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HEALTH REFORM IN NORTH CAROLINA

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Merry-K. Moos
Pioneer for Preconception Health

Often referred to as the "Pioneer for Preconception Health" by her colleagues, Merry-K. Moos has devoted a lifetime's worth of work to improving preconception health and birth outcomes for women. She was one of the first individuals in health care to promote the concept of preconception health and continues to serve as a leader for this movement. Twenty years ago, while the rest of health care was focusing on improving birth outcomes for women during pregnancy, Ms. Moos was talking about the need to care for women across their reproductive lifespan. In 1989 she wrote, "Only casual attention has been given to the proposition that one of the best protections available against low birth weight and other poor pregnancy outcomes is to have a woman actively plan for pregnancy, enter pregnancy in good health with as few risk factors as possible, and be fully informed about her reproductive and general health."[1]

In the late 1980s Ms. Moos and Dr. Robert Cefalo co-authored the first clinical textbook to focus on preconception health care. She then coordinated several innovative projects in North Carolina to move activities forward that were aimed at improving women's wellness. Twenty years later, due to her expertise and dedication to the preconception health movement, the Centers for Disease Control and Prevention's Panel for Preconception Health selected Ms. Moos to develop a national preconception curriculum for health care providers and to co-create preconception care national guidelines. She has been an integral part of the national conversation on preconception health and her leadership has been important in creating strong guidelines and recommendations for women's health during their reproductive years.

While Ms. Moos is a nationally recognized leader in preconception health, she is also a strong patient advocate and caring clinician. For many years, Ms. Moos ran the adolescent prenatal and parenting clinic at the University of North Carolina at Chapel Hill, connecting teenagers with the resources they needed and providing them and their babies with good care and counsel. The attention, effort, and energy she put forth in working with teenagers was inspiring and helped to create special bonds with her patients.

When asked about Merry-K. Moos, her close colleague Sarah Verbiest says, "She has been a great mentor to many students. She has provided guidance to students in many capacities—from classroom projects to doctoral committees. When Merry-K. commits to working with a student she truly pledges her time and her expertise. Her praise is valuable because of her high standards and the fact that she never gives it falsely." When asked to describe Ms. Moos as a collaborator, Verbiest says, "You always want her at your meetings! She's excellent at framing issues and moving the conversation forward. She's able to see many points of view and help synthesize them into a direction that all can embrace."

continued on page 384

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In addition to her work with patients and students, Ms. Moos provided training and support to public health and private clinics in North Carolina for over 20 years. Through her role as a perinatal outreach educator and trainer, Ms. Moos worked with clinicians to address a variety of issues to improve birth outcomes, and has also addressed many challenges from the health care system level to individual clinical practices.

Merry-K. Moos has a BSN from the University of Washington at Seattle, an FNP from the University of California at Los Angeles, and an MPH from the University of North Carolina at Chapel Hill (UNC). A long-standing March of Dimes volunteer, she has nationally authored nursing modules, served on many committees, and locally provided support to programs such as the North Carolina Folic Acid Campaign. Last year she retired from her full-time position at UNC, where she worked for the past 30 years. During that time she held many positions within the university, including research professor in the Division of Maternal-Fetal Medicine, adjunct professor at the Gillings School of Global Public Health, and director of the Women's Health Information Center at UNC Hospitals. Even though she has transitioned out of a full-time role at UNC, she is still closely linked with many ideas and initiatives going on there. Since her retirement Ms. Moos has been doing national and international speaking on preconception health and remains a top opinion leader in this area. Her work for the preconception health of women clearly continues.

REFERENCE

1 Moos M-K. Preconception health promotion: a health education opportunity for all women. *Women and Health.* 1989;15(3):55-68.

Contributed by Lindsey E. Haynes, a graduate student in the Department of Health Policy and Management, University of North Carolina at Chapel Hill, Gillings School of Global Public Health, with the assistance of Sarah Verbiest, DrPH, MSW, MPH executive director of the Center for Maternal and Infant Health at the University of North Carolina at Chapel Hill.

Practices for Sale

Bringing Medical, Dental, and Health-Care Related Buyers and Sellers Together.

Type Practice	*Location*	*Practice Price*	*Real Estate*	*Total Listing Price*
Women's Practice	**Wake County, NC**	**$725,000**	**$1,750,000**	**$2,475,000**

Primary care with a woman's touch. This is an established and well known practice in the heart of Wake County. Totally upscale with new computer system, exceptional staff and the physician willing to stay for several months, assuring a smooth transition. Two story building fully leased to MD's with excellent cash flow.

Hyperbaric Oxygen Therapy	**Raleigh, NC**	**$357,900**	**Leased**	**$357,900**

This practice, owned by an investment group, is fully equipped and ready for a new owner. Two treatment chambers and well appointed. This practice has been open for 1 ½ years and is ideal for an on-site MD. It can also become an extension of your existing practice. Owner is willing to finance part of the purchase price.

Urgent Care	**Greensboro, NC**	**$350,000**	**Leased**	**$350,000**

Upscale practice serving patients in the Triad for about 15 years. Medical equipment includes X-Ray, CBC and several up-fitted exam rooms with Welch Allyn Otoschopes. Consistent patient flow including walk-ins and corporate accounts. Physician is looking at retirement.

Urgent Care	**Wake County, NC**	**$1,005,000**	**$875,500**	**$1,880,000**

Established in the heart of Wake County, you will find the patient visits per day averaging 40 to 65 plus and a second provider is really necessary. Equipped to treat a volume of walk-ins, you will find this primary care practice has X-Ray, extensive phone service and wireless communication devices, numerous desktop and laptop computers, in-house electronic claims filing, electronic patient records, lab and a terrific layout allowing nice patient flow and parking.

Urgent Care	**South of Raleigh, NC**	**$2,900,000**	**$1,400,000**	**$4,300,000**

Full service walk-in practice seeing family, pediatric and women's corporate patients. A typical day will have this practice treating 75 to 120 patients. X-Ray, Lab and experienced staff makes this one of the thriving practices serving patients from Raleigh to Fayetteville.

Internal Medicine	**Greenville, NC**	**$600,000**	**$160,00**	**$760,000**

This primary care practice is a medical cornerstone of the community. Serving metropolitan Greenville and surrounding areas, you will be impressed with the 35 to 45 consistent patient volume. Owning physician is willing to stay up to one year to assist with smooth ownership transfer.

Neuropsychological	**Charlotte, NC**	**$640,000**	**Leased**	**$640,000**

This highly regarded practice offers psychological services that include diagnostic, rehabilitation, behavior medicine and specialized programming to include day treatment for brain injured adolescents and adults. Referral base includes hospitals, doctors, insurance companies, attorneys and case managers.

Internal Medicine	**Durham County, NC**	**$176,000**	**$165,000**	**$341,000**

This practice is a main-stay of the community. The retiring physician is willing to stay for a few days per week to mentor and help with a deliberate transition. Currently treating Internal and Gastrological patients as the owning physician is double boarded.

Orthopaedic	**Tidewater area, VA**	**$300,000**	**Leased**	**$300,000**

This hospital based Orthopaedic and Sports Medicine practice is established with X-Ray, experienced staff and internal electronic billing. Physician is retiring but willing to stay for several months to assist the new owner.

Urgent Care	**Johnson County, NC**	**$185,000**	**Leased**	**$185,000**

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PEER-REVIEWED ARTICLE

Multivitamin Use Among Non-Pregnant Females of Childbearing Age in the Western North Carolina Multivitamin Distribution Program

Linda M. Morgan, RPh, MBA; Judith L. Major, MPH; Robert E. Meyer, PhD; Amy Mullenix, MSW, MSPH

Abstract

Background: *Daily consumption of 400 mcg of folic acid prior to conception and throughout the first trimester of pregnancy reduces the risk of neural tube defects (NTDs) by 50%-80%. A daily multivitamin with folic acid can ensure that females receive the recommended amount of folic acid during childbearing years.*

Objective: *The purpose of this study was to determine if vitamin consumption is influenced by providing a free bottle of multivitamins to non-pregnant women of childbearing age during a face-to-face interaction with a health care provider in health departments.*

Methods: *An eight-question survey was given to a sample of women who had received a free bottle of multivitamins. Vitamin consumption behavior prior to the intervention was compared to current usage at the time of the survey.*

Results: *Twenty-five percent of all survey respondents reported taking a daily multivitamin or folic acid tablet before the intervention. Fifty-three percent reported taking a daily multivitamin 8-10 months later, a greater than two-fold increase (PR=2.1). Latino women reported the greatest increase in daily multivitamin intake, from 21% to 70% (PR=3.3).*

Limitations: *The results may be difficult to extrapolate to the general population as the survey population differs from the general population. Prior vitamin use was determined by patient recall. The intervention occurred simultaneously with a multifaceted, public folic acid campaign.*

Conclusions: *Eight to ten months after receiving a free three-month supply of multivitamins during a face-to-face interaction with a health care provider, the number of participants reporting daily use increased significantly.*

Keywords: *folic acid; vitamin; women's health; preventive medicine; neural tube defects*

Neural tube defects (NTDs), which include anencephaly and spina bifida, are serious birth defects of the brain and spine. Daily consumption of 400 mcg of folic acid prior to conception and throughout the first trimester of pregnancy reduces the risk of NTDs by 50%-80%.[1-3] In 1992 the US Public Health Service issued a recommendation that all females of childbearing age consume 400 mcg of folic acid daily.[2] This recommendation was recently reinforced by the US Preventive Services Task Force, which issued a Grade A recommendation that health care providers offer or provide counseling to their patients encouraging folic acid consumption.[4]

Following mandatory implementation of the US folic acid fortification of grains program in January 1998, the prevalence of spina bifida in the US dropped by 22.9%.[5] During roughly the same time period, the spina bifida prevalence declined 25.6% in North Carolina overall and by 61.2% in the western perinatal care region.[a] In more recent years, the rate of decline in NTDs has been much less pronounced both in the US and in North Carolina.[6]

a North Carolina Birth Defects Monitoring Program, unpublished data, 2009

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Amy Mullenix, MSW, MSPH, is the state coordinator of the North Carolina Folic Acid Campaign at the March of Dimes.

While fortification of grain products has been shown to increase folate levels by 100mcg/day, the proportion of women ages 15-44 obtaining 400 mcg of folate daily still remains low (23%-33%).[7] Although a daily multivitamin with folic acid can ensure that females receive the recommended amount of folic acid during childbearing years, only 37% of non-pregnant women ages 18-45 take a vitamin containing folic acid daily.[8] Women in certain groups are even less likely to consume daily multivitamins, including young women ages 18-24, women with a high school education or less, women whose annual household income is less than $25,000,[8,9] and Latino women.[8-10]

The purpose of this study was to determine if vitamin consumption is influenced by providing a free bottle of multivitamins to non-pregnant women of childbearing age during a face-to-face interaction with a health care provider in a health department setting.

Twenty-four local county health departments in Western North Carolina have participated in a multivitamin distribution program since 2003. These are appropriate locations to study the effects of this intervention for several reasons: (1) health department clients match the profile of women who are less likely to consume multivitamins, (2) health departments offer comparable infrastructures for evaluation purposes, and (3) health departments serve a growing number of Latino women, who have a two-fold increased risk of having NTD-affected pregnancies as compared to non-Latino whites and African Americans.[9]

Methods

In each of the 24 participating health departments, non-pregnant females of childbearing age received a free 100-count bottle of multivitamins containing 400 mcg of folic acid from a health care provider (usually a nurse). The encounter included verbal counseling and the provision of written materials, such as a brochure, explaining the importance of folic acid. The client was also told that when she ran out of multivitamins, she could return to the health department for another free bottle.

The Institutional Review Board of Mission Hospitals reviewed the study protocol and determined it to be exempt from the requirement for IRB approval as allowed under 45 CFR 46.101 (b) exemption #2. Vitamin recipients signed a consent form granting release of their contact information for use in this study.

Between the months of October 2004 and December 2004 a proportional-to-size sampling design gathered 3,500 consent forms from the health departments. Of these, 14% (500 clients) were randomly chosen to make up the study sample.

Eight to ten months after receiving a free bottle of multivitamins, each one of the randomly selected participants received a phone call and was given an eight-question survey to measure their vitamin consumption behavior and folic acid knowledge (see Table 1, page 388). All respondents who had indicated Latino/Hispanic ethnicity on the consent form were contacted by a bilingual interviewer. If the individuals could not be reached after six phone attempts a written survey was mailed.

The primary outcome measure was the change in the self-reported use of multivitamins as determined by the question, "Which answer best describes how often you *currently* take a multivitamin or folic acid tablet of any kind?" The response was compared to the question, "Were you already taking a daily multivitamin or folic acid tablet before you were given your first free bottle?"

Prevalence ratios (PRs) were calculated to compare the proportion of women who were taking a daily multivitamin after the intervention versus before. A PR > 1.0 would indicate an increase in multivitamin intake post intervention, whereas a PR of < 1.0 would reflect a decrease in consumption. McNemar's test for matched pairs was used to calculate p-values to determine whether the change in multivitamin intake was statistically significant.[11] All statistical analyses were performed using SAS version 9.1.

Results

The characteristics of the sample group are described in Table 2 (page 389). The characteristics of the original group of 3,500 women were not recorded, but the sample group has demographic characteristics similar to other females of childbearing age who receive services at the 24 county health departments included in the vitamin distribution program (see Table 3, page 389).

Of the 500 clients in the sample, 322 completed the survey for a response rate of 64.4%. Of this number, 278 (86.3%) women were surveyed by phone and 44 (13.7%) completed the written survey and returned it by mail. Responses from both groups were similar. A summary of responses to all questions is shown in Table 1. In this paper, the only results described are the changes in vitamin consumption behavior.

Twenty-five percent of all survey respondents reported taking a daily multivitamin or folic acid tablet before the intervention, while 53% reported taking a daily multivitamin 8-10 months later, a greater than two-fold increase (PR=2.1, $p < 0.001$). The increase was highest in the youngest age group (PR=2.3, $p < 0.001$) and lowest in the older group (PR=1.8, $p=0.012$) (see Table 4, page 389).

Among the different ethnic groups, Latino women reported the greatest increase in daily multivitamin intake, with more than three times as many taking a vitamin after the intervention as compared to before, increasing from 21.4% to 70.2% (PR=3.3, $p < 0.001$). Among non-Latino white women, consumption increased from 26.9% to 46.1% (PR=1.7, $p < 0.001$), and for non-Latino African American women consumption increased from 25.0% to 54.2% (PR=2.2, $p=0.035$). All of these changes were statistically significant at the alpha=0.05 level of significance.

Discussion

Multivitamin consumption more than doubled among survey respondents after the intervention, and the 53% of respondents who reported taking a daily multivitamin after the intervention was also much higher than the 37% of non-

Table 1.
Survey Questions and Responses

Question	Number (%)
1. Were you already taking a daily multivitamin or folic acid tablet before you were given your first free bottle?	n=322
Yes	82 (25%)
No	240 (75%)
2. When you were given your multivitamins, were you also given a brochure or some written information about folic acid?	n=322
Yes	243 (75%)
No	47 (15%)
I'm not sure, I don't remember	32 (10%)
3. Why should women like you take folic acid? (only **one** answer, please)	n=322
It makes strong bones	50 (16%)
It prevents certain birth defects	209 (65%)
It lowers cholesterol	0 (0%)
It prevents morning sickness	3 (1%)
I don't know	58 (18%)
No response	2 (< 1%)
4. Remembering the first free bottle of vitamins you got, did you finish the bottle?	n=322
Yes	200 (62%)
No	109 (34%)
I don't remember	13 (4%)
5. Which answer best describes how often you *currently* take a multivitamin or folic acid tablet of any kind?	n=322
Usually every day *(Go to question # 7)*	172 (53%)
5-6 days a week *(Go to question # 7)*	29 (9%)
1-4 days a week *(Go to question # 6)*	63 (20%)
Never *(Go to question # 6)*	58 (18%)
6. Which answer best describes the reason you don't take a multivitamin or folic acid tablet regularly? (only **one** answer, please) *(Skip questions 7 & 8)*	n=121
I forget to take them	65 (54%)
They upset my stomach	13 (11%)
I don't like the taste	4 (3%)
I don't think I need vitamins	0 (0%)
I never got another bottle	11 (9%)
No real reason, I just don't	17 (14%)
Some other reason	11 (9%)
7. Which of the following is the most important reason you, personally, take a multivitamin or folic acid tablet? (only **one** answer, please)	n=201
It's good for my health	95 (47%)
It's good for my future baby(ies)	69 (34%)
It's easy to get them at the clinic or health department	0 (0%)
I don't always eat well	16 (8%)
The doctor or nurse told me to	14 (7%)
Some other reason	7 (3%)
8. Store brand vitamins sell for $3-$4 for a three-month supply. When there are no more free vitamins, how likely is it that you'll buy your own?	n=201
Not very likely	32 (16%)
Likely	85 (43%)
Very likely	83 (42%)
No response	1 (< 1%)
Cross analysis of question 4 with question 5:	n=200
Of the respondents who finished the first free bottle of vitamins how many now take vitamins at least five days per week?	161 (81%)

pregnant women taking a daily multivitamin in a national study conducted at the same time.[8]

The increase in multivitamin consumption among Latino women is particularly significant considering their high NTD rates and low vitamin-taking behavior rates. In addition, the intervention was particularly effective with women younger than 25 (the age group shown least likely to take a daily vitamin before the intervention).

This substantial increase in vitamin consumption among all groups may be partially explained by the one-on-one interaction with a health care provider. The Gallup Survey results between 2005-2007 show that 86%-89% of women who do not take a daily multivitamin state they would likely do so if advised by their health care provider.[8] Among Latino women this number has been reported to be as high as 99%.[12] Another factor that may contribute to the findings is the design of the intervention itself. Providing a free, three-month supply of vitamins simultaneously with face-to-face health care provider counseling may be the ideal tool to move individuals from knowledge to action and allow women to change their behavior immediately. Many potential barriers to behavior change are eliminated such as traveling to a store, finding the "correct" bottle of vitamins, and having the funds and the motivation to purchase them.

Limitations

There were some limitations to this study. The results may be difficult to extrapolate to other populations as the demographics of those who did not respond to the survey as well as the demographics of the original consented group are unknown. In addition, health department clients fit the criteria of an individual least likely to take a daily multivitamin and thus presented a challenging target; however, they may differ from the general population with regard to how amenable they are to this type of intervention. It is unclear whether such an intervention would have similar results in a private health care setting.

Table 2.
Demographics of Survey Participants

	Number	Percentage
Race		
White	193	60.3%
Latino/Hispanic	85	26.6%
African American	24	7.5%
American Indian	9	2.8%
Other/Unknown	11	3.4%
Age		
< 25	163	51.6%
25-34	110	34.8%
> 34	43	13.6%
No response	6	1.9%

Table 3.
Demographics of 24 North Carolina Western County Health Department Patients[a]

	Number	Percentage
Race[b]		
White	14,095	69.1%
Latino/Hispanic	4,169	20.4%
African American	1,708	8.4%
American Indian	41	0.2%
Other/Unknown	378	1.9%
Age[c]		
< 25	12,123	57.8%
25-34	6,686	31.9%
> 34	2,162	10.3%

a NC Health Services Information System, HBS085, written communication, Bernie Operario, March 15,2009.
b Three year (2006-2008) average unduplicated family planning female patients.
c 2008 unduplicated family planning patients by age groups.

Information was collected between 8–10 months retrospectively, so patient recall regarding vitamin use prior to the intervention may have been inaccurate. If recall error was not related to current multivitamin usage then the prevalence ratios would likely be biased toward the null. Although the survey began with "We're learning useful things from ALL the women who complete the survey even those who have decided NOT to take the vitamins...," some participants may have responded favorably to the questions to please the interviewer (social desirability bias). This may have inflated the percentage of women reporting that they took a daily multivitamin after the intervention. However, written responses for current daily intake were similar to responses given on the verbal survey (52% vs. 53%, respectively), suggesting that social desirability bias was probably not a significant factor.

In addition, during the study period the 24 counties were also receiving a folic acid education campaign which included media, community outreach, and educational visits to health care providers. The effect of this campaign on the vitamin-taking behavior of participants is unknown, although likely to be synergistic. Finally, it is not clear whether these short-term changes in vitamin use are predictive of a longer-term change in behavior. Further studies of long-term vitamin use are needed.

Conclusion

Results after the intervention demonstrate a significant increase in daily consumption of multivitamins among program

Table 4.
Reported Daily Multivitamin Intake Before and After Participation in the Western North Carolina Multivitamin Distribution Program

Demographic	Number (%) Using Before Program	Number (%) Using Every Day After Program	Prevalence (after vs. before)	p-value[a]
Group				
All subjects	82 (25.5)	172 (53.4)	2.1	< 0.001
Age group				
< 25	38 (23.3)	86 (52.8)	2.3	< 0.001
25-34	30 (27.3)	60 (54.6)	2.0	< 0.001
> 34	12 (27.9)	22 (51.2)	1.8	0.012
Missing	2	4	-	-
Race/Ethnicity				
White, non-Latino	52 (26.9)	89 (46.1)	1.7	< 0.001
African American, non-Latino	6 (25.0)	13 (54.2)	2.2	0.035
Latino	18 (21.4)	59 (70.2)	3.3	< 0.001
Other/not stated	6 (28.6)	11 (52.4)	1.8	0.059

a Based on McNemar's test for matched-pairs.

participants. The largest increases in daily vitamin intake were found among the two groups most likely to be affected by NTDs and least likely to take multivitamins: Latinos and young women.[7] Significant behavior change was accomplished with a relatively inexpensive tool—a three-month supply of multivitamins costing only $1.15 per bottle.

The North Carolina Birth Defects Monitoring Program will continue to monitor NTD trends in the state to help determine whether efforts such as the multivitamin distribution program and other public health folic acid interventions are having the desired effect on reducing the prevalence of birth defects. To help reduce overall NTD rates, as well as the disparity in NTD prevalence among racial/ethnic groups, public health programs should consider providing free multivitamins and folic acid education during a face-to-face interaction with a health care professional. **NCMJ**

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Author's note: *On August 7, 2009 the North Carolina General Assembly passed SB374/HB523 which provides funding for the statewide distribution of multivitamins with folic acid to low-income women of childbearing age through the health departments and other safety net providers. The information and data to support the introduction of this bill was provided to Senator William Purcell in November of 2008 in a joint meeting of the Senator, representatives of the North Carolina March of Dimes, and the North Carolina Folic Acid Council. Data presented was compiled by the North Carolina Birth Defects Monitoring Program.*

Update: *On Monday, November 16, 2009, a notice was sent to all Health Directors and Safety Net Providers stating that funds to purchase multivitamins were no longer available. These funds had become a part of the Division of Public Health's 5% reduction as required by the governor's executive order.*

REFERENCES

1 Czeizel AE, Dudas I. Prevention of the first occurrence of neural-tube defects by periconceptional vitamin supplementation. *N Engl J Med.* 1992;327(26):1832-1835.
2 Centers for Disease Control and Prevention. Recommendations for the use of folic acid to reduce the number of cases of spina bifida and other neural tube defects. *MMWR Recomm Rep.* 1992;41(RR-14):1-7.
3 Berry RJ, Li Z, Erickson JD, et al. Prevention of neural-tube defects with folic acid in China. China–US Collaborative Project for Neural Tube Defect Prevention. *N Engl J Med.* 1999;341(20):1485–1490.
4 US Preventive Services Task Force. Folic acid for the prevention of neural tube defects: US Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2009;150(9): 626-631.
5 Honein MA, Paulozzi LJ, Mathews TJ, Erickson JD, Wong LY. Impact of folic acid fortification of the US food supply on the occurrence of neural tube defects. *JAMA.* 2001;285(23):2981-2986.
6 Boulet SL, Yang Q, Mai C, et al. Trends in the postfortification prevalence of spina bifida and anencephaly in the United States. *Birth Defects Res A Clin Mol Teratol.* 2008;82(7):527-532.
7 Bentley TG, Willett WC, Weinstein MC, Kuntz KM. Population-level changes in folate intake by age, gender, and race/ethnicity after folic acid fortification. *Am J Public Health.* 2006;96(11):2040-2047.
8 March of Dimes Foundation. *Improving Preconception Health: Women's Knowledge and Use of Folic Acid.* March of Dimes website. http://www.marchofdimes.com/peristats/pdfdocs/2007_FA_report.pdf. Published December 2007. Accessed January 24, 2009.
9 North Carolina State Center for Health Statistics. North Carolina Health Data Query System. Birth defects data. http://www.schs.state.nc.us/SCHS/data/query.html. Accessed January 24 2009.
10 Perlow JH. Comparative use and knowledge of preconceptional folic acid among Spanish- and English-speaking patient populations in Phoenix and Yuma, Arizona. *Am J Obstet Gynecol.* 2001;184(6):1263-1266.
11 Fleiss JL. *Statistical Methods for Rates and Proportions.* Hoboken, NJ: John Wiley & Sons; 1973.
12 de Rosset L, Mullenix A. Multivitamins, folic acid and birth defects: knowledge beliefs, and behaviors of Hispanic women in North Carolina. *Amer J Health Ed.* 2009;40(3):155-164.

PEER-REVIEWED ARTICLE

Patient Characteristics Associated with Receipt of Lifestyle Behavior Advice

Leonor Corsino, MD, MHS; Laura P. Svetkey, MD, MHS; Brian J. Ayotte, PhD; Hayden B. Bosworth, PhD

Abstract

Background: *Lifestyle behaviors such as reducing weight if overweight or obese, reducing salt intake, exercising, reducing alcohol intake, quitting smoking, and eating a healthy diet are related to the prevention and control of chronic diseases. However the amount of lifestyle advice provided by clinicians has been declining over the last decade.*

Methods: *In 2002, a telephone survey was conducted to assess the quality of preventive care offered by health care providers. The study was a cross-sectional observational study of a randomly selected sample of 516 diverse individuals in Durham County, North Carolina. Information regarding age, sex, race, education, health conditions, and self-reported receipt of lifestyle advice was examined in the study.*

Results: *The odds of receiving advice to engage in preventive lifestyle behaviors were significantly higher for those with a pre-existing diagnosis of diabetes or hypertension and for participants reporting poor health status. For example, the odds of receiving advice to control or lose weight was 8.32 (95% CI, 2.65, 26.15) among individuals reporting a diagnosis of diabetes. Similarly, the odds of reporting "receiving advice to reduce salt intake" was 6.97 (95% CI, 3.74, 13.00) among subjects reporting a diagnosis of hypertension.*

Limitations: *The results are from a cross-sectional study of a sample of individuals in only one county. Additionally, the results are based on patient self-reported information, which could be subject to recall and social desirability bias.*

Conclusion: *Patients with identified health problems were more likely than others to report being advised to adopt healthy lifestyle recommendations. Future research should examine methods to encourage health care providers to offer lifestyle advice to those without pre-existing illness.*

Keywords: *lifestyle; provider; prevention*

An estimated 7.8% of the United States population has been diagnosed with diabetes mellitus,[1] 25% with hypertension,[2] and 33% of adults in this country are obese.[3,4] Strategies for prevention and treatment of these conditions include lifestyle modification and adoption of preventive health behaviors. The benefits of engaging in preventive health behaviors are well-established. For example, weight loss can help prevent diabetes[5-9] and improve glycemic control.[10-12] Losing weight, eating a healthy diet,[13] increasing physical activity,[14-17] reducing salt intake,[18-20] and reducing excessive alcohol intake[21] lower blood pressure and prevent hypertension. Smoking cessation is also critical to reducing cardiovascular disease risk.[22,23] However, during the last decade multiple investigations demonstrated that the number of individuals reporting that they receive advice to engage in preventive health behavior is lower than expected.[24,25] Furthermore, the number of individuals reporting receiving smoking cessation advice is also low.[26] In summary, behavioral lifestyle modification has been demonstrated to prevent and control chronic medical conditions. However, the number of individuals reporting receiving this type of advice is likely to be insufficient.

