up with the parents and patient, ensuring they understood the importance of their asthma maintenance medication. Clients and providers are often pleased that a little asthma education and follow-up can reduce ED visits and subsequent asthma episodes. In rural communities, the emergency room is often much further away than in urban communities, so reducing asthma episodes becomes even more important in counties such as Union and Anson. Also, as a nurse case manager, I often meet clients in the clinic setting at the provider office where our presence is much more welcomed. As a result, our clients were more open to talking with us about barriers to their health care needs.

The rewards have been great and are due to this grassroots approach. While we will certainly have continuing challenges as our population grows and demographics change, we hope to continue to build many more close relationships and look forward to the continued growth of our program and that of others. **NCMJ**

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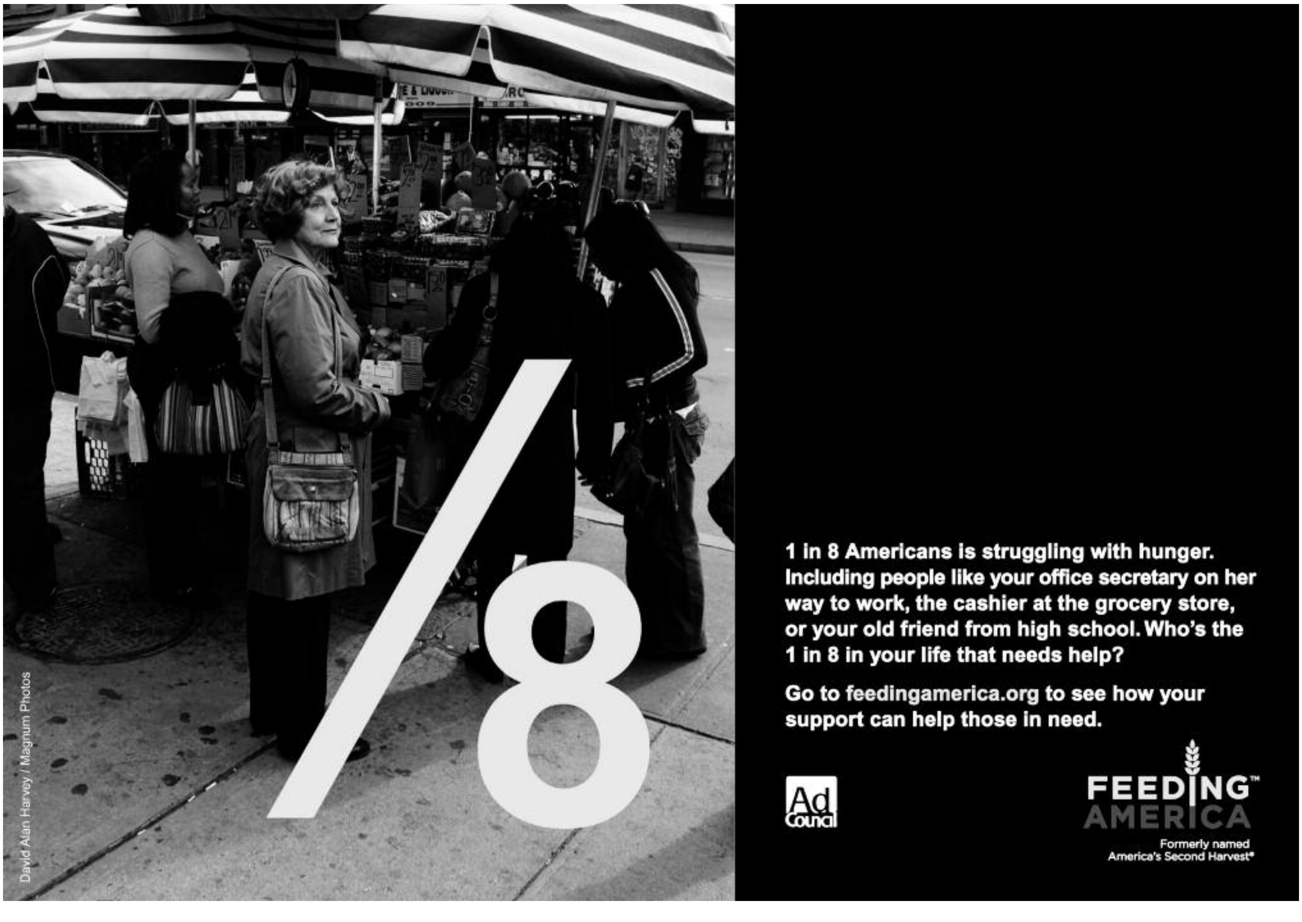

The Medicare Health Care Quality Demonstration Program:

The Promise and Opportunity of the 646 Waiver

Torlen Wade

In 2003, Congress established the Medicare Health Care Quality Demonstration Program (Section 646 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003). The program has become known as the 646 Demonstration. The goal of the 646 Demonstration is to improve the "quality of care and services delivered to Medicare beneficiaries through system redesign that fosters best practice…."[1] A competitive process was used to select health care organizations (physician group practices, integrated delivery systems, and regional coalitions of physician group practices and integrated delivery systems) to participate in this five-year demonstration.

The Centers for Medicare and Medicaid Services (CMS) intended to use this demonstration to identify, develop, test, and disseminate major and multifaceted improvements to the health care system. Projects approved under the demonstration were expected to implement a plan that would "address gaps in care, quality, and efficiency by combining system redesign—improvements in clinical and non-clinical process and structures within systems and organizations—with payment changes that alter the financial incentives."[1]

The application process was conducted in two phases. The first rounds of applications were submitted on January 30, 2006, and the second rounds of applications were submitted on September 29, 2006. Because CMS required that participating organizations in the 646 Demonstration be nongovernmental, the 14 Community Care networks established a new non-profit entity, NC Community Care, Inc., (Community Care) to represent them in the application process. Community Care applied in the second round of requests for proposals issued by the CMS.

Community Care's interest in participating in a Medicare demonstration began in 2006 after the North Carolina General Assembly directed Community Care to extend its medical home and community-based care management system to aged, blind, disabled, and dual-eligible (those who are eligible for both Medicaid and Medicare coverage) recipients. Because any work Community Care did in improving the care and care outcomes for dual-eligibles would also benefit Medicare, there was interest in exploring the possibility of involving Medicare funding and patients in the effort. The North Carolina Department of Health and Human Services encouraged and actively participated in this exploration process. After discussion with CMS leadership, it was determined that the 646 Demonstration would be the best fit for the goals set by the General Assembly.

> ***Under the 646 Demonstration …Community Care will extend its medical home and community-based care management system to dual-eligible and Medicare-only populations.***

There were several other reasons that participation in a Medicare demonstration became an attractive option, including:

- Community Care had historically focused on women and children enrolled in Medicaid and had large numbers of pediatric and family medicine physicians participating in the program. When Community Care was asked to extend its program to aged, blind, and disabled recipients, it became important to engage more physicians serving adults as well as community-based providers. By including Medicare patients, the program would be better able to capture the attention of adult physicians.
- There had always been barriers to improving care for the dual-eligible population. If approached from the Medicaid side, you were looking primarily at the long-term care

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services and expenses; if approached from the Medicare side, the focus was on the hospital and other acute-care services and expenses. One never had either the full patient picture or the incentive to work on all facets of care. By joining the Medicare and Medicaid pieces, Community Care would have both the data and the incentive to address the patient's complete care.

- The 646 Demonstration was seen as an opportunity to place Community Care's physician-directed and community-based approach in the national dialogue as the health reform debate began to take shape.

Demonstration Design

Under the 646 Demonstration, when finally approved, Community Care will carry out an intervention that "combines a physician-directed care management approach with the use of health information technology (HIT) to connect providers, support care management and delivery, measure performance, and implement pay-for-performance financial incentives."[1] Community Care will extend its medical home and community-based care management system to dual-eligible and Medicare-only populations.

After considerable negotiation with CMS, North Carolina's demonstration design took shape. During years one and two, Community Care will manage approximately 44,000 dual-eligible beneficiaries who receive care from 165 Community Care practices in 26 counties. At the beginning of year three, an estimated 170,000 Medicare-only beneficiaries, who receive care from those 165 practices, will be added to the demonstration. From years three to five, Community Care will manage approximately 214,000 Medicare-only and dual-eligible beneficiaries. As part of the demonstration there will also be a comparison group, which will be composed of the beneficiaries who receive their care from approximately 200 practices in 32 North Carolina control counties. The intervention, control, holdout, and exempt counties are shown in Figure 1. Exempt counties were excluded from the demonstration because they were part of another CMS demonstration. Counties that were not intervention, control, or exempt counties were deemed holdout counties and would be able to participate in other CMS demonstrations.

Unlike the Medicaid programs, where recipients are enrolled with Community Care practices and networks, there is no enrollment under the 646 Demonstration. Assignment of a beneficiary to an intervention or control practice is based on whether a beneficiary obtained a qualifying service from a participating practice during the demonstration period. The assignment of beneficiaries to a practice will be transparent to the beneficiary. Participation will not limit Medicare benefits nor limit the ability of beneficiaries to seek care from any Medicare provider. Community Care will continue working with the Division of Medical Assistance to enroll dual-eligible beneficiaries into Community Care for the Medicaid portion of their care.

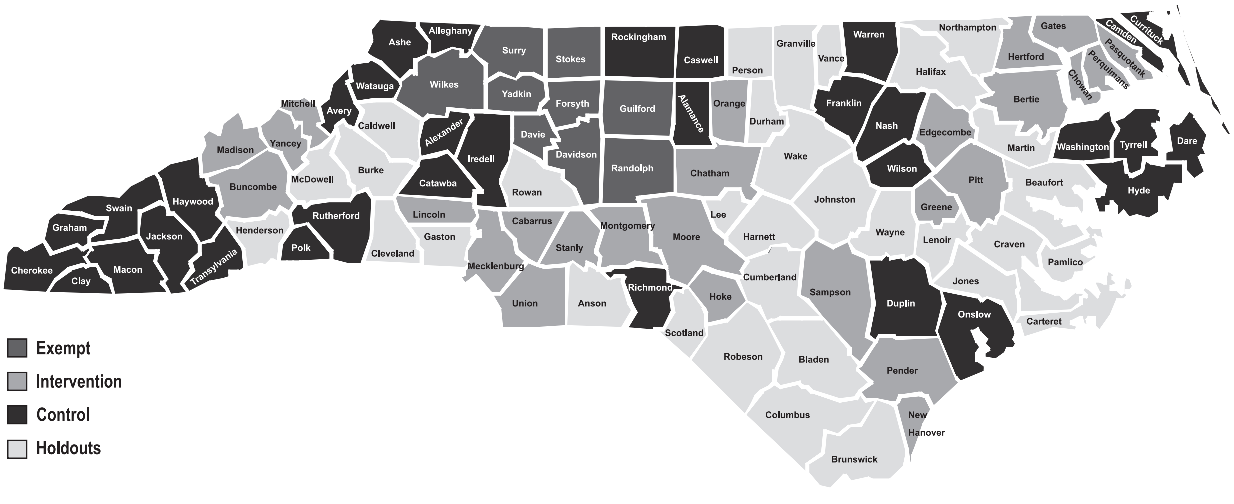
Demonstration Population

Although we are waiting on access to the Medicare files to better understand the Medicare-only portion of the 646 Demonstration, the program has been able to analyze the Medicaid files to capture a good picture of the dual-eligible participants. Based on an analysis conducted for the period April 11, 2007–March 31, 2008, characteristics of the potential dual-eligible participants were compiled and selected data from that analysis are presented in Table 1.

What Will Community Care Do To Improve Participant Care and Care Outcome?

Building on the work of Community Care's Chronic Care Program, which is currently being rolled out to all North Carolina counties by the 14 Community Care networks to

Figure 1.
646 Demonstration Program by County Status



Updated: Nov. 6, 2007

Table 1.
Characteristics of Potential Dual-Eligible Participants in the 646 Demonstration Program

Medical Condition	Percent of Patients with Condition
Hypertension	73%
Three or more chronic diseases	54%
At least one emergency room visit	40%
Diabetes	39%
Mental health condition	32%
At least one hospitalization	26%
Ischemic vascular disease	24%
Chronic obstructive pulmonary disease	19%
Asthma	13%
Chronic kidney disease	11%

Top Five Admissions:
Psychosis
Syncope and collapse
Renal failure
Heart failure
Chronic obstructive pulmonary disease

address the care needs of the aged, blind, and disabled Medicaid represents, the focus will be on at-risk patients. Community Care physicians, hospitals, health departments, and other community providers will work together to improve care outcomes in the following areas:

- Assist patients in transition (20% of Medicare patients discharged from the hospital are readmitted within 30 days. Fewer than 50% of those readmitted had seen their primary physician after discharge).
- Assist patients with multiple chronic illnesses (67% of Medicare dollars go to support care for patients with three or more chronic illnesses.)
- Address medication reconciliation.
- Support the medical home with care management support, information, and best practice.
- Assist the medical home in building the processes to improve chronic illness care.
- Strengthen the communication between community providers.
- Develop an information center to provide timely and meaningful data and reports.

With the arrival of the aged, blind, and disabled (and soon, the 646) populations, Community Care has had to re-engineer its model, which began as a program that focused on single diseases such as asthma or diabetes. With the new populations, the program has had to migrate to a multi-disease focus where medical homes and care managers must take a more patient-centered and holistic approach and where links with practices, community providers, and selected specialty practices must be strengthened.

How Success Will Be Determined

For each year of the demonstration, quality and expenditure targets will be set by CMS. Although specific targets have not yet been set, the following rules will apply:

- Control group growth rates will determine Community Care expenditure targets.
- There will be truncated claims expenses and savings thresholds.
- Bonus payments cannot exceed 50% of total annual savings.
- At least 50% of bonus payments are contingent on meeting quality targets.
- Quality targets, which will be based on measures adopted and used by Community Care, will be proposed by Community Care and approved by CMS.

The earliest Community Care will receive any savings is by the end of year two. Community Care will work with the North Carolina Department of Health and Human Services and the federal CMS to determine how any savings will be used. As originally proposed, it is expected that a significant percent will be set aside to fund access to care for the low-income uninsured population.

Although Community Care does not yet have a start date for its participation in the 646 Demonstration, it is now listed on the CMS's website as an approved project that will begin operation in 2009. We are now working with CMS on the completion of the Cooperative Agreement, which is the final step in the process. **NCMJ**

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Integrating Behavioral and Mental Health Services into the Primary Care Setting

Chris Collins, MSW

Internationally, nationally, and within North Carolina there is movement to more fully integrate physical and behavioral health care. One-fourth of the population has a diagnosable mental health condition, and half of those individuals with a serious illness will receive no mental health treatment.[1,2] The Substance Abuse and Mental Health Services Administration (SAMHSA) director, Katherine Power, has described this as a public health crisis.[2] Approximately one in five children and adolescents will experience the signs and symptoms of a DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) disorder during the course of a year.[3] 67% of psychoactive agents and 80% of antidepressants are prescribed by primary care providers.[4] 92% of all elderly patients will receive mental health care from primary care providers.[4] A staggering 70% of all patient primary care visits are related to behavioral health needs.[4,5]

Rational for Integrated Care

Primary care can provide access to mental health services that are affordable and generate favorable health outcomes, and the World Health Organization promotes the integration of mental health into the primary care setting.[1] The federal government's senior workgroup chaired by the Assistant Surgeon General has reviewed the activities of multiple federal departments with regards to what specific acitivities are occuring to support integrated care. Their work highlights significant movement within the VA and several branches of the military.[6]

The North Carolina Foundation for Advanced Health Programs, Inc. has developed the ICARE Partnership. The Foundation's goal is to create a health care system that is **I**ntegrated, **C**ollaborative, **A**ccessible, **R**espectful, and **E**vidence-Based (ICARE).[7] Partners include professional associations and other key stakeholders who have joined together to increase access to quality, evidence-based behavioral health care services for North Carolinian's citizens. The Office of Rural Health and Community Care, through its Community Care of North Carolina (CCNC) program, provided startup funds to over 50 primary care practices interested in bringing a new behavioral health provider into practice. The types of practices varied greatly and included pediatric, family, and internal medicine, health departments, community health centers, and rural health centers. CCNC did not dictate a model since significant differences exist for the practices among insurance carriers, patient populations, workforce availability, and access to specialty mental health services. Over the past 18 months, practices have provided quarterly clinical and financial data. It is through CCNC's work to support these primary care providers and the behavioral health providers (BHP) that several lessons have been learned.