Health-related messages are disseminated to the public by various health advocacy agencies. In addition, patients report

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that health care providers are an important source of information and counseling concerning healthy lifestyle.[27] However, the volume of lifestyle advice provided by physicians has declined over the last 10-15 years.[28] The extent to which patients report that they receive lifestyle advice from health care providers is likely to be influenced by several factors, most importantly the extent to which providers actually provide counseling. However, patient perceptions and characteristics such as sex, age, ethnicity/race, level of education, marital status, income, health, diagnosis of diabetes or hypertension, and perception of discrimination may also influence the extent to which patients report receiving lifestyle advice.

The purpose of this investigation was to determine if these patient perceptions and characteristics are associated with reporting receiving lifestyle advice from health care providers in a diverse community sample in North Carolina. Identifying how health, demographic information, and perceived discrimination are related to self-reported receipt of lifestyle advice can inform future development of interventions and strategies aimed at increasing engagement in preventive lifestyle behaviors.

Methods

Data Source

In 2002, a cross-sectional observational study was designed to collect data on a sample of Durham County residents. The study was conducted with survey items based primarily on the *Kaiser Family Foundation Survey of Public Perceptions and Experiences of Race, Ethnicity, and Medical Care*.[29] In addition, the survey included elements from other surveys including the California Health Interview Survey (CHIS),[30] the El Centro Hispano/Proyecto LIFE survey,[31] and a review of the literature.[32,33] The final draft survey was administered to a small sample of African American and Latino residents of Durham County to ensure the questions were understandable (face validity) and to address issues of relevance (content validity). Princeton Survey Research Association (PSRA) administered the final survey by phone to a random sample of white, African American, and Latino residents of Durham County. The survey was attempted in English or Spanish depending on the participant's preference. All aspects of the study were approved by the Duke University Institutional Review Board and verbal consent was obtained from all participants prior to completing the survey.

Sample

Eligible subjects included individuals 18 years and older living in Durham County, North Carolina, in households with a telephone. Individuals included were not required to have a primary care provider. However, 77.7% of the participants reported seeing a doctor in the last 12 months. The sampling strategy was designed to obtain a representative sample of whites, African Americans, and Latinos in Durham County. The sample was drawn using standard list-assisted random digit dialing (RDD) methodology. Active blocks of numbers that contained three or more residential directory listings were selected with probability in proportion to the number of listed phone numbers. After selection, two more digits were added randomly to complete the number. Phone exchanges with higher than average density of African American households were oversampled to help increase the overall sample of African Americans.[34] The same approach was not possible for the Latino sample due to the lower number of Latino households in Durham County. In order to include a representative number of Latinos, a list of Durham County residents was used to identify households listed under a Latino surname, with RDD methodology then being applied to these households. Additional details regarding the sampling procedure have been previously published.[34,35]

The proportion of initially cooperating and eligible interviews that were completed was 96% (1,131/1,175). Due to the large number of items included in the survey, the questions were divided into three parts: the core survey and two split-half samples. All participants completed the items in the core survey, while only half of the participants completed each split-half component of the survey. A total of 586 individuals were administered the split-half survey that included the items relevant to our study. Seventy of these individuals were not included in the analyses: Asian participants were excluded due to very small sample size (n=15), and 55 other individuals were excluded due to missing data on key study variables, such as race or reported receipt of advice. This resulted in a final sample size of 516.

Measures

Independent Variables

Ten independent variables were examined with regard to their association with the reported receipt of preventive health advice from health care providers. These variables included demographic variables, financial variables, physical health status, and general perception of discrimination.[34-36]

Demographic variables included age, gender, and educational level. The participants self-identified as white, African American/black, Hispanic/Latino, Asian, or other.

Financial variables included perception of financial adequacy and health insurance coverage. Perception of financial adequacy was assessed by asking participants to describe their household's finances based on how much trouble they have paying their bills. Participants were categorized as either having no problems paying their bills or having at least some trouble paying their bills. Health insurance coverage was categorized based on the patient response of having health insurance or not having any insurance coverage.

Physical health was assessed using three items. Participants were asked to rate their physical health on a scale of 1 (excellent) to 5 (poor). In addition, participants were asked if they had ever been diagnosed with diabetes or hypertension.

Finally, general perceived discrimination in heath care was measured with one item, asking: "Generally speaking, how often do you think our health care system treats people unfairly in the community based on race or ethnicity?" with the possible

responses of "never," "not too often," "very often," "moderately often," or "somewhat often." This item has been used in previous studies.[34, 35]

Dependent Variables

The dependent variables were assessed by asking participants if their health care provider had ever provided advice to do any of the following: control or lose weight, reduce salt or sodium intake, exercise more, reduce alcohol consumption, quit smoking, reduce fat intake, and/or avoid fast foods.

Analysis

Data analysis involved two steps. The first step involved calculating summary statistics for the key study variables. The second step involved a series of multivariable logistic regressions—one for each preventive behavior—that examined the relationships between the independent variables and each prevention variable. This approach was used in order to examine the relationships among the several independent variables and the dichotomous outcome variables. Preliminary analyses indicated that the assumptions of logistic regressions were met. The statistical analysis was conducted with SPSS software version 15.

Results

Descriptive Information

Of the 516 individuals included in this analysis, 38.0% were white, 30.2% were African American, and 31.8% were Latino. On average, respondents were 41 years old, female, had at least a high school education, had no problem paying their bills, were insured, and rated their health as "good to excellent." Seven percent of the sample reported a diagnosis of diabetes, and 22.5% reported a diagnosis of hypertension (see Table 1).[a]

Overall, 35.4% reported receiving advice to control or lose weight, 25.5% to reduce salt intake, 47.1% to exercise more, 10.2% to reduce alcohol consumption, 29.4% to quit smoking, 38.7% to reduce fat in their diet, and 26.0% reported receiving advice to avoid fast foods. With regard to gender differences, women reported receiving more advice to exercise (52.1%) than men (40.7%), while men (14.9%) reported receiving more advice to limit alcohol consumption than women (5.9%). With regards to racial differences, more African Americans reported receiving advice to reduce salt intake (36.0%) as compared to whites (19.1%) and Latinos (23.5%). Latinos were more likely to receive advice to reduce alcohol intake (18.0%) compared to 7.3% of whites and 6.6% of African Americans (see Table 2, page 394).

Table 1.
Descriptive Characteristics of Respondents by Race/Ethnic Group

Variable	Total (n = 516)	White (n = 196)	African American (n = 156)	Latino (n = 164)
	mean (SD)	mean (SD)	mean (SD)	mean (SD)
Demographics				
Age	40.65 (16.9)	45.84 (17.4)[a]	43.13 (18.1)[c]	32.06 (10.9)[a,c]
Female	289 (56.0)	113 (57.7)[b]	104 (66.7)[d]	72 (43.9)[b,d]
At least high school education	407 (78.9)	188 (95.9)[b]	133 (85.3)[b,c]	78 (52.4)[b,d]
Married	217(42.2)	103 (52.6)[a,b]	44 (28.2)[b,d]	70(42.7)[a,d]
Income				
No problems paying bills	433 (86.6)	185 (95.9)[b]	125 (82.2)[a]	123 (78.8)[b]
Has insurance	355 (68.8)	180 (91.8)[b]	123 (78.8)[b,d]	52 (64.4)[b,d]
Self-rated health				
Good to excellent	419 (83.1)	179 (95.7)[b]	124 (80.0)[b,d]	116 (71.6)[b,d]
Medical conditions				
Diabetes	36 (7.0)	8 (4.1)[a]	18 (11.5)[a]	10 (6.1)
Hypertension	116 (22.5)	47 (24.0)[a]	45 (28.8)[d]	24 (14.6)[a,d]
Perceived discrimination	318 (69.6)	111 (70.3)	96 (65.3)	111 (73.0)

a $p < 0.05$ (African Americans vs. whites)
b $p < 0.01$ (African Americans vs. whites)
c $p < 0.05$ (African Americans vs. Latinos)
d $p < 0.01$ (African Americans vs. Latinos)

a Details on the response rate for this study are provided in Friedman J, Anstrom KJ, Weinfurt KP, et al. Perceived racial/ethnic bias in healthcare in Durham County, North Carolina: a comparison of community and national samples. *NC Med J.* 2005;66(4):267-275.

Table 2.
Percentage of Respondents Reporting Receiving Lifestyle Advice by Sex, Race/Ethnicity

Advice	Overall	Sex		Race/Ethnicity		
		Male	Female	White	African American	Latino
Control weight or lose weight	35.4	31.6	38.4	35.9	40.4[b,c]	30.1
Cut down on salt or sodium	25.5	24.8	26.1	19.1[b]	36.0[b,c]	23.5
Exercise more	47.1	40.7[a]	52.1	46.2	51.9	43.6
Cut down on alcohol consumption	10.2	14.9[a]	5.9	7.3[c]	6.6[b]	18.0
Quit smoking	29.4	29.1	29.7	27.3	32.3	29.2
Reduce fat in diet	38.7	35.4	41.3	37.8	39.1	39.5
Avoid fast foods	26.0	24.0	27.6	22.1	27.2	29.4

a $p < 0.01$ (difference between males vs. females)
b $p < 0.01$ (difference between whites vs. African Americans; African Americans vs. Latinos)
c $p < 0.05$ (difference between whites vs. Latinos; African Americans vs. Latinos)

Many of the participants reporting a diagnosis of hypertension reported receiving advice to control or lose weight (62.6%), cut down on salt (60.4%), exercise more (68.7%), reduce alcohol intake (15.1%), quit smoking (37.7%), reduce fat in their diet (60.9%), and avoid fast food (35.5%). In addition, respondents reporting a diagnosis of diabetes reported relatively high levels of receiving lifestyle advice. Almost 90% of individuals with diabetes reported receiving advice to control or lose weight, 76.5% to reduce salt intake, 77.8% to exercise more, 31.8% to reduce alcohol consumption, 25.5% to quit smoking, 83.3% to reduce fat in diet, and 48.6% to avoid fast food (see Figure 1).

Characteristics Associated With Reporting Receiving Advice

The logistic regressions indicated that individuals with a low level of education, poor self-reported health, diabetes, hypertension, and less perceived discrimination were more likely to report receiving advice to control or lose weight. African Americans, people with diabetes, and people with hypertension were more likely to report receiving advice to reduce sodium intake. Females with a low level of education, poor self-rated health, and reported hypertension were more likely to report receiving advice to exercise more. Males and those who reported poor self-rated health were more likely to report receiving advice to reduce alcohol intake.

In addition, individuals with poor self-rated health were more likely to report receiving advice to stop smoking. Poor self-rated health and reporting a diagnosis of diabetes or hypertension were associated with an increased likelihood of reporting advice to reduce fat intake. Lastly, individuals with diabetes and those who reported low perceived discrimination were more likely to report receiving advice to avoid fast food. Odds ratios and 95% confidence intervals for each variable are presented in Table 3.

In summary, our results suggest that poorer self-rated health and reporting a diagnosis of either diabetes or

Figure 1.
Percentage of Respondents Reporting Lifestyle Behavioral Advice by Diagnosis of Hypertension or Diabetes

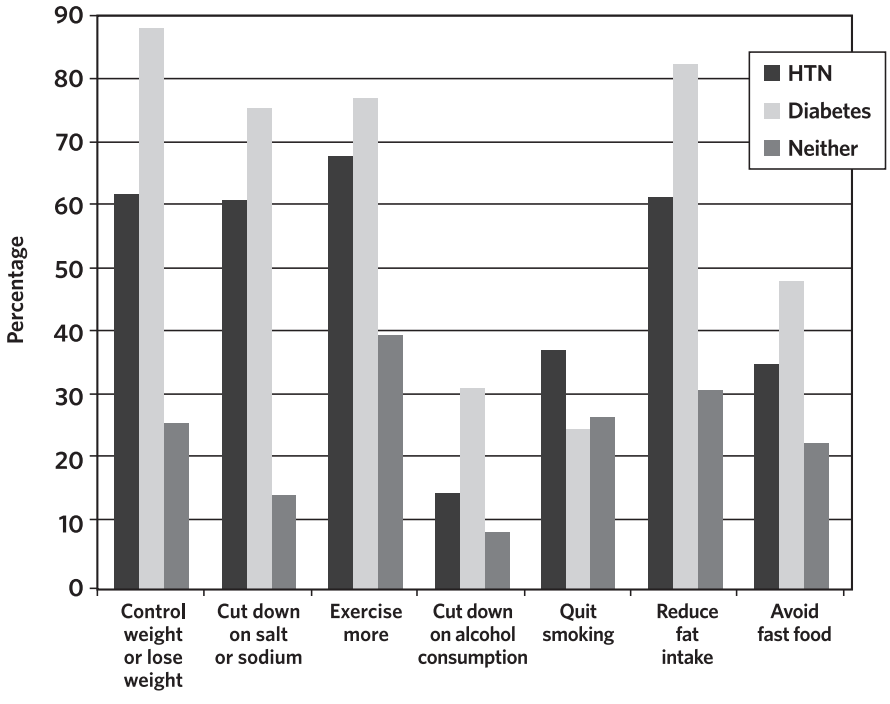

Table 3.
Multivariable Logistic Regression Examining Correlates of Reported Receipt of Lifestyle Advice

Variable	Control Weight/Lose Weight	Cut Down on Salt or Sodium	Exercise More	Cut Down on Alcohol Consumption	Quit Smoking	Reduce Fat Intake	Avoid Fast Foods
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Demographics							
Age	1.01 (0.99, 1.03)	1.01 (0.99, 1.03)	1.01 (0.99, 1.02)	1.01 (0.99, 1.04)	1.01 (0.99, 1.03)	1.01 (1.00, 1.03)	0.99 (0.97, 1.01)
Female	1.21 (0.77, 1.89)	0.93 (0.56, 1.55)	1.55[a] (1.02, 2.34)	0.41[a] (0.19, 0.89)	1.11 (0.65, 1.90)	1.33 (0.86, 2.07)	1.10 (0.69, 1.74)
At least high school education	0.51[a] (0.27, 0.95)	1.07 (0.55, 2.10)	0.48[b] (0.27, 0.85)	1.51 (0.63, 3.63)	1.10 (0.53, 2.26)	0.80 (0.45, 1.42)	0.86 (0.47, 1.54)
Latino	0.96 (0.48, 1.95)	2.07 (0.90, 4.78)	1.15 (0.60, 2.19)	1.31 (0.43, 3.99)	0.75 (0.33, 1.56)	1.80 (0.91, 3.55)	1.43 (0.70, 2.88)
African American	0.88 (0.51, 1.50)	2.50[b] (1.32, 4.74)	0.99 (0.61, 2.09)	0.58 (0.20, 1.65)	0.83 (0.44,1.56)	0.80 (0.46, 1.35)	0.98 (0.55,1.75)
Income							
Problems paying bills	1.31 (0.68, 2.51)	0.80 (0.38, 1.71)	1.13 (0.59, 1.63)	2.40 (0.96, 6.05)	1.32 (0.64, 2.74)	1.25 (0.67, 2.35)	1.44 (0.77, 2.69)
No insurance	1.14 (0.64, 2.01)	1.02 (0.53, 1.93)	1.17 (0.61, 2.09)	1.27 (0.53, 3.06)	1.45 (0.77, 2.76)	0.57 (0.32, 1.82)	0.76 (0.43, 1.35)
Physical health							
Fair to poor self-rated health	1.29[a] (1.04, 1.63)	1.00 (0.77, 1.31)	1.52[b] (1.22 ,1.89)	1.59[a] (1.08, 2.33)	1.74[b] (1.31,2.32)	1.45[b] (1.16, 1.82)	1.23 (0.97,1.56)
Diabetes	8.32[b] (2.65, 26.15)	4.65[b] (1.72, 12.59)	1.75 (0.70, 4.40)	2.68 (0.74, 9.70)	0.81 (0.27, 2.1)	4.53[b] (1.68, 12.18)	2.08[a] (1.90, 4.81)
Hypertension	2.65[b] (1.47, 4.69)	6.97[b] (3.74, 13.00)	1.92[a] (1.09, 3.40)	1.04 (0.39, 2.80)	1.12 (0.55, 2.30)	1.76[a] (1.01, 3.07)	1.53 (0.82, 2.84)
Discrimination							
Perceived discrimination	0.58[a] (0.37, 0.93)	0.75 (0.44, 1.30)	0.70 (0.45, 1.09)	0.90 (0.41, 1.97)	0.63 (0.37, 1.09)	0.76 (0.48, 1.20)	0.57[a] (0.35, 0.90)

a $p < 0.05$
b $p < 0.01$

hypertension was consistently associated with being advised to adopt recommended preventive behaviors.

Discussion

Our goal was to identify factors associated with patient-reported receipt of advice to engage in well-established preventive health behaviors. Race/ethnicity has been previously reported to be associated with disparities in health care.[37-40] In our study, African Americans were more likely to report receiving advice to reduce sodium intake, but otherwise there were no other racial or ethnic differences. In addition, perceived discrimination was not a major determinant of whether or not patients reported receiving lifestyle advice, being significantly associated only with advice to lose weight and to reduce intake of fast food. Our data suggest that the primary factors associated with receiving lifestyle advice are the presence and perception of illness. That is, the presence of diabetes or hypertension, as well as poorer self-reported health, were consistently associated with reporting receiving advice to adopt healthy lifestyle recommendations. However, even among those with hypertension and diabetes, lifestyle advice was not universal. In our study, less than 63% of those individuals with a diagnosis of hypertension reported receiving advice to adopt lifestyle changes that have been proven to improve blood pressure control, such as weight loss, reduced sodium intake, reduced alcohol use, reduced fat intake, and a healthy dietary pattern (assessed indirectly as reduced fast food intake).[2,41] Although respondents with diabetes reported receiving advice to adopt lifestyle changes more often than those with hypertension, advice was still not optimal among people with diabetes.

Our findings suggest that health care providers recognize the importance of lifestyle interventions in the treatment of conditions such as diabetes and hypertension, but might be missing the opportunity to engage in primary prevention for these conditions. A plausible alternative explanation is that health care providers are providing advice to a broader group

of patients, but those with diabetes or hypertension are more likely than others to recall and/or report that they got this advice. Regardless of the explanation, the percent of individuals reporting receiving any advice was lower among those without diabetes and hypertension. For example, only 26.2% of respondents without a diagnosis of hypertension or diabetes reported receiving advice to control or lose weight, despite clear evidence that even losing a little weight leads to significant reductions in the incidence of these conditions.[6,42] In the Trials of Hypertension Prevention Phase II, sustained weight loss of only 2 kg (4.4 lbs.) was associated with an approximate 20% reduction in incident hypertension,[43] and in the Diabetes Prevention Program, weight loss of only 1 kg (2.2 lbs.) reduced the incidence of diabetes by 16%.[6] Although the current dataset did not contain body weight measurements, population statistics would suggest that it is highly likely that more than the 26% without hypertension or diabetes who were advised to lose weight were in need of this advice.[44,45]

Our data are consistent with other research studies demonstrating that lifestyle advice is reported more frequently in patients with cardiovascular disease (CVD), diabetes,[46] and dyslipidemia.[47] It stands to reason that health care providers focus their attention on those individuals already affected by CVD risk factors. Such attention is consistent with national guidelines,[2,41,48] and certainly can improve treatment and control. However, national guidelines also call for lifestyle advice to prevent CVD risk factors, and our study is consistent with other research that suggests that less advice is given when the goal is primary prevention.[47,49,50] Overall, lifestyle advice, though of potential benefit to all patients, is reported by a minority of patients, with rates apparently falling since the early 1990s,[28] despite increasing evidence of efficacy and feasibility over this period of time.

Limitations and Strengths

Our study results are based on a cross-sectional study among a diverse group of individuals in one county in North Carolina. The results are based on a survey; therefore responses may be subject to recall and social desirability bias as well as sample error. Social desirability bias is the tendency of respondents to reply in a manner that will be viewed as acceptable by others. Further, it is possible that patients with hypertension and diabetes are more attentive to lifestyle advice and therefore more likely to report that they received it. Also, relying on self-reported receipt of health advice precludes the assessment of health care providers' behavior. However, to the extent that health care providers' advice leads to lifestyle change, it is the patient's perception of receiving advice that will drive engagement in the behavior. Ultimately, the larger public health goal of future prevention interventions is to increase the likelihood that lifestyle advice is provided, heard, remembered, and adopted. It is also important to recognize that due to the nature of this investigation there was no follow-up on whether individuals who reported receiving advice actually did change their behavior. In addition, our study was limited by a lack of baseline information on participants' behavioral risk, such as information regarding use of tobacco and alcohol, and the institution where the participants obtain health care. Further, not knowing the type of organization, financing, and nature of the practice is considered a limitation in our study because there is evidence that the type of organization, financing, and nature of the practice may have a big effect on whether practitioners will offer preventive health behavioral advice. Finally, participants were not required to have a primary care provider to be included in this study. Not knowing if the subjects included in this investigation had a primary care provider is important as we posit that the degree to which the individual reports receiving this advice could be directly affected by the presence or absence of a established relationship with a health care provider. Although generalizability may be limited by the exclusion of individuals without a telephone in the home, an important strength of this study is the fact that it is based on a random sample of telephone numbers that oversampled African Americans and Latinos.

Conclusion

In a racially and ethnically diverse population in one county in the state of North Carolina, patients with health problems were more likely than others to report being advised to adopt healthy lifestyle recommendations. While lifestyle advice in those with hypertension or diabetes is an important goal, the results of this investigation suggest that health care providers may be missing the opportunity to engage in primary prevention. It is estimated that 65% of CVD events could be prevented by adoption of lifestyle recommendations.[51] By patient report, it also appears that a large proportion of the population who could benefit from these recommendations are not being advised to adopt them or the advice is not being given effectively. Thus, the information reported in this investigation may serve as ground to expand our knowledge of patient education in North Carolina and also help health care providers to increase the discussion of lifestyle advice with those without pre-existing illness. Finally, future research should examine methods to facilitate health care providers providing lifestyle advice with the ultimate goal of primary prevention. **NCMJ**

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REFERENCES

1 All about diabetes. American Diabetes Association website. http://www.diabetes.org/about-diabetes.jsp. Accessed October, 5, 2009.
2 Chobanian AV, Bakris GL, Black HR, et al. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension.* 2003;42(6):1206-1252.
3 Ogden CL, Yanovski SZ, Carroll MD, Flegal KM. The epidemiology of obesity. *Gastroenterology.* 2007;132(6):2087-2102.
4 Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA.* 2006;295(13):1549-1555.
5 Lindstrom J, Ilanne-Parikka P, Peltonen M, et al. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. *Lancet.* 2006;368(9548):1673-1679.
6 Hamman RF, Wing RR, Edelstein SL, et al. Effect of weight loss with lifestyle intervention on risk of diabetes. *Diabetes Care.* 2006;29(9):2102-2107.
7 Williamson DF, Vinicor F, Bowman BA. Primary prevention of type 2 diabetes mellitus by lifestyle intervention: implications for health policy. *Ann Intern Med.* 2004;140(11):951-957.
8 Klein S, Sheard NF, Pi-Sunyer X, et al. Weight management through lifestyle modification for the prevention and management of type 2 diabetes: rationale and strategies: a statement of the American Diabetes Association, the North American Association for the Study of Obesity, and the American Society for Clinical Nutrition. *Diabetes Care.* 2004;27(8):2067-2073.
9 Knowler WC, Barrett-Connor E, Fowler SE, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med.* 2002;346(6):393-403.
10 Redmon JB, Reck KP, Raatz SK, et al. Two-year outcome of a combination of weight loss therapies for type 2 diabetes. *Diabetes Care.* 2005;28(6):1311-1315.
11 Pi-Sunyer X, Blackburn G, Brancati FL, et al. Reduction in weight and cardiovascular disease risk factors in individuals with type 2 diabetes: one-year results of the look AHEAD trial. *Diabetes Care.* 2007;30(6):1374-1383.
12 West DS, DiLillo V, Bursac Z, Gore SA, Greene PG. Motivational interviewing improves weight loss in women with type 2 diabetes. *Diabetes Care.* 2007;30(5):1081-1087.
13 Svetkey LP, Simons-Morton D, Vollmer WM, et al. Effects of dietary patterns on blood pressure: subgroup analysis of the Dietary Approaches to Stop Hypertension (DASH) randomized clinical trial. *Arch Intern Med.* 1999;159(3):285-293.
14 Elmer PJ, Obarzanek E, Vollmer WM, et al. Effects of comprehensive lifestyle modification on diet, weight, physical fitness, and blood pressure control: 18-month results of a randomized trial. *Ann Intern Med.* 2006;144(7):485-495.
15 Whelton SP, Chin A, Xin X, He J. Effect of aerobic exercise on blood pressure: a meta-analysis of randomized, controlled trials. *Ann Intern Med.* 2002;136(7):493-503.
16 Kelley GA, Kelley KS, Tran ZV. Walking and resting blood pressure in adults: a meta-analysis. *Prev Med.* 2001;33(2 pt 1):120-127.
17 Kelley GA, Kelley KA, Tran ZV. Aerobic exercise and resting blood pressure: a meta-analytic review of randomized, controlled trials. *Prev Cardiol.* 2001;4(2):73-80.
18 Cook NR, Cutler JA, Obarzanek E, et al. Long term effects of dietary sodium reduction on cardiovascular disease outcomes: observational follow-up of the Trials of Hypertension Prevention (TOHP). *BMJ.* 2007;334(7599):885.
19 Sacks FM, Svetkey LP, Vollmer WM, et al. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH-Sodium Collaborative Research Group. *N Engl J Med.* 2001;344(1):3-10.
20 Cutler JA, Follmann D, Allender PS. Randomized trials of sodium reduction: an overview. *Am J Clin Nutr.* 1997;65(2 suppl):643-651.
21 Xin X, He J, Frontini MG, Ogden LG, Motsamai OI, Whelton PK. Effects of alcohol reduction on blood pressure: a meta-analysis of randomized controlled trials. *Hypertension.* 2001;38(5):1112-1117.
22 Tosteson AN, Weinstein MC, Williams LW, Goldman L. Long-term impact of smoking cessation on the incidence of coronary heart disease. *Am J Public Health.* 1990;80(12):1481-1486.
23 Critchley JA, Capewell S. Mortality risk reduction associated with smoking cessation in patients with coronary heart disease: a systematic review. *JAMA.* 2003;290(1):86-97.
24 Friedman C, Brownson RC, Peterson DE, Wilkerson JC. Physician advice to reduce chronic disease risk factors. *Am J Prev Med.* 1994;10(6):367-371.
25 Viera AJ, Kshirsagar AV, Hinderliter AL. Lifestyle modification advice for lowering or controlling high blood pressure: who's getting it? *J Clin Hypertens.* 2007;9(11):850-858.
26 Doescher MP, Saver BG. Physicians' advice to quit smoking. The glass remains half empty. *J Fam Pract.* 2000;49(6):543-547.
27 Carter-Edwards L, Bynoe MJ, Svetkey LP. Knowledge of diet and blood pressure among African Americans: use of focus groups for questionnaire development. *Ethn Dis.* 1998;8(2):184-197.
28 Luepker RV, Arnett DK, Jacobs DR, Jr., et al. Trends in blood pressure, hypertension control, and stroke mortality: the Minnesota Heart Survey. *Am J Med.* 2006;119(1):42-49.
29 Lillie-Blanton M, Brodie M, Rowland D, Altman D, McIntosh M. Race, ethnicity, and the health care system: public perceptions and experiences. *Med Care Res Rev.* 2000;57(suppl 1):218-235.
30 California Health Interview Survey. CHIS 2001 Adult Public Use File, Release 2 [computer file]. Los Angeles, CA: UCLA Center for Health Policy Research; 2002.
31 deRosset L. *Access and Barriers to Healthcare.* Durham, NC: El Centro Hispano/Project LIFE; 2001.
32 Pignone MP, Gaynes BN, Rushton JL, et al. Screening for depression in adults: a summary of the evidence for the US Preventive Services Task Force. *Ann Intern Med.* 2002;136(10):765-776.
33 Siegler IC, Peterson BL, Barefoot JC, et al. Using college alumni populations in epidemiologic research: the UNC Alumni Heart Study. *J Clin Epidemiol.* 1992;45(11):1243-1250.
34 Friedman JY, Anstrom KJ, Weinfurt KP, et al. Perceived racial/ethnic bias in healthcare in Durham County, North Carolina: a comparison of community and national samples. *NC Med J.* 2005;66(4):267-275.
35 Van Houtven CH, Voils CI, Oddone EZ, et al. Perceived discrimination and reported delay of pharmacy prescriptions and medical tests. *J Gen Intern Med.* 2005;20(7):578-583.
36 Casagrande SS, Gary TL, LaVeist TA, Gaskin DJ, Cooper LA. Perceived discrimination and adherence to medical care in a racially integrated community. *J Gen Intern Med.* 2007;22(3):389-395.
37 Fiscella K, Franks P, Doescher MP, Saver BG. Disparities in health care by race, ethnicity, and language among the insured: findings from a national sample. *Med Care.* 2002;40(1):52-59.
38 Blendon RJ, Buhr T, Cassidy EF, et al. Disparities in health: perspectives of a multi-ethnic, multi-racial America. *Health Aff.* 2007;26(5):1437-1447.

39 Franks P, Fiscella K, Meldrum S. Racial disparities in the content of primary care office visits. *J Gen Intern Med.* 2005;20(7):599-603.
40 Lillie-Blanton M, Maddox TM, Rushing O, Mensah GA. Disparities in cardiac care: rising to the challenge of Healthy People 2010. *J Am Coll Cardiol.* 2004;44(3):503-508.
41 Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA.* 2003;289(19):2560-2572.
42 Neter JE, Stam BE, Kok FJ, Grobbee DE, Geleijnse JM. Influence of weight reduction on blood pressure: a meta-analysis of randomized controlled trials. *Hypertension.* 2003;42(5):878-884.
43 Stevens VJ, Obarzanek E, Cook NR, et al. Long-term weight loss and changes in blood pressure: results of the Trials of Hypertension Prevention, phase II. *Ann Intern Med.* 2001;134(1):1-11.
44 Christakis NA, Fowler JH. The spread of obesity in a large social network over 32 years. *N Engl J Med.* 2007;357(4):370-379.
45 Eckel RH. Clinical practice. Nonsurgical management of obesity in adults. *N Engl J Med.* 2008;358(18):1941-1950.
46 Wee CC, McCarthy EP, Davis RB, Phillips RS. Physician counseling about exercise. *JAMA.* 1999;282(16):1583-1588.
47 Kreuter MW, Scharff DP, Brennan LK, Lukwago SN. Physician recommendations for diet and physical activity: which patients get advised to change? *Prev Med.* 1997;26(6):825-833.
48 American Diabetes Association. Executive summary: standards of medical care in diabetes—2008. *Diabetes Care.* 2008;31(suppl 1)S5-S11.
49 Sciamanna CN, Tate DF, Lang W, Wing RR. Who reports receiving advice to lose weight? Results from a multistate survey. *Arch Intern Med.* 2000;160(15):2334-2339.
50 Honda K. Factors underlying variation in receipt of physician advice on diet and exercise: applications of the behavioral model of health care utilization. *Am J Health Promot.* 2004;18(5):370-377.
51 Chiuve SE, McCullough ML, Sacks FM, Rimm EB. Healthy lifestyle factors in the primary prevention of coronary heart disease among men: benefits among users and nonusers of lipid-lowering and antihypertensive medications. *Circulation.* 2006;114(2):160-167.

PEER-REVIEWED ARTICLE

Selecting an Electronic Medical Record System for Small Physician Practices

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Abstract

Background: *While electronic medical record (EMR) systems have demonstrated the potential to improve quality of care and reduce medical errors, relatively few practitioners have implemented EMR systems. This article presents a case study that explores the process by which small physician practices may select an ambulatory EMR system.*

Methods: *We assessed the appropriate criteria small practices should use in selecting an EMR system and then evaluated a range of commercially available EMR systems according to cost, functionality, and interoperability with existing systems.*

Results: *The process for selecting an EMR system starts by creating a budget for start-up costs and monthly maintenance expenses. Next, a practice should evaluate its strategic objectives and current computer infrastructure. The group should then define the appropriate functionality requirements specific for their practice. Finally, a certified ambulatory EMR system that interfaces with existing office systems can be selected.*

Limitations: *This case study explores the process of EMR selection for rural, solo physician practices. The ability to generalize the process described herein to broader types of physician practices, such as multi-specialty group practices or to those practices with larger budgets for EMR systems, may be limited.*

Conclusions: *Multiple critical and often competing factors—including cost and interoperability with existing systems, as well as organizational goals and obstacles—influence the selection of an EMR system for small physician practices. However, by following a standardized process for selecting an EMR system, small physician practices will find EMR selection to be a relatively straightforward process.*

Keywords: *electronic medical record; family medicine; rural community; small physician practices*

The Bush administration developed a goal to have the US health care industry adopt electronic medical records (EMRs) by the year 2014; with only five years to go, that seems less and less likely.[1] Proponents of EMRs anticipate they will generate long-term cost savings, reduce medical errors, and promote greater health system efficiency.[2-8] In a survey of 2,758 physicians in September 2007 and March 2008, only 4% of physician practices had a fully functional EMR.[3] For rural physician practices these numbers are thought to be even lower.[9] While most physician practices use electronic practice management systems for billing, the adoption of clinically functional EMRs has been quite slow.[10] Initial start-up costs, lack of interoperability with existing systems, lack of national standardization of information technology, and lack of motivation to learn a new system are a few of the barriers to purchasing an ambulatory EMR system.[10]

Many small physician practices and small hospitals that lack their own information technology staff hire consultants to select an EMR system for them. Choosing an EMR system may be one of the major impediments to the broader adoption of EMRs. Critical objectives include finding a vendor that can meet a practice's individual needs and selecting a system that will be easy to learn and cost effective for the practice. This paper presents a case study describing the process by which a small, rural physician practice in Smithfield, North Carolina, selected an ambulatory EMR system that was recommended by the authors of this article—students and faculty of the University of North Carolina Gillings Schools of Global Public Health. This

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process can be used as a model for other similarly-situated practitioners to follow in adopting EMRs in their own practices.

Methods

The physician practice in this case study decided to purchase an ambulatory EMR system to meet their goals of creating a paperless and more efficient practice. The owner did background research on what type of EMR her practice needed, created a budget for the practice's start-up costs and monthly maintenance fees, and provided a list of priorities for a suitable EMR system. She also gained staff buy-in before meeting with the authors of this study. The authors' task was to select an EMR system that would meet the practice's budget and internal priorities and interface with recently purchased practice management software (see Table 1).

The EMR selection process began by evaluating ambulatory EMR systems certified by the Certification Commission for Health Information Technology (CCHIT). An initial list of CCHIT certified vendors were identified and then the search was narrowed to vendors who were frequently used in North Carolina because interfacing with the existing EMR systems of local hospitals and local referring physicians was important to this practice. The remaining EMR vendors were assessed by their ability to provide web-based EMR services. Finally, data relating to cost and user satisfaction were evaluated in the final stages of the selection process.

Table 1.
Selection Criteria Worksheet with Functional Requirements Based on One Practice's Priorities

Primary
Manage diagnostic studies results
Order diagnostic tests
Support secure electronic communication
Write prescriptions
Secondary
Assess clinical guidance
Capture patient history
Drug, food, and allergy interaction checking
Enable printout of information when necessary
Enforce patient privacy and confidentiality
Ensure integrity, data retention, and availability
Manage medication lists
Manage patient reminders
Manage patient-specific care plans, guidelines, and protocols
Manage problem lists
Online patient portal
Order referrals
Patient-specific dosing and warnings
Provide secure authentication
Summarize health record
Tertiary
Capture external clinical documents
Capture variances from standard care plans, guidelines, and protocols
Manage clinical documentation
Manage consents and authorizations
Manage medication formularies
Provide patient-specific instructions

Practices that had adopted EMRs were contacted by one of the authors (DK) and asked about their satisfaction with the EMR. Calls were made to three physicians and one practice administrator. The telephone surveys asked the informants to describe the advantages and disadvantages of each user's individual EMR system, their opinion of their EMR system, and their overall satisfaction with their system. In addition to these telephone surveys, we analyzed published customer satisfaction surveys and weighed the published survey data results more heavily than our informal telephone survey findings when assigning user satisfaction scores to each EMR system. We then narrowed the field of EMR systems to two systems that best met these priorities and presented this list to the owner of the practice.

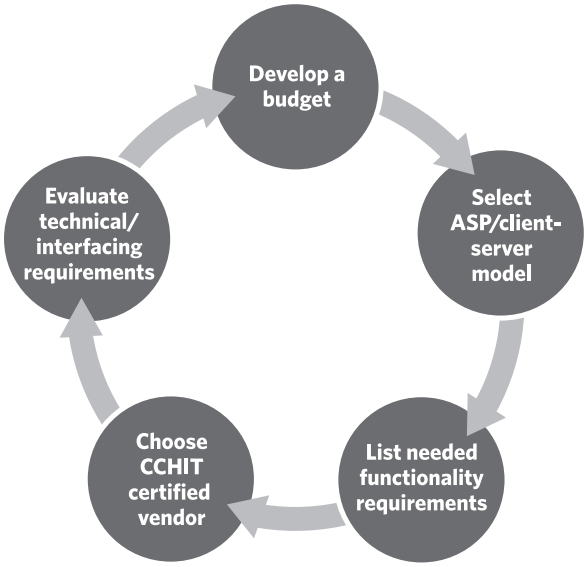
Results

Practice Budget

The current EMR market has many vendors and finding a system suitable for a practice with a single provider is time-consuming and can be tedious. Solo practitioners usually have few staff in one office location, a condition that may affect the usability of an EMR. Deciding to purchase an EMR system includes creating a budget, detailing available funds for start-up costs and monthly EMR maintenance expenses, determining whether an application service provider (ASP) model or a client server model best fits the practice's needs, and choosing an EMR that interfaces with existing office systems (see Figure 1).[11,12]

In terms of cost, a practice should determine how much they can afford to spend on an EMR system. The total cost of an EMR system includes the cost of hardware, software, EMR implementation, technological support, and temporary loss of practice productivity.[13] Published reports describe the total initial cost of an EMR system ranging from $15,000 to $30,000.[8,14] Annual maintenance fees run from $1,500 to $5,000 per provider per year.[8,14] Other costs that should be specified in the budget are technological upgrades necessary to fully implement the EMR system. These technical upgrades include the technical and interfacing requirements needed to ensure that workstation computers have enough functional memory, the correct internet connections [e.g., T1/T3 or digital subscriber line (DSL)], hard disk space, interface cards to execute the software, and a single workstation for a fax server. Most offices can meet these interfacing requirements without any additional costs. Despite these high initial startup costs the return on investment is positive. There are potential cost

Figure 1.
Process for Selecting an Ambulatory EMR for a Physician Practice[11,16,26]



savings from improved provider and staff efficiency, reduced transcription costs, fewer prescribing errors, reduced maintenance of paper charts, reduced coding errors, and increased charge capture.[8,13-15]

Application Service Provider vs. Client-Server Model

The practice in this case study wanted an EMR system based on an ASP system. The ASP model is a web-based EMR system that has many features similar to online banking. The ASP model is ideal for small practices who want to outsource the maintenance, storage, and security of their EMR systems (see Table 2, page 402).[16] Conversely, the client-server model is ideal for large practices that have internal information technology departments and can maintain their own server. Of the two, the ASP model offers lower start-up costs. Once a practice has selected an ASP model or a client-server model system and the budget has been determined, the practice should decide what it needs the EMR system to do.

Functional Capabilities

There are many different types of EMRs with different functional capabilities. Most EMR systems have more capabilities than a small physician practice needs, but each practice should articulate the functionalities they need so the most appropriate EMR system is selected.

Certification Commission for Health Information Technology Certification

Given a practice's functional requirements, an EMR search should be narrowed to include only ambulatory EMR systems that are certified by the Certification Commission for Health Information Technology. CCHIT certification ensures that baseline functionality requirements are met. Founded by the American Health Information Management Association, the National Alliance for Health Information Technology, and the Healthcare Information and Management Systems Society, CCHIT is a nonprofit organization that offers voluntary certification to EMR vendors who have the functionality, interoperability, and security requirements to meet current industry standards.[17] CCHIT certified vendors have the following functionality: (1) maintaining patient records that include medication, demographics, and problem list management; (2) summarizing the health record; (3) managing clinical documents; (4) ordering medication and managing drug interactions with pharmacy communication; (5) ordering diagnostic tests (including imaging and laboratory tests); (6) managing patient directives and care plans; and (7) presenting disease management and wellness alerts.[18] Beyond these criteria, CCHIT certified vendors should be assessed regarding their cost and overall fit for a physician's specific practice environment.

Case Study

The small, rural family medicine clinic that served as the case study for this analysis is owned and operated by a single physician. The practitioner sees 25-30 patients daily and has a staff of one registered nurse and two office assistants. The practice's current technological infrastructure includes three computers running an ASP-based practice management software and Microsoft Office 2003. The clinic previously purchased a practice management system that performs scheduling, demographic capture, claim filling, billing tasks, and reporting. The practice needed an EMR that could interface with its practice management software and function without an on-site server.

Three of the authors (ND, DK, and JG) served as unpaid consultants to the practice. The EMR selection process outlined here served as a class project for a health care informatics course taught at the University of North Carolina at Chapel Hill Gillings School of Global Public Health.

After meeting with the physician in Smithfield, North Carolina, we evaluated the practice's needs and developed a list of functionality requirements that would meet their goals. The practice budgeted $500 a month for the EMR system so vendors costing more than this amount were excluded. This budget was a predetermined amount the practice felt it could afford to spend on an EMR. The list of functionality requirements were ranked according to the practice's priorities. We then narrowed the pool of potential EMR vendors to four. All four vendors offered ASP models at a monthly rate, based upon either the number of providers or the number of users. The costs for the four vendors ranged from $50 to $450 per provider per month. Additional costs not included were interfacing fees (these involved connections between LabCorp and the practice management system) and maintenance fees. After further examination of the costs and functionality for these four vendors, the field was narrowed to the two vendors who had the highest reviews in user satisfaction surveys. We

Table 2.
Differences Between the Application Service Provider (ASP) and Client-Server Based Electronic Medical Record Systems[16]

EMR Characteristics	ASP Model	Client-Server Model
Ideal practice size	Small practices or practices with multiple locations	Large practices
Secure data center	Designed to meet HIPAA security rule requirements	Physician must build and maintain a secure data center
Data storage	Provided	Not provided
Help desk	24/7 operating support provided by vendor	Physician provides own technical support
Customized EMR functionality	Customized EMR functionality support is provided	Customized EMR functionality support is provided
Remote access	Access provided by internet-based system	Limited off-site access
Software	Often included in EMR	Purchased separately
Speed of data access	Slower than client-server model	Speed of data acquisition is faster than ASP model
Cost	Monthly fee for secure data center Lower start up costs	Higher start up costs Higher maintenance costs Server purchased separately
Type of internet connections	T1/T3 connection required	Business class DSL connection needed
Limitations	Access to records may be lost if EMR company goes bankrupt	Remote access to EMR is limited

presented these two vendors to the practice and allowed the physician to choose the system for purchase. We also recommended that portable tablet personal computers or small laptop computers be placed in each exam room to aide patient flow during clinic hours. The practitioner chose to purchase one of the recommended systems. To date, her experience has been good. She likes the product she chose and is currently working with one of the authors (DK) to incorporate a new billing system into her EMR to replace her practice management system.

Discussion

A recent survey of over 400 members of the American Academy of Family Physicians ranked EMRs used by family practitioners.[19] This study analyzed functionality, ease of use, customer service support, cost, interoperability, security, and overall satisfaction through a survey posted on the Family Practice Management website. KLAS, an independent research organization that evaluates health care technology, also provides an annual list of top EMR systems in its KLAS Top 20 Report.[20] We used the KLAS and the results reported by Edsall and colleagues[19] in conjunction with our own informal telephone survey as one criterion in the selection process for this case study. Using survey and opinion-based methods provide poor inter-rater reliability, but while the customer survey data is biased, several vendors had consistently high user satisfaction scores.

The selection of a single EMR product is fraught with difficulty because practice needs vary by geographic location, practice size, and the need for interoperability with preexisting systems. These challenges prevent standardization of the electronic medical record system in the United States.

Small, rural physician practices present organizational obstacles to the selection and implementation of an EMR system that larger group practices may not experience. The office staff of a rural practice may have limited time to plan for and participate in the selection and implementation of an EMR system due to its small size and may lack the organizational capabilities to adequately implement an EMR so that all of its functionalities are fully utilized.[21,22] There may be difficulties associated with the time required to conduct initial and ongoing training, particularly if the staff possesses limited technical inclinations and interest in learning the system due to inadequate buy-in during the initial stages of selection.[23] Scheduling EMR training during the lunch hour, on weekends, or by closing the practice to patients for a day, will help small practices find adequate training time. Also, going live on a slow day may offer the least interruption to a practice. Finally, rural practices face limited budgets for information technology and may struggle to adequately fund an EMR system, but long-term cost savings can be realized in primary care settings.[14]

There are many factors influencing the selection of an ambulatory EMR system for a small rural practice. The primary criteria should include CCHIT certification, interoperability with current systems, and cost. EMRs have demonstrated the ability to increase practice and staff productivity by streamlining processes and reducing inefficiency.[13] The broader adoption of EMRs in ambulatory settings is expected to improve the quality of health care by improving patient safety. Improvements in patient safety have already been realized with computerized physician order entry.[2,13] Using medical alerts incorporated into

the EMR system provides better adherence to clinical practice guidelines. Medical errors are reduced when clinicians have better access to patient data. Moreover, computerized physician order entry reduces prescribing errors with drug-drug and drug-allergy checking systems.[2,8,13,14,24,25] When practitioners use EMRs to their fullest capability medical errors will be reduced.

The process by which an EMR is selected is straightforward and can be easily accomplished by solo practitioners. Practices who have limited understanding of EMRs may find going through a step-by-step process beneficial. **NCMJ**

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REFERENCES

1 Litvin CB. In the dark—the case for electronic health records. *N Engl J Med.* 2007;356(24):2454-2455.
2 Leape LL, Berwick DM. Five years after *To Err Is Human*: what have we learned? *JAMA.* 2005;293(19):2384-2390.
3 DesRoches C, Campbell E, Rao S, et al. Electronic health records in ambulatory care—a national survey of physicians. *N Engl J Med.* 2008;359(1):50-60.
4 Muirhead G. Overcoming resistance to electronic medical records. *OB GYN News.* 2008;43(4):34.
5 Otieno GO, Hinako T, Motohiro A, Daisuke K, Keiko N. Measuring effectiveness of electronic medical records systems: towards building a composite index for benchmarking hospitals. *Int J Med Inform.* 2008;77(10):657-669.
6 Singh R, Servoss T, Kalsman M, Fox C, Singh G. Estimating impacts on safety caused by the introduction of electronic medical records in primary care. *Inform Prim Care.* 2004;12(4):235-242.
7 Singh R, Singh A, Servoss TJ, Singh G. Prioritizing threats to patient safety in rural primary care. *J Rural Health.* 2007;23(2):173-178.
8 Adler KG. Why it's time to purchase an electronic health record system. *Fam Pract Manag.* 2004;11(10):43-46.
9 Bahensky JA, Jaana M, Ward MM. Health care information technology in rural America: electronic medical record adoption status in meeting the national agenda. *J Rural Health.* 2008;24(2):101-105.
10 Valdes I, Kibbe DC, Tolleson G, Kunik ME, Petersen LA. Barriers to proliferation of electronic medical records. *Inform Prim Care.* 2004;12(1):3-9.
11 Adler KG. How to select an electronic health record system. *Fam Pract Manag.* 2005;12(2):55-62.
12 Peres KE. Choosing software for smaller providers. *Behav Healthc.* 2007;27(11):48-49.
13 Menachemi N, Brooks RG. Reviewing the benefits and costs of electronic health records and associated patient safety technologies. *J Med Syst.* 2006;30(3):159-168.
14 Wang SJ, Middleton B, Prosser LA, et al. A cost-benefit analysis of electronic medical records in primary care. *Am J Med.* 2003;114(5):397-403.
15 Gearing P, Olney CM, Davis K, Lozano D, Smith LB, Friedman B. Enhancing patient safety through electronic medical record documentation of vital signs. *J Healthc Inf Manag.* 2006;20(4):40-45.
16 EMR Experts. Implementing an EMR. EMR Experts website. http://www.emrexperts.com/emr-ebook/implementation-introduction.php. Updated 2008. Accessed April 16, 2008.
17 Hammond W. The making and adoption of health data standards. *Health Aff.* 2005;24(5):1205-1213.
18 CCHIT Certified Ambulatory EHR 2007. Certification Commission for Healthcare Information Technology website. http://www.cchit.org/choose/ambulatory/2007/index.asp. Updated 2008. Accessed April 30, 2008.
19 Edsall RL, Adler KG. User satisfaction with EHRs: report of a survey of 422 family physicians. *Fam Pract Manag.* 2008;15(2):25-32.
20 Ambulatory EMR top 20: 2006 best in KLAS. KLAS website. http://www.klasresearch.com/KLAS/Site/. Updated 2007. Accessed April 5, 2008.
21 Lorenzi NM, Riley RT. Managing change: an overview. *Am Med Inform Assoc.* 2000;7(2):116-124.
22 Travers D, Downs SM. Comparing user acceptance of a computer system in two pediatric offices: a qualitative study. In: *Proceedings of the AMIA Symposium.* 2000:853-857.
23 Glaser J. Management's role in IT project failures. *Healthc Financ Manage.* 2004;58(10):90-92.
24 Menachemi N, Perkins RM, van Durme DJ, Brooks RG. Examining the adoption of electronic health records and personal digital assistants by family physicians in Florida. *Inform Prim Care.* 2006;14(1):1-9.
25 Litvin C, Ornstein S, Anthony W Jr, Tanner D. Quality improvement using electronic medical records: a case study of a high-performing practice. *Top Health Info Manage.* 2001;22(2):59.
26 Kannry J, Mukani S, Myers K. Using an evidence-based approach for system selection at a large academic medical center: lessons learned in selecting an ambulatory EMR at Mount Sinai Hospital. *J Healthc Inf Manag.* 2006:20(2):84-99.

HEALTH REFORM IN NORTH CAROLINA

Market Hazard, Moral Imperative: Why We Need Health Reform

Chris Fitzsimon

Despite the rancor about health care reform this summer, there is little disagreement about the problems with the current health care system in the United States. The US Census Bureau reports that the number of uninsured reached 46.3 million in 2008, with 1.5 million uninsured in North Carolina.[1]

The majority of Americans still receive health care from their employers, and they lose the coverage if they lose their job. People with preexisting conditions are often denied coverage or only offered plans with exorbitant premiums and copayments they cannot afford. People with insurance can lose their coverage if they become sick and an insurer discovers a precondition, even if it is unrelated to their current illness.

The rising cost of health care is unsustainable. Premiums for family coverage rose 5% in 2009 and have risen 131% in the last 10 years.[2] US health care expenditures reached 16% of the gross domestic product (GDP) in 2007, significantly higher than any other industrialized democracy. However, the US ranks well below the average for industrial nations on life expectancy and other major health indicators.[3]

Many Americans with coverage still cannot afford their medical care when a major illness strikes. Sixty-two percent of personal bankruptcies are related to health care costs, and 75% of those filing for bankruptcy reported had health insurance coverage.[4]

The current health care system is clearly broken, but that is where the consensus ends. Proposals for reform vary widely but fall distinctly into philosophical approaches, based on the role of the public sector and degree of regulation of the private health care market.

Solutions suggested by those who identify themselves as free market conservatives include expansion of health savings accounts (HSAs), creation of broad personal health care tax credits, and further deregulation of the insurance industry by allowing companies to sell policies across state lines.

Each of those solutions is based on the assumption that a significant factor in health costs is that individuals with insurance are unaware of the total cost of their care and therefore seek treatment they may not need. The author Malcolm Gladwell explains this "moral hazard" argument by comparing the current health care system to an employer providing free Pepsi at the workplace, which leads to employees drinking more Pepsi. Gladwell says, "Making you responsible for a share of the costs, the argument runs, will reduce moral hazard: you'll no longer grab one of those free Pepsis when you aren't really thirsty."[5]

But health care is a much different commodity than soft drinks. Gladwell cites a Rand Corporation study in the late 1970s that found that people with higher copayments did cut back on care they might not have needed. But Gladwell points out the study also found that higher copays led people to forgo care that is important, like treating high blood pressure.[5]

Other proposed market solutions like health savings accounts are based on that flawed moral hazard argument, and that's not their only flaw. HSAs assume that even low-wage workers can save enough to pay for their medical care, including emergencies and major illnesses. The accounts are currently available to many employees now and are used primarily by wealthy families as a tax shelter, not by middle-class workers as a health care plan.[6] The investment publication Kiplinger.com calls HSAs "just another tax-deferred way to save for retirement."

The argument for relaxing regulations of insurance companies to allow them to sell policies across state lines is also misguided. It assumes only the benefits of the market, not the negative consequences. The

proposal would encourage states to end virtually all regulation to attract insurance companies in a race to the bottom, removing most restrictions and safeguards for consumers, a scenario that has already occurred in the financial industry.

The only way interstate competition makes sense is if a public insurance plan is also an option for consumers. The public plan, modeled generally on Medicare with its lower administrative costs, would provide an incentive for private companies to reexamine their operations to look for savings. The companies would be allowed more flexibility in the plans they offer to compete with the public plan and other companies in the private sector.[7] Estimates of the savings from a national health insurance exchange that includes a public option range from $224 billion to $400 billion over 10 years.[8]

The incentives in the current system encourage insurance companies to deny coverage and claims to maximize profits. Even most opponents of a public option support regulations that would prohibit insurance companies from denying coverage because of preexisting conditions, which contradicts their fundamental assumption that regulation is the problem. Much of what economist Paul Krugman calls the "health-care industrial complex" makes money based on the number of procedures they perform, which provides an incentive to perform more, or on the number of high-tech machines they sell, which then must be used to justify their cost.

The bottom line is that the delivery of health care doesn't fit into the traditional understanding of the free market. There is no profit for insurance companies in providing care for the chronically ill. The profit comes from denying it.

The problems in our current system are costing us billions of dollars and endangering millions of lives. As distasteful as it may be to the conservatives' free market doctrine, the public sector must step in and play a larger role.

All the other Western industrialized nations have recognized that this is the only way to provide basic coverage for all citizens. Everybody needs health care, and there is a strong argument to be made that to ensure the equal opportunity guaranteed in our Constitution, everybody deserves it.

REFERENCES

1 US Census Bureau. Income, poverty, and health insurance coverage in the United States: 2008 [press release]. US Census Bureau website. http://www.census.gov/Press-Release/www/releases/archives/income_wealth/014227.html. Published September 10, 2009. Accessed September 14, 2009

2 The Kaiser Family Foundation, Health Research & Education Trust. *Employer Health Benefits: 2009 Summary of Findings.* The Kaiser Family Foundation website. http://ehbs.kff.org/pdf/2009/7937.pdf. Accessed September 14, 2009

3 Organization for Economic Co-Operation and Development. *OECD Health Data 2009: How Does the United States Compare?* OECD website. http://www.oecd.org/dataoecd/46/2/38980580.pdf. Accessed September 14,2009

4 Himmelstein DU, Thorne D, Warren E, Woolhandler S. *Medical Bankruptcy in the United States, 2007: Results of a National Study.* Physicians for a National Health Program website. http://www.pnhp.org/new_bankruptcy_study/Bankruptcy-2009.pdf. Accessed September 17, 2009

5 Gladwell M. The moral hazard myth: the bad idea behind our failed health care system. The New Yorker website. http://www.newyorker.com/archive/2005/08/29/050829fa_fact?currentPage=all. Published August 29, 2005. Accessed September 17, 2009

6 Park E; Center on Budget and Policy Priorities. GAO study again confirms health savings accounts primarily benefit high-income individuals. http://www.cbpp.org/cms/?fa=view&id=291. Published May 19, 2008. Accessed September 17, 2009.