Tendency to Adopt Specialty Mental Health Systems of Care

It is critical to remember that primary care generally provides services to a large number of individuals that are low in cost. This leads to high numbers of individuals being served with brief interventions of generally 15 to 30 minutes. When additional services are needed, patients are moved up the continuum of care to a higher intensity of services. Professionals from the current mental health workforce are skilled in specialty mental health care. They are accustomed to providing high intensity of services to low numbers of patients. They have considerable knowledge about comprehensive mental health assessments, physiological testing, and an array of therapy modalities. In addition, they are familiar with the billing and coding information necessary to support these specialty services. CCNC sees evidence of this when reviewing quarterly reports from the primary care practices. It is not uncommon to see the BHP coding for 40 to 50 minutes of individual psychotherapy three times as often when compared to the code for 20 to 30 minutes of individual psychotherapy.

> ***A staggering 70% of all patient primary care visits are related to behavioral health needs.***

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In CCNC's baseline survey, primary care providers reported being most comfortable with the treatment of attention-deficit/hyperactivity disorder (ADHD), adult depression, and anxiety. They were least comfortable with schizophrenia, other psychotic disorders, bipolar disorder, personality disorders, eating disorders, and dual or mixed diagnoses. It is understandable that providers would refer the most complex patients to the new BHP.

There are concrete reasons that, without careful attention, BHPs when placed into the primary care setting will default to known roles and responsibilities, resulting in the co-location of specialty mental health. The goal of the grant is to break down silos between mental health and primary care. A BHP on site is a first step in that process, but services can remain separated within the practice. Integrated care is a new and evolving method of care—one in which behavioral health becomes a routine component of primary care.

A Model for Primary Care

As CCNC moved further into implementation, an integrated model was promoted in keeping with the one outlined by the US Bureau of Primary Health Care for community health centers. This lays out a model in which the BHP sessions are generally limited to one to three visits, with clinical pathways for common mental health conditions expanding sessions to four to eight appointments, each generally 15 to 30 minutes in length.[4] Such a BHP will have a much stronger focus on services that are team-based, provided on the same day, in support of primary care providers, and with a strong self-management component.

A statement from the American Academy of Family Physicians (AAFP) supports key recommendations from the Institute of Medicine of the National Academies and the Chronic Care Model and speaks to the steps that AAFP is taking to change the current system of care.[8] Highlighted in the AAFP's presentation to the House Committee on Ways and Means are key components that integrated care can support, such as promoting behavioral changes, assisting patients with self-management, developing integrated systems of care, and linking providers with community resources.[8]

Considering that 70% of all patient primary care visits are related to behavioral health needs,[4,5] a behavioral health provider can be used as a member of the team for substantially more than specialty mental health. Primary care practices can create meaningful opportunities to assist patients and their families in developing self-management plans for nutrition, exercise, tobacco cessation, chronic conditions, pain management, substance use, medication adherence, and improve childhood social-emotional development, if the vision for the behavioral health provider's role is expanded. This model will require both the medical and the behavioral health provider to move beyond their traditional roles as new clinical pathways are developed, team care is operationalized, and cross-training of disciplines occurs.

The Use of Evidence-Based Screenings

There are several recommendations for the integration of evidenced based screening into the primary care setting. The American Academy of Pediatrics' preventive health care recommendations call for psychosocial/behavioral assessment at all ages and that assessment for alcohol/drug use be included at ages 11-21 years.[9] The US Preventive Services Task Force (USPSTF) recommends screening adults for depression in clinical practices that have systems in place to ensure accurate diagnosis, effective treatment, and follow-up,[8] and the screening of adolescents (12-18 years of age) for major depressive disorder (MDD) when systems are in place to ensure accurate diagnosis, psychotherapy (cognitive-behavioral or interpersonal), and follow-up.[10,11] For substance use SAMHSA recommends Screening, Brief Intervention, Referral, and Treatment (SBIRT) in the medical setting.[12]

To date, our primary care practices have reported the adoption of evidenced-based screening tools. Listed below are the most commonly used tools. Table 1 provides the websites for practices interested in acquiring them.

- Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)
- Beck Anxiety Inventory (BAI)
- Beck Depression Inventory–II (BDI)
- Conners Rating Scales-Revised (CRS-R)
- Edinburgh Postnatal Depression Scale (Edinburgh)
- Generalized Anxiety Disorder 7-item Scale (GAD-7)
- Guidelines for Adolescent Preventive Services (GAPS)
- Modified Checklist for Autism in Toddlers (M-CHAT)
- Patient Health Questionnaire Screeners (PHQ 2 and 9)
- Pediatric Symptom Checklists (PSC and Y-PSC)
- Vanderbilt ADHD Diagnostic Parent Rating Scale (Vanderbilt)

Implementing screenings and clinical pathways in the primary care setting for common mental health conditions such as depression, anxiety, and ADHD prove to be difficult if a specialty model is well entrenched. The volume of referrals outpaces the systems design, particularly if the BHP is employed by a specialty mental health agency that requires extensive intake. Adopting these recommendations, in addition to being evidence-based, will promote a model that requires brief intervention and treatment, self-management, and referral. Clinical pathways require that all of the practice's clinical teams examine their role in improving the quality of care for these disease states.

The BHPs within the primary care setting report that their interventions to date have been targeted toward a wide range of diagnoses that include at-risk children (34%), depressive disorder (16%), ADHD/ADD (12%), episodic mood disorder (11%), anxiety (9%), adjustment reaction (7%), major depression (3%), and small percents for targeted diagnoses such as post-traumatic stress syndrome, bipolar disorder, and schizophrenia.

Table 1.
Evidence-Based Screening Tools

These assessments (many of which are free) can be acquired through the following websites:
Ages and Stages Questionnaires: Social-Emotional (ASQ:SE) http://www.brookespublishing.com/store/books/squires-asqse/index.htm
Beck Anxiety Inventory (BAI) http://pearsonassess.com/HAIWEB/Cultures/en-us/Productdetail.htm?Pid=015-8018-400&Mode=summary
Beck Depression Inventory–II (BDI) http://pearsonassess.com/HAIWEB/Cultures/en-us/Productdetail.htm?Pid=015-8019-415&Mode=summary
Conners Rating Scales-Revised (CRS-R) http://www.pearsonassessments.com/crsr.aspx
Edinburgh Postnatal Depression Scale (Edinburgh) http://www.dbpeds.org/articles/detail.cfm?TextID=485
Generalized Anxiety Disorder 7-item Scale (GAD-7) http://archinte.ama-assn.org/cgi/content/full/166/10/1092
Guidelines for Adolescent Preventive Services (GAPS) http://www.ama-assn.org/ama/pub/physician-resources/public-health/promoting-healthy-lifestyles/adolescent-health/guidelines-adolescent-preventive-services.shtml
Modified Checklist for Autism in Toddlers (M-CHAT) http://www.dbpeds.org/articles/detail.cfm?TextID=466
Patient Health Questionnaire Screeners (PHQ 2 and 9) http://www.phqscreeners.com/
Pediatric Symptom Checklists (PSC and Y-PSC) http://www2.massgeneral.org/allpsych/psc/psc_home.htm
Vanderbilt ADHD Diagnostic Parent Rating Scale (Vanderbilt) http://www2.massgeneral.org/schoolpsychiatry/screeningtools_table.asp

Resources for Practices Interested in Integrated Care

CCNC networks and practices frequently request tools and resources that could assist them with implementation. The following websites and books warrant further review as they discuss both mental and behavioral health services from a medical perspective.

- *A Curriculum for Community Health Centers on Integrating Primary Care and Behavioral Health Services*[4] provides a good overview for any primary care practice.
- *Integrated Behavioral Health in Primary Care: Step by Step Guidance for Assessment and Intervention*[13] is a very comprehensive book with tools treatment of medical, behavioral, and mental health conditions that can be used by both medical and behavioral health providers.
- The ICARE website posts clinical trainings, evidence-based clinical pathways, screenings for mental health/substance abuse, and tools for billing/coding. ICARE's services and provider tools can be found online at http://www.icarenc.org.[7]
- Mountain Area Health Education Center website has a section dedicated to integrated care[14] and in prior years has offered a certificate in integrated care for BHPs employed in the primary care setting.
- SAMHSA's SBIRT Model[12] lays out a brief model that can be used by both medical and behavioral health providers in the primary care setting to address substance use.
- The Air Force manual on integrated care.[15]

Strong Referral Relationships

Where the opportunity exists, it is recommended that primary care providers develop partnerships with local mental health providers and agencies just like they do with other medical professionals so that, when appropriate, patients can be moved across the continuum of care. Unstable targeted patients should receive the enhanced services that only a mental health agency can provide. Some communities have sponsored "meet and greet" evening events between primary care and specialty mental health providers, which they report as very productive.

It is a wise investment, regardless of the model, to develop a streamlined referral and communication process. In some communities, these new collaborations are creating access to psychiatric consultation, telemedicine, mobile crisis units, wrap-around services, and mental health case managers. It is important to acknowledge that a few of our practices report that their BHP is the only mental health resource in their community. In such cases the challenge is limiting services to only the practice's primary care patients.

Financial Considerations

Providing brief behavioral health interventions during the same visit has financial benefits. The most obvious is that the patient will keep the appointment (several practices in which the BHP had a separate appointment schedule or referral process reported problems with patients not keeping the appointment).

In a more fully integrated model, the medical provider can introduce and hand-off the patient to the BHP during the appointment. The BHP assists with screening, diagnosis, brief interventions, and the development of a self-management plan. Providers move on to assist other patients, returning to finalize the plan of care. This allows for additional practice efficiencies such as increased provider productivity.

It is important that the BHP can be interrupted so the provider, at a minimum, can introduce the BHP to the patient. This "warm hand-off" results in 85-95% of the patients entering treatment versus just 10% in the regular referral system.[16]

Some primary care practices report spending significant amounts of uncompensated time on case management and commitment activities. When available, it is clear that patients needing high levels of mental health support should be served in the specialty mental health system. Resources have been allocated to provide these wrap-around services.

It should be noted that in the integrated model, when clinical pathways call for follow-up clinical monitoring with parents, school systems, or patient by phone, these remain uncompensated activities.

The Devil is in the Details

It is critical to involve all players within the practice in the planning process. This should include clinical and business staff so that all involved understanding the billing infrastructure needed to financially support the clinical model. Funding is a moving target and can vary greatly based on the type of practice, patient characteristics, and insurance type. We asked our providers to self-report on their patient panel and learned that collectively our pediatric practices reported, on average, 55% of their patient population had Medicaid, followed by 31% private insurance, whereas family practices reported 34% with private insurance, 25% Medicare, and 22% Medicaid. Consider the points below and how this information would influence a practice's decision about the type of professional to be hired, how the billing process will work and determining what clinical services can be provided.

- It is important to know if a BHP is already paneled with the practice's major carrier. If not, is that specific carrier accepting new providers into their panel? Some BHPs reported being informed that the insurance carriers' mental health panel was full. In other cases, the carriers carve out mental health services.
- Medicaid has different prior authorization policy for children than adults.[17]
- Medicare has a narrow set of disciplines that can bill for services and in some cases it varies by code.[7]
- Medicare currently has a higher co-payment for therapy services than for medical services.[18]
- Both Medicare and Medicaid allow for incident to billing when the BHP meets criteria.[16,17]
- Medicaid allows most practice types to bill for an evaluation and management (E/M) and a therapy code on the same day.[17] However, policy change is in process for community health centers and CMS-sponsored rural health centers to bill same day. This is a key component to integrated care.
- Medicaid has recently opened new codes to support team based integrated care. Services are covered when provided by the physician or incident to the physician by a qualified BHP.[19,20] Medicare has similar codes; however it also has policies that differ from Medicaid.[7] It will be important to ask private carriers about their coverage and policy for these services.
- Smoking and tobacco use cessation counseling visits.
- Alcohol and/or substance (other than tobacco) abuse structured screenings.
- Administration and interpretation of health risk assessment instruments (i.e., depression screening).
- Health and behavior assessments (must provide medical ICD-9 code and focus on behavioral health that impacts physical health/chronic conditions).
- Detailed coding information for Medicaid and Medicare can be found on ICARE's website under provider tools in the billing and coding subsection.[7] In addition, ICARE can provide practice-based technical assistance for billing and coding.
- As a general rule, uninsured individuals do not have coverage for mental health care. It is important for the BHP to work with your county's Local Management Agency (LME) as they have access to some resources for uninsured high risk patients that have targeted mental health conditions.

Moving Forward

The federal government and several states are moving to develop systems of integrated care and North Carolina is poised to be one of the leaders. Providers are expressing interest and high levels of satisfaction. They are adopting evidence-based tools and their patients are reporting improvement in their overall functioning. Providers should review the literature to ensure that clinically and operationally they implement a model that fits well within the design of their practices and maximizes the opportunity to improve clinical outcomes for all their patients. It is new ground, so it is likely that a practice's model will evolve over time. It will take commitment and attention if the practice wants to optimize the outcomes integrated care has to offer.

Given the tight economic reality of most primary care practices, one can anticipate that they will logically proceed with the elements or models that offer the greatest budget neutrality. North Carolina must move forward to align resources so that the model best suited for primary care is enhanced and properly funded. To this end, we must have the support of all payers.

The Federal Government appears, at many levels, to be making a substantial commitment to integrated care and their work could serve as a guide to North Carolina.[6] Real commitment is necessary to support ICARE, their partners, and the primary care practices in their efforts to implement evidence-based care. Clinical training is needed for the existing workforce and educational institutions to develop new programs for both primary and behavioral health providers.

Integrated care offers an exciting opportunity to build models in which behavioral and mental health are key components of overall health. It does not replace the need for specialty mental health and substance abuse services.[1] But if we are attentive to clinical guidelines, policy, and payment, we can realign resources to promote a system of care that, at the primary care level, incorporates self-management, behavioral change, and disease prevention, and where mental health and substance abuse are identified early and treated with parity like any other chronic condition. **NCMJ**

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Expanding Innovation through Networks:
The Assuring Better Child Health and Development (ABCD) Project

Marian Earls, MD, FAAP

The North Carolina Assuring Better Child Health and Development (ABCD) Project began in 2000 with a grant from the Commonwealth Fund. North Carolina was one of four states that received a grant after responding to the request for proposal (RFP) sent to state Medicaid agencies to develop and enhance a program to provide child development services. Utilizing the infrastructure of the Community Care of North Carolina (CCNC) networks (then called Access II/III), the NC ABCD Project began as a quality improvement initiative, which was piloted in one network and then rapidly expanded to networks covering 11 counties by the third year of the grant, and, in the years since, has encompassed the entire state.

North Carolina ABCD History

The project developed a "best practice" comprehensive community model that had two components:

- Introduction and integration of a practical, standardized, and validated screening tool (Ages and Stages Questionnaire—ASQ) at selected well-child visits.
- Collaboration with local and state agency staff and families in developing this system for identifying and serving children.

Shortly after the practices began integrating the screening tool, a State Advisory Group was formed of representatives from key agencies who could assist with removal of administrative barriers and who could facilitate policy change. This group continues to meet quarterly, and this has enabled the project to be expanded and enhanced to include social-emotional screening, maternal depression screening, and autism screening. The Office of Rural Health and Community Care (ORHCC) has been the convener of this group. The advisory group includes representatives from ORHCC, Medicaid, North Carolina Pediatric Society, North Carolina Academy of Family Practice, Early Intervention Program (Part C), Interagency Coordinating Council (ICC), North Carolina Department of Public Instruction Preschool Services, Division of Public Health, Smart Start, and the Family Support Network.

To help practices integrate screening and referral successfully, an office systems approach was used. Multiple trainings of practice teams were provided by the ABCD work group with collaboration from the Early Intervention Program (Part C), the state ICC, Medicaid managed care consultants, the North Carolina Pediatric Society, and the North Carolina Academy of Family Practice. Practices were trained using the ABCD Getting Started Worksheet to follow steps to incorporate the process into their office flow and to network with their community partners to establish relationships and communication processes for referral and follow-up.

> *...the significance of the CCNC infrastructure emerged as a key factor in the success of ABCD in North Carolina.*

In addition, the CCNC care managers were given additional training which prepared them to assist their network practices in linking families with community resources. They were also able to help practices with office processes.

Data on Outcomes Drives Policy Change

Data collection in the pilot networks was facilitated by care managers who served as early intervention coordinators for the period of the grant. Baseline data from the 1999 Early Periodic Screening, Diagnosis, and Treatment (EPSDT) Program audit was available for use as a comparison. In 1999 the rate of developmental screening throughout the North Carolina Medicaid systems (Access I, Access II/III, and HMO) averaged 15% for children by age two. After just one

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year, the rate was 70% in the pilot practices. These results led to policy changes, both in the Division of Public Health and the Medicaid program. Public Health (Child Health) transitioned clinics and community nursing to a menu of valid, standardized developmental screening tools in 2003. Medicaid changed EPSDT policy (Health Check) effective July 1, 2004, requiring a valid, standardized developmental screening tool when screening children at the 6, 12, 18, or 24 month visits and at the 3, 4, and 5 year visits. The ABCD work group published an article in *Pediatrics* in July 2006 describing the project, including details on the implementation of screening, referral, and follow-up in primary care practice which was accomplished through utilization of the CCNC infrastructure as a quality improvement initiative.[1]

Replication, Spread, and Sustainability

Replication to other CCNC networks brought ABCD to 11 counties by 2003 (the end of the grant) and, after the 2004 policy change, it moved more rapidly with practice team trainings and distribution of a training DVD and workbook created by project staff. The ABCD Quality Improvement Group, consisting of CCNC network care managers, Medicaid managed care consultants, EPSDT staff, Smart Start ABCD coordinators, and ORHCC staff continues to meet quarterly to share strategies and discuss program enhancements. The Smart Start coordinators are in practices in 23 counties to assist with screening integration and linkage to community referral partners. They collaborate with the CCNC network care managers in those locations.