7 Commission on a High Performance Health System; The Commonwealth Fund. *The Path to a High Performance US Health Care System: A 2020 Vision and the Policies to Pave the Way.* New York, NY: The Commonwealth Fund; 2009.

8 Holahan J, Blumberg LJ; Urban Institute Health Policy Center. *Is the Public Option Plan a Necessary Part of Health Reform?* Urban Institute website. http://www.urban.org/uploadedpdf/411915_public_plan_option.pdf. Accessed September 17, 2009.

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HEALTH REFORM IN NORTH CAROLINA

Get Health Reform Right, Not Quick

John Hood

No one can doubt that the American health care system is broken and needs fundamental change. No one can doubt that North Carolina, in particular, exhibits all of the problems inherent in the current system and would benefit significantly from well-structured reforms. So why do I argue policymakers should slow down? Because the last few months of public debate have revealed a shocking and debilitating level of ignorance, misunderstanding, and misrepresentation that can only result in legislation destined to hike costs, harm quality, and hamper the nation's economic recovery.

Some politicians, commentators, and activists have lodged similar complaints about recent health care protests. But their rhetoric has been rougher and targeted at the wrong actors. They've accused conservative politicians and commentators of lying about President Obama's plan, scaring seniors with false statements about Medicare cuts and death panels, and doing the bidding of nefarious special interests in health care who want to protect the status quo. Some of the claims by critics of the Democratic plans have indeed been intemperate, inexact, or exaggerated. But for the most part, public opposition to those plans has arisen for understandable and legitimate reasons—and the critics have, in my judgment, exhibited superior knowledge of and candor about the issues involved than have the president and his allies.

Is this just a case of ideological name-calling? Not at all. While partisans and lobbies have thrown bombs at each other for years, health care economists and policy analysts from across the spectrum have been engaged in a serious, far-reaching exploration of the complex issues of health care finance and delivery. Just in the past decade, there has been an explosion of research published by Health Affairs, economic journals, and think tanks across that nation ranging from the Cato Institute and American Enterprise Institute on the right to the Brookings Institution and Urban Institute on the left.

By no means am I suggesting that this freewheeling discussion has yielded a policy consensus. Some analysts think that we need to adopt a national version of health care along the Massachusetts Connector model, which mixes some choice and competition features with new taxes, mandates, and insurance regulation. Some think we need to expand Medicare and Medicaid, set up a new "public option," or otherwise move further towards the government being the primary and perhaps the only financing mechanism for medical care. Still others—I am among them—believe that we need to adopt measures that allow and encourage the development of consumer-driven health care that addresses issues of cost, choice, and portability.

Despite this disagreement, there are some common myths that health care economists of all stripes reject but that the president and other advocates of current reform plans continue to propagate. These are not minor quibbles. They go to the very heart of why the nonpartisan Congressional Budget Office and other neutral arbiters have scored the proposed bills as far more expensive than advertised[1]—and that, in turn, helps to explain why they're in trouble. Here are some examples:

Prevention

Policymakers continue to assert that we can reduce health care costs in the long run by reducing the ranks of the uninsured. Because the assertion is inherently counterintuitive—adding more consumers with more buying power into a market tends to bid up costs, not drive them down—advocates further assert that spending more money on preventive care today will save money tomorrow by reducing incidence of disease or the need for more expensive treatments. This may sound plausible, but it is no exaggeration to say that virtually no reputable expert on health care finance believes it to be true.[2]

Don't take my word for it. "On average, preventive care does not save money," said Paul Van de Water, a senior fellow at the liberal Center on Budget and Policy Priorities. Similarly, Len Burman of the Tax Policy Center, a joint venture of Brookings and the Urban Institute, recognizes that while preventive care is a good thing and may well alleviate much suffering, it isn't a tool for financing health care reform. "Advocates think they can cut health care spending by expanding health care spending," Burman said, but that is false.[3]

Cost-Shifting

A related notion, popular among lobbyists for current health insurers and medical providers, is that a substantial amount of the recent run-up of health care costs comes from having to provide expensive emergency room treatment to the uninsured. Reformers assert that by expanding government programs or subsidies to insure these patients, the system as a whole will save a lot of money and the currently insured will see less cost-shifting pressure on their premiums. This is another plausible-sounding notion that doesn't bear up to careful economic scrutiny. For one thing, uncompensated medical care to the uninsured, while bothersome for providers, does not represent a large enough tail to wag the medical inflation dog. It makes up somewhere between 3%-4% of total health care spending in the United States, depending on the measurement.[4] Insuring the uninsured won't make most of those costs disappear. It will just change somewhat who pays what to whom. In fact, as a matter of public finance, the uninsured as a group already offset most if not all of this uncompensated care due to the higher income and payroll taxes they pay when compared to similarly situated Americans with tax-deductible insurance premiums.[5]

Should public subsidies of emergency room care be more explicit and rational? Of course. I also like WakeMed CEO Bill Atkinson's proposal to reform the Emergency Medical Treatment and Active Labor Act to give hospitals more authority to engage in triage at the point of contact—to refer uninsured patients with nonemergency conditions to providers other than emergency rooms.[6] But such situations are not the primary drivers of medical inflation and addressing them won't generate nearly enough savings to finance grandiose federal health reforms.

Profit and Administrative Costs

Advocates of making government either the dominant or the single payer for medical services are fond of demonizing private health insurers for squandering vast amounts of the national health care budget by delivering profits to shareholders, compensating CEOs, and administering medical claims. Once again, the economic literature and basic statistics disprove these arguments.

The average profit margin in health insurance is a little less than 4%.[7] If there was some way to eliminate it entirely, that wouldn't save enough to curtail medical inflation noticeably or to subsidize coverage for the uninsured. But even that would be an overstatement of the potential "savings," reflecting a misunderstanding of what profit is. Any large-scale enterprise, private or public, must raise sufficient capital to invest in assets and cover unforeseen costs. Profits represent the return to shareholders for investing their money in building and operating the business. Government-run health insurance programs also have to pay to acquire necessary capital. Taxpayers bear this cost in part through tax compliance—higher levels of taxation require costlier efforts to collect and comply with the tax code—and by paying interest to holders of government debt. These costs may not show up in simplistic comparisons of national health care spending, but they are very real.

As for the broader issue of administrative cost, once again the picture is far more complicated than simplistic measures can capture. Analysts routinely overestimate administrative costs in the private sector—by including such expenditures as regulatory compliance and providing consumer information—and underestimate the administrative costs of Medicare and Medicaid—by ignoring costs located elsewhere in the federal budget (including the IRS) or shifted to providers.[8] Manhattan Institute economist Benjamin Zycher conducted an important study of true administrative costs in 2007 and found that shifting to government-run insurance would not save nearly enough administrative costs to finance care for the currently uninsured.[9]

These are just some examples of commonly held assumptions that are based on incorrect or incomplete understanding of health care economics. Reform programs that promise to finance massive increases in

government expenditure through relatively painless initiatives are fiscal time bombs, as the Congressional Budget Office and others have pointed out.

Instead of trying to rush through legislation that would grant the federal government massive new powers over one-seventh of the nation's economy, policymakers should calm down, slow down, and start with reforms that won't break the bank or throttle insurance markets. Analysts of varying ideological backgrounds agree with this gradualist approach.[10] Here's my short list:

- Equalize the tax treatment of employer-based and individually purchased health insurance. Without the tax bias, far more Americans could have personal, multi-year health insurance policies that manage their risk of catastrophic medical expenses and are fully portable during future job losses, career changes, or relocations.
- Require the advance publication of real price information by hospitals, doctors, and other medical providers, while arming patients with savings accounts and other incentives to shop around and consume care more wisely. Wasteful consumption of medical services is a far, far bigger part of the health care bill than most of the targets of the current political invective.
- Free up markets for medical services by allowing nurse practitioners and other low-cost providers to deliver more care, reducing the barriers to entry for new doctors and nurses, and eliminating certificate-of-need regulations that protect incumbent providers from competition.

While it would be nice to get health care reform quickly, it would be better to get health care reform right.

REFERENCES

1 Elmendorf DW. *Preliminary Analysis of America's Affordable Health Choices Act of 2009.* Washington, DC: Congressional Budget Office; July 17, 2009.
2 Goodman J. The price of prevention. Governing website. http://www.governing.com/article/price-prevention. Published April 1, 2008. Accessed September 23, 2009.
3 Cheplick T. Prevention brings less-than-expected savings. *Health Care News.* 2009;10(8):5.
4 Hadley J, Holahan J. How much medical care do the uninsured use, and who pays for it? *Health Aff.* Web exclusive. http://content.healthaffairs.org/cgi/content/full/hlthaff.w3.66v1/DC1. Published February 12, 2003. Accessed September 23, 2009.
5 Cannon MF. Fannie Med? Why a "public option" is hazardous to your health. Policy Analysis No. 642. Cato Institute website. http://www.cato.org/pub_display.php?pub_id=10382. Published July 27, 2009. Accessed September 23, 2009.
6 Atkinson W. A proposal for jump-starting national health care reform. *NC Med J.* 2009;70(4):346.
7 Industry summary. Yahoo! finance website. http://biz.yahoo.com/p/sum_qpmd.html. Published September 25, 2009. Accessed September 23, 2009.
8 Matthews M, Matthews MR. Medicare fraud: what government can learn from the private sector. In Frogue L, ed. *Stop Paying the Crooks: Solutions to End the Fraud that Threatens Your Health Care.* Atlanta, GA: The Center for Health Transformation; 2009:92-93.
9 Zycher B. Comparing public and private health insurance: would a single-payer system save enough to cover the uninsured? Medical Progress Report No. 5. Manhattan Institute for Policy Research website. http://www.manhattan-institute.org/html/mpr_05.htm. Published October, 2007. Accessed September 23, 2009.
10 Aaron HJ. The pitfalls of overreaching in health reform. *Health Aff.* 2009;28(2):184-187.

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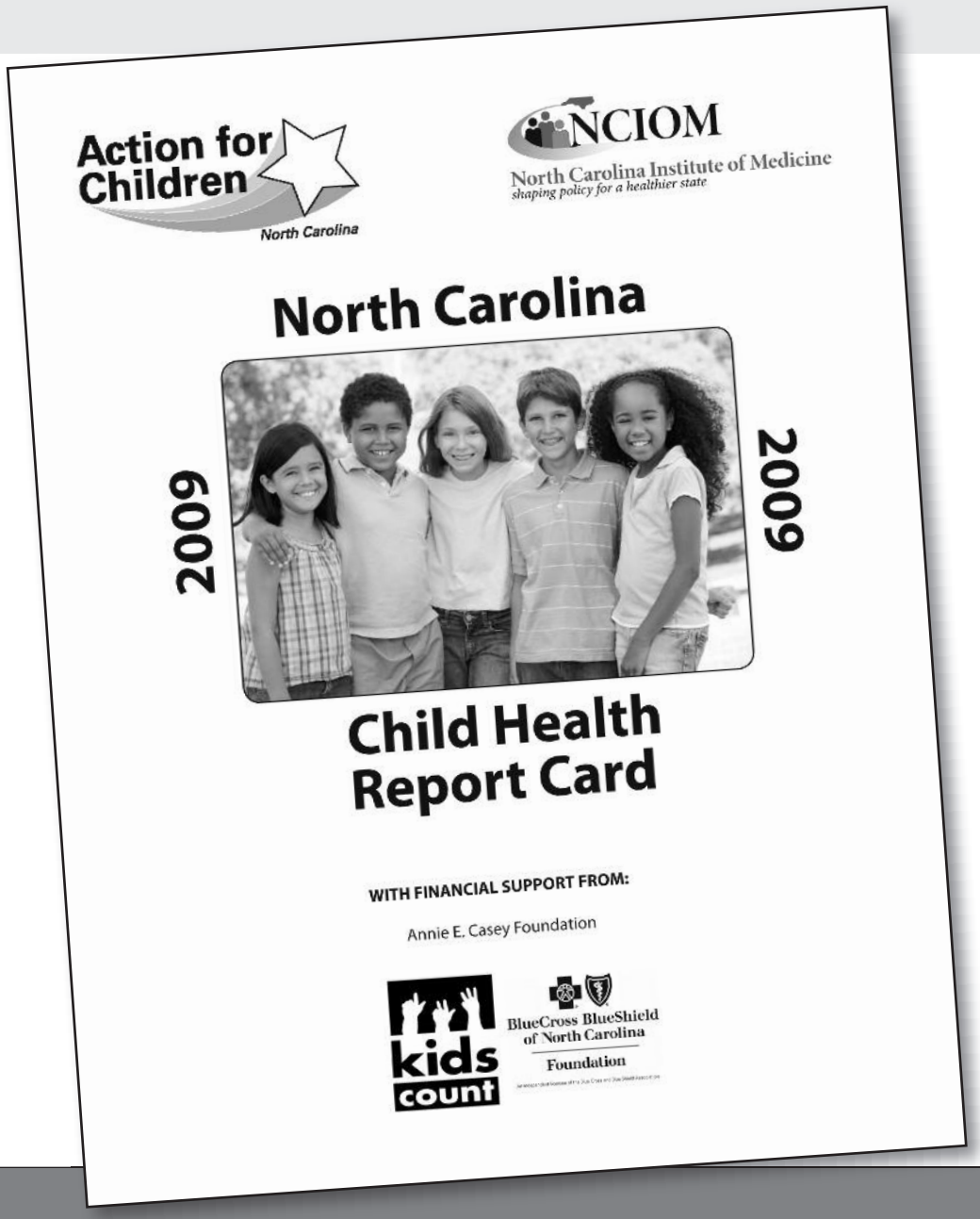
Editor's Note: An Introduction to the Child Health Report Card

This year marks the 15th issue of the *North Carolina Child Health Report Card*, co-published by the North Carolina Institute of Medicine and Action for Children North Carolina. Occasionally in the past, the *North Carolina Medical Journal* has reprinted the Card in one of its issues, regardless of the issue theme, to help ensure its wider dissemination. While this particular issue of the *Journal* focuses on women's health, we feel that the inclusion of the *Child Health Report Card* here is especially relevant due to the indisputable interplay between women's health and that of their children. In comparing the *Child Health Report Card* with the *North Carolina Women's Health Report Card*, it is clear that the trend in prevalence of risk factors like obesity, physical inactivity, and alcohol, tobacco, and substance abuse are similar in these populations. This suggests that initiatives to address these issues should consider a mother/child dyad or a family approach. Indicators around breastfeeding, teen pregnancy, preterm birth, and infant death are reported on both cards, demonstrating the obvious link between maternal health and infant outcomes.

Child health is affected by multiple factors, including the health of other family members and the household environment. For example, child abuse and neglect may be a reflection of the mother's mental health, economic, and relational status, while environmental exposures to toxins such as lead not only affect child health, but fetal and maternal health as well. So while it is important to carefully track and record indicators specific to women and to children, the synergy between these indicators and what they represent should not be ignored.



The purpose of the North Carolina Child Health Report Card is to heighten awareness – among policymakers, practitioners, the media, and the general public – of the health of children and youth across our state. All of the leading child health indicators are summarized in this one easy-to-read document. This is the 15th annual Report Card, and we hope it will once again encourage everyone concerned about young North Carolinians to see the big picture and rededicate their efforts to improving the health and safety of the children whose lives they affect.

Statewide data are presented for the most current year available (usually 2008), with a comparison year (usually 2000) as a benchmark. This time period was chosen because it reflects the administrations of President Bush and Governor Easley and the concurrent congressional and legislative sessions. Though government is not the sole determinant of child heath, it does indeed set the tone. To the extent that a public "vision" of healthy, nurtured children is maintained, responses in terms of fiscal investments, child safety laws, state and local agency efforts, and parental involvement are enhanced. Thus, it is instructive to be aware of the changes in child health and safety during this period.

The specific indicators were chosen not only because they are important, but also because data are available. In time, we hope expanded data systems will begin to produce more comprehensive data that will allow the "picture" of child health and safety to expand. *Ethnic/racial disparity data for many of the indicators are now available, and will soon be presented in a companion document by Action for Children North Carolina.*

"We can chart our future clearly and wisely only when we know the path which has led to the present." - Adlai E. Stevenson

The period 2000-2008 began and ended in recessions, with several years of growth in between. The number of children (age 0-17) grew each year to a total of more than 2.2 million, more than ever before. However approximately 20% of them continued to live in poverty, meaning that more children than ever before were living in significant financial stress. Under such conditions, a general decline in children's health and safety would be expected.

Fortunately this was not the case. A review of the indicators in this Report Card shows that, though the picture is not always rosy, the health and safety of our children generally improved, and analysis makes it clear that these generally favorable outcomes are not happenstance. They are a reflection of increased government investments, both fiscal and enhanced child safety laws; the hard work and perseverance of child advocates and state and local agencies in developing and implementing child health and safety initiatives; and the attentiveness of parents and other caregivers.

Though results are somewhat mixed, it is remarkable that virtually all the indicators were improved during the 2000-2008 period, and continue to be so. Investments fall into three categories, with state highlights below:

- Additional appropriations have significantly expanded public health insurance for children, have brought the infant mortality rate to historic lows, and have expanded access to dental care for children in low-income families.
- Laws were enacted to enhance children's safety, particularly to prevent motor vehicle-related injuries, and the overall child fatality rate fell to the lowest rate ever recorded in North Carolina.
- State and local agencies, often in partnership with private providers, foundations, and the business community, worked hard to improve service delivery, and in some instances revamped entire service systems. Community Care of North Carolina has enhanced both access and quality of health care for children on Medicaid; the Early Intervention Program was reorganized to expand services for young children with special needs and their families; and the Multiple Response System has been implemented statewide to respond more appropriately to families in stress. During this same period, a Healthy Weight Initiative was developed, a Blueprint to Support Breastfeeding was published, a State Plan to Eliminate Childhood Lead Poisoning was put into effect, and a successful Youth Tobacco Prevention Campaign was launched.

This period has also seen the growing use of evidence-based decision-making in affecting changes in policies and services. The North Carolina Institute of Medicine has supported this movement by sponsoring task force studies on access to care, the prevention of child maltreatment, adolescent health, prevention, and many others.

While all of the above efforts are heartening, it is clear that North Carolina has a long way to go. Most of the indicators show improvement, and for several the progress is truly encouraging. However, even where progress has been made, the data for some indicators – child abuse homicides, access to dental care, overweight children, and the use of tobacco, alcohol, and illegal substances – reflect continued unacceptable risks to children and youth, and should be cause for grave concern.

The data in this Report Card now become the baseline for the new administrations of President Obama, Governor Perdue, and concurrent congressional and legislative sessions. These leaders inherit the progress that has been made in 2000-2008, but face daunting economic challenges. These are the times, however, when it is especially important for our leaders to set and maintain the vision of healthy, safe children within nurturing families.

Access to Care and Preventive Health

Access to preventive and primary care is critical to assuring the health of our children. Given that there has been no improvement in child poverty in the period 2000-2008, and the fact that North Carolina has experienced one of the largest decreases in employer-based coverage in the nation, it is quite remarkable that the uninsured rate for children has essentially returned to the 2000 level. This is largely due to the dramatic increase in children's enrollment in public health insurance programs. This would not have happened without increased investments made by the North Carolina General Assembly and the hard work of state and local agencies and others who enroll eligible children and assure that they receive preventive care.

Other investments in prevention and early intervention have been exemplary. The early intervention system for young children with special needs has received national acclaim, exposure to lead continues to decline, and serious chronic illnesses such as asthma are being identified earlier and managed more successfully. However, the initiation and duration rates for breastfeeding, which has the potential to prevent both mortality and morbidity in infants, need improvement; the immunization rate at age 2 has declined a bit, possibly due to some parental concerns about the immunization schedule; and access to dental care, though showing much improvement, is a problem that warrants serious attention.

Grade	Health Indicator	Current Year	Benchmark Year	Percent Change	Trend
	Insurance Coverage	**2008**	**2000**		
B	Percent of uninsured children (age 0-17) below 200% of poverty level	15.6%	17.4%	-10.3%	Better
	Percent of all children (0-17) uninsured	9.3%	9.9%	-6.1%	Better
	Number of children (0-18) covered by public health insurance (Medicaid or NC Health Choice) (in December)	947,036	578,486	63.7%	Better
	Percent of Medicaid-enrolled children (0-18) receiving preventive care	79.4%	66.8%	18.9%	Better
	Breastfeeding	**2006**	**2000**		
C	Percent ever breastfed	66.9%	66.5%	0.6%	No change
	Percent breastfed at least six months	36.7%	29.3%	25.3%	Better
	Immunization Rates	**2008**	**2000**		
B	Percent of children with appropriate immunizations:				
	At age 2[1]	71.2%	80.6%	-11.7%	Worse
	At school entry	96.5%	97.5%	-1.0%	No change
	Early Intervention	**2008**	**2000**		
A	Number of children (age 0-3) enrolled in early intervention services to reduce effects of developmental delay, emotional disturbance, and/or chronic illness	15,869	7,046	125.2%	Better
	Environmental Health	**2008**	**2000**		
A	Lead: Percent of children (1 and 2 year olds)[2]				
	Screened for elevated blood lead levels	46.2%	33.7%	37.1%	Better
	Found to have elevated blood lead levels	0.5%	2.4%	-79.2%	Better
	Asthma:				
	Percent of children diagnosed	14.2%	11.0%	29.1%	Worse
	Hospital discharges per 100,000 children (age 0-14) (2007)	166.2	201.3	-17.4%	Better
	Dental Health	**2008**	**2000**		
C	Percent of children:				
	With untreated tooth decay (kindergarten)	17.0%	23.0%	-26.1%	Better
	With one or more sealants (grade 5)	44.0%	37.0%	18.9%	Better
	Percent of Medicaid-eligible children:				
	Age 1-5 who use dental services	40.6%	16.0%	153.8%	Better
	Age 6-14 who use dental services	52.3%	31.0%	68.7%	Better
	Age 15-20 who use dental services	36.1%	18.0%	100.6%	Better

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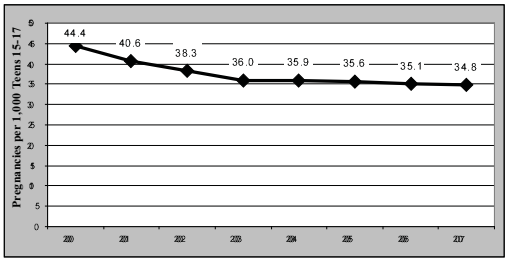
Health Risk Behaviors

Children's health behaviors and risk-taking (sexual activity, poor nutrition, physical inactivity, substance abuse, violence, driving habits; etc.) are determined by a variety of factors. Governments, foundations, communities, and schools establish a strong, supportive foundation through the implementation of evidence-based programs and policies that facilitate positive health behaviors.

North Carolina Teen Pregnancy Rate



Source: North Carolina State Center for Health Statistics. North Carolina Reported Pregnancies 2000-2007. http://www.schs.state.nc.us/SCHS/data/vitalstats.cfm. Accessed October 2, 2009.

There have been some improvements worth noting in the period 2000-2008. The national decline in teen pregnancy rates has also been experienced in North Carolina. The continued drop in congenital syphilis and the near elimination of perinatal transmission of HIV/AIDS are true public health success stories. The collaborative efforts of the North Carolina Department of Health and Human Services and the North Carolina Health and Wellness Trust Fund have helped realize a significant decline in youth tobacco use.

While these same agencies have been collaborating on a Healthy Weight Initiative for some time, there has been no progress as yet in the relevant indicators. A broad approach to weight management and physical activity that takes into account environmental, economic, and social factors is needed to overcome this negative trend and set more children on the path to healthy adulthood.

Grade	Health Indicator	Current Year	Benchmark Year	Percent Change	Trend
	Teen Pregnancy	**2007**	**2000**		
C	Number of pregnancies per 1,000 girls (age 15-17)	34.8	44.4	-21.6%	Better
	Communicable Diseases	**2008**	**2000**		
A	Number of newly-reported cases:				
	Congenital syphilis at birth	10	20	-	-
	Perinatal HIV/AIDS at birth	1	4	-	-
	Tuberculosis (age 0-18)	31	27	-	-
	Obesity	**2008**	**2002**		
F	Percent of low-income children who are obese[3]:				
	Age 2-4	15.4%	13.5%	14.1%	Worse
	Age 5-11	25.7%	21.1%	21.8%	Worse
	Age 12-18	28.5%	26.3%	8.4%	Worse
	Physical Activity	**2007**	**2005**		
C	Percent of students (grades 9-12) who were physically active for a total of 60 minutes or more per day on five or more of the past seven days	44.3%	45.9%	-3.5%	No change
	Alcohol, Tobacco, and Substance Abuse	**2007**	**2001**		
D	Percent of students (grades 9-12) who used the following in the past 30 days:				
	Cigarettes	19.0%	27.8%	-31.7%	Better
	Smokeless tobacco	8.6%	8.9%	-3.4%	No change
	Marijuana	19.1%	20.8%	-8.2%	Better
	Alcohol (including beer)	37.7%	38.2%	-1.3%	No change
	Cocaine (lifetime)	7.0%	6.7%	-4.5%	No change
	Methamphetamines (lifetime)	4.7%	7.8%	-39.7%	Better

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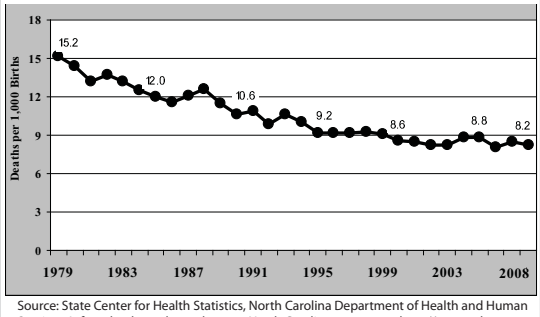
Death and Injury

After a significant decline during the 1990s, the infant death rate has been relatively stagnant in the period 2000-2008. Though the rate is near the lowest ever recorded, North Carolina still ranks very poorly among the states. The North Carolina Department of Health and Human Services, the North Carolina Child Fatality Task Force, the March of Dimes, and other agencies are jointly providing increased attention to the interconceptional period in hopes of reducing prematurity and low birthweight, which have been serious, relatively intractable components of infant mortality.

The overall child death rate has continued to drop and was at its lowest level in 2008. Injuries remain the leading cause of death in children, but these have been ameliorated and reduced in the period 2000-2008, largely due to the passage of numerous child safety laws, including requirements for booster seats, bicycle helmets, ATV safety, and enhancements to the graduated drivers license system. The Child Fatality Task Force continues to explore ways to prevent child deaths. Homicides, suicides, and firearm-related deaths command increased attention.

In an attempt to deal with child abuse and neglect and to provide family support more effectively, all 100 counties now participate in the Multiple Response System, which evaluates and responds to alleged child abuse and, or neglect. Since this has changed many data definitions, trend data on assessments and substantiations are not available. However, though the recurrence of maltreatment had been in decline, in 2008 it increased to former levels, providing cause for concern. Though child abuse homicides have moderated in the period 2000-2008, this is perhaps the most tragic of all the indicators.

North Carolina Infant Mortality Rate



Source: State Center for Health Statistics, North Carolina Department of Health and Human Services. Infant deaths and rates by race, North Carolina 1979-2008. http://www.schs.state.nc.us/SCHS/deaths/ims/2008/table3.html. Accessed October 2, 2009.