Currently, according to data from the EPSDT claims reporting, more than 90% of all primary care practices in North Carolina are doing developmental screening, and 84% of all appropriate EPSDT claims for children ages 0-5 years include developmental screening. Since 2004, when the 96110 billing code for screening was introduced, screens have increased from 50,000 in 2004 to 230,000 in 2008. Paralleling this trend, the referrals to Part C have likewise increased from 4,719 in 2003-2004 to 20,000 in 2007-2008. Referrals from physicians make up 35% of those referrals. Increasing the identification and referral of eligible children has been longtime goal of the North Carolina Part C program.

As the ABCD Project has continued to develop, adding screening for maternal depression, social-emotional development, and autism, it has contributed tools, processes, and strategies to the Mental Health Integration (co-location) Project for CCNC. It can also assist the Aged, Blind, and Disabled Project in understanding referrals and systems for children who have disabling conditions.

The ABCD Project has also been able to accomplish spread and sustainability by aligning its goals with those of Part C, the Department of Public Instruction Preschool Services, EPSDT, Smart Start, and the Family Support Network. As a result of these collaborations and participation on the ABCD State Advisory Group, the partners have endorsed a statewide referral process and single-page referral form for primary care practice use, one for Part C and one for Part B. There is also agreement on the medical home needing to receive feedback on their referrals. The Kindergarten Health Assessment completed by the primary care provider for children entering public school now requires the results from the developmental and behavioral screening tool.

North Carolina as a Model for other States

The Commonwealth Fund awarded grants to five more states for ABCD II from 2003-2006. NC ABCD periodically provided consultation to these states. Then in 2006 the NC ABCD medical director and project director were offered a grant to provide technical assistance to five additional states (Colorado, Michigan, New Mexico, Oklahoma, and Rhode Island). As part of this Setting the Stage for Success Project, a state manual was developed for Medicaid agencies to work with primary care practices and early childhood agencies to implement screening, referral, and follow-up systems. In 2007 the Commonwealth Fund sponsored a multi-state Screening Academy for which the NC ABCD directors participated as part of the faculty. The North Carolina project is seen as a model for other states to replicate.

Lessons Learned

In all of these consultations with other states, the significance of the CCNC infrastructure emerged as a key factor in the success of ABCD in North Carolina. Three factors provided through CCNC stand out: 1) practices that have experience with quality improvement; 2) care coordination made possible through the network care managers; and 3) a culture of using data to drive best practice and improvement.

In the initial pilots, the practices involved were known to be "early adopters." They had already implemented quality improvement protocols for asthma and diabetes in their networks. They therefore had already become familiar with office systems strategies. ABCD was a prevention protocol rather than a disease management protocol, but the tools could be integrated similarly.

ABCD challenged practices to network with new community partners—Early Intervention (Part C), preschool programs including Head Start, child service coordinators (CSC) in Public Health, and the Family Support Network. These groups had some experience with networking, and the care managers often facilitated referrals and linkages for families. The ABCD referral study tracked 291 children who were referred for services between 2000 and 2002, and 95% made it to the referral due to the efforts of the care managers. Care managers were also learning about this array of services for young children, which they were able to incorporate into their other work with families.

Throughout the ABCD Project, data have been used to drive improvement and policy change. Practices have been able to see their rates of screening and referral and to capture information on children who were referred. Through the Office of Rural Health and Community Care, claims data have provided information on the progress of the project with screening rates. Care managers enter data on children who have at-risk scores on the screening and record their management and follow-up into the management information system. In this way practices can know their referral rates and track whether and when children receive services.

The experience of ABCD has moved those practices who serve young children well on their way to meeting the criteria for a medical home. Use of parent-completed screening tools includes parents as experts on their children, making the care more family-centered (a key feature of the medical home). Practices have become more comprehensive in the care of children at risk for developmental and behavioral problems and they have learned to coordinate care in the community.

All of the partners involved in the ABCD State Advisory and Quality Improvement Groups continue the work of ABCD as the ABCD enhancements (maternal depression screening, social-emotional screening, and autism screening) are spread statewide. ABCD and EPSDT are working together with Medicaid managed care consultants, network care managers, and Smart Start staff to monitor all of the preventive screening components of EPSDT—developmental and behavioral screening, vision screening, and hearing screening—and to give feedback and/or assistance to practices for screening, referral, and follow-up. The infrastructure of CCNC continues to be key for reaching out to practices and promoting community collaboration. **NCMJ**

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The Role of Health Information Technology in Creating Networks of Medical Homes in Rural North Carolina

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Steven Crane, MD

Health information technology (HIT) has been front and center in the conversation about improving access, efficiency, quality, and reducing costs in the health care system. In a systematic review of the published scientific literature, Chaudhry and colleagues concluded that there was convincing evidence that HIT could increase the adherence to guideline-based care, enhance surveillance and monitoring, and decrease medication errors.[1] But others caution that the impact of HIT implementation on the cost and quality of care may not be consistent across institutions and that the characteristics of the clinical setting where it is applied is likely to greatly influence its use and effect.[2]

As one of North Carolina's two remaining rural track family medicine residency programs, we have been very interested in learning how a multifunctional electronic health record (EHR) could be adapted into small rural practices. In 2007 we were selected to be one of 14 family medicine residency programs in the country to participate in a five-year research project known as Preparing the Personal Physician for Practice (P4).[3] Our project is designed to test three hypotheses: 1) that providing an electronic health record to rural practices through a local hospital-based network is a cost-effective model, 2) that HIT can improve quality of care and provider, staff, and patient satisfaction in rural practices, and 3) that training students and residents in redesigned rural practices will increase their interest and eventual practice in rural medicine careers following graduation.

This commentary describes our early experience with this project and identifies opportunities and barriers to effective implementation of HIT in rural practice.

Description of Project

We began our project by implementing a multifunctional electronic health record in our residency teaching practice. Our EHR includes the evidence-based care templates we developed for a number of chronic care and preventive services, e-prescribing, advanced reporting functions to track quality measures, and integrated EHR and practice management modules to allow computer physician order entry (CPOE) in the outpatient setting. A secure care portal allows patients direct access to some portions of their medical records through the internet, which also allows secure messaging with their health care provider and the ability to directly schedule their own office visit appointments online. Lab results come back directly into the patient's electronic record through an electronic interface with the hospital lab. From within the EHR, physicians can directly access a number of evidence-based databases to provide point-of-care decision support and can even document and receive Category I continuing medical education (CME) credit when they use an evidence-based medicine (EBM) resource to answer a clinical question. Within the EHR is a rich database of patient education material that can be individualized for each patient. The servers, technical support, training staff, and licenses for this EHR are all owned or provided by our local community hospital.

> *Our EHR includes evidence-based care templates... e-prescribing, advanced reporting functions to track quality measures, and integrated EHR and practice management modules...*

This EHR has allowed our teaching practice to be fully paperless for the last two years. It has also supported a radical redesign of our office, allowing us to effectively close our front

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desk and waiting room. We promptly usher each arriving patient into an exam room where a care team provides the patient all the needed care throughout the visit. Medical assistants have been retrained to provide a wider range of both clinical and administrative tasks at the point of care and more closely assist the providers in documenting the visit and carrying out clinical services. In some cases the medical assistants remain in the exam room and scribe directly into the EHR as the physician conducts the history and physical exam and discusses the treatment plan with the patient. This redesign has allowed our practice to reduce median clinic cycle times for an office visit from 65 minutes to 37 minutes and operate with a staffing level that is in the 25th percentile benchmark for practices of our size and patient volume.[4]

Using an application service provider (ASP) model we expanded access to this EHR to three solo practitioner rural practices located 10-20 miles from the hospital. Taking advantage of safe-harbor changes in Stark rules,[5] the hospital was able to provide licenses and training to these practices at an 85% discount. Economies of scale for centralized servers and technical support personnel from the hospital's IT department allowed these practices to be added for only $3,500 of actual cost to the practice and a low marginal cost for the hospital. A robust EHR such as this would have cost each practice at least $50,000 if they had contracted directly with the EHR vendor for hardware, software, and training. Each practice was also enrolled in a clinical performance collaborative called Improving Performance in Practice (IPIP) to further support efforts to improve chronic care measures.[6]

Results

The practices implemented the EHR in late 2007 and early 2008. Approximately one year into the project we conducted an evaluation of each practice to see how they were using the EHR and how each practice felt the EHR had changed their practice up to that point. We conducted a series of focus groups with physicians and staff of the practices and recorded comments. These comments were then analyzed to identify themes and common concepts. We found that these could be divided into the major classifications of "benefits/positive effects," "challenges/drawbacks," and a residual category of "other." The following statements or quotations characterize the key themes that came up during the focus groups of providers and staff of rural practices.

Benefits/Positive Effects

- "Things run smoother—everything is right at your fingertips."
- The EHR minimizes error—medication refills get done quicker with fewer mistakes.
- Easier for continuity of care—the medication list is automatically updated.
- "Sparks you to think of things you might have forgotten to do."
- Easier access to patient education handouts.
- The EHR has freed up room in the office.
- Quality of care has improved—documentation is better.
- For medical assistants, job satisfaction has increased.
- "Having access to the EHR from home is a nice feature, but a two-edged sword—I'm more likely now to take work home."

Challenges/Drawbacks

- Maintaining two systems (EHR and paper chart) is difficult and time-consuming.
- Slow connection to the EHR—"we're completely crippled if the system goes down."
- "As a small practice the rate of learning new features is slower, and there is a lot less filtering of information that goes into the EHR."
- Notes take longer to do—workday for the providers is longer than before the EHR was implemented.

Other Observations

- Two of the three practices were still using both paper and electronic records.
- Two of the three practices had different practice management programs. As a result providers were not able to use CPOE.
- None of the practices were using the Care Portal to allow patients to schedule, communicate, or request records.
- Practices have not yet used the EHR for chronic care improvement because generally they are not using the point-of-care templates to document care provided at office visits.
- None of the practitioners in the practices has yet used the point-of-care CME feature available through the network.
- Although the practices have the ability to e-prescribe, only a small percentage of prescriptions were processed electronically because the rural pharmacies do not yet have the software to send or accept prescriptions in this format.

Discussion

As we have demonstrated in our own teaching practice, HIT is capable of delivering on its promise to improve clinical efficiency and reduce overhead costs by reducing average clinic cycle times for an office visit from 65 to 37 minutes while keeping overhead costs within the MGMA 25th percentile benchmark. HIT is a powerful tool to support improvements in guideline-based chronic care in that it is able to extract monthly clinical chronic care measures by each provider from the EHR without having to do time-consuming audits, and this monthly feedback supports the quality improvement activities of the teams. Without an automated system to collect data, the collection and analysis of performance improvement measures is inefficient, if not impossible.

Local regional networks also appear to be an efficient way to take advantage of the considerable economies of scale of HIT. A key advantage of using a local network as opposed to a remote internet site is that the local network can employ its own trainers. Our experience suggests that, in order for physicians to employ all the potential benefits of this technology, regular updates and training are needed. Local trainers can develop a close ongoing working relationship with practices and can help to not only teach the specific software features but to assist the practice in changing processes to provide more efficient and effective care.

Hospitals are logical choices to be the hubs for these local networks.[a] Most already have an IT infrastructure. Furthermore, because many rural patients also receive care at the local hospital, these institutions are in the best position to create electronic interfaces between the hospital clinical information systems and the outpatient EHR to post lab results, x-rays, discharge summaries, and inpatient consultations directly into the outpatient record. These connections make practices not only more efficient but could also help make care safer for patients in the hospital by allowing admitting physicians to have immediate access to outpatient records to confirm medications, allergies, and other vital clinical information. This is particularly important as more inpatient care is provided by hospitalists.[7]

Finally, a local network that also incorporates a teaching practice can serve as a valuable asset in developing new templates and tools to support guideline-based care. Our program has developed a number of such templates as part of the systems-based care curriculum of the family medicine residency, including sophisticated templates for managing depression, diabetes, congestive heart failure, and chronic pain. This capacity provides tremendous economies of scale because the developed template can be used by any other practice in the network at no additional cost.

Our preliminary experience also clearly demonstrates significant barriers to achieving these benefits in small rural practices. The key to achieving practice efficiencies using an EHR is its integrated use to eliminate unnecessary steps in the care process such as filing paper and countless hand-offs between staff members that can be done more efficiently in an electronic environment. The paradox is that to accomplish this, nearly all elements of the EHR need to be in place, and to get all these features in place requires excess capacity to allow for staff to be trained and develop these new processes. But excess capacity is nonexistent in a busy rural practice. Some have likened the process to "building planes in the air." Although our rural practices have made remarkable progress in implementing some aspects of the EHR in their practices, the road ahead remains daunting.

The other key lesson we have learned is that while the EHR can make a practice system much more efficient, it may not actually reduce the time a practitioner spends providing patient care. For instance, using an EHR to document a visit note frequently takes considerably longer than it would to dictate the same note or complete a paper form by hand. Similarly, while e-prescribing can reduce the total staff time required to process a single medication refill from over five minutes to less than 30 seconds, it still takes the same amount of provider time. To prevent consuming valuable clinician time with direct scribing into the EHR, practices need to redistribute these overall efficiencies by training medical assistants to take a more direct role in assisting physicians in completing their work. But again, this requires additional time which is a very rare commodity in rural practices.

According to the definitions of the North Carolina Rural Economic Development Center, over half of North Carolinians lived in rural areas in 2006;[8] most of those people receive primary care close to home. As we look to improve access and quality of care for this large segment of our population, we need to develop models of health information technology that not only take advantage of economies of scale but are also designed to enhance local and regional systems of care and recognize that small rural practices may require additional support to fully implement this technology. We believe our hospital-based EHR network is a model that could work in other communities and should receive special attention from policymakers. **NCMJ**

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[a] A network "hub" is a centralized secure data center where the servers are maintained that support the software. Maintenance functions include monitoring system function, regular backup of data, redundant data servers and power sources to prevent unscheduled downtime, doing regular software upgrades, and monitoring security and unauthorized access of records. The hub also supports a help desk to troubleshoot should any system problems at the practice sites. In addition, the hub employs an application (EHR) specialist who conducts trainings for new practices coming on to the EHR, provides on-going training as new features are developed, develops new point of care EHR templates to improve documentation in the EHR, and provides reports to support performance improvement activities at each practice.

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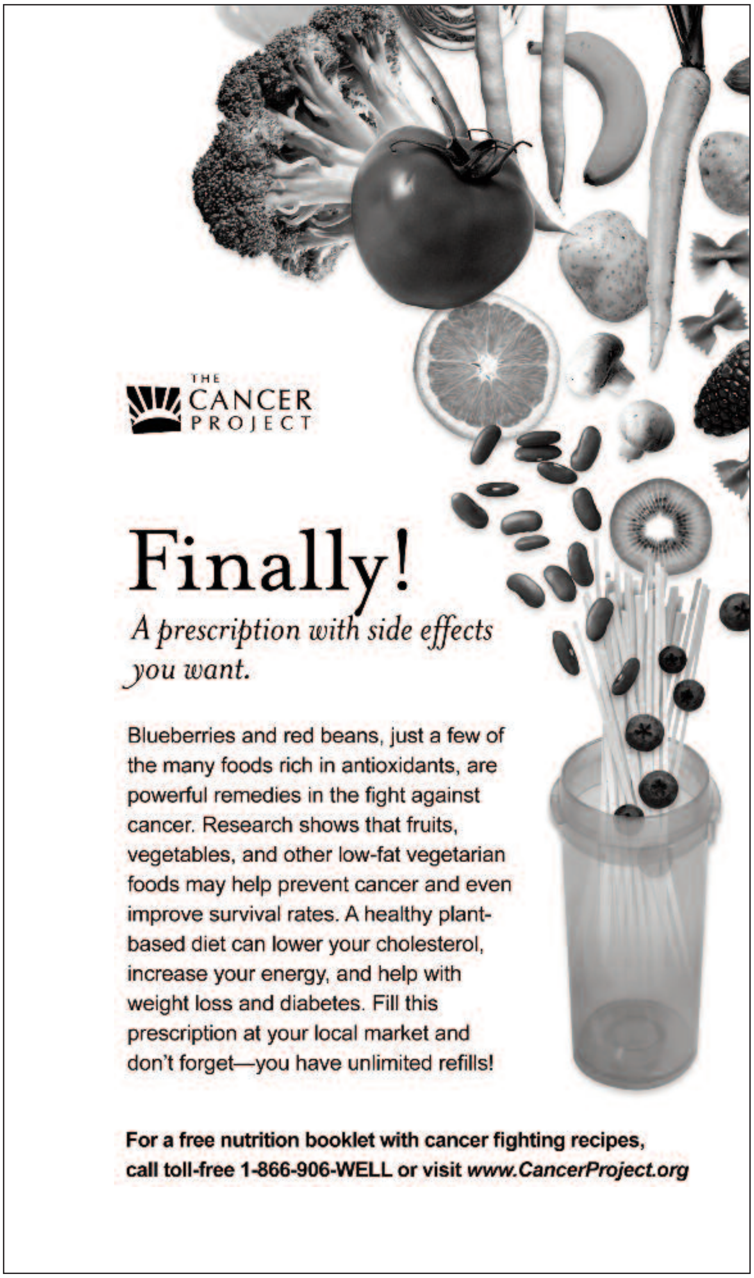

Flexibility in a CCNC Network:
The Northwest Community Care Experience

Elizabeth Gamble, MSPH, MD; James Graham, MHA; Kelly Livengood, RN; Loralee B. Inman, RN; Ronald E. Gaskins, MBA, MPA; Linda J. Michalski; Rebecca Eleanya, MBBS, MPH

Northwest Community Care Network (NCCN) operates in six counties (Surry, Wilkes, Stokes, Davie, Yadkin, and Forsyth) in northwestern North Carolina. In 1998, the Office of Rural Health and the Department of Health in Surry County began a managed care pilot project for the county's Medicaid population. These pilots, then known as Carolina Access II, were "developed to enhance recipient access to primary care, to improve the coordination of care, and to reduce recipient reliance on hospital emergency departments."[1] In 2003, the project was expanded to all counties in North Carolina and Community Care of North Carolina (CCNC) was created, comprised of 14 networks across the state. Surry County joined the five other counties listed above to form Central Piedmont Carolina Access II. Originally a limited liability corporation, in 2005 Piedmont Carolina Access II became Northwest Community Care Network, a not-for-profit organization currently serving over 72,000 Medicaid recipients. The governing board is made up of each participating county's public health director, the NCCN medical director, and a representative from North Carolina Baptist Hospital. The change to not-for-profit status, subsequently made by each network in North Carolina, has allowed for a broader range of projects and has removed barriers to grant applications. The NCCN board governs fiscal as well as operational activities and is charged with approving all projects undertaken by the network. This governance structure allows for flexibility in addressing the core tenets of CCNC as well as incorporating local and regional interests and resources. All of the current projects at NCCN embrace this flexibility and utilize local resources, an approach reflected in the uniqueness of the projects and initiatives, case management, and network administration in NCCN.

> ***The strength of CCNC has been its ability to address issues in a timely and innovative manner.***

Projects and Initiatives

Of the over 20 specific clinical projects currently active in NCCN, eight originated from the central CCNC office. These include the Behavioral Health Initiative, the Kate B. Reynolds Stroke Reduction Grant, the Chronic Care Program for the Aged, Blind, and Disabled, Emergency Department Diversion, Congestive Heart Failure Management, Improving Pediatric Access through Collaborative Care (IMPACC), Yadkin Healthy Carolinians/Stanford Model Self-Management, and Intensive Pharmacy Management/Network Pharmacist. The goals for CCNC projects are characterized by clear goals for the populations served, but the means to achieve them are not centrally prescribed. Each CCNC network is able to undertake different approaches to fulfill the goals of each program. This flexibility allows for increased experimentation and the rapid spread of subsequent knowledge of effective practices and methodologies. This freedom and individualization have allowed for the success of many of NCCN's programs.

This flexibility was useful and effective for implementing the Behavioral Health Initiative, since the model had to be modified to the individual resources, interests, and constraints of each practice in NCCN. This necessary modification was

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the result of the upheaval in the mental health system in North Carolina occurring at the time the initiative was being implemented. The original practice for this project had been a site for a demonstration grant funded by the Duke Endowment and was led by Dr. Jane Foy at Wake Forest University Pediatrics. The NCCN network was able to take that example of co-location (where a behavioral health practitioner is located in a primary care clinic) and expand it into four more practices, with each of the practices uniquely incorporating NCCN's experiences and the practice's own parameters. This includes a "reverse co-location" project in a safety net outpatient psychiatric practice where a primary care practitioner has been moved into the psychiatric location.

For the Kate B. Reynolds funded program, NCCN built on the work of Dr. David Goff at the Wake Forest University Division of Public Health and his GLAD Heart Trial, which used academic detailing to increase awareness of hypertension treatment and risk guidelines for cardiovascular disease.[2] Because it proved so effective, the academic detailing guide was then shared with the other two CCNC networks participating in the project. With the Chronic Care Pilot in Surry County, network coordinator and lead case manager Lori Inman assembled a team that developed a program for identifying, evaluating, and better managing the chronic health problems of the aged, blind, and disabled (ABD) population. Dr. Jim Wofford at the Downtown Health Plaza, which has an ABD population of approximately 2,800 patients, is currently developing an individualized program to help with overutilization of the emergency department.

NCCN's local projects demonstrate the great strength of CCNC: local engagement. The network integrates input and contributions from all levels and asks participating practices and local partners to engage NCCN with questions and ideas for bettering the program. The key link in this process is the free flow of information among the member practices, case managers, county medical directors, and the network staff. In each county there is a county NCCN medical director who serves on the Network Medical Management Committee, as well as his or her county's steering committee. Many interesting and creative projects have come out of these group meetings. One example is the Davie County Day Care Asthma/Obesity Program, which is lead by the medical director in Davie County. This program is looking at the management of asthma in day care and developing asthma action plans for these children as well as diet counseling for the children and the parents. The Chronic Pain Program in Wilkes County began after the local Wilkesboro Healthy Carolinians group and the medical director noted a large number of unintended deaths from prescription narcotics. This program has expanded with the creation and incorporation of the Lazarus Project which involves giving nasal naloxone to each person who is prescribed a narcotic and arranging the use of a case manager in the emergency department of the county hospital. Dr. Su Albert, the Wilkes County medical director, championed the use of a family nurse practitioner in a nursing home in order to evaluate the cost savings and quality improvement in nursing home care gained by placing a physician extender in that setting. Lastly, Project INFORM, an intensive diabetes management program that is based on the interventions in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) study[3] works to improve compliance and glycemic control with patients at the Downtown Health Plaza—home to NCCN's largest Medicaid population. Additional NCCN projects include Stokes County Diabetes, Stokes County Mental Health Coordinator, a Hospital Readmission Study, the Surry Diabetes Patient Education Program, an Uninsured Medication Project, an Obesity Roundtable, and a Masters of Public Health Practicum.

The NCCN has also benefitted from the presence of the Translation Science Institute (TSI) at Wake Forest Baptist Medical Center, an important local resource for NCCN, in particular the community engagement component. Dr. Jane Foy, already involved with the Behavioral Health Initiative, joined NCCN's Medical Management Committee. She felt that the model of a physician-based network was one to be emulated by TSI and, due to the increase in the infant mortality rate in Forsyth County in 2007, the network formed a coalition with TSI, the Infant Mortality Reduction Coalition at the Forsyth County Health Department, Triad Baby Love, Mom Baby, the Department of Maternal and Child Health at the University of North Carolina at Chapel Hill, and the Departments of Pediatrics and Obstetrics and Gynecology at Wake Forest University Baptist Medical Center. The first work to come out of this coalition was the 17-P Project. With the help of an epidemiologist at TSI, the coalition designed a study examining improvement in infant mortality, morbidity, and pre-term birth rate with the increased use of 17-hydroxy prednisilone caproate (17-P). These interventions included university-based educational outreach (academic detailing) to all providers of prenatal care in Forsyth County, general public education of the benefits of 17-P, and postnatal and intraconception education to pediatricians, as well as parents and other caregivers, on children born pre-term.

Case Management

The primary directive for all CCNC networks is to provide case management to all enrolled Medicaid patients as a means of improving quality of care and reducing costs. The unique NCCN model of contracted nurse case management within health departments allows the network a direct connection with local communities and county leaders through the county health departments. This allows for easy, timely referrals to local programs, such as Baby Love (maternity care coordination), child service coordination, Health Check coordination, and school nurses, along with awareness of community programs to which to refer our clients/family members who are under- or uninsured. In addition, this arrangement expedites clinical involvement in public health issues such as lead exposure, air quality, violence, and diversity—all of which affect the Medicaid population.

Forsyth County has two large tertiary care hospitals—North Carolina Baptist Hospital and Forsyth Medical Center.

Managing patients in these two health care systems generates issues that do not arise in the other counties of the network. In particular, transitional care has required the creation of a transitional case manager to span the gap in care between hospital discharge and reconnection with a primary care provider. In other counties, the number of patients is more manageable and transitional care can be integrated into the scope of care of the regular case manager.

Of NCCN's six counties, three have one case manager, another has two, the fifth has four, and Forsyth County has eight. A bimonthly case managers' meeting serves to bring case managers together for updates of individual county activities, to participate in group trainings, and to foster collegiality. Because of concerns raised by the case managers about the use and abuse of personal care services, several of them are becoming or are certified to evaluate patients for these services. The case managers have been instrumental in developing a communication bridge with county Departments of Social Services (DSS). There is now a network DSS liaison whose job is to sustain and improve the communication between the network and local DSSs. Many of our case managers have voluntarily obtained case management certification. Case managers are the substance of our program and without their hard work, insights, ideas, and suggestions, none of the work of NCCN could or would done.

In addition to the nurse case managers, the network has a full time pharmacist who participates at all levels by attending steering committee meetings and meetings of the Medical Management Committee. In addition, she also does individual medication reviews, visits practices, and consults with case managers. She was instrumental in developing the pharmacy home for our network and helped the network build strong allegiances with local pharmacies.

Administration

The NCCN administration staff consists of five people who are employees of North Carolina Baptist Hospital and contracted to NCCN as a management group. The original group has expanded the number of projects and has adopted the chronic care approach to patient management. NCCN now has an executive director, support manager, operations manager, and an administration assistant. This group works together as a team in running the network with weekly staff meetings in addition to case management and project meetings. There is also a monthly management team meeting with the same staff for larger issues such as project reviews, budgetary decisions, and goal setting. This team approach has allowed NCCN to develop a horizontal management environment as opposed to a pyramid structure, with the free flow of ideas across, up, and down the organizational structure. NCCN's executive director is the leader of our group but rarely makes a decision without consulting all the members of the management team. Ultimately, the Board is the final arbiter in the business of the network.

The strength of CCNC has been its ability to address issues in a timely and innovative manner. This has been accomplished by allowing different approaches to answering the same question and encouraging solutions at all levels of the organization. At Northwest Community Care Network, we feel that we have prospered by replicating and utilizing this model of flexibility and ingenuity. **NCMJ**

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Community Care of Wake and Johnston Counties

Paul Harrison

Jim Bernstein's vision of a locally-organized and effective care management program for Medicaid enrollees is alive and well in Wake and Johnston Counties. The Wake County Medical Society Community Health Foundation, with a focus on increasing access to health care for the least advantaged in our community, applied to become a local Community Care Network for Wake and Johnston Counties in late 2002. Prior to that date, there were no organized efforts to coordinate care for chronically ill patients with physicians, hospitals, mental health, and public health providers in this community. Community Care of Wake and Johnston Counties (CCWJC) quickly became a coordinating resource to expand providers' capacity to manage care and patients' needs on a community-wide basis.

CCWJC and Its Process

Currently, CCWJC serves 74,000 patients in association with 100 participating primary care practices in the two counties. Participating primary care practices receive a monthly "per enrollee per month" fee to better manage Medicaid patients with a focus on patients with comorbid chronic conditions, frequently including a mental heath diagnosis. CCWJC works with local physicians to ensure patients comply with physician's orders, including filling prescriptions and using medications as prescribed. In addition, CCWJC has established close working relationships with each of the five hospital facilities in the two county service areas. The hospital corporations have allowed CCWJC access to daily discharge summaries for inpatient, observation bed, and ED utilization. CCWJC is able to use this real time data to meet with patients and intervene in the potential cycle of frequent rehospitalization. To this end, CCWJC has posted nurse case managers at WakeMed Raleigh based on the volume of patients served by that facility in order to meet with patients and develop both a personal relationship and a plan of action to prevent rehospitalization. This is a challenging social process, especially when the patient has a mental health diagnosis in addition to comorbid chronic physical conditions. CCWJC created two teams of nurse case managers, adult and pediatric, to follow patients after a hospitalization. For example, a young man with a bleeding ulcer was recently discharged from a local hospital without outpatient prescription medication. However, he was given instructions to use over-the-counter medications, despite the fact that the patient's discharge summary stated there should be no further use of over-the-counter medications by this patient. A CCWJC nurse case manager intervened by arranging an urgent office visit at the patient's medical home where the patient's primary physician prescribed the proper medication. The case manager worked with the patient to ensure he filled and used the prescription, thereby avoiding an almost certain rehospitalization.

> ***Currently, CCWJC serves 74,000 patients in association with 100 participating primary care practices in the two counties.***

CCWJC Support for Primary Care, Patient-Centered Medical Home Settings

CCWJC, with its many links to the local health care system, is uniquely suited to support primary care provider's (PCP) patient-centered medical home settings. Nurse case managers work in the medical home settings to intervene with patients who are frequent users of health care services and/or non-compliant with physician's orders. In addition to the real time hospital discharge summaries, physicians are a key source of referrals to the case managers for either noncompliant patients or patients who have a pattern of aberrant hospital utilization. In addition, the Case Manager Information System (CMIS), a Medicaid claims data repository, provides a historic perspective of patients' utilization data, which serves as a third type of referral source for patients with abnormally high or low utilization data. Prescription compliance and hospital

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facility utilization are key indicators in CMIS, which focuses on the frequency of inpatient stays within the past six months, two ED visits within the past six months, or four PCP or specialist visits within the past six months. For example, historic CMIS data revealed a Medicaid patient who had been resident in a local hospital for more than four months. After evaluating this 53-year-old morbidly obese, hypertensive patient with diabetes and kidney failure, a nurse case manager learned the patient could not be discharged because the requirement for outpatient kidney dialysis could not be fulfilled. Specifically, local outpatient dialysis units lacked a patient dialysis chair that could accommodate a patient of their size. The nurse case manager arranged for the patient to be dialyzed while reclining on a reinforced stretcher at the outpatient dialysis center and arranged transportation from home to the dialysis center using an ambulance service with bariatric patient transport capacity, including special stretchers, ramps, and lifts with up to 700-pound patient capacity.

Nurse case mangers also provide valuable follow-up with patients including telephone follow-up, home visits, and/or joining the patient for medical appointments. These interventions are designed to strengthen the link to the primary care provider, facilitate greater patient self-management, and link the patient with useful community resources to ensure the highest degree of patient compliance.

Another CCWJC resource for patient-centered medical home settings includes pharmacy initiatives to ensure patient compliance with medications while providing practices support with local pharmacies and pharmacists. A staff network pharmacist employs specialized software in order to contain costs by ensuring that patients receive prescribed medications. By using this tool, the pharmacist is able to develop a snapshot of medication adherence and compliance. The central role of the network pharmacist is to design a clinical approach that focuses on improving drug therapy management, cost-effectiveness, and coordination of local services for all Medicaid patients and especially for those patients designated as aged, blind, and/or disabled in the Medicaid population. The network pharmacist also conducts medication management reviews directly with the patients. Finally, the network pharmacist assists the primary care physician with a better link to local pharmacists by working to ensure that local pharmacists understand Medicaid pharmacy policy, drug information, and unique cost-saving opportunities for low cost over-the-counter medications, such as proton pump inhibitors and non-sedating antihistamines, which have unique covered benefit status under Medicaid.

CCWJC has established two pilot mental health co-located practices, which combine both primary medical care and mental health services within one practice. In addition, CCWJC nurse case managers work to integrate patients' mental health needs further through greater coordination with the Local Management Entity (LME), a county agency with responsibility to coordinate mental health care services within its jurisdiction. In this case, the nurse case managers seek to ensure that all patients' mental and physical health needs are met to the greatest degree possible. CCWJC works to establish linkages between primary care practices, mental health services, hospital discharge systems, and community resources of all types to help manage very sick chronically ill patients. This holistic approach best serves the aged, blind, and/or disabled populations by strengthening the links that best address patients' needs in concert with the patient's primary care medical home.