Grade	Health Indicator	Current Year	Benchmark Year	Percent Change	Trend
	Birth Outcomes	**2008**	**2000**		
C	Number of infant deaths per 1,000 live births	8.2	8.6	-4.7%	No change
	Percent of infants born weighing 5 lbs., 8 ozs. (2,500 grams) or less	9.1	8.8	3.4%	No change
	Child Fatality	**2008**	**2000**		
B	Number of deaths (age 0-17) per 100,000	71	81	-12.3%	Better
	Number of deaths (age 0-17):				
	Motor vehicle related	123	172	-	-
	Drowning	30	37	-	-
	Fire/Burn	17	18	-	-
	Bicycle	3	6	-	-
	Suicide	22	32	-	-
	Homicide	58	54	-	-
	Firearm	45	47	-	-
	Child Abuse and Neglect	**2008**	**2003**		
D	Number of children:				
	Receiving assessments for abuse and neglect	127,192	n/a	-	-
	Substantiated as victims of abuse and neglect[4]	12,396	n/a	-	-
	Found in need of services[4]	13,951	n/a	-	-
	Percent of children experiencing recurrence of maltreatment within six months	7.3%	7.6%	-4.0%	No change
	Confirmed child deaths due to abuse	33	30	-	-

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Data Sources

Access to Care and Preventive Health

Uninsured: North Carolina Institute of Medicine. Analysis of the Annual Social and Economic Supplement, Current Population Survey, U.S. Census Bureau and Bureau of Labor Statistics; Public Health Insurance: Special data request to the Division of Medical Assistance, NC Department of Health and Human Services, August 2009; Medicaid-Enrolled Preventive Care: Calculated using data from the Division of Medical Assistance, NC DHHS, "Health Check Participation Data." Available online at: http://www.dhhs.state.nc.us/dma/healthcheck/; Breastfeeding: Centers for Disease Control and Prevention. "Breastfeeding Practices—Results from the National Immunization Survey." Available online at: http://www.cdc.gov/breastfeeding/data/NIS_data/index.htm; Immunization Rates and Early Intervention: Data for 2-year-olds from the Centers for Disease Control and Prevention, National Immunization Survey. Available online at: www.cdc.gov/vaccines/stats-surv/imz-coverage.htm#nis. Kindergarten data are from a special data request to the Women and Children's Health Section, Division of Public Health, NC DHHS, August 2009; Lead: Special data request to the Childhood Lead Poisoning Prevention Program, NC Department of Environment and Natural Resources, August 2009; Asthma Diagnosed: State Center for Health Statistics, NC DHHS Child Health Assessment and Monitoring Program. Available online at: http://www.schs.state.nc.us/SCHS/champ/; Asthma Hospitalizations: State Center for Health Statistics, NC DHHS. County Health Data Book. Available online at: http://www.schs.state.nc.us/SCHS/data/databook/; Dental Health: Special data request to the Oral Health Section, Division of Public Health and Division of Medical Assistance, NC DHHS, August 2009.

Health Risk Behaviors

Teen Pregnancy: State Center for Health Statistics, NC DHHS, "North Carolina Reported Pregnancies." Available online at: http://www.schs.state.nc.us/SCHS/data/county.cfm; Communicable Diseases: Special data request to the HIV/STD Section, Division of Public Health, NC DHHS, August 2009; Obese: 2008 NC-NPass Data "Proportion of Obese (BMI >=95th Percentile) Children by Age, Race, and Gender, NC-NPASS." Available online at: http://www.eatsmartmovemorenc.com/Data/ChildAndYouthData.html; Tobacco Use: NC Tobacco Prevention and Control Branch, NC DHHS, NC Youth Tobacco Survey. Available online at: http://www.tobaccopreventionandcontrol.ncdhhs.gov/data/index.htm; Physical Activity, Alcohol and Substance Abuse: 2007 Youth Risk Behavior Survey, North Carolina High School Survey, detailed tables. Available online at: http://www.nchealthyschools.org/data/.

Death and Injury

Infant Mortality: State Center for Health Statistics, NC DHHS, "Infant Mortality Statistics." Available online at: http://www.schs.state.nc.us/SCHS/data/vitalstats.cfm; Low Birth-Weight Infants: State Center for Health Statistics, NC DHHS, "Infant Mortality Report, Table 10: Risk Factors and Characteristics for North Carolina Resident Live Births." Available online at: http://www.schs.state.nc.us/SCHS/dealths/ims/2008/; Child Fatality and Deaths Due to Injury: Women's and Children's Health Section, Division of Public Health, NC DHHS, and the State Center for Health Statistics. "Child Deaths in North Carolina." http://www.schs.state.nc.us/SCHS/data/vitalstats.cfm; Child Abuse and Neglect and Recurrence of Maltreatment: Duncan DF, Kum HC, Flair KA, Stewart CJ, Van Busum K, Huang SP. (2009). Management Assistance for Child Welfare, Work First, and Food & Nutrition Services in North Carolina. Retrieved September 25, 2009, from University of North Carolina at Chapel Hill Jordan Institute for Families website. URL: http://ssw.unc.edu/ma/; Child Abuse Homicide: information was obtained from the North Carolina Child Fatality Prevention Team (Office of the Chief Medical Examiner) for this report. However, the analysis, conclusions, opinions and statements expressed by the author and the agency that funded this report are not necessarily those of the CFPT or OCME.

2009 Report Card Data Notes

1. Immunization is measured for 2 year-olds using the 2000 CDC recommendation (4:3:1:3:3). More information is available online at: http://www.cdc.gov/vaccines/stats-surv/imz-coverage.htm#nis.
2. Elevated Blood Lead Level is defined as 10 micrograms per deciliter or greater.
3. Obese is defined as a body mass index equal to or greater than the 95th percentile using federal guidelines. This represents a change in terminology by NC-NPASS, which used to definte BMI >=95th percentile as overweight. The children represented in these data are those who receive services in local health departments or school health centers and are primarily low-income. They may not be representative of the state as a whole.
4. The number substantiated and in need of services findings are not exclusive, i.e. a child may be counted more than once within those categories and may be counted in both of those categories. This is the case because a child may have more than one report investigated in a state fiscal year.

Grades and Trends

Grades are assigned to bring attention to the current status of each indicator of child health and safety. Grades are assigned by a group of health experts from the sponsoring organizations. "A" indicates that the current status is very good; "B" is satisfactory; "C" is mediocre; "D" is unsatisfactory; "F" is very poor.

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

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POLICY FORUM

Preconception Care: Building the Foundation for Healthy Women, Babies, and Communities

"Focusing on preconception and interconception health broadens our current intervention for women of reproductive age... and recognizes that the mother's health is at least as important as the infant's."

Introduction

POLICY FORUM:
Preconception Care: Building the Foundation for Healthy Women, Babies, and Communities

Healthy women are the foundation for healthy communities and families. While each of us holds the potential for making new lives, responsibility often falls most heavily on the women who decide to have children. Their health and the health of their babies depend on a complex web that joins biology and society. Biologically speaking, important elements such as good nutrition and avoidance of dangerous substances are necessary for the intricate development of babies, from conception to birth. However, an equally complex set of social structures, policies, and practices influence both women and children's health outcomes as well.

Making healthy choices for ourselves is often something we can set aside. But when it comes to healthy choices for our children, we must become much more vigilant. That transformation reflects our instincts to support future generations. However, making healthy choices is not always easy. Simple things such as a taking a daily multivitamin, scheduling doctor's visits, exercising, and eating right, are all too often set aside for later. When it comes to women's health, however, setting aside healthy behaviors now can lead to poor outcomes for future generations. *Preconception health*, a concept that is changing the way women are cared for, emphasizes the idea that a woman must be continuously cared for across her lifespan in order to improve her health and, if she so chooses, the health of her baby.

Women's health and the health of their babies depend on multiple, interrelated factors. The health of women before they become pregnant is vital to ensuring healthier birth outcomes. Women who plan their pregnancies are more likely to have better health outcomes than women who don't. Unfortunately, in North Carolina, almost half of all pregnancies are unintended. Our health care system should work with women of reproductive age to help them actively plan for their future, regardless of whether they intend to have a family. For women who do plan to have children, ensuring that they receive appropriate care before, during, and after pregnancy is key to ensuring better outcomes. This means entering into pregnancy in good health (physically and mentally), receiving appropriate prenatal care during pregnancy, and realizing their postpartum needs.

From the most private of matters such as birth control, to very public places, such as the worksite, women's health issues are present and should be addressed. From family planning to breastfeeding in the workplace, many opportunities arise for communities to work together to support women of reproductive age. The message "every woman, every time" is one echoed throughout these commentaries and is one that health care providers and public policy practitioners alike should strive to keep in the forefront. Caring for North Carolina's women and girls is vital to the health of our next generation. As the collection of commentaries in this issue of the *Journal* will demonstrate, caring for the whole woman across the lifespan will help ensure better health for women and their children.

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ISSUE BRIEF

Preconception Care:
Building the Foundation for Healthy Women, Babies, and Communities

Sarah Verbiest, DrPH, MSW, MPH; Joe Holliday, MD, MPH

In 2004, the *North Carolina Medical Journal* published an issue titled: "Infant Mortality in North Carolina: A New Perspective on a Persistent Problem." In that issue authors Julie DeClerque, Janice Freedman, Sarah Verbiest, and Stuart Bondurant called for a new approach to the entrenched problem of infant mortality in North Carolina. They put forth the argument that the greatest potential impact on infant mortality rates might be realized by addressing the health of women of reproductive age.[1] Included in the issue was a detailed timeline of the interventions, policies, and projects that had been put in place over several decades, pointing to the investment and progress that had been made in infant mortality prevention. The issue concluded that North Carolina needed a new strategy if it was to reduce infant death—an approach that needed to broaden its focus from pregnancy and prenatal care to the health of women before, between, and beyond pregnancy.

Bringing us up to 2009, the current issue of the *Journal* describes an evolution of thought, practice, and programs in North Carolina that embraces the concept of wellness for women of reproductive age, both as a component of infant mortality reduction and an improvement of women's health overall. This issue brief will define and frame the concept, make the case for action, provide an update on preconception health activities in North Carolina and the nation, and offer some thoughts on where to go from here.

Definition and Framework

Evidence shows that healthy women who plan their pregnancies are more likely to have healthy babies. However we know that over half of American women do not plan their pregnancies. Women of reproductive age are not as healthy as they could be: overweight and obesity, infections, poor mental health, violence, and substance use are widely prevalent among this group. Over one-quarter of women in this age group do not have health insurance, and those who do have insurance may not have coverage for needed services such as behavioral health care.

The terms *preconception* and *interconception* health are used currently to identify the times when interventions may be most helpful in improving birth outcomes. The Centers for Disease Control and Prevention (CDC) defines preconception care as interventions that aim to identify and modify biomedical, behavioral, and social risks to a woman's health through prevention and management, emphasizing those factors which must be acted on before conception or early in pregnancy. Interconception care speaks specifically to the period of time between pregnancies, generally about 18 to 24 months postpartum.[2]

While these widely-used terms describe the timeframe for intervention, they are restrictive in terms of defining women's health in the context of their overall reproductive capacity. The

Our work now is to continue to shift our paradigm from a singular focus on the pregnant woman and fetus to a wider frame that encompasses the adolescent, woman, and mother.

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words continue to be used both due to lack of better terminology and because they create a bridge between women's health and infant health. Focusing on preconception and interconception health broadens our current intervention for women of reproductive age, which still centers on prenatal care, labor, and delivery. It takes time to create change, particularly when pushing forward a movement that recognizes that the mother's health is at least as important as the infant's.

In spite of its somewhat narrow technical definition, the word preconception is being used by most proponents to reflect a larger goal of improving women's wellness, with the affirmation that women of childbearing age are an important population in need of attention and resources regardless of their reproductive capacity. Atrash and colleagues define the purpose of preconception care as the promotion of health throughout the lifespan for women, children, and families. Preconception care offers health services that allow women to maintain optimal health for themselves, to choose the number and spacing of their pregnancies, and, when desired, to prepare for a healthy baby.[3]

The fundamental elements of preconception care are broad and include screening for medical and social risk factors; providing vaccinations, counseling, and health education; and delivering effective interventions to improve health. To help us understand the evidence base for interventions, a team of clinical experts in partnership with the CDC spent two years reviewing over 700 scientific papers and 83 topics related to preconception care.[a] Working with specific criteria, the group reviewed the strength of the recommendations and the quality of the evidence for these studies and came to consensus on each of the interventions. The results of their work provide a sound framework of evidence for clinicians who want to know if specific preconception interventions will improve birth outcomes. More scientific research, however, is required in this field to strengthen the evidence for interventions that look promising.[4] In this issue Suzanne Shores and Tanya Bailey provide an overview of recommendations for care for all women of reproductive age.

Our work now is to continue to shift our paradigm from a singular focus on the pregnant woman and fetus to a wider frame that encompasses the adolescent, woman, and mother. This calls for an educational and cultural movement that gives value to a woman's health across her lifespan, not only because it impacts her children but because it also influences her quality of life, contributions to society, and state of her well-being. The guiding principles set forth in the *North Carolina Strategic Plan for Preconception Health* reiterate the importance of looking at the whole woman, not only on her reproductive capacity, and the importance of avoiding messages that might imply that certain women should or should not become mothers. The vision of the state's *Preconception Plan* is that through a collaborative focus on women's wellness, North Carolina will improve the quality of life for women as well as the health of infants.[5]

Impact of Women's Health on Birth Outcomes

One goal in addressing women's health does indeed focus on improving birth outcomes. While the state's recent 8% drop in infant mortality is cause for celebration, the persistent racial disparities in birth outcomes and our state's continued poor national ranking (44th) remind us that we must remain even more vigilant in our efforts. Current data demonstrate that the leading cause of infant death is premature birth, which is increasing in prevalence and in the percentage of infant lives claimed. Premature birth is defined as an infant born at 37 weeks or less gestation. Further, minority women experience very preterm and very low birth weight births at markedly higher rates than white women (13.4% vs. 7.4%). This, in turn, accounts for much of the gap in birth outcomes between these two groups.[6] In 2006, 13.6% of all infants were born preterm (17,369 babies), over 3,000 were born with serious anomalies, and 1,066 died before their first birthday.[7] Of the babies who died, almost half (508) were from minority families. Infant death accounts for approximately 67% of all child deaths (birth to 19 years) in our state. In light of the serious consequences and costs of these birth outcomes, continued urgency and attention to prevention is required.

Much time and effort has gone into understanding the causes of infant mortality and deciphering the factors that may put a woman at risk for an infant death, early birth, and/or birth defects. In the 2004 issue of the *Journal*, the Perinatal Periods of Risk (PPOR) analysis was introduced as a different way of studying infant mortality. This analysis has been used by the World Health Organization and the CDC for over a decade. PPOR essentially helps to map fetal and infant deaths into three distinct periods of time based on when the deaths occur and the birth weight of the baby or fetus at the time of death. Infant deaths are described as pre-birth fetal deaths (24 weeks or greater gestation), neonatal deaths (first 28 days of life), and postneonatal deaths (1-12 months of life). Birth weight is divided into low birth weight (500-1,500 grams) or higher birth weight. The deaths are then attributed to one of four areas: maternal health/prematurity, maternity care, newborn care, and infant health. Using this method, the death rates for a particular population are compared to the rates of a reference group. The reference group is the population with the best birth outcomes. The "excess" deaths in each category are considered fatalities that could be averted based on interventions to influence health and care in that category.[1]

In 2005, the North Carolina State Center for Health Statistics applied this analysis method to its study of infant mortality. Their results showed that the largest number of excess deaths for North Carolina were in the Maternal

a A complete review of these findings is available in the December 2008 supplement to the *American Journal of Obstetrics and Gynecology*. The articles may also be accessed at www.beforeandbeyond.org.

Health/Prematurity category. Their report suggested that more prevention interventions should be concentrated on maternal behaviors before and during pregnancy, including preconception health, unintended pregnancy, smoking, and drug abuse.[8] These findings concur with the work a team of North Carolina leaders in maternal and child health did through participation in the Association of Maternal and Child Health Professionals/Centers for Disease Control and Prevention's Action Learning Lab on State Infant Mortality (2004-2007). This group's careful study resulted in recommendations that included a focus on increasing planned pregnancies and improving women's health.[8] The PPOR analysis for North Carolina clearly demonstrates that improvements in the care for infants in intensive care units and maternity care have been important, but they are not the answer if we desire to significantly reduce poor birth outcomes.

Providing early access to culturally appropriate and high quality prenatal care has played a very important part in the progress we have made so far in reducing infant mortality. Many programs including maternity care coordination, the perinatal outreach program, regionalization, public health awareness campaigns, and high-risk maternity clinics have contributed to declining rates of infant death. North Carolina has more than a 20 year legacy of commitment to the next generation. Unfortunately, this legacy is under threat due to massive cuts resulting from the 2009 budget deficit. This issue brief does not call for a shift in resources from one point of care to another. Nor does it attempt to put forward that prenatal care is not important. Rather, it calls for a broadening of this care which will allow women to begin prenatal care healthy and will allow for a continuation of health messages and services once the woman has given birth. Investment in the health of women of reproductive age has the potential to double its impact—first for this generation and again for the next. Paul Wise, a prominent leader in the field of maternal and child health recently called us to action: *"At some point, we must recognize that the tragedy of poor birth outcomes in the United States is largely a legacy of the poor general health status of women in the United States... It is time for a comprehensive approach to improving newborn health, one that respects the complex epidemiology of childbearing and the pragmatic requirements of constructing a strong, collective commitment to women's health."*[9]

Impact of Poor Health on Women

North Carolina's infant health data are not encouraging, and data reflecting the health of the state's 1.8 million women of childbearing age indicate a number of troubling trends and conditions. For example, only a little over half of all young women (53%) meet daily physical activity recommendations, 28% are obese, 26% overweight, 10% have hypertension, and 3% have diabetes.[5] Further, 38% of women over the age of 18 have high cholesterol. Half of all mothers were not breastfeeding at eight weeks.[10] Many of these statistics are related to the growing trend of obesity, which poses a major threat to women's health. Robert Meyer, Harry Herrick, and Fatma Simsek's work in *Running the Numbers* illustrates this point by reporting body mass index numbers for women of reproductive age. Also in this issue, Anna Maria Siega-Riz and Corrine Giannini provide an overview of obesity and overweight in North Carolina and offer recommendations for physicians about how to promote healthy weight in women.

There are other areas of concern for the health of women of reproductive age. Eleven percent of these women report binge drinking, 24% report tobacco use, 8% report illicit drug use, 20% experience postpartum depression, and 26% report poor mental health.[5] The *North Carolina Women's Health Report Card* found that 6.7% of women reported physical abuse in the 12 months preceeding pregnancy.[10] Further, one out of every six women will be sexually assaulted in their lifetime, with college age women four times more likely to be assaulted.[11] The consequences of physical, sexual, and mental abuse of women are far-reaching. A woman's mental well-being is foundational to her ability to care for herself, plan her life, and create a healthy family. The upheaval in North Carolina's mental health care system has the potential to not only impact women but to affect their offspring as well. In this issue of the *Journal*, Laura Louison, Sherri Green, Sheila Bunch, and Anna Scheyett discuss mental illness and substance abuse among women of reproductive age and provide a comprehensive review of this issue in our state.

Data describing women's reproductive health are also worrisome. In 2006, the proportion of births that were unintended was 48%. Sexually transmitted infections remain a problem in North Carolina: for every 100,000 women, 1,234 have chlamydia, 451 have gonorrhea, and 240 live with HIV/AIDS.[5] Unplanned pregnancies and sexually transmitted infections impact women's health, fertility, relationships, goals, and economic status.

Chronic disease is often linked with aging and older members of the population. However results of the 1996 National Health Interview Survey show that the prevalence of a number of chronic conditions is high among women under 45 years of age. Using data from this survey, Misra and colleagues found that of every 1,000 women, 82.9 had a deformity or orthopedic impairment, 68 had asthma, 64 migraine headaches, 51.9 chronic bronchitis, 35.8 arthritis, 35.5 heart disease, 31.9 diseases of the female genital organs, and 30 hypertension. The authors also found that approximately one in four young women with diabetes and one in five young women with asthma had been hospitalized at least once in the preceeding year because of their disease.[12] A more recent study by Chatterjee and colleagues found that, within their sample of 6,294 women ages 19 to 45, 39% reported a chronic illness. Among the chronic physical conditions, asthma was the most prevalent followed by hypertension, chronic obstructive pulmonary disease (COPD), arthritis, and heart disease. Mental illness was more common than physical illness, with 12% of women reporting a mood disorder.[13] As women postpone childbearing, there is also an increased prevalence of chronic disease that affects pregnancy-related care. In addition, pregnancy may exacerbate chronic diseases and cause increased maternal morbidity.[12]

The diversity of the health needs of women of reproductive age highlights the necessity for all health care providers, regardless of specialty, to be involved in the preconception care movement. It also suggests that the many different organizations and associations that represent disease-specific issues (such as asthma and migraines) have an obligation to look at their patients not only in the context of their disease but also as women who may choose to become mothers. Women of reproductive age are important in the workforce and in their communities. These indicators suggest that many may be experiencing risks and/or living with health behaviors that are compromising their health over their life course as well as affecting their productivity now. While women between the ages of 18 and 44 are generally considered to be a healthy segment of the population, these data suggest that this may not always be the case. At a minimum it is clear that a significant portion of this group may be laying the foundation for a long future of poor health.

Inequities in Women's Health

Research shows that minority women often experience health inequities that manifest themselves in many ways throughout their lives. African American women in the United States have a life expectancy at birth more than four years shorter than white women and a maternal mortality ratio nearly four times higher.[14] Their babies are almost three times more likely to die than babies born to white women. African American and Native American women in particular bear an increased burden of chronic disease, infections, unintended pregnancy, and poverty. North Carolina will not improve ranking in infant mortality without addressing the needs of African American women across their lifespan.

In May 2005, the North Carolina State Center for Health Statistics found that racial disparities in birth outcomes increased with maternal age. Their data suggested that health indicators for African American women worsen substantially with age, and that racial disparities in women's health also increase with age. For example, the ratio of neonatal deaths for African American and white women ages 15-19 was 1.50 as compared to a ratio of 3.03 for women 35 years or older. The authors noted that this data supported the "weathering hypothesis" which suggests that the health of African American women may begin to deteriorate in early adulthood as a physical consequence of cumulative socioeconomic disadvantage.[15]

Scientific evidence is building to support this hypothesis, suggesting that environmental, biological, and behavioral stressors occurring over the lifespan of the mother from the moment she herself was conceived until she delivers her own child may explain some health disparities. Based on this concept, it could take several generations for effective interventions to reduce disease.[16] Preconception health and women's wellness offers a very important opportunity for programs and policies to take a longer vision and a collaborative life course approach to health inequities. The *North Carolina Preconception Plan* prioritizes programs with the potential to address health disparities. Further, the Plan calls for infusing community development and consumer leadership into each step that is taken. Without an intentional, culturally appropriate focus on African American and Native American women, it is possible that preconception education and care could further widen the disparities in birth outcomes and women's health. Focusing on this population of women provides the greatest opportunity to impact the health of North Carolina, not only for women but for the communities in which they live and work as well.

Paradigm Shift in Action

There has been tremendous activity and momentum in the arena of preconception health since the publication of the 2004 infant mortality issue of the *North Carolina Medical Journal*. In November 2004, the CDC launched the Preconception Health and Health Care Initiative, which included experts and representatives from over 35 national, state, and local organizations as well as representatives from 22 CDC programs concerned with the health of women and infants. In June of 2005, the CDC created a Select Panel on Preconception Care to develop recommendations to improve preconception health and health care. As part of this work they also held the first National Summit on Preconception Health and Health Care. Recommendations and goals were released in April 2006 (see sidebar, page 421). In June 2006 the CDC established five implementation workgroups (clinical, public health, consumer, policy and finance, and research and surveillance) to fine tune the recommendations and begin to move them forward.

The second National Summit on Preconception Health and Health Care was held in October 2007, with double the number of participants from the first summit and attendees representing all the states and a wide variety of agencies and groups. The workgroups used this summit as an opportunity to share their work with the larger community, collect new ideas and strategies, and recruit additional volunteers. In December of 2008, two national journals published supplements of issues focused entirely on preconception health. These supplements profiled the efforts of two of the work groups. The *American Journal of Obstetrics and Gynecology* issue focused on the clinical content of preconception care. The *Women's Health Issues* supplement focused on policy and finance related to preconception health and health care. Both of those issues were made available to the public free of charge.[b] In August 2009, a national meeting for the work

b The articles may be accessed at www.everywomannc.org in the "Take Action" section.

groups was held in Washington, DC. This provided another opportunity for sharing, networking, and reporting on progress. While the work groups were frank about the challenges they faced in the areas of system changes, access to services, and consumer marketing and the engagement, the momentum remained strong. The establishment of preconception health and health care as a long-term initiative with significant participation was clear.

The call for change has been clear in many areas. During a keynote address during the Association for Maternal and Child Health Professionals' annual conference, leadership called for a broadening of definition, including turning the maternal "M" upside down to include the "W" for women. The March of Dimes has expanded its materials and messages to move beyond pregnancy to information about fertility, preconception health, and postpartum wellness. Groups such as the National Association of City and County Health Officials, the Federal Healthy Start Association, and the Office of Women's Health are fully engaged in preconception and interconception health initiatives. There is also a strong focus on sharing information about available resources, programs, and tools (a national catalogue is being developed) and working collectively to use scarce financial resources well. Many states are developing preconception plans, materials, websites, and initiatives.

North Carolina has been equally active in advancing the preconception agenda. In June 2006, the North Carolina Folic Acid Council and the North Carolina Chapter of the March of Dimes responded to the CDC Preconception Health and Health Care Recommendations by commissioning the University of North Carolina at Chapel Hill (UNC) Center for Maternal and Infant Health to develop an inventory of preconception health activities in North Carolina. The product, *Looking Back, Moving Forward: North Carolina's Path to Healthier Mothers and Babies*, reviews three decades of preconception health programs in North Carolina and proposes action steps for the future.[b] The contents of the report clearly show that while preconception health may have been a new concept to many people in 2004, it was an approach that had been cultivated in North Carolina for many years. One of the founders of the preconception movement, Merry-K. Moos, is recognized in the *Tarheel Footprints in Health Care* article in this issue of the *Journal* for her long-standing commitment to defining, promoting, and teaching about this vision for women's and infant's health.

Following the publication of the inventory and call for action, a Preconception Leadership Team was convened and a strategic plan developed for North Carolina. In this issue of the *Journal*, Anna Bess Brown describes the process for developing the plan, its contents, and work group activities. Along with the development of the plan, numerous programs were underway to address elements of preconception health. Amy Mullenix describes the continued successes of the North Carolina Folic Acid Campaign in her commentary, including information about strategies that have worked well and the innovative next steps the campaign will take. In their commentary, Alvina Long

CDC Preconception Health and Health Care Goals

1. To improve the knowledge, attitudes, and behaviors of men and women related to preconception health.
2. To assure that all US women of childbearing age receive preconception care services—screening, health promotion, and interventions—that will enable them to enter pregnancy in optimal health.
3. To reduce risks indicated by a prior adverse pregnancy outcome through interventions in the interconception (interpregnancy) period that can prevent or minimize health problems for a mother and her future children.
4. To reduce the disparities in adverse pregnancies outcomes.