The management of patients with multiple comorbid conditions dovetails closely with both CCWJC disease prevention and chronic disease management initiatives. Periodic, practice specific chart reviews are used to track progress with quality standards over time for management of chronic diseases such as asthma, diabetes, and congestive heart failure. CCWJC provides resources and information on best practice strategies associated with national standards to support adherence to those guidelines. Nurse case managers provide support for high-risk patients with chronic diseases and work to improve coordination of care by utilizing all of the resources available within the community. For example, in the case of asthma, providers are given tools that align with national guidelines on asthma management, including asthma control tests and asthma management plans, to use with their patients. In addition, the case managers can arrange for an intensive in-home assessment of environmental asthma triggers through joint efforts with Wake County Environmental Services.

Prevention initiatives are closely associated with CCWJC, and the network has created separate prevention tracking reports for pediatric and adult populations. The pediatric tracking list includes body mass index, lead levels, developmental screening, vision, hearing, vaccine, and tobacco use determination. The adult preventive tracking tool includes smoking cessation, blood pressure screening, vaccines, and consideration of a daily aspirin regimen.

CCWJC and Expanded Access to Care for Medicaid Patients

In the past year, CCWJC staff has recruited 16 new primary care practices to Community Care. Some practices are new to the Medicaid program and other practices have converted from Carolina Access I to Carolina Access II or directly to Community Care. Since early 2008, this represents a 25% increase in primary care practices, from 61 to 77 practices. A second access to care effort focuses on increasing the cultural and linguistic capacity of private providers to care for children of Spanish-speaking families, which helps assure timely and easier access for newborn and infant patients.

To help break barriers for this population, the CCWJC medical director, Elizabeth Tilson, MD, MPH, has secured grant funding for Su Hogar Médico (Your Medical Home) through the local John Rex Endowment. The goals include working with 10 primary care practices to increase adherence to federal standards for culturally and linguistic appropriate services. Bilingual and bicultural "practice liaisons" work with the practices to provide verbal interpretation for patients, written translation of signage, key messages, written patient instructions, and referral and resource information. Another goal of the program is to increase the local bilingual health care work force. Using scholarship support from the grant funds, CCWJC is working with Wake Technical Community College to train qualified bilingual candidates in health care fields, including certified nursing assistants and medical assistants. The intent is that these bilingual health care workers would be hired by local practices, thus increasing their internal language capacity and decreasing the need for the practice liaisons.

CCWJC Future Directions

CCWJC will continue to develop linkages between primary care medical homes and local mental health services (local management entities or LMEs). The LMEs in both counties will be a critical part of that process; however, all resources will be examined and incorporated to assure that mental health and substance abuse are included in the patient assessment in addition to physical health issues. The current limitation on sharing patient data for these conditions continues to be problematic. However, as the problem of patient data sharing is resolved by legislative or regulatory action, CCWJC will be best positioned within the community to assure that Medicaid patients are served in a holistic fashion.

CCWJC will develop more and more effective strategies to prevent unnecessary hospitalization or hospital utilization. Current reporting tools, mentioned above, offer only a retrospective view of patient utilization. CCWJC is seeking new partners with a proactive focus. Wake County Emergency Medical Services (Wake EMS) is interested in a joint effort to reduce repeat hospitalizations by visiting with patients on a preemptive non-emergency basis to increase the likelihood that the patients' compliance will reduce repeat hospitalizations. CCWJC is exploring data sharing with Wake EMS in order to focus on the needs of the Medicaid population. However, current limitations in data sharing limit the potential of this effort for the moment.

And finally, at least for the moment, CCWJC will work to maximize the most productive and effective use of electronic medical record (EMR) systems, especially in association with the anticipated stimulus package for this purpose and related e-prescribing initiatives. The EMR initiative will seek to combine the interests of the four local hospital corporations and private practice physicians through an integrated community effort that will further enhance all the collaborative efforts described above, with the goal of continually improving the quality of care to the Medicaid population. **NCMJ**

The Evolution and Development of a Largely Rural Network:

Access III of the Lower Cape Fear

Lydia Faulkner Newman

Like all Community Care of North Carolina (CCNC) networks, Access III of the Lower Caper Fear, Inc. (ALCF) emerged from the vision of state levels leaders Jim Bernstein, Tork Wade, Dr. Allen Dobson, Denise Levis, Dr. David Bruton, and others. In our case, Jim Bernstein and Tork Wade approached Dr. Dan Gottovi and Dr. James Jones to spearhead the development of Access III. With their leadership, ALCF was organized during 2002 and was the first Community Care of North Carolina Network to emerge as a five county operation from its inception; most networks developed to that point started with one or two counties and then joined with neighboring counties. The decision to develop a multi-county network was also stimulated by the decision that a regional network must have at least 30,000 patients to become a network. North Carolina has many rural counties, especially in the east, and five counties would need to band together to meet that 30,000 patient threshold in our region. Thus our original makeup in 2002 included Bladen, Brunswick, Columbus, New Hanover, and Pender counties. Subsequently, Onslow County elected to join our network.

In 2002 the state CCNC leadership outlined these key tenets for the networks: 1) all new networks would have at least 30,000 patients; 2) every network would be governed by a board that functioned as a partnership between hospitals, health departments, departments of social services, and primary care providers; and 3) each network would tackle five key issues: asthma, diabetes, unnecessary emergency room use, lowering prescription drug costs, and managing high risk/high cost patients.

> ***We decided that we were primarily in the business of the education and reinforcement of national, evidence-based treatment guidelines for managing certain chronic illnesses. We started our efforts with asthma.***

With that outline in place, local areas were asked to bring these networks to life, which would require a key group of local physicians to recruit practices and support the clinical initiatives and an administrative leader to staff and operationalize the vision. That meant the involvement of key local physicians and an administrative leader was necessary to operationalize the vision. In the southeast, ALCF was fortunate to have Dr. Gottovi, the original founder of Wilmington Health Associates, North Carolina's largest multidisciplinary medical practice, and a key leader of the local and statewide medical community, as the physician charged with organizing our network. Dr. Gottovi, in turn, called on Dr. Jones, a prominent family practice physician and founding chair of the East Carolina University Department of Family Medicine and former head of both the US and the North Carolina Academy of Family Physicians, to be the first chairman of the Board.

Working together, Drs. Gottovi and Jones were able to easily recruit key leaders from the local health departments, departments of social services, hospitals, and the physician community in each county to serve on the board. A full board emerged in late 2002, and ALCF was incorporated in November. Once incorporated, Drs. Gottovi and Jones quickly recruited primary care practices in our region to join the network. The program was easy to sell to providers as they were already seeing Medicaid patients, and they had already agreed to serve as a medical home through the Carolina Access Medicaid program. Signing up with our network would increase the management fees from $1.00 for each Carolina

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Access Medicaid patient assigned to their practice per month to $2.50 and would bring the practice access to disease management tools and the services of a case manager. It took only a few short months of a practice recruitment campaign involving letters and visits to practices for Drs. Jones and Gottovi to recruit almost all the eligible practices in our region. Today, Access III includes nearly all of the eligible primary care practices in our region, for a total enrollment of 128 practices and almost 50,000 patients.

With practices coming on board and a Board of Directors in place, it was time to begin the recruitment process for an executive director and staff. I was chosen for this position in July of 2003, having had experience as a policy advisor to Governors Jim Hunt and Mike Easley and with experience with working on Medicaid quality and cost containment strategies at the National Governors Association's Center for Best Practices. Luckily for Access III, Dr. Gottovi also agreed to join the staff as a part-time medical director. His duties included serving both on the statewide team of clinical directors, who shape the direction of the program, and leading our local efforts to reach out to practices and providers. Once Dr. Gottovi's family moved to Raleigh, Dr. Jones stepped down as board chair to become our current medical director.

With a clear outline of the clinical issues we were to address, with a Board of Directors, an executive director, and a medical director in place, and with practices recruited, we were ready to start bringing the vision of Access III (CCNC) to life. Practices received portions of the capitation funds to support them in implementing our quality improvement strategies, and networks received their portion to support the case management functions of the network. Our network's budget now includes funds for an executive director, medical director, case management coordinator, 15 case managers, a quality improvement coordinator, a registered dietitian, a PharmD, an administrative support team, and the costs associated with supporting these roles (e.g. training, travel, benefits, insurance, rent, and equipment). In addition, we budget funds for hosting evening meetings with guest speakers to provide continuing medical education (CME) credits for providers and for printing patient and provider educational tools.

As we began to shape our network, it was clear what our focus would be: 1) helping practices and patients to adhere to National Institutes of Health (NIH) treatment guidelines for asthma; 2) helping practices and patients adhere to American Diabetes Association guidelines for diabetes; 3) reducing unnecessary emergency room use by redirecting patients to their medical home for nonemergent care visits; 4) helping providers remember to use the Prescription Advantage List (PAL), a voluntary formulary put in place to save state funds based on what is prescribed; and 5) case managing other high cost/high risk patients. However, how to implement these initiatives was left to each network to determine. Therefore Dr. Gottovi and I, along with the 10 case managers hired in September of 2003, spent many weeks around a conference table determining how we would interact with patients and providers, what tools we would offer to providers and patients, and what training programs would be put in place to support providers and case managers in implementing our initiatives.

As part of our efforts to engage providers, we determined that we wanted our case managers to be considered an extension of their practices and a part of the patient's care team—a flexible resource to help them with their difficult patients. Therefore, we assigned case managers to a particular set of practices so that they could develop a close, ongoing working relationship with providers and staff in those practices. Our goal was for the provider to refer patients who were having difficulty self-managing the disease to the case manager. The case manager could then conduct a home visit, call the patient on the phone, or meet them in the practice to reinforce the doctor's treatment plan and gather information for the provider that might inform the treatment plan.

We also decided that we were primarily in the business of the education and reinforcement of national, evidence-based treatment guidelines for managing certain chronic illnesses. We started our efforts with asthma. Dr. Laura Gerald, a practicing pediatrician and the state's asthma consultant, served as a guest speaker at evening meetings of network clinical leaders where we offered Level 1 CME credit. These were held in central locations throughout our six-county network. At the meetings, providers were educated about NIH asthma guidelines and given tools developed by CCNC and our own network that boiled those hundreds of pages of guidelines into simple prompt sheets that would help the provider at the point of care to stage the patient's asthma severity, prescribe the right medications for each stage, and offer each patient an asthma action plan to help them know how to self-manage their asthma and know what to do in the case of an attack. Our purpose was to make "doing the right thing" for the patient much easier to do for the provider, regardless of the patient's insurance type. We hoped the gains in care quality would impact all patients in the practice.

The case managers worked as embedded quality improvement resources in their practices, working with staff to determine how to best integrate the disease management tools into the practice's work flow. In addition, all of the case managers pursued a four-and-a-half month distance learning asthma management certification course, offered by the National Respiratory Training Center, and used their extensive asthma education to help reinforce the doctor's treatment plan with the patient. They would conduct home visits and assess the asthma triggers that may be in the home (e.g. smoke, pets, cockroaches, and strong chemicals), talk to families about eliminating such triggers, explain proper medication use with parents and children, help label daily maintenance medications versus rescue inhalers, and go over the doctor's asthma action plan to ensure everyone understood how to follow the provider's instructions for managing asthma daily and in the event of an attack.

The results of our combined efforts with providers and patients regarding asthma were dramatic. Before we began our educational efforts, a baseline review of a random sample of charts in our network for the four key NIH asthma guideline measures: percent staged, percent stage II-IV on a controller medication, percent with an action plan in the chart, and percent flu shot given. That initial review indicated that 20% of asthma patients had the severity of their asthma staged, 73% of those were stage II-IV with a maintenance medication prescribed, no charts had an asthma action plan in place, and 23% had a flu shot documented. Just one year after we began our educational efforts, these numbers jumped from 20% to 46% staged, from 73% to 96% stage II-IV on a controller medication, from 0% to 71% of charts with an asthma action plan in place, and from 20% to 40% with a flu shot documented. The key to preventing asthma attacks is whether a daily maintenance medication is prescribed for those with more severe asthma, so we were thrilled to see that number climb to nearly 100% and to have it remain at that level each year thereafter. More importantly, a review of claims data for asthma patients with an inpatient visit over the same period of time shows a decline from almost 20% of asthma patients having an inpatient visit to 11%, a 45% drop in inpatient rates.

On a more personal level, the importance of our work can best be demonstrated with an example of the relationship between provider, patient, and case manager. Dr. Jugta Kahai, a pediatrician in Oak Island, North Carolina, had a nine-month-old asthma patient who had multiple other complex medical and respiratory issues. The parent's mother spoke Spanish and had some transportation barriers, but came to the doctor with an interpreter and seemed to understand the instructions given. Despite Dr. Kahai's precise instructions, the patient wound up having such severe asthma attacks that he was repeatedly taken to the emergency room and wound up getting admitted to the Pediatric ICU at UNC Chapel Hill. Dr. Kahai referred the case to Connie McMurry, her Access III RN case manager, for a home visit. Upon arrival, one of the culprits was clear. While attempting to keep her house immaculately clean and free of dust triggers, the patient's mother was scrubbing the surfaces of their tightly confined trailer with a solution of bleach. The chemical exposure in the confined space triggered the acute asthma attacks. Ms. McMurry also learned that the mother had discontinued use of the oxygen and the apnea monitor ordered by Dr. Kahai because she had not understood their importance. Ms. McMurry was able to congratulate the mother for her good cleaning habits but educate her about safe cleaning techniques and the importance of the oxygen and the apnea monitor. Ms. McMurry also learned that the mother could not follow the prescription instructions as they were written in English so, working with our PharmD, the case manager had those prescriptions translated into Spanish. Over time, Ms. McMurry also learned that the child was having episodes at daycare where his care givers did not understand how to care for a child with asthma, including the importance of keeping him out of the sand box. Ms. McMurry scheduled a time to teach approximately 50 daycare employees about asthma and how to identify signs and symptoms, avoid triggers, and give medications as directed on the asthma action plan. Thanks to a host of interventions by the provider and case manager, the patient is now three years old and is much healthier. He has had some relapses due to the severity of all of his issues but has had far fewer trips to the hospital and enjoys a much better quality of life.

Subsequent to rolling out our asthma management program, each disease state initiative thereafter was rolled out in a similar fashion with evening meetings for providers. CME credit was available, quick reference tools for the treatment guidelines were on hand, and extensive education and training was provided to case managers to ensure that they could be effective health educators for the patients. In addition, our network hired a quality improvement coordinator who was charged with visiting practices, often with the medical director, to provide them with performance feedback from the state's annual chart review process in which the adherence to national guidelines for asthma and diabetes is measured through a review of a random sample of charts. Providers use the feedback to tweak their processes to better incorporate the guidelines and better manage their patients. The quality improvement coordinator also visits practices to apprise them of any new initiatives or special programs we are undertaking and helps us to recruit practices that have yet to join our network.

Today, North Carolina's Community Care effort is beginning to move in a different direction. There is a realization that we must strive harder to improve the health of the complex and costly aged, blind, and disabled (ABD) Medicaid population, the 25% of the Medicaid population who account for 75% of Medicaid costs. To do so requires addressing the needs of patients with multiple comorbidities and utilizing a different approach to working with practices and patients. Rather than rolling out an initiative for every chronic disease, we are now taking a chronic care approach, focusing on the general needs of all complex patients. Specifically, we are focusing attention on helping patients to make a successful transition from hospital to home so that they are not readmitted for a hospitalization for complications in their recovery that could have been avoided.

Our efforts have led us to even closer relationships with our hospital systems. We receive a daily list of our admitted patients. We then screen their conditions to identify patients who may be unstable and likely to relapse. For those screened unstable, a case manager visits them in the hospital to introduce our program and to indicate that one of our case managers will be visiting them within three days of their discharge. During the home visit, the case manager determines if they have filled their prescriptions, if necessary services such as home health care have been ordered and are in place, if follow-up doctor's appointments have been made, and if they understand their treatment/recovery plan. Case managers also make a list of all the medications they are taking and they submit that information and the provider's discharge instructions to our PharmD on staff to review for any discrepancies. Between January and June 16, 2009, we have reconciled medications on

238 patients and found 852 discrepancies, an average of 3.5 per patient. The most common discrepancies are continuation of prior medications (not on discharge instructions, but found on home assessment), medication compliance, medication dose/frequency issues, and therapeutic duplications. We inform the provider of these discrepancies so that they can make any necessary changes directly with patient and pharmacy. Clearly this is a very high rate of medication discrepancies, and we are certain that many unnecessary complications will be avoided through that intervention alone.

Although we do not yet have any concrete data about the results of our recent switch to a chronic care focus, anecdotally we know we have solved many problems, particularly with medication errors, and have most likely prevented some severe complications. These are very complex patients who need a lot of help in following up on their medical appointments, linking with appropriate community resources, and following through on their treatment plans. In addition, our providers seem to welcome our attention to this group of patients who are often the most difficult to manage. Our quality improvement coordinator offers the list of ABD patients at his meetings with practices, and the providers immediately want to look through it and discuss strategies for working with their case manager on patients. We are excited about our new direction and feel as though this focused approach on the sickest patients will definitely improve the care they receive, prevent unnecessary complications, improve care quality and quality of life, and ultimately save tax dollars—a true win-win for all. **NCMJ**

Role and Structure of the North Carolina Physician Advisory Group:
A Collaborative Effort Between Providers and Medicaid

Steven E. Wegner, MD, JD; L. Allen Dobson, MD, FAAFP; William W. Lawrence Jr, MD; Eileen Ciesco, MHA

Bringing practitioners into the process of implementing a program like CCNC is an important element in its success. Since Community Care of North Carolina (CCNC) is part of the Medicaid program in the state it falls under legislative guidance provided by Congress. The Deficit Reduction Act of 2005 required states to restructure their Medicaid programs and many were criticized for not including appropriate input from health care providers or the public.[1,a] North Carolina had already developed a strong process to bring physician input into the CCNC planning and implementation process and was able to make use of existing structures to help achieve federal as well as state goals. Still, CCNC physicians wanted to provide input regarding the clinical content of Medicaid policies in order to benefit the Department of Medical Assistance (DMA), the public, and the physician community. The North Carolina Physician Advisory Group (NCPAG) was formed to address this need.

> ***CCNC physicians wanted to provide input regarding the clinical content of Medicaid policies... The North Carolina Physician Advisory Group was formed to address this need.***

The NCPAG is a not-for-profit organization of health care professionals that makes recommendations to the North Carolina Department of Health and Human Services (DHHS) regarding Medicaid clinical coverage policies. This collaborative advisory role allows the NCPAG to suggest clinically appropriate policy decisions early in the administrative process, offering a potential model for other states to follow.

NCPAG Background and Statutory Authority

Federal regulations (Title 42, section 431.12) mandates each state to support a Medical Care Advisory Committee (MCAC) to advise the Medicaid agency about health and medical care services. While this entity is mandatory for every state that operates a Medicaid program, the roles and structures of such committees vary significantly from state to state. Roles of such committees may include setting budget priorities, lobbying for funds or legislation to support medical assistance objectives, involvement in policymaking, or recommending priorities and actions for the Medicaid agency. In addition, each state agency is directed to consult with the MCAC in the review of marketing materials from managed care entities.

Each state defines its own set of responsibilities for the MCAC. Only a select group of states relies on their committees to play an active role in determining the actual clinical context for

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a In response, the American Medical Association is developing model state legislation to encourage a standard public comment process for proposed Medicaid changes. See Resolution 701, AMA House of Delegates, 2006 Interim Meeting, November 10, 2006. Available at: http://www.ama-assn.org/ama1/pub/upload/mm/475/comjannotatedi06.doc. Accessed on January 5, 2007.

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policies. For example, Alaska has five standing subcommittees that focus on strategic planning, legislative matters, and consumer relations, in addition to bylaws and executive matters. Pennsylvania has a highly structured group that focuses primarily on consumer issues, with subcommittees for consumers, fee-for-service, managed care, and long-term care. Several states involve their MCAC membership in the review of new technologies.

North Carolina has successfully taken the advisory concept to a more expert level. The North Carolina Physician Advisory Group was formed in December 1997 when the North Carolina Medical Society incorporated a 501(c)(3) not-for-profit organization to work with the state's Division of Medical Assistance to implement medical management policies for Medicaid patients. In 2003, the North Carolina General Assembly further expanded the role of NCPAG by requiring DHHS to consult with NCPAG during the development of new Medicaid medical coverage policies or amendments to existing medical coverage policies.[2]

On March 27, 2006, NCPAG entered into a contract with DHHS to make recommendations regarding clinical coverage policies and to provide funding for NCPAG to develop a representative panel of medical expertise and an organizational infrastructure.[3] Later in 2006, the General Assembly modified a provision outlining the process for changing medical coverage policies that reiterated the role of NCPAG by requiring that:

> During development of new medical coverage policy or amendment to existing medical coverage policy, [the Department shall] consult with and seek the advice of the Physician Advisory Group of the North Carolina Medical Society and other organizations the Secretary deems appropriate.[4,b]

NCPAG Structure

The NCPAG is structured in three basic membership levels: 1) Board of Directors, 2) Committees, and 3) Consulting Council. The Board of Directors is comprised of 12 members. The NCPAG bylaws require all of the Board members to be physicians or dentists licensed in North Carolina. At least three board members must represent CCNC. Currently the following specialties are represented on the Board: family medicine, pediatrics, internal medicine, psychiatry, dental, hospitals, plastic surgery, neurosurgery, and obstetrics/gynecology.[5] The standing committees review several policies, while members of the clinically diverse consulting council provide advice on policies related to their specialty by joining existing or ad hoc committees as needed.

In addition to these permanent members, supplementary review groups are formed when the subject of the referred Medicaid policy is outside the scope of an existing committee. These review groups are comprised of a mixture of consulting council members, board members, and clinicians referred by state medical societies, associations, and the community. Over 100 professionals representing all medical specialties actively participate with the NCPAG as either direct members or ad hoc reviewers.

NCPAG Medical Policy Review Process

The medical policy review process begins at a monthly meeting between the NCPAG executive director, NCPAG board chair, DMA medical director, DMA assistant director for clinical policy and programs, and chief of policy development and special projects. This initial meeting facilitates open discussion between DMA and NCPAG leadership about the monthly NCPAG agenda, potential controversies, and other Medicaid issues such as service expansion, improvement, and access.

After the agenda is determined, the NCPAG holds its monthly meeting, generally via conference call due to the geographic dispersion of its members. The attendance at these meetings includes the Board of Directors, NCPAG committee chairs, the NCPAG executive director, and DMA staff. The executive directors of the state medical societies are also invited to participate in each meeting. When face-to-face meetings are scheduled, all members of the NCPAG inclusive of the consulting council and invited guests are asked to attend.

During the monthly NCPAG meeting, each new policy is introduced by DMA staff and assigned to a lead reviewer. The lead reviewer, who may be a committee chair, will oversee the review team's examination of the policy, which is typically reviewed via email and completed in one month, depending on the complexity of the issue. DMA staff members are often invited to participate in the policy review team's discussions.

Once the review team completes its deliberations, the lead reviewer and the NCPAG executive director present the policy recommendations to the Board for discussion and vote at the next NCPAG meeting. After the recommendations are approved by a quorum of the Board, the board chair sends an official communication to the DMA medical director citing the suggested revisions to the policy. However, because the NCPAG acts in an advisory capacity only, DMA has the ultimate authority to choose which recommendations to incorporate into policy.

NCPAG 2008 Policy Reviews

During the 2008 state fiscal year, DMA introduced 28 new Medicaid policies to NCPAG for review. The NCPAG completed reviews and provided clinical recommendations for 29 Medicaid policies. The number of policies reviewed by the NCPAG is greater than the number of policies received from DMA during SFY 2008 because some of these were introduced to the NCPAG at the end of SFY 2007, but not presented for

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[b] This process is now codified in NC General Statutes Chapter 108A.

approval to the Board until the beginning of SFY 2008. These 29 policies covered a wide range of clinical services and resulted in 102 recommendations; 91 (89%) of the recommendations were incorporated into policy by DMA.[6]

NCPAG considered most policies within a relatively short period. The panel reviewed and approved all of the policies within three months of the initial presentation from DMA. Within two months, DMA posted the majority of these policies on their website for public comment. While input is often received from the public during the required 45-day period of notice, it is rare for those policies that include the full recommendations of the NCPAG to generate negative commentary that is substantial enough to delay implementation. If comments received during the standard 45-day posting period result in significant policy changes, DMA will grant an additional 15-day posting and comment period.

NCPAG reviewed an additional 92 policies during state fiscal years 2004 and 2005, before the role of NCPAG was codified by the North Carolina General Assembly.[7]

Advantages of the NCPAG Advisory Model

First, the advisory nature of NCPAG allows it to control the collaborative process used by its physician board members to provide recommendations to DHHS. Members are asked to "leave specialty advocacy at the door," and the DHHS contract limits input only to "questions referred by the Department," specifying that NCPAG "shall not advocate for any unreferred issue."[8] If the General Assembly were to grant NCPAG formal decision-making authority, then its Board meetings would be subject to open meetings and public records laws.

Second, this structure ensures that any DHHS decisions requiring clinical input consider current clinical practice standards and reliable evidence. By having experienced providers and academic leaders share their knowledge during policy development, DHHS is able to reinforce its assessment of current information through additional reliable sources. In fact, when DHHS has been challenged through fair hearings processes about specific policy decisions, administrative hearing officers have acknowledged the value and high standards that the NCPAG process brings to North Carolina Medicaid policy.

Third, this advisory role encourages the resolution of potential conflicts before they occur. The deliberations of technical advisory groups like the NCPAG are regulated through disclosure laws like the Freedom of Information Act, sunshine laws, or other statutes.[9] In the Medicaid program, conflicts over the applicability of these laws often lead to costly litigation over questions of payment adequacy, coverage of denied services, or other issues.[10] Public policy conflict resolution models like the NCPAG encourage up-front negotiation between parties, greater buy-in from participants, and a more efficient use of taxpayer dollars.

Fourth, since the law requires that NCPAG be involved early in the process of a proposed policy change, NCPAG members have the necessary time to consider thoroughly any relevant clinical concerns before giving an opinion. While many policies are discussed quickly, NCPAG also has adequate time to discuss recommendations that are more complex. In contrast, once DHHS publishes such policies, outside parties, including Medicaid providers, have only 45 days to comment on the proposed changes.[11] NCPAG's deliberations provide an opportunity for timely provider input while preserving the typical forum for relevant public comment. In contrast, the comment period for the standard administrative rule-making procedure allows for 60 days of public comment.

Finally, the consultative role of NCPAG has streamlined the process for adopting medical coverage policies. The North Carolina General Assembly has exempted the adoption of new or amended medical coverage policies from the regular rulemaking process under the North Carolina Administrative Procedure Act.[12] As a result, DHHS medical coverage policy decisions are implemented much more quickly than most other state agency policy changes. When clinicians give input in the early stages of policy development, the public benefits through the creation of timely, well-informed policies.

Disadvantages

While the NCPAG model has many advantages, its advisory nature also presents a potential weakness. Because the panel's recommendations are nonbinding, similar bodies could be at risk of becoming irrelevant to or ignored by policymakers. In North Carolina, the caliber of medical participation, the quality of its prior recommendations, and its constructive relationship with DHHS and DMA officials have contributed to the group's reputation as a trusted advisory panel. However, should other states or agencies consider this type of arrangement, it should be noted that structure alone would not guarantee success.

Additionally, the streamlined review process leaves room for criticism that patients and the public do not have early input into Medicaid coverage policy. While these policies are implemented more quickly than many state regulations, North Carolina assures the protection of patient interests by preserving the 45-day public comment period after clinicians work with DMA to revise the initial policy draft.

The nonbinding advisory nature of the clinical recommendations of the North Carolina Physician Advisory Group is the key to its nimbleness in the administrative process. Through an early integration of input from North Carolina physician experts, the NCPAG model secures informed decision-making by policymakers while streamlining the process itself. Although the final policy may occasionally differ from the advisory group's recommendations, the collaboration between North Carolina policymakers, CCNC, and specialists offers a promising model as other states continue to redesign Medicaid's federal-state partnership. **NCMJ**

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The Role of the Pharmacist in CCNC

Troy Trygstad, PharmD, MBA, PhD

The Community Care of North Carolina (CCNC) Network Pharmacist Program began in 2007 in response to two emerging needs among the 14 networks. The first was a paradigm shift in care management from a historical reliance on disease-specific, protocol-driven interventions to engagement of the whole patient, with multidisciplinary chronic care delivery for the most at-risk Medicaid enrollees. In large part, this population was represented by the categorically aged, blind, and/or disabled. The change in caseload catchment attracted patients with a remarkable diversity of medications and prescribers, making them particularly prone to polypharmacy-related problems.

In addition to meeting the pharmaceutical care needs of the medically complex patient, it became evident over time that network pharmacists could play a dual role and simultaneously manage drug costs. Educating CCNC case managers and prescribers about generic alternatives was a natural fit for the Network Pharmacist Program. Past experience working with pharmacists proved successful in saving over $10 million in drug costs in the long-term care setting prior to the advent of Medicare Part D and the creation of a similar program for non-dually eligible ambulatory enrollees was a logical extension.

> *From the outset, the guiding principles of the Network Pharmacist Program have emphasized overall health care costs and global patient outcomes.*

The CCNC Vision of Pharmaceutical Care

While managing drug costs is an important programmatic element, it isn't the primary focus for CCNC. From the outset, the guiding principles of the Network Pharmacist Program have emphasized overall health care costs and global patient outcomes. Historically, pharmacist-led medication management programs have tended to focus on drug selection and related costs in a silo. There is no better example of this than the current Medication Therapy Management programs (MTMs) sponsored by Part D plans; these are completely separate from non-drug medical problems, costs, and outcomes. Rare is the pharmacy program or study whose primary endpoints are total health care costs and reductions in global events such as hospitalizations. Indeed, the Asheville Project in our own state has produced one of the rare examples that resulted in increased drug costs and decreased total health care cost.[1]

The CCNC networks seek to reduce costs of pharmaceuticals where appropriate and where it contributes to overall goals. Since the beginning of the program in 2007, CCNC enrollees have experienced a 10% absolute (16% relative) increase in generic utilization through the promotion of the Prescription Advantage List (PAL) along with other voluntary programs. This rate of increase is twice the national trend for fee-for-service Medicaid.

While drug cost savings are a convenient ancillary benefit to the program, the primary objective of CCNC pharmacy projects has never been to minimize drug costs, but rather to achieve therapeutic optimization to maximize health. This is a subtle but important distinction since the former invites perverse incentives and administrative hassles while the later allows for prescriber and patient-centered interventions such as coaching for adherence that in some instances actually increase drug costs when appropriate.

A Team-Based Approach that Connects the Dots

A team-based approach that assists the primary care provider (PCP) in building a medical home for at-risk patients has been the hallmark of CCNC, and the pharmacy projects are designed accordingly. One example is an enhanced version of medication reconciliation. In order to manage patients over time as they traverse the health care system, multiple points of contact and sources of information are required to ascertain the actual drug use of the patient. This type of layered information

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is far more valuable and usable to the PCP than a simple listing of medications. Drug use information tells a patient-specific story about drugs prescribed and not taken, drugs taken and not prescribed, side effects not reported to the prescriber, as well as fears, barriers, and attitudes towards their diseases as they relate to their prescribed medications. Sources of drug use information may include home visits with "brown bag" interviews,[a] pharmacy fill information, medical charts, discharge summaries, or interviews with caregivers. CCNC's definition of medication reconciliation highlights the general approach: Medication Reconciliation Plus (Med Rec Plus) is the process of gathering, organizing, and sharing drug use information from multiple sources with community-based providers (including the patient, medical chart, prescription fill history, and discharge instructions) in order to identify and resolve urgent/emergent duplications, interactions, possible adverse events, poor adherence, or other suboptimal drug-taking behaviors.

Ultimately the goal for the pharmacist-case manager team is to synthesize the drug use information, make an assessment, and prioritize a set of bullet points that will best inform the PCP in the 6-13 minutes of face time he or she has with the patient. Though time intensive, the CCNC infrastructure makes this activity possible through its deployment of over 350 case managers working in conjunction with CCNC pharmacists in home, office, and hospital settings. It would be an otherwise impossible task for a PCP given limited time and ability to "reach outside the four walls" of his/her practice to perform Med Rec Plus.

The Role of the Network Pharmacist in CCNC

Currently, there are 14 network pharmacists (one per network) who split their time between administrative/management activities and clinical activities. The network pharmacist is the lead project manager and facilitator of pharmacy-related activities within the geographic boundaries of the network. They are employed and supervised by the networks themselves. Network pharmacists are currently based in a variety of settings depending on the networks' specific and diverse needs. Some are based in a practice, some are based in their central office, and some are based out of their home for geographic reasons to cover geographically large networks.

Their daily activities may include developing proposals for new initiatives, reporting to the network leadership on existing initiatives, or presenting at local medical management meetings about new and ongoing initiatives. Network pharmacist activities are necessarily managerial due to the number of CCNC projects that involve drug-related management and the entirety of human resources involved.

The breadth and scope of activities in the CCNC networks is uniquely challenging for pharmacists who are used to a well-defined, iterative process. Unlike traditional pharmacist settings, any day may bring a different palate of tasks since medication-related problems touch on so many different CCNC initiatives, settings, and issues—from care transitions in institutional settings, to drug and medical equipment coverage issues, to drug-disease specific education for case managers, to promoting and assisting with e-prescribing. Fortunately, the work histories of the network pharmacists prior to employment in the networks are quite varied, coming from every corner of the pharmacy profession including managed care, retail pharmacy, hospital pharmacy, specialty pharmacy, mail order pharmacy, HIV clinics, anti-coagulation clinics, diabetes clinics, and academic residency teaching. As such, it has evolved into an active learning community where network pharmacists from different networks rely on each other for resolution of daily requests for troubleshooting that come in from case managers and PCPs alike. Despite being employed by 14 different entities, CCNC pharmacists rely on each other daily for assistance in managing pharmacy projects that would have otherwise been outside their scope of experience.