CDC Preconception Health and Health Care Recommendations

1. Each woman, man, and couple should be encouraged to have a reproductive life plan.
2. Increase public awareness of the importance of preconception health behaviors and services by using information that is relevant across various age groups, literacy levels, and cultural/ethnic groups.
3. As a part of primary care visits, provide risk assessment and educational and health promotion counseling to all women of childbearing age to reduce reproductive risks and improve pregnancy outcomes.
4. Increase the proportion of women who receive interventions as follow-up to preconception risk screening, focusing on high priority interventions (i.e., those with evidence of effectiveness and greatest potential impact).
5. Use the interconception period to provide additional intensive interventions to women who have had a previous pregnancy that ended in an adverse outcome (i.e., infant death, fetal loss, birth defects, low birth weight, or preterm birth).
6. Offer, as a component of maternity care, one prepregnancy visit for couples and persons planning a pregnancy.
7. Increase public and private health insurance coverage for women with low incomes to improve access to preventive women's health and preconception and interconception care.
8. Integrate components of preconception health into existing local public health and related programs, including an emphasis on interconception interventions for women with previous adverse outcomes.
9. Increase the evidence base and promote the use of the evidence to improve preconception health.
10. Maximize public health surveillance.

Valentin, Amy Hattem, and Shelby Weeks describe a number of innovative programs currently underway in the eastern region of North Carolina. These programs are particularly important as they focus on the area of the state with the highest rates of infant mortality, disparity, and chronic disease.

The profile of the Health and Wellness Trust Fund's *You Quit Two Quit* project, written by Vandana Shah, Candice Justice, and Barbara Moeykens, describes a program with a renewed commitment to smoking cessation not only for pregnant women but for new mothers as well. Cathy Melvin and Sally Herndon Malek examined the importance of smoking cessation in the 2004 issue and highlighted the difference cessation makes in infant survival. The *You Quit Two Quit* project builds on this foundation with new materials and messages that also model the positive impact that smoking cessation can have for the mother.

The North Carolina Healthy Start Foundation has developed a number of valuable educational tools for consumers and providers. These include nationally recognized women's health diaries in English and Spanish (*My Health Journal/Mi Diario de Salud*), a magazine about women's health for new mothers (*Taking Care of Me*), health promotion posters in English and Spanish for women (*It's Time to Take Care of You/Es Hora de Dedicarse a Su Salud*), two magazines about general women's health (*Choices: Health Matters for Women/Mujer Total*), wallet cards for tracking a woman's menstrual cycle (*Private Matters*), and brochures to educate about HIV (*Keeping It Real/VIH Una Realidad*).[c]

North Carolina has produced more original materials for consumers about preconception health than any other state in the nation. All materials are developed with input and feedback from consumers; Spanish language materials are developed by Latinas for Latinas. The North Carolina Healthy Start Foundation also promotes the health information and referral services for families provided by the statewide, toll-free, bilingual North Carolina Family Resource Line. There are also a growing number of websites with good resources and tools for women and the health care professionals who serve them. The resource page in this issue describes some of these sites.

In addition to the projects highlighted in this issue, there are a number of innovative programs in place in North Carolina that are taking on components of the preconception challenge. The UNC Center for Maternal and Infant Health is involved in two such projects. In the Postpartum Plus Prevention Program, the March of Dimes and the Office of the Dean of the School of Medicine are supporting an intervention for mothers of infants in the neonatal intensive care unit (NICU) with the goal of reducing recurring adverse birth outcomes. In the second initiative, the John Rex Endowment is investing in the Mothers Matter Interconception Care Program at Wake County Human Services to improve postpartum visit utilization, visit content, and extended care for high-risk mothers. Our state has also made efforts to listen to what women have to say about health and wellness. For example, the North Carolina Healthy Start Foundation, in partnership with the North Carolina State Infant Mortality Collaborative and the Latina Infant Mortality Awareness Project, conducted a series of focus groups with women in North Carolina to assess their knowledge, attitude, and practices around health and wellness. The first set of groups focused largely on low-income African American women while the second was conducted with Latinas. The reports for this work are available on the North Carolina Healthy Start website.

In Durham County, the Durham Connects program is providing outreach to new families, including postpartum home visits to many new mothers. A growing number of infant mortality reduction coalitions in North Carolina are learning about preconception health and taking steps to shift their focus to this new framework. For example, in October 2009 the Forsyth County Infant Mortality Reduction Coalition, with funding from the CDC, held a statewide Preconception Conference. The March of Dimes has sponsored several Preconception Conferences for health care providers in North Carolina over the past two years. They also support a series of innovative preconception health projects across the state through their community grant program. There are likely many other projects and programs underway across our state.[d]

In light of the work already in place, this issue of the *Journal* provides us with the opportunity to move even further ahead in our journey of improving the health of mothers and their children. While there is much to be done, the following section of this issue brief highlights several core strategies for consideration.

Provide Continuous Health Care for the Whole Woman

While genetic predisposition, behavioral patterns, social circumstances, and environmental exposures are major influences on women's health,[14] health care providers play an integral role in promoting and insuring the health of women of reproductive age. Each provider, regardless of specialty, has a responsibility to provide preconception health information and messages to female patients of reproductive age. Over the past several years, the importance of preconception care has been articulated by family medicine, obstetrics and gynecology, nurse midwifery, nursing, and public health. The American Diabetes Association, the American Academy of Neurology, and the American Heart Association/American College of Cardiologists have put forward preconception care recommendations as well. In their 2008 article, Atrash and colleagues noted that while existing research suggests that most women realize the importance of being in good health before a pregnancy, and

c Thanks to support from the General Assembly, these materials are available free of charge and may be ordered online at www.NCHealthyStart.org/orderform or by calling 919.256.3581 to request an order form.

d To share your work, email cmih (at) med.unc.edu and information about your project will be posted for others to see.

most physicians think preconception care is important, most providers do not routinely provide preconception care to their patients.[3]

In a 2008 editorial in *Current Opinion in Obstetrics and Gynecology*, Michael Lu described three gaps in women's health care. The first gap relates to access to care, noting that women of childbearing age were more likely to be uninsured than other women, and that the number of uninsured women is higher among minority groups. The second gap is continuity of care: for many women, particularly those with low-income, health care is sporadic and fragmented. Finally, he highlights a quality gap in which needed ancillary services are unavailable and providers may neglect providing appropriate screening and counseling to patients.[14] Jack and Culpepper also identify barriers to the dissemination of preconception care: women who are the most in need of services are the least likely to receive them, reimbursement for risk assessment and health promotion is inadequate, and many clinical training programs do not emphasize risk assessment and health promotion skills.[17] In her commentary, Merry-K. Moos acknowledges these barriers to care, but then moves forward and offers suggestions about steps clinicians can take to become better providers of and advocates for preconception care and women's wellness. She, along with many others, continues to reiterate the singular and core role of health care providers in offering comprehensive and complete care to women.

While previous (and current) efforts to address infant mortality have largely focused on obstetricians/gynecologists and nurse midwives, preconception health requires reaching out to all providers who interface with women and their young children. This brings a host of different players to the table and into the spotlight. The commentary by Daniel Frayne, Richard Hudspeth, and Janalynn Beste describes the unique role that family medicine can play in caring for women across their reproductive age span. In another commentary in this issue of the *Journal*, M. Kathryn Menard and William Goodnight describe the role of specialists in providing preconception health care and guidance to women with chronic conditions. They also offer specific clinical guidelines and related information for practitioners. While broader changes that address the health care system gaps described by Lu may take time, there remain many incremental changes that North Carolina's health care professionals can make in their practice today that will shape that change in the future and improve care for women now.

Promote Reproductive Life Planning

Reproductive life planning refers to the process of men and women setting life goals for childbearing. It includes planning the timing and spacing of pregnancies as well as identifying and modifying medical, behavioral, and social factors that negatively affecting pregnancy outcomes, and managing pre-existing conditions and behaviors before, between, and beyond pregnancies. Understanding that an individual's reproductive life plan is likely to change, providers need to talk with their patients about their plan over time. Effective life planning can reduce unintended pregnancies.

Unintended pregnancies matter for many reasons. Mothers with unintended pregnancies are less likely to adopt healthy behaviors during pregnancy, less likely to seek prenatal care in the first trimester, have a greater risk of delivering low birth weight babies or babies who die before their first birthday, and are at greater risk of physical abuse. Their relationships with their partners are also at greater risk of ending.[18] Preventing unintended pregnancies would also help prevent abortions—just under half of all unplanned pregnancies are terminated. Unintended pregnancies can also derail a woman's plans for her education, career, and financial security. The CDC's vision for preconception health includes the goal that all women and men of childbearing age will have high reproductive awareness, that all women will have a reproductive life plan, and that all pregnancies will be intended. As mentioned previously, with almost half of all pregnancies unplanned, there is much work to be done.

In North Carolina women who are younger than 20 years of age, African American, have less than a high school education, are unmarried, and/or receive Medicaid are more likely than other women to experience an unintended pregnancy.[18] These women are also less likely to be taking a multivitamin everyday and are more likely to smoke prior to pregnancy.[18] While the vast majority of women under the age of 20 say their pregnancy was unplanned, five out of six unplanned pregnancies were to women over the age of 20.[18]

Starting the conversation about reproductive life planning is not difficult—it may even be done in the form of a questionnaire that the woman completes prior to the visit. The initial question posed is simply an inquiry as to whether the woman wants to be a mother someday (or again). If her answer is yes, then questions follow about how old she wants to be when she has that child, the number of children she may desire, and how far apart she'd like her children to be. It is also important to ask about her plans to prevent pregnancies that she isn't ready for and what she will do if she ends up getting pregnant when she isn't ready. If she answers "no" or "don't know" to the first question, the conversation should focus on her plan to prevent herself from getting pregnant and what she will do if she becomes pregnant anyway.[19]

Amy Bryant, Cheryl Kovar, and Alicia Luchowski's commentary describes long-acting reversible contraceptive methods, such as intrauterine devices (IUDs). These are an effective and safe option for many women. The authors discuss the use of these methods in North Carolina and the impact they could have helping women fulfill their reproductive life plans. Haywood Brown's commentary on preconception counseling with infertile couple focuses on a different issue that women face in achieving their goals for having a family. His article includes information about diagnosing infertility and some of the special preconception needs of couples that are having trouble conceiving.

While women are often the focus of family planning clinics and counseling, men's education about fertility, contraceptives, and reproductive life planning should not be ignored. Men

should also be encouraged to envision the family that they may or may not want to have in the future. Men have an important decision-making and supportive role that is often overlooked. While the CDC is clear that individuals should be responsible for their own reproduction, the support of health care providers, policymakers, families, and the community is often needed in helping women actualize their plans. This includes providing information about contraceptives, access to family planning services, information, infertility prevention and treatment, and policies, services, and support for families and children.

Align Policy and Funding

Among the 30 nations that make up the Organization for Economic Cooperation and Development, the United States ranks near the bottom on most standard measures of women's health. American women rank 23rd in life expectancy, 22nd in maternal mortality, and 25th in infant mortality.[14] This, in essence, reflects the lack of commitment by policymakers and the public in investing in and supporting the health of women in our country.

Women's access to health care is a glaring issue. Twenty-five percent of women of reproductive age in North Carolina are uninsured.[5] Others may be underinsured or have co-pays and deductibles that may reduce the likelihood that they obtain the care they need. In other cases, these plans may not reimburse for ancillary services such as lactation consultation, mental health, social work, and nutrition counseling. Further, there are many areas across the state that have limited numbers of health care providers in general especially those who accept Medicaid and provide OB/GYN services.

With the health care reform debate raging at the time of the publication of this issue, it is essential that women's health and health care be considered at all levels of discussion. Associations such as the American College of Obstetricians and Gynecologists have developed reform agendas that promote critical elements of women's health care. Other groups are focusing on the importance of including preventive services, another core component of the preconception health framework. As Atrash and colleagues point out, "for preconception care to be successful, there must be a shift from the delivery of procedure-based acute care to the provision of counseling-based preventive care. In turn, for this to occur, there must be changes in the financing of medical care and in the education of trainees."[3] Fortunately, North Carolina has been an innovator in its efforts to provide access to care to low-income women. In her sidebar, Patti Forest describes the role of North Carolina Medicaid in promoting women's health and wellness.

One recent example of good preconception health-related legislation is the Healthy Youth Act. While controversial for some North Carolinians, this legislation provides abstinence until marriage *and* comprehensive sexuality education programs in grades seven through nine. This act moves North Carolina one step closer to the CDC's vision that all men and women will have reproductive awareness by developing a foundational understanding among adolescents of the family planning options available to them as they make decisions about their future. Another example of legislation that supports preconception health is the Act to Prohibit Smoking in Public and Work Places. Tobacco use is prevalent among women of reproductive age, including pregnant women. Women of reproductive age are often found working in places that expose them to secondhand smoke. This legislation both reduces exposure to secondhand smoke for women and infants and increases the likelihood that women who are trying to stop smoking will be successful.

A final example from the session, however, demonstrates an opportunity for more integrated thinking. The newly created Legislative Task Force on Childhood Obesity was developed to study issues related to childhood obesity and provide recommendations for addressing this problem by encouraging healthy eating and increased physical activity. Many of the specific items to be studied relate to the school environment. While this work is critical, the Task Force should be encouraged to consider information about children's family environment, including maternal weight, perceptions about weight, socioeconomic conditions and food supply, and the parents' capacity to affirm and support school health efforts. The committee should also review the role of breastfeeding in preventing obesity—both for the child and the mother. Viewing the child outside of the context of the mother continues to foster a policy dichotomy in serving one but not the other.

As seen above, the recent General Assembly long session will have a significant affect on women's health, both positive and negative, for many years to come. In his sidebar, Tom Vitaglione recaps the impact of the recent legislative session, highlighting the serious implications current fiscal policy has for the health of women and children.

In their commentary, Paige Hall Smith and Irene Tessaro discuss the lack of societal response to the needs of working women, especially mothers, and the resulting systematic gender-based inequities in labor force opportunities, salaries, and benefits. They point out how these inequities negatively impact the physical, psychological, social, and financial well-being of women and their families. One new approach to redressing these inequities was the creation of the White House Council on Women and Girls in March 2009. The purpose of this Council is to provide a coordinated federal response to the challenges confronted by women and girls and to ensure that all Cabinet and Cabinet-level agencies consider how their policies and programs impact women and families. According to President Obama, "The purpose of this Council is to ensure that American women and girls are treated fairly in all matters of public policy... I want to be clear that issues like equal pay, family leave, child care, and others are not just women's issues, they are family issues and economic issues."[20] One approach to improving women's wellness and birth outcomes may well be the development of a similar Council in the Office of the Governor in North Carolina.

Integrate and Collaborate

Paul Wise gives public health leaders, clinicians, and researchers a challenge:

The portrayal of adverse birth outcomes as the product of a series of relatively rare, largely behavioral risk factors has created a deeply fragmented epidemiology. This, in turn, has generated a fragmented array of policies, programs, and constituencies all joined in the common goal of improving birth outcomes but all insulated from one another by artificially narrow domains of expertise and disciplinary self-interest. This is the context for assessing the utility of preconception, prenatal, and interconception care. Indeed, it presents the fundamental challenge to these public health constructs: How can they help to unify rather than further fragment the growing array of preventive and therapeutic interventions capable of improving birth outcomes?[9]

North Carolina has many programs and agencies that deal with individual pieces of women's wellness and preconception health. These include adolescent pregnancy prevention, STI screening and treatment, family planning services, the Eat Smart, Move More campaign, healthy living and environment initiatives, domestic violence prevention services, infant mortality prevention coalitions, Healthy Carolinians, chronic disease prevention, maternal and child health services, and much more. Our state is also fortunate to have numerous research institutions, public health leaders, health care professional associations, nonprofit health organizations, insurers, and funders. Unfortunately, all of these programs have been impacted by budget constraints, dwindling resources, and increased workloads.

With limited resources and great need, this is the time to finally bridge the proverbial silos of our thinking, funding, and programming. It is time that we recognize that each of us serves a complete woman, even though our funding stream or work plan may be focused only on her insulin control, contraceptive method, or annual exam. It is critical that stronger linkages are developed between health care providers and community resources, as well as among health care specialties.

Just as women are complex and influenced by a variety of environmental and personal factors, so must our programs work together to support women in achieving health, career, and reproductive goals. The North Carolina Preconception Plan has created the foundation for this work by considering women's health needs and related wellness recommendations within the context of their family and communities as well as utilizing a collaborative planning, implementation, and evaluation process that includes a large and diverse group of partners across North Carolina. We need to now actualize this plan by building innovative partnerships and stretching our resources in new ways.

Acknowledge the Complexity and Move Forward Anyway

If we are to improve women's health and birth outcomes, we must consider health and social systems issues, environmental impacts, and the reality of life today for young women and mothers. It is no longer possible to disregard the gap that exists between knowing and doing. Women's lives are busy, complex, and filled with multiple demands. Offering guidance and information about preconception care, healthy living, and behavior risk reduction will be more effective when delivered within a context that focuses on the whole woman. With this as the canvas, health care providers, policymakers, educators, public health leaders, and community leaders need to strategically offer supports to women to assist them in their efforts to improve their health and well-being.

While it is important to place preconception health in a larger biopsychosocial context, this can also be somewhat overwhelming and risks fostering inertia, something North Carolina's women and infants can't afford. As Boulet and colleagues comment, "Because preconception interventions can take place at any time during a woman's reproductive life and across a variety of dimensions, countless opportunities exist for positively influencing the health of women, children, and families."[21] With a mind to the larger picture, each reader can engage in efforts to improve women's health within his or her practice, department, agency, and/or community. Assess the population you serve and then implement one initiative to broaden your outreach and messages to include women's wellness and preconception health. The commentaries in this issue of the *North Carolina Medical Journal* provide sound clinical guidance on various elements of preconception health care, offer examples of successful projects and available resources, and highlight several particularly critical issues for women of reproductive age. As is evident in the considerable progress North Carolina has made in the past five years, we are well on our way to embracing this new framework for addressing infant mortality and supporting women's wellness. **NCMJ**

REFERENCES

1 DeClerque J, Freedman J, Verbiest S, Bondurant S. North Carolina's infant mortality problems persist: time for a paradigm shift. *NC Med J.* 2004; 65(3):138-146

2 Centers for Disease Control and Prevention. Recommendations to improve preconception health and health care–United States: a report of the CDC/ATDSR Preconception Care Work Group and Select Panel on Preconception Care. *MMWR.* 2006:55 (RR-6):1-21.

3 Atrash H, Jack B, Johnson K, et al. Where is the "W"oman in MCH? *Am J Obstet Gynecol.* 2008;199(6 suppl 2):S259-265.

4 Jack B, Atrash H, Coonrod D, Moos MK, Donnell J, Johnson K. The clinical content of preconception care: an overview and preparation of this supplement. *Am J Obstet Gynecol.* 2008;199(6 suppl 2):S266-279.

5 *North Carolina Preconception Health Strategic Plan, September 2008–September 2013.* North Carolina Division of Public Health website. http://mombaby.org/PDF/preconception_health_strategic_plan.pdf. Accessed September 4, 2009.

6 North Carolina State Center for Health Statistics. 2008 infant mortality data. http://www.schs.state.nc.us/SCHS/deaths/ims/2008/. Accessed September 1, 2009.

7 *Perinatal Data Snapshots: North Carolina.* March of Dimes website. http://www.marchofdimes.com/peristats/pdflib/999/pds_37_all.pdf Accessed September 1, 2009.

8 Mittal M. *Statistical Brief. Perinatal Periods of Risk (PPOR): A Useful Tool for Analyzing Fetal and Infant Mortality.* Statistical Brief no. 28. Raleigh, NC: North Carolina Dept of Health and Human Services; 2005.

9 Wise P. Transforming preconceptional, prenatal, and interconceptional care into a comprehensive commitment to women's health. *Women's Health Iss.* 2008;18(6 suppl):S13-18.

10 Center for Women's Health Research, University of North Carolina at Chapel Hill. *North Carolina Women's Health Report Card 2009.* UNC Center for Women's Health Research website. http://cwhr.unc.edu/files/report-card-pdfs/rc-2009/2009_RC_Eng.pdf. Accessed September 1, 2009.

11 Statistics. Rape Abuse and Incest National Network website. http://www.rainn.org/statistics. Accessed September 3, 2009.

12 Misra D, Grason H, Weisman C. An intersection of women's and perinatal health: the role of chronic conditions. *Women's Health Iss.* 2000;10(5):256-267.

13 Chatterjee S, Kotelchuck M, Sambamoorthi U. Prevalence of chronic illness in pregnancy, access to care, and health care costs. *Women's Health Iss.* 2008;18(6 suppl):S107-116.

14 Lu MC. We can do better: improving women's health in America. *Curr Opin Obstet Gyn.* 2008;20(6):563-565.

15 Buescher P, Mittal M. *Statistical Brief. Racial Disparities in Birth Outcomes Increase with Maternal Age: Recent Data from North Carolina.* Statistical Brief no. 27. Raleigh, NC: North Carolina Dept of Health and Human Services; 2005.

16 Badura M, Johnson K, Hench K, Reyes M. Healthy Start lessons learned on interconception care. *Women's Health Iss.* 2008;18(6 suppl):S61-66.

17 Jack B, Culpepper L. Preconception care: risk reduction and health promotion in preparation for pregnancy. *JAMA.* 1990;264(9):1147-1149.

18 North Carolina State Center for Health Statistics. *North Carolina PRAMS Fact Sheet. March 2009. Unintended Pregnancies, 2004-2006 NC Pregnancy Risk Assessment Monitoring System (PRAMS).* Raleigh, NC: North Carolina Dept of Health and Human Services; 2009.

19 Planned Parenthood Association of Utah, University Health Care, Utah Chapter of the March of Dimes, Utah Department of Health. *You're A Busy Woman.* Utah Department of Health website. http://health.utah.gov/rhp/pdf/RLP_Adult.pdf. Accessed September 2, 2009.

20 President Obama announces White House Council on Women and Girls. The White House website. http://www.whitehouse.gov/the_press_office/President-Obama-Announces-White-House-Council-on-Women-and-Girls/. [Press release.] Published March 11, 2009. Accessed September 3, 2009.

21 Boulet S, Johnson K, Parker C, Posner S, Atrash H. A perspective of preconception health activities in the United States. *Matern Child Healt J.* 2006;10(5 suppl):S13-20.

Speeding the Progress to Improved Health and Wellness for North Carolina's Women

Merry-K. Moos, RN, FNP, MPH

Over time, the delivery of women's health care has evolved into a series of relatively distinct silos that separate a woman's pregnancy-related services from those unrelated to prenatal and intrapartum care; the latter services have been further compartmentalized into reproductive and non-reproductive care. Thus, it is common for family planning considerations not to be mentioned by a woman's endocrinologist, glycemic control issues to be overlooked by gynecologists, and for women to enter into pregnancy in poor health with potentially avoidable threats to pregnancy outcome already exercising their influence. The nation's approach to the clinical care of women is fragmented, inefficient, and, too often, incomplete and ineffective. How this silo organization affects the numbers of clinical encounters women have each year is unknown; it is known, however, that women ages 15-44 average 3.8 medical visits each year.[1]

In 2005, the Kaiser Family Foundation reported in a survey of 2,766 women ages 18 and older that just over half of the of the women (55%) had talked to a doctor or nurse in the previous three years about diet, exercise, or nutrition while fewer than 50% had talked about calcium intake (43%), smoking (33%), and alcohol use (20%). Only 31% of women between the ages of 18-44 had talked with a provider about their sexual history in the preceding three years. Discussions of related topics such as sexually transmitted infections (STIs) (28%) and HIV/AIDS (31%) were even rarer. Emergency contraception was included in the content of care for 14% of the women and domestic and dating violence was addressed for 12%.[2]

The experiences of 1,325 diverse women of childbearing age who participated in a cross-sectional random-digit telephone survey in central Pennsylvania also recorded large gaps in preventive services.[3] Only half of the women reported receiving counseling about pregnancy planning or contraception in the prior year. One-third of the women did not receive any routine physical exam or screening services (pelvic exam, breast exam, Pap smear, and/or blood pressure measurement) during the preceding 12 months, and 57% of the sample reported not receiving health counseling or counseling about tobacco use, dietary intake, physical activity, alcohol and other drug use, safety and violence concerns, STI infections, or stress and stress management.

It could be possible to deduce that women in the various studies simply didn't recall the content of their encounters. However, the findings of a chart audit examining the content of care included during routine gynecology visits supports the lack of attention to many important health promotion and disease prevention topics. For instance, 91% of records contained no documentation of nutrition related recommendations and 85% of records did not include documentation of the woman's medical history.[4]

The nation's approach to the clinical care of women is fragmented, inefficient, and, too often, incomplete and ineffective.

As other commentaries in this issue underscore, women's health outcomes are not improved by our current organization of preventive and treatment services; neither are their pregnancies. Nearly 50% of all conceptions in the nation are unintentional[5] and our infant and maternal mortality rates lag far behind other industrialized nations. In fact, despite spending more on health care than any other nation, the US ranked 30th in international infant mortality rate comparisons in 2005,[6] and our ranking continues to drop. Twenty-five years ago, the US ranked 19th in international comparisons.[7]

Efforts to close the distance between the various women's clinical silos began to emerge approximately 30 years ago with the recognition that women who entered pregnancy in good health had an increased likelihood of healthy pregnancies and healthy infants.[8-11] Energy was focused on stimulating awareness of the advantages of emphasizing preconception health for both women and clinicians. Over time, visits to promote preconceptional wellness began to be framed as a new categorical service—a special visit for women planning to

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become pregnant. This approach invited many objections, including the likelihood of increased fragmentation in services, additional health care costs, and, by definition, exclusion of the women who became pregnant by chance rather than by deliberate choice. Although a special preconception visit is appropriate for women with complex medical and reproductive risks, it is not sufficient or appropriate to recommend this strategy as a standard approach for improving the preventive care of women who may, at some time, become pregnant.

In 1990, Jack and Culpepper[12] recommended that preconceptional care be made available to all women and their partners as an integrated part of primary care and that it also become a routine component of all initial and annual family planning visits. The authors' interest in the natural alliance of family planning visits and preconceptional health promotion was stimulated, in part, by pioneering work done in North Carolina family planning clinics.[11,13] By 2006, the desire to narrow the gap between reproductive and non-reproductive health care services gained great momentum when the Centers for Disease Control and Prevention convened a Select Panel on Preconception Care and produced recommendations to improve preconception health and health care.[14]

Improved preventive care to women of childbearing age has the potential to benefit women's health status in the immediate and more distant future and to result in healthier pregnancies and healthier pregnancy outcomes for those women who do become pregnant. Achieving these benefits will require a conscious determination to provide preventive services to "every woman, every time," a concept first proposed by the California Preconception Initiative.[15] This simple imperative is designed to take advantage of all health care encounters to stress prevention opportunities throughout the lifespan, address conception and contraception needs and choices at every encounter, and involve all medical specialties—not only those directly involved in reproductive health.[16]

However, adding more tasks to patient encounters which are already burdened by regulations, reimbursement structures, and office inefficiencies, is unlikely to be successful. A recent study found that to meet current guidelines for the preventive, chronic, and acute care needs of an average family practice patient panel would require 21.7 hours a day.[17] To address only preventive guidelines would require 7.4 hours. No professional organization, government agency, think tank, or educational institution has been able to produce more hours in the day so the only option for addressing the prevention needs of the women in North Carolina is to find pathways to work smarter, not harder.

Strategies for improving women's health care and levels of wellness are being created across the nation. Table 1 (page 429) outlines points of assessment and evidence-based recommendations that are appropriate to the preventive care of all women of childbearing age.[18] Achieving these recommendations will involve both clinical emphases as well as activities outside the examining room. Below is a list of ideas for busy providers to use in promoting higher levels of wellness for all women including those who will eventually become pregnant.

- Engage women in visit preparation by directing them to your office's or other websites to print and complete pre-visit questionnaires. Whether women have access to computer resources should be ascertained when the appointment is made and, for those without access, paper copies of the requested materials should be mailed to the woman. Specific pre-visit consideration could be given to:
  - health history,[a]
  - reproductive life plan,
  - identification of a specific health goal for the next year, and
  - completion of the online Surgeon General's family history form.[b]
- Introduce well woman prevention messages into the care of adolescents including weight management, calcium intake, daily use of a multivitamin with folic acid, and deliberate decisions about when (if ever) they hope to become pregnant.
- Utilize computer prompts in patient care encounters to tailor preventive care services to individual patient profiles.
- Use patient-driven worksheets to help patients develop specific strategies to address personal health goals. The Bright Futures for Women's Health and Wellness project, sponsored by the US Health Resources and Services Administration, has a number of valuable tools for adolescent and adult women who want to decrease their health-related risks. Worksheets are available on weight control, exercise, physical activity for women with physical limitations and for women living in rural areas, interpreting nutrition labels, making healthy choices at the grocery store, calcium intake, and improving iron intake.[c]
- Engage every member in the office in prevention messages and activities including nurses, laboratory personnel, and front desk staff, all of whom are likely to be underutilized relative to promoting preventive health behaviors. For example, if every woman was greeted with a message about folic acid utilization every time she called a clinicians' office, the commitment of the practice to this behavior would be underscored.
- Expand the provider panel to include nurse practitioners who are especially skilled in health promotion and disease prevention.

a Examples are available at www.beforeandbeyond.org.
b Available at www.hhs.gov/familyhistory or at http://www.beforeandbeyond.org under "Practice Supports."
c These and many other materials can be accessed at http://www.beforeandbeyond.org under "Practice Supports."

Table 1.
Recommendations for the Routine Care of All Women of Reproductive Age (Adapted from Moos et al[18])

Family planning counseling and use of a reproductive life plan
■ Routine health promotion activities for all women of reproductive age should begin with screening women for their intentions to become or not become pregnant in the short and long term and their risk of conceiving (whether intended or not).
■ Providers should encourage patients (women, men, and couples) to consider a reproductive life plan and educate patients about how their reproductive life plan impacts contraceptive and medical decision-making.
■ Every woman of reproductive age should receive information and counseling about all forms of contraception, from abstinence to permanent sterilization to the use of emergency contraception, that are consistent with her reproductive life plan and risk of pregnancy.
Physical activity
■ All women should be assessed regarding weight-bearing and cardiovascular exercise and offered recommendations that are appropriate to their physical abilities.
Nutrition
■ All women should have their BMI calculated at least annually.
■ All women with BMIs greater than 26 kg/mg should be counseled about the risks to their own health, the risks for exceeding the overweight category, and the risks to future pregnancies, including infertility. These women should be offered specific behavioral strategies to decrease caloric intake and increase physical activity and be encouraged to consider enrolling in structured weight loss programs.
■ All women with a BMI less than 19.8 kg/mg should be counseled about the short- and long-term risks to their own health and the risks to future pregnancies, including infertility.
■ All women with a low BMI should be assessed for eating disorders and distortions of body image. Women who are unwilling to consider and achieve weight gain may require referral for further evaluation of eating disorders.
Nutrient intake
■ All women of reproductive age should be advised to ingest 0.4 mg (400 mcg) of synthetic folic acid daily from fortified foods and/or supplements and to consume a balanced, healthy diet of folate-rich food.
Immunizations
■ All women of reproductive age should have their immunization status for tetanus, diphtheria, pertussis, measles, mumps, rubella, and varicella reviewed annually and updated as indicated.
■ All women should be assessed annually for health, lifestyle, and occupational risks for other infections and offered indicated immunizations.
Infectious disease
■ Health care providers should assess STI risks regularly and routinely, provide counseling and other strategies that include immunizations to prevent the acquisition of STIs, and provide indicated STI testing and treatment for all women of childbearing age.
Parental exposures
■ All women should be assessed for the use of tobacco at each encounter with the health care system, and those who smoke should be counseled, using the 5 As, to limit exposure.
■ All women should be assessed at least annually for alcohol use patterns and risky drinking behaviors and provided with appropriate counseling. All women should be advised of the risks to the embryo/fetus of alcohol exposure in pregnancy and that no safe level of consumption has been established.

- Introduce group care as a vehicle to reach more women with greater efficiency. A model of group care called Centering Pregnancy has been demonstrated to affect behaviors and improve pregnancy outcomes;[19] groups built upon similar principles have also shown promising results. Women could be divided into natural subgroups (e.g., by decade of age, by pregnancy status such as between pregnancies or beyond pregnancies), or by specific health issues (e.g., pre-diabetes, hypertension, obesity) in order to efficiently encourage women to develop and sustain wellness plans.[d]
- Coordinate care between specialties by linking clinical electronic medical records or, more immediately, by

d For more information about group care go to http://www.centeringhealthcare.org.

providing women with a copy of their own health profile to carry between providers. A practice that holds promise is for primary care providers to supply their patients with a memory stick that includes a summary of the woman's health profile. The woman should be instructed to carry the memory stick on her key chain and to provide it to every clinician she sees with a specific request that it be reviewed and updated as appropriate.

- Use wellness contracts and wellness prescriptions. The North Carolina Folic Acid Council created a "Women's Wellness Rx" which allows the provider to check preprinted health promotion recommendations such as 30 minutes of exercise most days of the week, 1,200 mg of calcium intake, and taking a multivitamin with folic acid daily; the provider then signs the "prescription" and hands it to the woman as a quick way to reinforce appropriate health promoting recommendations specific to her.[e]
- Place posters that encourage health promoting behaviors throughout the office environment.[f]
- Visit and revisit www.beforeandbeyond.org, the national preconception curriculum and resources guide for health clinicians. More information about this site is featured in this issue of the *Journal*. The educational modules offer free CMEs. Module 2, *Every Woman, Every Time*, uses a case-based approach to underscore opportunities for integrated care in routine encounters. Content of the site is continually updated.
- Become familiar with the evidence-based preconception guidelines created by the CDC Select Panel on Preconception Care Clinical Committee and use these guidelines to provide or refer women to recommended care. These guidelines were published in a supplement to the *American Journal of Obstetrics and Gynecology* in December 2008.[g,20]
- Engage members of your office staff in the use of evidence-based counseling strategies, such as the 5A approach to smoking cessation, which have been found to produce clinically meaningful changes in health behaviors.[21]
- Refer women to behavior change support programs.
- Distribute materials created in North Carolina to promote high levels of wellness for women, such as the Women's Health Diaries.[h]

To be successful, the responsibility for achieving higher levels of women's wellness cannot rest with clinicians and their office staff alone.[16] The health of populations and individuals is shaped by a wide range of factors within the social, political, natural, built, and economic environments which interact with each other in complex ways. However, the influence of the clinician should not be lost in the complexity of influences on health behaviors as studies report that provider recommendations are critical to adoption of healthy behaviors.[21-23] In addition, providers are generally respected and influential within communities and thus may be essential in guiding or reinforcing community-based initiatives to improve the health of the population.

Clinicians can be instrumental in stimulating and supporting existing agencies in their practice area around community-wide health promotion initiatives. While the specific organizational structure, strategies, and leadership to drive population-based health promotion foci can reside with local health departments, local hospitals, existing or new coalitions, or other local entities, clinician engagement and support will add credibility to the initiative and may increase its impact. For example, a Canadian study demonstrated that social marketing coupled with provider reinforcement resulted in 71% of women taking a supplement containing folic acid as compared to only 17% of those exposed to the social marketing campaign alone.[22]

Indeed, there is so much to do and so little time. However, changing the way we work, even in small ways, can empower our staffs, our patients, and our communities to value prevention and to take increasing interest in addressing their health habits and status. Continuing to expect short one-on-one, clinician-driven encounters to cover all that matters is to reinforce the existing paradigm which has resulted in care for our women that is costly and too often ineffective. With the current pressures on clinicians, we have little choice but to work smarter to make a difference for today's women and tomorrow's children. **NCMJ**

e The Women's Wellness Rx is available from www.getfolic.com.
f Visit http://www.everywoman.nc for guidance in finding appropriate resources.
g All 17 articles can be reviewed or downloaded from http://www.beforeandbeyond.org under "Key Articles and Studies."
h Available through the North Carolina Healthy Start Foundation at http://www.nchealthystart.org.

REFERENCES

1 Schappert SM, Rechtsteiner EA. Ambulatory medical care utilization estimates for 2006. *Natl Health Stat Report.* 2008;(8):1-29.
2 Salinigoff A, Ranji UR, Wyn R. Women and health care: a national profile: key findings from the Kaiser Women's Health Survey 2005. The Henry J. Kaiser Family Foundation website. http://www.kff.org/womenshealth. Accessed January 9, 2009.
3 Hillemeier MM, Weisman CS, Chase GA, Dyer AM, Shaffer ML. Women's preconceptional health and use of health services: implications for preconception care. *Health Serv Res.* 2008;43(1 pt 1):54-75.
4 Bernstein PS, Sanghvi T, Merkatz I. Improving preconception care. *J Reprod Med.* 2000;45(7):546-552.
5 Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspect Sex Reprod Health.* 2006;38(2):90-96.
6 March of Dimes Perinatal Data Center. PeriStats. March of Dimes website. http://www.marchofdimes.com/peristats. Accessed August 4, 2009.
7 National Center for Health Statistics. *Health, United States, 2007.* Hyattsville, MD: National Center for Health Statistics; 2007.
8 US Department of Health, Education and Welfare (PHS) HAS/BCHS. *Primary Care Effectiveness—An Approach to Clinical Quality Assurance in BCNS Programs and Projects.* Washington, DC: US Dept of Health, Education and Welfare; 1979.
9 Institute of Medicine Committee to Study the Prevention of Low Birthweight. *Preventing Low Birthweight.* Washington, DC: National Academies Press; 1985.
10 US Public Health Service Expert Panel on Prenatal Care. *Caring for Our Future: The Content of Prenatal Care.* Washington, DC: Public Health Service, Dept of Health and Human Services; 1989.
11 Moos MK, Cefalo RC. Preconceptional health promotion: a focus for obstetric care. *Am J Perinatol.* 1987;4(1):63-67.
12 Jack BW, Culpepper L. Preconception care: risk reduction and health promotion in preparation for pregnancy. *JAMA.* 1990;264(9):1147-1149.
13 Moos MK. Preconceptional health promotion: a health education opportunity for all women. *Women & Health.* 1989;15(3):55-68.
14 CDC/ATSDR Preconception Care Workgroup and the Select Panel on Preconception Care. Recommendations for improving preconceptional health and health care—United States. A report of the CDC/ATSDR Preconception Care Workgroup and the Select Panel on Preconception Care. *MMWR Recomm Rep.* 2006;55(RR-6):1-23.
15 Cullum AS. Changing provider practices to enhance preconceptional wellness. *J Obstet Gynecol Neonatal Nurs.* 2003;32(4):543-549.
16 Moos MK. From concept to practice: reflections on concerns about the preconception health agenda. *J Women Hlth.* In press.
17 Yarnall KSH, Østbye T, Krause MA, Pollack KI, Gradison M, Michener JL. Family physicians as team leaders: "time" to share the care. *Prev Chronic Dis.* 2009:6(2):A59.
18 Moos MK, Dunlop AL, Jack BW, et al. Healthier women, healthier reproductive outcomes: recommendations for the routine care of all women of reproductive age. *Am J Obstet Gynecol.* 2008;199(6 suppl 2):S280-289.
19 Ickovics JR, Kershaw TS, Westdahl C, Magriples U, Massey Z, Rising SS. Group prenatal care and perinatal outcomes: a randomized controlled trial. *Obstet and Gynecol.* 2007;110 (2 pt 1):330-339.
20 Jack B, Atrash HK, Coonrod CV, et al. The clinical content of preconception care: an overview and preparation of this supplement. *Am J Obstet Gynecol.* 2008:199(6 suppl 2):S266-279.
21 Whitlock EP, Orleans T, Pender N, Allan J. Evaluating primary care behavioral counseling interventions: an evidence-based approach. *Am J Prev Med.* 2002;22(4):267-284.
22 Pataszak A, Bhatia D, Okotore B, Koren G. Preconception counseling and women's compliance with folic acid supplementation. *Can Fam Physician.* 1999;45:2053-2057.
23 US Preventive Services Task Force. Counseling to prevent tobacco use and tobacco caused disease. Agency for Healthcare Research and Quality website. www.ahrq.gov/clinic. Accessed January 8, 2009.

Recommendations for Women of Reproductive Age

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Maintaining health and promoting wellness among women of reproductive age includes a daily routine of healthy habits. The goal of wellness is for women to be in the best state of health possible. It is known that healthy women generally experience healthier pregnancies and deliver healthier babies than women in poorer health. The concept of preconception health includes all women of childbearing age both prior to an initial pregnancy and between pregnancies. Since just under half of all pregnancies are unplanned, all women should be prepared for future pregnancies by maximizing health and minimizing health risks.[1] Part of maximizing health includes receiving recommended routine health screenings, immunizations, education, and management of chronic conditions from health care providers. This article will provide a brief overview of the messages women of reproductive age should receive from their health care practitioner in order to maximize health, minimize health risks, and prepare for future pregnancies.

Routine Screenings and Immunizations

Routine cytology screenings of the cervix (Pap tests) are the best prevention against cervical cancer. Screening should start at age 21 or three years after the onset of sexual activity (whichever comes first).[2-4] The recommended frequency of screening varies among the US Preventive Service Task Force (USPSTF), American Cancer Society (ACS), and American College of Obstetricians and Gynecologist (ACOG). The ACS recommends performing Pap tests annually when using conventional preparations and every two years with liquid-based cytology preparations. The ACOG recommends annual screenings until the age of 30 years, then every two to three years thereafter with no history of abnormalities. The USPSTF states that screening every three years offers the most benefit.[2-4]

All women should be assessed regularly and routinely for risk factors for sexually transmitted infections (STIs) and provided individualized counseling based on identified risk behaviors. STI testing, treatment, and counseling that includes information about immunizations available to prevent the transmission of certain STIs should be provided to all women of childbearing age.[5] All women should be encouraged to know their HIV status prior to pregnancy and counseled regarding safe sex practices. Women with known HIV infection should be offered contraception and counseling regarding their reproductive life plan and treatment options available in pregnancy to prevent fetal transmission of HIV in pregnancy.[5]

Human Papillomavirus (HPV)

The HPV vaccination has the potential to decrease the occurrence of HPV-related genital disease, including precancerous and cancerous lesions of the cervix, vulva, vagina, and anus.[3] The Advisory Committee on Immunization Practices (ACIP) recommends that all women and girls 9-26 years of age receive the HPV vaccination series to reduce the incidence of cervical abnormalities and cervical cancer.[6]

Since just under half of all pregnancies are unplanned, all women should be prepared for future pregnancies by maximizing health and minimizing health risks.

Measles, Mumps, and Rubella (MMR)

The MMR vaccination is extremely efficacious against measles, mumps, and rubella.[7] All women of reproductive age should be assessed for immunity against measles, mumps, and rubella due to the serious complications that these infections can inflict on the health of women and their pregnancies. Women without acceptable documentation of immunity or a vaccination series should receive the MMR vaccination. To date, there is no evidence of risk to a fetus by receiving the

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vaccination during pregnancy. However, since there remains a potential for harm, women should be counseled against becoming pregnant for three months after receiving the vaccine, and women who state they are pregnant should not receive the vaccine until the postpartum period.[7-8]

Varicella

Varicella is a highly contagious disease that is usually mild in children but can be severe in adults and cause congenital abnormalities including limb atrophy, central nervous system abnormalities, and eye problems if transmitted to a fetus during the first trimester or early second trimester of pregnancy.[9] All women of reproductive age should be screened for evidence of immunity for varicella. Those without evidence of immunity by a history of previous vaccination, previous varicella infection, or laboratory documentation of immunity should be offered vaccination for varicella. The varicella vaccination is contraindicated in pregnancy. Nonpregnant women should avoid becoming pregnant for one month after receiving the vaccination.[9]

Diphtheria, Tetanus, and Pertussis

All women of reproductive age should be assessed for being up-to-date for tetanus toxoid because of probable protection against neonatal tetanus with passive immunity.[8] A single dose of diphtheria-tetanus-pertussis vaccine is recommended for women who might become pregnant to prevent pertussis. This may be given as early as two years after a tetanus-diptheria (Td) immunization. A combined tetanus, diphtheria, and pertussis (Tdap) vaccination may also be given if the woman has not received a Td booster in the past 10 years.[10,11]

Hepatitis B

Vaccination is the primary method of hepatitis B prevention. The Advisory Committee on Immunization Practices recommends that all children 0-18 years receive the hepatitis B vaccination.[12] Women of reproductive age who are at high risk for acquiring hepatitis B virus infection, those who have not previously received the vaccination series, or who request vaccination (regardless of risk) should receive the hepatitis B vaccination series.[8]

Folic Acid

All women of reproductive age should be encouraged to take a multivitamin containing folic acid to support healthy pregnancy outcomes and prevent congenital birth defects.[13,14] Folic acid is found in folate rich foods such as dark green leafy vegetables, dried beans, oranges, and fortified products such as enriched flour, rice, pasta, bread, cereal, and orange juice. Folic acid from vitamin supplements and fortified foods are more readily available for use by the body than natural folate sources. The Centers for Disease Control and Prevention (CDC) and the March of Dimes recommend that women who could become pregnant consume 400 micrograms daily from a synthetic form of folic acid to help prevent neural tube defects (NTDs).[14] For women who have had a previous pregnancy affected by a NTD, the recommended daily dose of folic acid is increased to 4,000 micrograms to decrease the risk of having another affected pregnancy.[14]

Establish and Maintain a Healthy Weight

Maintenance of a healthy weight contributes to overall health. A balanced diet high in fruits, vegetables, and whole grains while limiting total fat, saturated fats, and simple sugars is recommended to manage weight. Daily activity and exercise will improve cardiorespiratory fitness, decrease abdominal fat, and increase metabolism to support weight management efforts.[15] Dietary habits including excessive fat, sugar, and caloric consumption in combination with inactivity can have serious negative health effects on the body. Health risks of obesity include cardiovascular disease, hypertension, diabetes, breast cancer, and colon cancer.

The World Health Organization estimates over one billion adults are overweight and over 400 million are considered obese by standard definition. Overweight and obesity are classified by measuring a person's body mass index (BMI) which captures a height to weight ratio; obesity is defined as a BMI that equals or exceeds 30kg/m^2.[16] The current recommendation is to establish a healthy weight range and body mass index through balanced diet and daily activity.

Weight reduction prior to pregnancy can reduce risks associated with obesity in pregnancy. The degree of risk to the pregnancy is positively correlated to overweight; therefore, any reduction in weight would improve pregnancy outcomes. Stillbirth rates are 60% higher in obese women with an alarming racial disparity noted among obese African American women who are nearly 90% higher.[17] Finally, birth defects are significantly higher in obese women; open neural tube defects such as spina bifida occurs twice as often in obese women than average weight women.[18] Other risk factors in pregnancy associated with obesity include gestational hypertensive disorders, gestational diabetes, increased cesarean section rates, and birth trauma associated with macrosomia.

Obesity-related pregnancy complications can be minimized and perhaps avoided by promoting healthy behaviors that contribute to a healthy weight before pregnancy. Recognition of risk may also facilitate early screenings and interventions in pregnancy to improve both maternal and fetal outcomes in pregnancy.

Everyday Healthy Habits

Stress is often overlooked in wellness. Recent research has shown that acute and chronic stress can lead to negative physical effects on the body. Stress may be physical, resulting from illness or injury, but it is most often associated with the social pressures of daily life that result from things such as job pressure, racism, interpersonal relationships, grief responses, and time management. Stress can be reduced with relaxation

State Budget's Effect on Women's Health Care

Tom Vitaglione, MPH

In Proverbs, a book of the Christian and Jewish Bible, is an oft-quoted passage: *Without a vision, the people perish.* This prophetic saying was frequently used to encourage leaders to respond to the critical needs of their constituents. In modern times, it has been used to remind leaders that budgets should reflect a vision for what life should be like and not simply a compilation of numbers that must be in balance. This is apparently much easier said than done, for budgets are often developed in piecemeal fashion through line-items, and any possible overall vision is easily obscured.

The recent budgetary approach to the health care of women of reproductive age in North Carolina is a case in point. It seems reasonable to assume that our leaders would subscribe to a vision of our state in which all women of reproductive age have access to the information and services they need to maximize their own health status and to assure the best possible birth outcomes. The challenge is to keep that vision (and of course many others) when individual service programs are being considered. And unfortunately this challenge is exacerbated when economic downturns require that serious budget reductions be made.

By all accounts, both the state's administrators and the General Assembly have faced the greatest budgetary shortfall in more than a generation. And because the state's revenue picture became worse and worse during the legislative session, any hopes of holding on to a vision were overwhelmed by deadlines to balance the budget.

This is not to say that there are no positive pieces of the new budget. New appropriations were approved for folic acid/vitamin supplements for low-income women to reduce the occurrence of neural tube defects; health education and progesterone will be available for low-income pregnant women who have had a previous preterm birth; and teen pregnancy prevention initiatives will be enhanced. In addition, a special provision asks the Department of Health and Human Services (DHHS) to develop a federal Medicaid waiver request that would provide interconceptional care to low-income women who are at high risk for preterm birth. Finally, another provision instructs DHHS to submit a Medicaid plan amendment to provide coverage to financially-eligible legally-resident pregnant immigrant women who have been in this country for less than five years.

It should be noted that most all of these pieces focus on the reproductive process itself (and therefore better birth outcomes) and do not respond to the greater vision of creating the healthiest possible cohort of women during their reproductive years. What is even more disappointing is that the budget contains huge reductions that have the potential to reverse the gains that have been made in infant mortality reduction in our state.

The General Assembly has taken the relatively rare step of requiring budget reductions within broad parameters while allowing the administrative departments to make the final decisions regarding the reductions. (The decision-making process will be ongoing for some time.) For example, the Division of Public Health is required to reduce contracts by more than $5 million. These contracts include high-risk maternity care, the outreach/education campaign to reduce infant mortality, and a host of other services affecting women of reproductive age. All could be in jeopardy.

Perhaps worse, another item requires the reduction of more than $200 million in case management services. While most legislators believed this would affect mental health services almost exclusively, this reduction is so deep that department personnel are seriously considering eliminating maternity care coordination, which has been acclaimed for more than a decade as a cost-saving, baby-saving support service for families.

For some time now, the practice and research communities have been developing a vision of knowledgeable, healthy women of reproductive age. This vision needs to become part of the legislative process. It is clearly not yet there, and one could say that the severe economic downturn will make it difficult to have this vision adopted. Historically, however, difficult times have usually produced the greatest prophets. We await ours.

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techniques such as guided imagery, meditation, breathing exercises, and hypnosis. Exercise reduces stress through a reduction in cortisol levels and an increase in circulating endorphins, thereby causing a physiologic response that reduces the effects of a stressful event.[19]

Substance use must be addressed when promoting a healthy lifestyle. Tobacco use is associated with cardiovascular disease, cancer, fetal growth restriction, stillbirth, and stroke. It is estimated that 22% of all women in the US smoke and about 20% of those women will not quit smoking in pregnancy.[1] Smoking cessation programs and medications can be helpful when the commitment to quit is finalized; however, it is important to know that medications for smoking cessation are not recommended once pregnant.[20] Health care providers should refer women for formal treatment when use of recreational drugs is identified; the occasional drug user may

be using more than they report. Alcohol use may be more difficult to assess and more readily hidden from providers. Utilization of a standardized questionnaire may make screening more universal, but it may not identify all women at risk. The provision of education to women regarding the potential risks to their health and future family is essential in empowering women to take responsibility for their personal health.

Routine health examinations and dental examinations are encouraged to keep women engaged in routine screenings to allow for prompt intervention when abnormalities are identified. Most women do not see a dental provider during pregnancy, which increases risk for gingivitis and oral infections that could predispose women to preterm labor and premature birth.[21]

The concept of preconception health should be envisioned as a continuum or circle of health in life, rather than a time period identified as prior to a pregnancy.

Control Chronic Disease

Many women have underlying medical conditions or chronic diseases that require special attention during childbearing years. A preconception visit is recommended for all women prior to pregnancy, but it is particularly important in women with diabetes, hypertension, cardiac disease, asthma, seizure disorders, endocrine disease, and psychiatric disorders.

Providers need to discuss health status and recommendations for pregnancy; if a woman is not healthy enough to become pregnant then a reliable and effective contraception should be prescribed. Pre-existing disease prior to pregnancy creates a high-risk state in pregnancy that requires close observation and management.

Approximately 7% of the US population has a form of diabetes; this rate continues to increase with the growing rate of obesity. Pre-existing diabetes increases the risk of intrauterine fetal death and stillbirth in pregnancy. Women with uncontrolled diabetes with a hemoglobin (Hgb) A1c level of greater than six will have a 15%-20% increase in the risk of miscarriage and a 5%-10% increase in birth defects, specifically fetal cardiac anamolies.[22] It is recommended that women with uncontrolled diabetes with elevated HgbA1c levels be counseled about potential fetal anomalies and offered options for pregnancy management that include genetic counseling, genetic screening, and pregnancy termination if desired.[23] Women with pre-existing diabetes have an increased risk of pregnancy-induced hypertensive disorder such as preeclampsia and HELLP syndrome (H – hemolysis; EL – elevated liver enzymes; LP – low platelet count).[24] It is not just maternal risks that should be a concern; children exposed to high levels of glucose in utero have increased risk of birth trauma, development of childhood obesity, and adult onset of diabetes.[25] It is recommended that women establish and maintain glycemic control several months prior to conception and throughout pregnancy in order to reduce risk to both mother and baby. A combination of prescribed dietary changes, exercise, weight reduction, and medications are utilized to achieve the goals of therapy. Oral hyperglycemic agents and insulin are utilized in pregnancy to maintain glycemic control; increasing levels of hyperglycemic agents are necessary in later gestation due to effects of placental lactogen on insulin regulation.

Hypertension is the most common complication of pregnancy and the leading cause of maternal morbidity. Approximately 22% of childbearing women in the United States have a hypertensive disorder. Women with pre-existing hypertension prior to pregnancy have significant risk to develop gestational diabetes and preeclampsia.[26] In women of childbearing years it is important to choose the appropriate medication for hypertensive management with consideration for pregnancy implication. Many of the pharmaceuticals used for hypertension may not be well-suited for pregnancy and lactation. Ace inhibitors and angiotensin II receptor blockers are not utilized in pregnancy due to potential fetal birth defects.[27] In addition, diuretics are not routinely prescribed to prevent counteraction of the physiological volume expansion in pregnancy. Risks in pregnancy associated with hypertensive disorders include placental abruption, fetal growth restriction, preterm delivery, and intrauterine fetal death.

Seizure disorders do not usually cause problems in pregnancy. Over 90% of women with seizure disorders experience a normal pregnancy and deliver healthy neonate. There is a 4%-8% increase in fetal anomalies with the use of anti-seizure medications. The most common fetal defects identified are cleft lip, cleft palate, cardiac anomalies, and spina bifida. Valporic acid is identified as a teratogen specifically associated with open neural tube defects.[28] It is not recommended to stop medications while pregnant as this may cause increase in seizure activity; however, it is important to utilize the lowest effective dose and select medications less likely to cause fetal harm.

Mental health disorders are very common among childbearing women with depression, anxiety, bipolar disorder, and attention deficit/hyperactivity disorder (ADHD) being commonly cited in medical records. An acute depressive episode can result with abrupt cessation of antidepressant medication. Collaborative management with mental health providers is crucial in the management of mental health disorders in pregnancy and postpartum due to the overriding psychosocial issues that can emerge with pregnancy. There are many questions and concerns about antidepressant use in pregnancy. The current recommendation is to continue medications at the lowest effective dose after counseling about potential effects to the pregnancy.[28] The March of Dimes issued a statement about depression in pregnancy which stated there is no definitive evidence linking antidepressants to fetal anomalies, but cautioned providers to weigh risk versus benefit in individual cases. There is a warning from the Federal Drug Administration about the antidepressant Paxil being associated with fetal cardiac defects and a recommendation that alternative medications be prescribed during pregnancy and lactation. The recommendations will change as new research becomes available; the best practice remains to stay informed of current recommendations and provide women with information to make informed decisions.