Dividing Time between Administrative and Clinical Activities

The single greatest barrier to expanding the scope, scale, and intensity of pharmacy-related activities in the CCNC networks is the limited number of pharmacists available to devote time to the many projects, initiatives, and programs that all involve medications and their use in some fashion. Across our networks we have a pharmacist-to-enrollee ratio as low as 1:35,000 and as high as 1:130,000. Currently network pharmacists often split their time between administrative and clinical activities, providing reviews of patients on referral from case managers or PCPs when time allows.

A scalable model would place clinically-oriented pharmacists in PCP medical homes, working under the direction of the practice but with activities facilitated and coordinated by their local network pharmacist to meet the medical home service needs of our practices.

As the need for more practice-based activities and clinical referrals have grown, networks have started to contract with clinically-oriented pharmacists who have work experience or residency training in primary care practice settings. Currently 10 pharmacists are engaged with projects that put them in direct contact with a medical home practice. Their effort includes activities ranging from Med Rec Plus, to group medical visits, to e-prescribing adoption and facilitation.

Though most medical home practices would welcome the notion of having a well-acclimated, clinically-oriented

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[a] A "brown bag" interview is traditionally patient-facing and inquiry-based, focusing on what and how patients actually take their medications. The "brown bag" naming comes from the traditional brown paper bag that patients would customarily use to bring their bottles of medication to the interview.

pharmacist at their disposal, it is economically infeasible to do so without funding that is external to the practice. While the CCNC payment model has been able to support ancillary staffing of case managers in medical home practices, a multipayer medical home payment model would be required for clinical pharmacists to be revenue-neutral or revenue-positive for the practice. Until such a time arrives, CCNC pharmacists continue to share time across practices and projects, ever looking for a model that would allow them to participate more fully in the medical home. **NCMJ**

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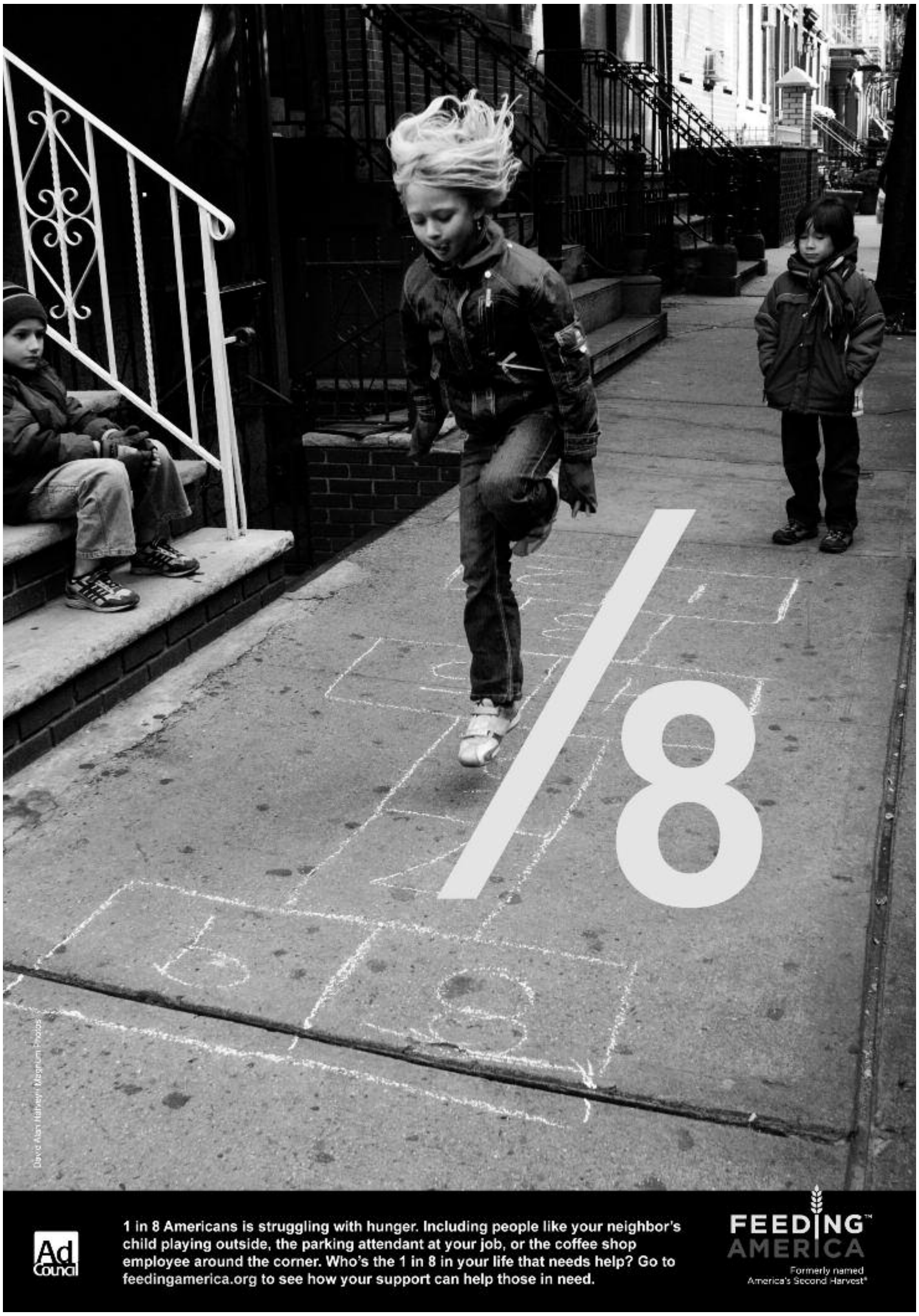

CCNC Program Evaluation:
Strategies and Challenges

Alice K. Fortune-Greeley; Sandra B. Greene, DrPH

Since Medicaid medical home programs are still in their nascent stages, there is little in the literature that documents the best way to determine their effectiveness. Additionally, understanding the programs' efficacy in an operating environment such as a statewide Medicaid program can be difficult.[1] Recent reports identify key methodological issues involved in the evaluation of Medicaid disease management programs.[2-6] The challenge to evaluating these programs is establishing precise, equivalent comparison groups that enable us to compare the quality and cost of care for patients enrolled in the medical home as compared to what these patients would have encountered in absence of the medical home initiative.

Establishing Precise, Equivalent Comparison Groups

In heath care delivery research the gold standard for comparing the effectiveness of an intervention like Community Care of North Carolina (CCNC) would be to conduct a randomized control trial. However, for ethical and pragmatic reasons, this type of trial is not feasible. With the assumption that care provided within CCNC is better care, randomizing patients into care options outside of the CCNC networks may cause concern and raise objections. In general, truly randomized assessments of financing options for health care are difficult to field. CCNC networks now span all 100 counties and participation is mandatory for most Medicaid recipients.[7] Consequently there are no other practice locations to randomize patients into. Thus, we must consider other methods to create an intervention and reference groups that are as equivalent as possible to obtain an unbiased and accurate assessment of the effectiveness of the program.

The intervention group in this case would be a group of patients who receive care from a CCNC medical home. A reference group would be a group of patients with similar characteristics and in similar environments who received care from a "standard" health care system. A properly selected intervention group and reference group should be able to use comparable metrics to measure process and outcomes. We also should be able to adjust for the difference in key variables. This enables the intervention group's health and health care resource use to be compared to what was expected in the same population in the absence of intervention.[5] With complex concepts such as medical homes, however, achieving equivalence can be a difficult task; there are many elements to consider when selecting comparison groups before we are able to isolate the differential effect of the medical home program.

Patient Equivalence

In order to create equivalent comparison groups, there should be no systematic differences between the patients in the intervention group and the reference group. Differences in patient demographic characteristics such as age, gender, socioeconomic status, and health status have the potential to affect assessment of outcomes or costs between the comparison groups. Additionally, since patients are able to select their own physicians, there may be systematic differences in utilization and cost for those who choose medical home practices involved in the CCNC program. For example, patients with greater anticipated utilization may select a medical home provider due to increased care coordination. Since we are unable to randomize patients into medical homes in order to control for selection bias, adjustments should be made in the analysis stage for demographic differences, comorbidities, and other measurable factors that are related to self-selection into medical homes.

> ***The challenge to evaluating these programs is establishing precise, equivalent comparison groups...***

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Practice Equivalence

In order to examine the efficacy of the CCNC program, it is important to consider the possible systematic differences between the practices in the CCNC program and those outside of the program. Practice patterns may vary among the program networks and practices due to the degree of CCNC program implementation or the services available in particular networks. Given that the program was rolled out over time, the practice style of early-adopting providers could differ in important ways from those that recently joined the program. For example, the early adopters may be more likely to be supportive and engaged in the disease and case management program.[1] The practices that joined the program more recently may still be training managers and orienting their practitioners, and their program effects may not yet be realized.[1] The degree of implementation and varying practice patterns of the CCNC medical homes may limit the precision of the estimate of the effect of the program and should be taken into consideration when interpreting the results.

External Factors

In addition to patients and practices, other external factors can affect the equivalency of comparison groups. Changes in health care outcomes and costs between groups over time cannot be assumed to be solely due to the CCNC intervention.[5] External factors such as changes in physician practice patterns, patient severity mix, and prices of health care supplies and services could have an impact on costs, utilization, or outcomes.[3] If it is believed that these factors disproportionately affect one comparison group over the other, they must be controlled for in the analysis, if possible, in order to obtain unbiased estimates of efficacy.

There are additional external factors that could affect the precision of the estimates. Medicaid enrollees are likely to shift in and out of Medicaid eligibility. This affects those enrolled in the medical home program because care discontinuity can limit the effectiveness of a medical home initiative. Thus, if we include those with interruptions in Medicaid coverage in analyses, we may reduce the accuracy of our estimates about the program's efficacy. Conversely, if we limit the study population to individuals who are continuously enrolled in the focus time period, we may reduce the sample size and jeopardize the significance of the findings.[1]

Interventions such as disease management programs and medical homes do not and are not expected to produce immediate, even short term, results. Medical home components such as increased preventive care and case management may take years to generate measurable health improvements and cost reduction. There are also costs associated with setting up and running the CCNC program, so there will be a delay before the program sees a return on investment. Moreover, some medical home components may actually lead to a short-term cost increase. Case management, for example, is aimed at increasing adherence to medications, which may lead to long-term decreases in utilization but can actually lead to short-term increases in costs.[1] If we use baseline estimates measured before the program effects were realized, we may underreport the effect of the CCNC program on select outcomes and cost.[3]

Selecting a Reference Group

Another option is to create baselines from reference groups. Given the many factors that can result in biased and imprecise assessments of the comparison groups, reference groups should be selected carefully to ensure internal validity. Evaluations of disease management programs have typically involved two major categories of reference groups: the first, historical comparison groups, involves patients chosen from a prior time period. The second, concurrent comparison groups, comprises patients selected from the same, present time period.[5]

Historical Comparison Groups

Historical comparison groups can include the same patients who eventually receive the intervention (such as pre-post tests studies), a group of patients who do not get the intervention (such as benchmark designs), or some combination of both.[5] The benefit to a pre-post design is that it is comparatively easy to conduct because it uses patients as their own control; thus, there is no need for an external reference group.[5] However, if the patient, practice, and external threats to validity described above are not successfully controlled for, this design has the potential to be biased.

To assess the cost-effectiveness of the CCNC program for fiscal year 2003-2006, Mercer Human Resources Consulting Group employed historical benchmarks.[8] They used utilization and cost data for all Medicaid enrollees statewide from the previous year and trended the data forward using the utilization and unit cost trend components of medical inflation. They compared these historical benchmarks to actual cost data for the CCNC program and concluded that savings ranged from $118-$130 million in 2004, with an average per member per month (pmpm) payment savings of 17%.[8] A more recent study by Mercer for fiscal year 2007 found an average pmpm payment savings of 11%. The second study employed a similar methodology as the first, but the benchmark data used in the projection was limited to historical claims data for only patients enrolled in the state's traditional primary care case management program, Carolina Access.[9] Other than medical inflation, they did not control for other patient, practice, and external factors that could confound the results; thus, their conclusions may have been biased.

Concurrent Comparison Groups

Concurrent comparison groups enable the researcher to compare the intervention group with a defined subset of the general population during the same time period.[5] The benefit of this design is that, compared to historical comparison design, it can control for external factors or secular trends. For example, spending levels and patient outcomes in any given year may be more reflective of the Medicaid case mix during the time period than of the intervention,[3] but with historical benchmarks, the researcher would be unable to control for this trend. The drawback to concurrent comparison design is that all measurable non-equivalences between the intervention and reference groups must be adjusted for. Failure to adjust for these non-equivalences could bias the estimates.

In their evaluation of the CCNC asthma and diabetes programs, researchers at the Cecil G. Sheps Center for Health Services Research elected to use a concurrent comparison group. Although their analyses were limited due to unmeasurable population differences, discontinuity of care, and the degree of program implementation, they did not have to be concerned with some external confounding factors such as medical inflation and were able to adjust for some measured differences in the enrolled populations such as age. The study found modest savings for patients enrolled in CCNC networks compared to patients using Access. Per member per month payments were 2.6%-4.7% lower for asthma patients and 1.7%-3.7% lower for patients with diabetes during the three years of the study (2000-2002). A critical component of their analysis was age adjustment, given the finding that the CCNC asthma population was significantly younger than the Access population and that younger people with asthma were less costly to treat.[1]

Suggestions for Solution

Although both the historical and the concurrent comparison groups have their benefits and limitations, the concurrent approach is the most applicable in the evaluation of the CCNC program because it allows for stratification of key variables that may affect the equivalence of the comparison groups. It also easily addresses secular trends that could influence cost and outcomes and have an impact on the internal validity of the study. This method is more accurate than the use of a historical method that ignores demographic differences in reference and comparison groups, which can lead to invalid results.

The real challenge in evaluating the CCNC program in North Carolina moving forward is the difficulty of finding an appropriate concurrent reference group of patients treated outside CCNC networks. There is no longer a large enough contingent of Medicaid patients treated in earlier iterations of the program or outside CCNC. Our suggestion is that researchers may look to neighboring states for comparison groups. States with fee-for-service Medicaid reimbursement programs, in environments absent formal managed care or HMO structures, would provide near contrasting interventions for equivalent comparison groups. If there were managed elements in the Medicaid program those would have to be described carefully. Any potential comparison group would need to be evaluated on the basis of demographic characteristics in order to determine a similar distribution to the North Carolina reference group under study. Differences in demographic characteristics could be adjusted in the analysis and still provide valid evaluation results. While gaining access to another state's Medicaid data can be a challenge, accessibility is improving. The effort to find and use a comparison population will be paid off with greater confidence in a sound evaluation of this important program. **NCMJ**

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The Evolution of Community Care

PHILANTHROPY PROFILE

Torlen Wade

While it is commonly known among health leaders that North Carolina has built a statewide medical home and care management system for its Medicaid recipients, there is limited understanding of how North Carolina arrived at where it is today. Community Care of North Carolina (CCNC) did not rise up as a finished vision but rather has evolved over 25 years. Over those 25 years there have been three groups of organizations involved at every step of the way:

- North Carolina Department of Health and Human Services (Office of Rural Health and Community Care and the Division of Medical Assistance)
- North Carolina Foundation for Advanced Health Programs
- Kate B. Reynolds Charitable Trust, The Duke Endowment, Blue Cross Blue Shield of North Carolina Foundation, and other national foundations

Key Development Steps in the Evolution of Community Care

1983-1985

In an effort to improve participation of primary care physicians in Medicaid and to reduce inappropriate use of the emergency room, the North Carolina Foundation for Advanced Health Programs, in partnership with the North Carolina Division of Medical Assistance, submitted a proposal to the Kate B. Reynolds Charitable Trust to pilot North Carolina's first effort at developing "medical homes" for Medicaid recipients. The Foundation received a grant of $63,566 to work with health organizations in Wilson County to plan and develop the Wilson County Health Plan. Under the Wilson County Health Plan, systems and processes were designed and implemented that would enable Wilson County Medicaid recipients to enroll with primary care providers and group practices who would assume responsibility for providing and coordinating enrollee care.

1986-1988

During the implementation phase of the Wilson County Health Plan, 1,500 Medicaid recipients in Wilson County became members of the plan. During the first year of operation, the average number of hospital days per Medicaid recipient declined by 58%. The net savings to the state and Wilson County was $300,000 in that 12-month period. The Kate B. Reynolds Charitable Trust contributed $49,434 to this implementation phase.

1989-1991

With the success of the Wilson County project and with encouragement and a $631,000 grant from Kate B. Reynolds, the North Carolina Foundation for Advanced Health Programs again joined with the Division of Medical Assistance to propose spreading the medical home concept to additional North Carolina counties with the goal of building a statewide medical home program.

From 1989-1991, the medical home program, which became known as Carolina Access, secured a federal waiver, developed state support and systems, and expanded the new program to 12 counties (Beaufort, Burke, Durham, Edgecombe, Greene, Henderson, Madison, Moore, Nash, Pitt, Wayne, and Wilson). By May 1993, 45,649 Medicaid recipients had enrolled and 469 primary care physicians were participating in the program.

1992-1997

Based on the success of the 12 county expansion, the Division of Medical Assistance, with support from the General Assembly and the Centers for Medicare and Medicaid Services, began, in 1992, to spread the Carolina Access program statewide. By the end of 1997, Carolina Access was in place in 99 out of 100 North Carolina counties.

1997-1998

In the mid-90s there were serious proposals circulating in Washington, DC that would shift more of the financial responsibilities for the Medicaid program to the states. With this looming prospect, the Secretary of the Department of Health and Human Services asked the Foundation to join with the Division of Medical Assistance and other organizations to plan for North Carolina's next generation Medicaid managed care program. The goal of the effort would be to build on the popular Carolina Access program and to create a medical home model that could better improve the quality and cost-effectiveness of care. In designing the next phase, the Foundation and its partners would work with state and local leaders. The plan developed was to focus on strengthening

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the ability of the primary care physician to improve care and care outcomes by introducing four new elements to Carolina Access:

- Formation of networks
- Introduction of population management tools
- Case management and clinical support
- Data and feedback

Out of this design and development effort emerged the Access II and III programs, which would later become known as Community Care of North Carolina. During phase one, nine networks were formed and program-wide technical assistance and management information system support was put in place. Kate B. Reynolds contributed $358,000 to the development of the Access II and III programs.

1999-2007

The establishment of Community Care and its medical home and care management system became North Carolina's primary vehicle for improving care and care outcomes for Medicaid recipients. During this time, more than 785,000 Medicaid recipients were enrolled and more than 3,000 primary care physicians were participating.

2007

In addition to shifting the focus of Community Care to patients with chronic illnesses, the program also wanted to focus on prevention. With encouragement and a $130,900 grant from Kate B. Reynolds, the Community Care Program established a Prevention Workgroup. The workgroup, after reviewing data and considering a number of program options, elected to develop two prevention initiatives: childhood obesity and stroke prevention. Both initiatives received the full endorsement of Community Care's Clinical Directors Group and nine networks requested to participate in one of the prevention initiatives. Core elements, tools, and implementation activities were developed.

2008-2009

A Kate B. Reynolds grant of $381,000 supported the proposed implementation phase of the prevention program.

2008

CCNC received funding of $250,000 from the Blue Cross and Blue Shield of North Carolina Foundation to provide technical assistance and incentives to encourage primary care providers to adopt e-prescribing technologies in their practices.

2008-2009

CCNC developed a telehealth monitoring initiative to improve health outcomes in high risk Medicaid recipients with congestive heart failure with the help of $250,000 in funding from The Duke Endowment.

2006-2009

Community Care, in partnership with the North Carolina Department of Health and Human Services, developed the Integrated, Collaborative, Accessible, Respectful, and Evidence-Based Care Initiative (ICARE) to improve mental health, developmental disabilities, and substance abuse services provided to Medicaid enrollees. This initiative helps increase the capacity of primary care providers to provide evidence-based care, while creating and strengthening linkages between primary care practices and behavioral health practitioners. The Kate B. Reynolds Charitable Trust ($653,000) and The Duke Endowment ($2,096,000) provided funding to support training for primary care providers, create linkages to Local Management Entities, and develop collocation models. (ICARE is described more fully in the May/June 2007 issue of the *North Carolina Medical Journal*.)

The Role of National Foundations

CCNC, through the Foundation for Advanced Health Programs, also received support from other national foundations, including the Annie E. Casey Foundation, the Center for Health Care Strategies, and the Commonwealth Fund. Funds from The Commonwealth Fund are being used to help duplicate CCNC models in other states. **NCMJ**

Running the Numbers

A Periodic Feature to Inform North Carolina Health Care Professionals about Current Topics in Health Statistics

From the State Center for Health Statistics, North Carolina Department of Health and Human Services
http://www.schs.state.nc.us/SCHS

Recent Data Related to a Medical Care Home for North Carolina Residents

Consistent access to primary care is a basic tenet of the medical home, frequently referred to in the commentaries in this issue of the *North Carolina Medical Journal*. Four indicators have been proposed to define and measure the quality of a medical home: 1) having a regular doctor or place of care; 2) ability to contact the provider by telephone; 3) ability to get medical care or advice in the evening or on weekends; and 4) having office visits that are well-organized and on time.[1] A regular primary care provider gets to know the patient and can recommend not only effective treatment but also lifestyle and environmental changes to prevent health problems.

Two of North Carolina's ongoing public health surveillance systems address one aspect that should characterize a good medical home. The Behavioral Risk Factor Surveillance System (BRFSS) is a random telephone survey of North Carolina residents ages 18 and older. The BRFSS is funded by the Centers for Disease Control and Prevention (CDC) and is conducted in all 50 states. In 2007, the most current year of available North Carolina BRFSS data, nearly 15,000 adults were interviewed. The Child Health Assessment and Monitoring Program (CHAMP) is a child health survey specific to North Carolina. CHAMP is a follow-up survey to the BRFSS, where parents or caregivers with a child age 17 or younger in the household are called back (if they agree) for a second interview about the heath of the child. In 2007, approximately 2,700 CHAMP interviews were completed. For both BRFSS and CHAMP, the data are self-reported over the telephone, and therefore may not be as reliable as some other means of data collection.

The BRFSS and CHAMP questions that are related to a medical care home are:

Q1: Do you have one person you think of as your personal doctor or health care provider? (BRFSS)

Q2: Do you have one or more persons you think of as the personal doctor or nurse for your child? (CHAMP)

Q3: Does your child have a dentist or dental clinic where (he/she) goes regularly? (CHAMP)

Table 1 shows that 22% of adult BRFSS respondents in 2007 said that they did not have a personal doctor (Q1). The 95% confidence interval shows the range in which we would expect the true value for all North Carolina adults to fall 95% of the time. As a good approximation, if two 95% confidence intervals do not overlap, then the difference between the corresponding percentages is statistically significant at $p < 0.05$.

Males are significantly more likely than females to not have a personal doctor. Other groups who are significantly less likely to have a medical care home are African Americans, Spanish-speaking Hispanics, adults with less education, persons without health insurance, smokers, and persons without diabetes. Results for some of the other BRFSS chronic disease questions are similar to those for diabetes:

adults with chronic lung disease, asthma, and hypertension are much less likely than those without these conditions to report that they do not have a personal doctor. Though not shown in the table, the percentage reporting that they do not have a personal doctor decreases steadily with age, from 47% in the 18-24 age group to 4.5% in the 75+ age group.

Table 1.
2007 BRFSS Survey Results: Percent Who Reported No Personal Doctor (Q1) by Selected Characteristics (Adults Ages 18+)

	Percent with No Personal Doctor	95% Confidence Interval
Total	22.0	20.8-23.3
Gender		
Male	28.8	26.7-30.9
Female	15.7	14.4-17.0
Race		
White	16.8	15.6-18.1
African American	23.6	20.5-26.9
Ethnicity		
Non-Hispanic	18.7	17.5-19.9
Hispanic, English Speaking	22.4	15.6-30.9
Hispanic, Spanish Speaking	75.4	68.8-80.9
Education		
Less than High School	35.6	31.7-39.7
High School or GED	26.2	24.0-28.7
Some Post-High School	17.8	15.6-20.2
College Graduate	14.9	13.1-16.9
Have Health Insurance		
Yes	13.5	12.4-14.6
No	59.3	55.8-62.7
Current Smoker		
No	19.1	17.8-20.5
Yes	32.0	29.0-35.1
Diabetes		
Yes	6.0	4.6-7.8
No	23.9	22.5-25.3

Note: Detailed 2007 BRFSS data tables for this question available at: www.schs.state.nc.us/SCHS/brfss/2007/nc/all/persdoc2.html and www.schs.state.nc.us/SCHS/brfss/2007/nc/risk/persdoc2.html

Table 2 (page 286) shows the 2007 CHAMP results for a personal doctor (Q2) and a regular dentist (Q3). Fewer of the differences within the CHAMP data are statistically significant due to the substantially smaller sample sizes, compared to BRFSS. As before, African American children, Hispanic children, and children of parents with less education are more likely to have their parent/guardian report that they did not have a personal doctor or a regular dentist. Children with special health care needs were more likely than others to have a medical or dental home. There is an increase in the percentage of children without a personal doctor as age increases, while children under age five are much more likely than children in older age groups to have their parent report that they do not have a regular dentist (58% vs. 13% or less) (data not shown in table).

These data illustrate that certain demographic groups or people with certain characteristics in North Carolina are less likely to have a personal doctor or regular dentist. The extremely high percentage of adults with no health insurance who report that they do not have a personal doctor (59.3%) shows that lack of health insurance is a serious barrier to having a medical care home and continuity of health care. Additional population-based data on phone access to providers, hours of availability of care, and the organization of office care could provide a more refined picture of the status of the medical home in North Carolina.

RTN—continued on page 284

RTN—continued from page 283

Table 2.
2007 CHAMP Survey Results: Percent Reporting No Personal Doctor (Q2) or No Regular Dentist (Q3) by Selected Characteristics (Children Ages 0-17)

	Percent with No Personal Doctor	95% Confidence Interval	Percent with No Personal Dentist	95% Confidence Interval
Total	17.3	15.6-19.1	22.2	20.3-24.3
Race				
White	14.5	12.7-16.5	18.5	16.4-20.7
African American	22.0	17.7-27.0	25.1	20.4-30.5
Ethnicity				
Hispanic	21.3	16.0-27.8	38.0	30.8-45.8
Non-Hispanic	16.8	15.0-18.7	20.4	18.4-22.5
Parent Education				
Less than High School	26.6	19.2-35.7	42.1	32.9-51.9
High School or GED	23.7	19.5-28.4	26.8	22.4-31.8
Some College	16.8	13.7-20.5	20.8	17.2-24.9
College Graduate	13.3	11.2-15.7	18.0	15.5-20.9
Child with Special Health Care Needs				
Yes	12.8	9.8-16.4	16.8	13.4-21.0
No	18.7	16.7-20.9	23.6	21.3-26.1

Note: Detailed 2007 CHAMP data tables for these questions available at:
www.schs.state.nc.us/SCHS/champ/2007/k07q12.html and
www.schs.state.nc.us/SCHS/champ/2007/k14q01.html

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Spotlight on the Safety Net

A Community Collaboration

Kimberly Alexander-Bratcher, MPH

Access II Care of Western North Carolina Toe River Project Access at Blue Ridge Regional Hospital Foundation

Community Care of North Carolina (CCNC) networks enhance access to primary care medical homes for Medicaid recipients statewide, and HealthNet partnerships increase access to care for the uninsured. A unique partnership between these two programs in the western part of North Carolina is providing access to a comprehensive array of services for the uninsured. Access II Care of Western North Carolina (AIICWNC), a CCNC network, and the Toe River Project Access (TRPA) at Blue Ridge Regional Hospital Foundation, both HealthNet partners, joined forces to create a synergistic system of care in a very rural part of the state. According to Anne Braswell, senior analyst for research and development and HealthNet program manager at the Office of Rural Health and Community Care in the Office of the Secretary of the North Carolina Department of Health and Human Services, the two programs "have implemented an exemplary multicounty HealthNet project making excellent use of limited resources in a remote, rural community."

Toe River Project Access was formed in 2003 in response to the growing number of uninsured and underinsured residents in the Spruce Pine area. Community providers had seen the success of Project Access in Buncombe County[a] and wanted to help the citizens in Mitchell and Yancey counties in a similar way. The providers approached the Blue Ridge Regional Hospital Foundation for support and also volunteered their own time and resources to begin providing services. Toe River Project Access, formed as an initiative of the Foundation, now serves as a central referral service, spreading the burden of care across medical, dental, and vision providers, in addition to providing emergency prescription assistance. Clients may qualify for services if they have an existing condition, are uninsured, have a family income of less than 150% of the federal poverty level, and have been a resident of Mitchell or Yancey counties for the past 30 days.[b] More than 600 people have been provided medical and dental services in the amount of over $2.8 million since the TRPA program began.[1]

Access II Care of Western North Carolina is an eight-county community-based health care network of Community Care of North Carolina. Mitchell and Yancey counties were added to the AIICWNC Community Care network in 2003. In May 2009, AIICWNC had more than 38,000 enrollees across its eight counties.[2] The groups in Mitchell and Yancey counties quickly became aware of the work of TRPA. The two organizations leverage funds to maximize limited resources by building on partnerships to bring greater access to care for the uninsured and underinsured in their region through a HealthNet network. Since the beginning of the partnership, they have provided 187 clients with case management and have launched an initiative to provide case management to Latinos with asthma, diabetes, chronic obstructive pulmonary disease, and congestive heart failure.

The HealthNet network provides comprehensive services including primary care, prescription assistance, health education, disease management, dental care, vision care, mammography, and nutritional counseling. It also provides emergency prescription assistance for patients with diabetes during the critical period between a provider writing a prescription and a patient's enrollment in a prescription assistance program. AIICWNC and TRPA also work with other community organizations to coordinate additional services for the uninsured. Partners include the MYMeds program (a faith-based medications assistance ministry that provides long-term prescription assistance), Toe River Health District, Healthy Yancey and Mitchell Community Health Partnership (Healthy Carolinians partnerships), Centro de Enlace and Centro Latino community organizations, NC Farmworker Health Program, Mitchell and Yancey counties Departments of

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[a] Buncombe County Project Access was the first Project Access program in North Carolina. It is an innovative physician volunteer initiative providing access to comprehensive medical care for low-income uninsured Buncombe County residents. The first patients were seen in June 1996. Information available at: https://www.bcmsonline.org/pa/pp/. Accessed June 8, 2009.

[b] Personal communication with Cheryl Craigie. May 19, 2009

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Social Services, Blue Ridge Regional Hospital, and more than 50 primary care providers, dentists, and optometrists.

In a rural community hit especially hard by the current economic downturn, this HealthNet network is increasing access to medical care for the uninsured. The program not only met, but exceeded, all but two of the first quarter performance standards, increasing the number of participants from 203 to 394, offering them with a medical home, and providing access to many needed services. The local emergency room use decreased 666% for people participating in the program for one year or more, and Blue Ridge Regional Hospital has seen a 33% decrease in dental disorders.[b] Technology is being used to capture utilization rates of the uninsured, track the uninsured as they move across the state, and help with continuity of care across providers.

Much of the program's success is due to the commitment and dedication of the providers. TRPA has 100% of the two counties' primary care physicians participating in the program and strong support from the extended medical community. Even during tough financial times, the providers are not only continuing to provide services at a substantially reduced cost, similar to an insurance co-pay, but many are offering to increase the number of program participants they serve. Program staff note that providers make a lifestyle choice to come to a rural community and make professional and personal sacrifices. The only providers that are no longer with the program are several dentists who moved to start practices in even more rural areas.

There are several challenges to providing services in this rural area. Access to specialty care may only be available in larger communities because there are very few specialists in the two counties. Those specialists in larger communities may accept patients but most likely already provide reduced care for program participants in the cities of Asheville or Boone. There is also a shortage of health care providers, with both Mitchell and Yancey counties designated as federal Health Professional Shortage Areas.[3] Continuing layoffs have introduced many people unfamiliar with supportive services to the ranks of the uninsured. Spruce Pine was featured in a recent CNN story due to the more than 2,000 layoffs in a community of just over 15,000 residents.[4] In order to increase awareness and establish credibility with the newly uninsured, the program works with churches and trusted community partners.

There are also success stories. The partners were recently awarded a grant from the Tri City affiliate of the Susan G. Komen for the Cure Foundation. The project provides gas cards to TRPA clients and participants in Mitchell and Yancey counties' Breast and Cervical Cancer Control Program. Separate grant funds provide free mammograms to TRPA clients. Patients are required to complete surveys that assess the unmet medical needs in the area. The results will be shared with the partnership to help address these unmet needs. In a specific example of the HealthNet program's effectiveness, a patient was scheduled for a complete eye exam. During the exam, the optometrist noticed an abnormality. He tested the patient's blood sugar in the office and received an elevated result. The patient was sent to the emergency room for care and was diagnosed with diabetes. She is receiving medication assistance through TRPA and case management through Access II Care.

Without the continuity of care provided by the network, this patient and many others may not have received timely and effective treatment for a wide spectrum of medical problems. This HealthNet network is making a difference in the lives of Mitchell and Yancey county residents one person at a time.

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