Promoting health and wellness for women of reproductive age requires a commitment from both the health care provider and the woman being cared for. As health care providers of women, we need to arm ourselves with the knowledge and tools to empower women to plan for the future by investing in their health today. As the providers seeing these women, we need to thoughtfully consider the impact of our word, actions, and recommendations on the health and actions of our patients. The preconception recommendations are summarized in Table 1. **NCMJ**

Table 1.
Risks and Recommendations for Women of Reproductive Age

Subject	Risk to Health	Recommendation
Acne medications[28]	Increased risk of miscarriage and birth defects.	Discontinue and avoid exposure to Acutane, products containing Retin-A, Vitamin A supplements, and doxycycline during pregnancy.
Alcohol[28]	Fetal alcohol syndrome may occur with even a small exposure. Moderate to heavy amounts of alcohol ingestion may contribute to habituation and eventually cause liver damage.	There is no safe amount of alcohol in pregnancy. Avoid all alcohol consumption during pregnancy.
Anti-seizure medications[28]	Valproic acid is teratogenic and is linked with the following birth defects: cleft lip, cleft palate, open neural tube defects, and cardiac defects.	Do not abruptly stop medication as it may trigger increased seizure activity. Use lowest effective dose and consider other alternatives to valproic acid.
Dental care[21]	Poor dental hygiene and undiagnosed periodontal disease can contribute to systemic illness, preterm labor, and fetal death.	All women should have routine dental visits and periodontal disease be addressed. Dental visits are safe and recommended in pregnancy.
Diabetes – type 1 or 2[22]	Uncontrolled diabetes is associated with cardiac defects, miscarriage, stillbirth, and birth trauma.	Maintain glycemic control prior to conception and throughout pregnancy.
Epilepsy[28]	Seizure activity may increase as serum levels of medications change in pregnancy. Medications used to control seizure are associated with fetal birth defects and growth restriction.	Counsel women prior to pregnancy to risk of medication to a fetus. Utilize lowest effective dose of anti-seizure medication and consider alternative medications.
Folic acid[14]	Folic acid deficiency is associated with open neural tube defects.	All women should supplement with 400-800 mcg of folic acid daily.
Hepatitis B[8]	Adult risk with hepatitis infections; ultimately fatal liver damage is possible. Fetal effects include miscarriage and stillbirth.	All women should be screened for hepatitis B infection in pregnancy. Recommendation for hepatitis B vaccine series.
HIV	Unmanaged HIV can result in AIDS and death. Viral transmission is associated in pregnancy across placental barrier and through breastfeeding.	All women should be screened for HIV infection in pregnancy. Utilization of anti-viral medication reduces viral transmission in pregnancy. Delivery route determined by viral load. Breastfeeding is not recommended.

Table 1. (cont.)
Risks and Recommendations for Women of Reproductive Age

Subject	Risk to Health	Recommendation
Hypertension[1]	Hypertension is associated with stroke, kidney disease, and cardiovascular disease. Risk to pregnancy includes placental abruption, fetal growth restriction, and stillbirth. Some antihypertensive agents are not recommended for use in pregnancy and lactation.	Women should be screened for hypertension at annual exams. Avoidance of ace inhibitors and diuretics in pregnancy due to potential fetal effects.
Immunizations[7]	Lack of adequate immunization may lead to increased risk of acquiring disease.	
MMR (measles/mumps/rubella) Tdap (tetanus/diphtheria/pertussis) Varicella (chicken pox)	Risk of active infection in pregnancy associated with growth restriction, birth defects, and neonatal death.	All women should be current on all immunizations. Serum titres should be checked on varicella and rubella should be assessed for immunity in women. Live attenuated immunizations are not recommended in pregnancy. Women should wait at least one month to conceive after receiving immunizations.
Influenza	Significant respiratory illness may occur in pregnancy due to physiological decrease in immune function.	Offer flu vaccination to pregnant and lactating women.
Obesity[16]	Increases risk of cardiovascular disease and diabetes. Risk to pregnancy includes an increased risk of stillbirth, cesarean section delivery, and open neural tube defects.	Establish and maintain a normal BMI. Institute a weight loss management program suited for individual results/compliance.
Nutrition[15]	Poor dietary choices high in fat and sugar lead to excessive weight gain and nutritional deficiencies.	Nutritional counseling to promote a balanced diet high in fiber, fruits, and vegetables with reduction in fats and sugars. Consider nutrition/dietician consult as indicated.
Preconception visit[28]	Pregnancy preparation allows for identification of potential risks and early intervention to promote positive pregnancy outcomes.	Women should have a preconception visit prior to conception.
Sexually transmitted infections	Untreated sexually transmitted infections can lead to pelvic inflammatory disease, preterm labor, premature rupture of membranes, and infertility. Fetal risk includes eye infections, congenital malformations, blindness, low birth weight, premature delivery, and stillbirth.	Screen all women in pregnancy for STIs and treat according to CDC recommendations.
Stress	Excessive daily stress levels cause physiological responses that can depress the immune system leading to illness, cardiovascular disease, and mental health conditions.	Discuss chronic stress and interventions to reduce stress in daily life.
Tobacco[1]	Tobacco use is associated with cancer, cardiovascular disease, fetal growth restriction, preterm birth, SIDS, and stillbirth.	Counsel women not to smoke or use tobacco products and offer referral to a formal cessation program.

REFERENCES

1 Collins J, Lehnherr J, Posner SF, Toomey KE. Ties that bind: maternal and child health and chronic disease prevention at the Centers for Disease Control and Prevention. *Prev Chronic Dis.* 2009;6(1):A01.

2 US Preventive Services Task Force. Screening for cervical cancer. Agency for Healthcare Research and Quality website. http://www.ahrq.gov/clinic/uspstf/uspscerfv.htm. Accessed August 17, 2009.

3 Saslow D, Runowicz CD, Solomon D, et al. American Cancer Society guidelines for the early detection of cervical neoplasia and cancer. *J Low Genit Tract Dis.* 2003;7(2):67-86.

4 American College of Obstetricians and Gynecologists. Cervical cytology screening. ACOG practice bulletin. Number 45, August 2003. *Int J Gynecol Obstet.* 2003;83(2):237-247.

5 Moos MK, Dunlop AL, Jack BW, et al. Healthier women, healthier reproductive outcomes: recommendations for the routine care of all women of reproductive age. *Amer J Obstet Gynecolgy.* 2008;99(supp B);S280-289.

6 Markowitz LE, Dunne EF, Saraiya M, Lawson HW, Chesson H, Unger ER. Quadrivalent human papillomavirus vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep.* 2007;56(RR-2):1-24.

7 Watson JC, Hadler SC, Dykewicz DA, Phillips L. Measles, mumps, and rubella—vaccine use and strategies for elimination of measles, rubella, and congenital rubella syndrome and control of mumps: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Morb Mortal Weekly Rep.* 1998;47(RR-8):1-57.

8 Coonrod DV, Jack BW, Boggess KA, et al. The clinical content of preconception care: immunization as part of preconception care. *Am J Obstet Gynecol.* 2008;99(supp B);S290-295.

9 Prevention of varicella. Update recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep.* 1999;48(RR-6):1-5.

10 Preventing tetanus, diphtheria, and pertussis among adults: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine. *MMWR Recomm Rep.* 2006;55(RR-17):1-37.

11 Advisory Committee on Immunization Practices. Prevention of tetanus, diphtheria and pertussis among pregnant women: provisional ACIP recommendations for the use of Tdap vaccine. Migrant Clinicians Network website. http://www.migrantclinician.org/files/resourcebox/TdapPregnantACIPProvRecom062006.pdf. Published 2006. Assessed August 17, 2008.

12 Immunization Action Coalition. *Summary of Recommendations for Adult Immunization.* Immunization Action Coalition website. http://www.immunize.org/catg.d/p2011.pdf. Published 2007. Accessed August 20, 2009.

13 March of Dimes. Most important health messages for your patients. March of Dimes website. http://www.marchofdimes.com/professionals/1399.asp. Accessed August 17, 2009.

14 Centers for Disease Control and Prevention (CDC). Spina bifida and anencephaly before and after folic acid mandate—United States, 1995-1996 and 1999-2000. *MMRW Morb Mortal Wkly Rep.* 2004;53(17):362-365.

15 Lichtenstein AH, Appel LJ, Brands M, et al. Diet and lifestyle recommendations revision 2006: a scientific statement from the American Heart Association Nutrition Committee. *Circulation.* 2006;114(1):82-96.

16 Centers for Disease Control and Prevention. Overweight and obesity. Centers for Disease Control and Prevention website. http://www.cdc.gov/obesity/defining.html. Published 2009. Accessed August 25, 2009.

17 Chu SY, Kim SY, Lau J, et al. Maternal obesity and risk of stillbirth: a meta-analysis. *Am J Obstet Gynecol.* 2007;197(3):223-228.

18 American College of Obstetricians and Gynecologists. ACOG Committee Opinion number 315, September 2005. Obesity in pregnancy. *Obstet Gynecol.* 2005;106(3):671-675.

19 Rimmel U, Seiler R, Marti B, Wirtz PH, Ehlert U, Heinrichs M. The level of physical activity affects adrenal and cardiovascular reactivity to psychosocial stress. *Psychoneuroendocrinology.* 2008;34(2):190-198.

20 American College of Obstetricians and Gynecologists. ACOG committee opinion. Number 316, October 2005. Smoking cessation during pregnancy. *Obstet Gynecol.* 2005;106(4):883-888.

21 Bogess KA, Edelstein BL. Oral health in women during preconception and pregnancy: implications for birth outcomes and infant health. *Matern Child Health J.* 2006;10(supp 5):169-174.

22 Centers for Disease Control and Prevention. *Diabetes and Women's Health Across Life Stages: A Public Health Perspective.* Centers for Disease Control and Prevention website. http://www.cdc.gov/diabetes/pubs/pdf/womenshort.pdf. Published 2001. Accessed September 1, 2009.

23 Hod M, Jovanovic LG, Di Renzo GC, De Leiva A, eds. *Textbook of Diabetes and Pregnancy.* London, UK: Martin Dunitz; 2008:262-329.

24 Centers for Disease Control and Prevention. National diabetes fact sheet. Centers for Disease Control and Prevention website. http://www.cdc.gov/diabetes/pubs/factsheet07.html. Published 2009. Accessed August 25, 2009.

25 Martorell R. Diabetes and Mexicans: why the two are linked. *Prev Chronic Dis.* 2005;2(1):A04

26 D'Angelo D, Williams L, Morrow B. Preconception and interconception health status of women who recently gave birth to a live-born infant. *MMWR Surveill Summ.* 2007;56(10):1-35.

27 Gibson P, Carson MP. Hypertension and pregnancy. Emedicine website. http://emedicine.medscape.com/article/261435-overview. Updated July 30, 2009. Accessed October 1, 2009.

28 Johnson K, Posner SF, Biermann J, et al. Recommendations to improve preconception health and health care—United States. *MMWR Recomm Rep.* 2006;55(RR-6):1-23.

The Unique Role of Family Physicians in Caring for Women Across the Reproductive Age Span

Daniel Frayne, MD; Richard Hudspeth, MD; Janalynn Beste, MD, FAAFP

Women of reproductive age receive their usual health care from a variety of providers, including family physicians, general internists, obstetricians/gynecologists, and nurse midwives at private practices, health departments, community health centers, and hospitals. Nationally, 27.3% of all office visits for women ages 18-44 were to family physicians' offices, compared with 31.2% to obstetricians/gynecologists and 10.3% to general internists, with the remaining 31.2% of visits to subspecialty care physicians.[1] While many women consider their obstetrician/gynecologist their primary care physician, a significant number of women consider family physicians to be their primary physician for all of their health care needs.

After medical school, family physicians complete three years of residency training during which they focus on the care of the whole person, irrespective of age and/or gender. The residency requirements for family medicine include training in gynecologic care and maternity care, as well as structured experiences in non-obstetrical, non-gynecologic care of women that deal with the study of gender differences and the diversity of women's health needs throughout the life cycle.[2] Family physicians are also trained to care for children and adolescents and often begin care for a woman during her childhood. In addition to providing preventive, gynecologic, and contraceptive care to women, family physicians routinely diagnose and treat common acute and chronic medical conditions such as diabetes, hypertension, obesity, mental health disorders, and tobacco abuse. Many perform gynecologic procedures such as endometrial biopsies, colposcopy, and insertion of intrauterine devices (IUDs) and other implantable contraceptives. Family physicians can also facilitate contraception by performing vasectomies on male partners. Because of the breadth and depth of their training, family physicians are capable and well-suited to fill the role of primary care provider for women of reproductive age.

Family physicians play a critical role in access to care for women of North Carolina. As of 2007, there were 2,612 licensed family physicians practicing in all but two of the 100 counties in the state.[3] In contrast, there were 1,009 obstetricians/gynecologists practicing in only 71 of the 100 counties. Figure 1 shows the Health Profession Shortage Areas (HPSA) in North Carolina with all providers included; 41 counties are designated partial or full HPSAs. Figure 2 shows how the same HPSA map would look without family physicians; 64 counties would be designated as HPSAs. Figure 3 shows how the map would look without general internists; 49 counties would be designated as HPSAs. Figure 4 shows how the map would look without obstetrician/gynecologists; 42 counties would be designated as HPSAs. Finally, Figure 5 shows how the map would look without pediatricians; 42 counties would be designated as HPSAs. Family physicians also play a large role in supervising mid-level providers (nurse practitioners and physician assistants) either in private offices or public health department settings, thereby expanding the number of primary care providers in a given community. The impact of family physicians on access to health care in North Carolina, especially in the rural areas of the state, is readily apparent.

Because of the breadth and depth of their training, family physicians are capable and well-suited to fill the role of primary care provider for women of reproductive age.

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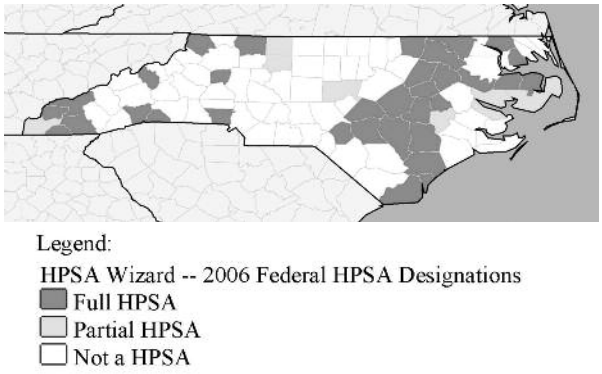
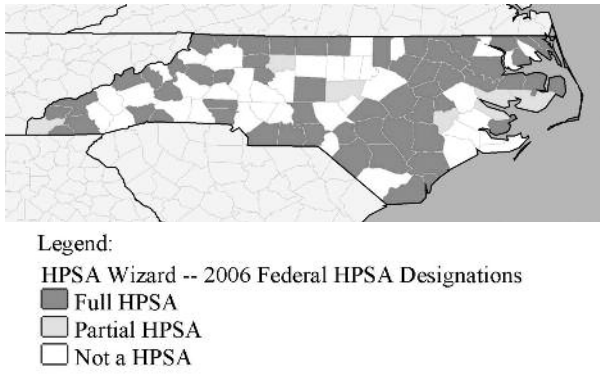
Figure 1.
Health Professional Shortage Area (HPSA)



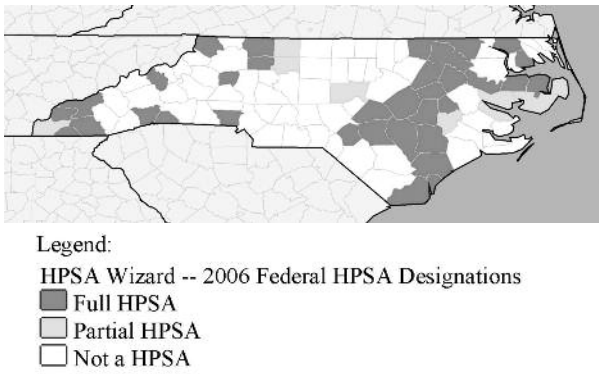
Source: Data derived from the *Health*Landscape website. http://www.healthlandscape.org/. Accessed August 20, 2009.

Figure 2.
Health Professional Shortage Area (HPSA) without FP



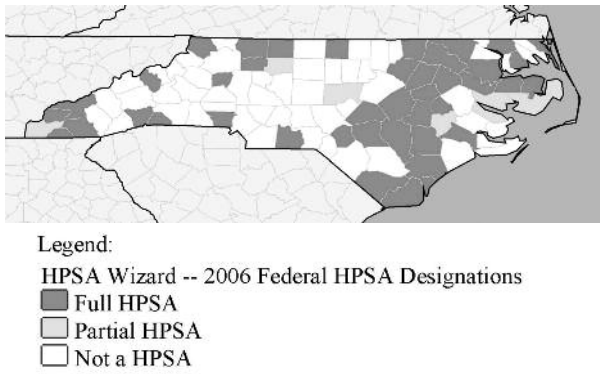
Source: Data derived from the *Health*Landscape website. http://www.healthlandscape.org/. Accessed August 20, 2009.

Figure 3.
Health Professional Shortage Area (HPSA) without OB/GYN



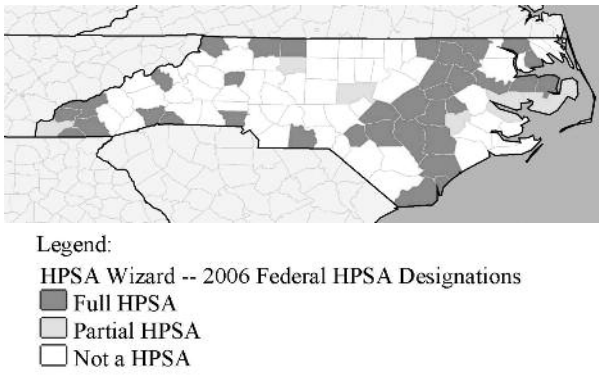
Source: Data derived from the *Health*Landscape website. http://www.healthlandscape.org/. Accessed August 20, 2009.

Figure 4.
Health Professional Shortage Area (HPSA) without GIM



Source: Data derived from the *Health*Landscape website. http://www.healthlandscape.org/. Accessed August 20, 2009.

Figure 5.
Health Professional Shortage Area (HPSA) without Pediatricians



Source: Data derived from the *Health*Landscape website. http://www.healthlandscape.org/. Accessed August 20, 2009.

Family physicians who provide primary care in North Carolina are essential to improving the overall health of the community. One emerging model in medicine is the patient-centered medical home (PCMH). The importance of the PCMH and its vital role in providing care for patients' needs has been widely published.[4] Family medicine is uniquely positioned to answer the growing need for PCMHs in North Carolina. In 2007, the American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, and American Osteopathic Association issued a joint declaration of principles to describe a PCMH. In it, the patient-centered medical home is described as having the following components: (1) *a personal physician* with an ongoing relationship with the patient to provide continuous and comprehensive care; (2) *physician directed medical care* by personally leading a team responsible for the ongoing care of the patients; (3) *whole person care*, for example, care for all stages of life, acute and chronic illnesses, preventive services,

The Role of North Carolina Medicaid in Women's Health and Wellness

Patti Forest, MD, MBA, FAAFP

There are numerous opportunities for public policy to improve women's health care. Programs that promote access to comprehensive health care and support services deliver long-term cost benefits and enhance quality of life. North Carolina Medicaid collaborates with several partners across the state to address the physical, mental, and perinatal health care needs of eligible women. According to the Henry J. Kaiser Family Foundation, three-quarters of the adult Medicaid population are women. Medicaid finances 41% of all births in the US and accounts for 71% of all publicly-funded family planning services. However, in their words: "childless women without disabilities typically are never eligible no matter how poor."[1] Over the years, North Carolina Medicaid has been proactive in seeking ways to expand eligibility to low-income women while delivering cost benefits to the state.

In October 2005, North Carolina Medicaid implemented the Be Smart Program, a five-year demonstration waiver project for family planning services to reduce unintended pregnancies and improve the well-being of children and families. Though only in its fourth year, this Family Planning Waiver has provided services to thousands of women across the state. During its first year, 9,819 women received services, 15,858 the second year, and the number of women receiving services continues to increase annually. The program has drastically reduced Medicaid-covered costs associated with unintended pregnancies. According to the January 2009 Interim Annual Report for the program, 1,139 pregnancies were averted by pregnancy prevention during the second year of the waiver due to the existence of the program. This resulted in a Medicaid cost savings of $11,735,000. Preliminary findings show that the subsequent waiver year resulted in an even greater Medicaid cost savings of between $13,862,000 and $14,219,000.[2]

North Carolina has taken advantage of federal options to expand Medicaid eligibility criteria to allow greater coverage for pregnant women. The Baby Love Program was launched in 1987 as a joint effort between the Division of Medical Assistance and the Division of Public Health. This Medicaid-funded program was designed to offer pregnant women and their infants early, continuous, and comprehensive health care and other needed support services with the goals of improving health and reducing infant mortality. Services include case management, childbirth education classes, in-home nursing care for high-risk pregnancies, medical nutrition therapy, and health and behavioral interventions.[3] Since the beginning of this program, the infant mortality rate has decreased from 14.9 deaths per 1,000 live births (1987) to 8.2 infant deaths per 1,000 (2008).

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and end of life care; (4) *coordination and integration of care* across all elements of the health system (e.g., hospital, subspecialty care, skilled nursing care) and the patient's community (family and community-based services); (5) *optimal quality and safety of care* through evidence-based medicine and continuous quality improvement techniques and with patient participation; (6) *enhanced access* to care; and (7) *just and appropriate payment structures* that support the provision of the above services and values improved outcomes.[5] There is growing evidence to support this model of care as a viable system to improve quality outcomes.[4] Many aspects of the PCMH focus on improving access, communication, and integration of care. Women's health, including prenatal care, family planning, and chronic disease management, provide excellent opportunities for collaboration among family physicians and other specialists.

The World Health Organization's key indicators for overall community health are infant mortality and birth weight.[6] Unfortunately, North Carolina is currently 43rd in the nation with regards to infant mortality.[7] In 2007, there were 1.8 million women of childbearing age in North Carolina with 130,886 births, of which 12,100 were classified as low birth weight (< 2,500 grams).[8] There were 1,568 perinatal deaths (< one month of age) and 1,107 infant deaths (> one month but < one year of age).[8] Communities with an increased supply of primary care practitioners (family physicians, general internists, and pediatricians) per capita have lower infant mortality rates and higher birth weights, especially in areas with high levels of disparities.[9] Although there are a small but significant portion of family physicians who provide prenatal care (in North Carolina, 5% of family physicians provide both maternity care and deliveries and 11% provide prenatal care only, though in some counties family physicians are the only maternity care provider),[10] the improvements in infant birth weight and lower infant mortality rates are not necessarily the result of the care patients receive during the narrow prenatal timeframe. Evidence suggests these improvements are more the result of a continuity of health care provided across the reproductive lifespan, beginning with preconception family planning, chronic disease management, and risk reduction aimed at improving overall maternal and neonatal health.[9]

North Carolina Pregnancy Risk Assessment Monitoring System (PRAMS)[11] data showed that approximately 45% of all

In spite of this improvement, North Carolina continues to have an infant mortality rate higher than the national average. In an effort to improve neonatal outcomes in the state, the Division of Medical Assistance was awarded a grant by the US Centers for Medicare and Medicaid Services to address this challenge. The project is in partnership with the Perinatal Quality Collaborative of North Carolina and builds upon the collaborative success that North Carolina has demonstrated in primary care. In the recent legislative session, the General Assembly directed the Division of Medical Assistance to research and report on the feasibility and efficacy of a Medicaid waiver allowing two years of interconceptional coverage to low-income women who have given birth to high-risk infants. The report will address whether estimated cost savings from improved birth outcomes will offset the cost of providing Medicaid coverage to additional eligible women.[4]

Aside from family planning and reproductive health issues, North Carolina also covers mammograms and preventive care to eligible women. Chronic disease management through the Community Care of North Carolina network provides valuable services to recipients while delivering cost savings to the state. Low-income adults with disabilities may be eligible for a broad array of services under the Community Alternatives Program for Adults. Medicaid coverage is extended to uninsured women under the age of 65 with breast or cervical cancer that has been detected through North Carolina's Breast and Cervical Cancer Control Program. The common theme in all of these programs is the partnership and collaboration between Medicaid and other entities across the state. In moving forward with health care reform, these partnerships will be vital in improving access to quality health care for all North Carolina citizens.

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REFERENCES

1 Henry J. Kaiser Family Foundation. *Women's Health Policy Facts: Women's Health Insurance Coverage.* http://www.kff.org/womenshealth/upload/6000_07.pdf. Published October 2008. Accessed August 24, 2009.

2 North Carolina Department of Health and Human Services, Division of Medical Assistance. *North Carolina Be Smart Family Planning Waiver: Waiver Year Three Interim Annual Report.* http://www.ncdhhs.gov/dma/mfpw/0109year3interimannualreport.pdf. Published January 2009. Accessed August 21, 2009.

3 North Carolina Department of Health and Human Services, Division of Medical Assistance. *Medicaid in North Carolina Annual Report, State Fiscal Year 2007.* http://www.ncdhhs.gov/dma/2007report/2007report.pdf. Accessed August 20, 2009.

4 2009 NC Session Laws 451, §10.72A.(a). http://www.ncleg.net/Sessions/2009/Bills/Senate/PDF/S202v8.pdf. Accessed August 20, 2009.

pregnancies in North Carolina were unintended. Mothers with unintended pregnancies are more likely to have low birth weight infants and infants who die before their first birthday.[11] The causes of unintended pregnancy are multifactorial, including, but not limited to, the availability of birth control, the timing of postpartum follow-up, and the messages given to patients regarding health priorities and life choices. Because of the associated risks with unintentional pregnancies, Healthy People 2010 has set a goal of achieving 70% of pregnancies as intentional.[12] Family physicians, because they are the primary care practitioner for so many women in North Carolina are vital to the success of reducing unintended pregnancies.

When women interact with multiple providers in our fragmented health care system, the historical details of their total health care "picture" can easily become disconnected. Family physicians in a PCMH can reconnect those disparate fragments. They have the ability to affect family planning and pregnancy intendedness for these women as they seek care with their family physician for preconception care or, if now pregnant, for their immediate pregnancy. They may also affect pregnancy intendedness after patients return from receiving care from their obstetricians, midwives, or maternal-fetal medicine specialists. Also, by providing care for children, family physicians have the opportunity to interact with mothers during well-child checkups and vaccinations and can partner with pediatrician colleagues to encourage all health care providers to take an active role in family planning.[13]

The 2007 PRAMS report also states that mothers with unintended pregnancies are less likely to adopt healthy behaviors during pregnancy, such as avoiding tobacco, illegal drugs, or alcohol.[11] In 2006, the Center for Disease Control and Prevention's (CDC) Preconception Care Work Group and Panel on Preconception Care recommended that elements of preconception care be integrated into every primary care visit, including screening for risks, identifying and treating chronic diseases, and reviewing reproductive health during the interconception period.[14] The North Carolina Department of Public Health's Preconception Health Strategic Plan mirrors the CDC Preconception Care Work Group with six priority areas: (1) pregnancy intendedness, (2) obesity and related conditions, (3) substance abuse, (4) mental health, (5) collaborative research and policy development, and (6) access to care.

Family physicians are ideally suited to meet all of these recommendations as they routinely care for acute and chronic diseases of women as well as provide care for their children.

Two examples illustrate how family physicians are best suited to help North Carolina achieve these goals. Thirty-six percent of North Carolina women ages 18-44 reported poor mental health.[15] Yet nearly 50% of individuals with a mental health disorder never see a mental health care professional.[16] At least once a year, however, 80% of these individuals visit their primary care provider.[16] Fifty percent of all mental health care in the US is delivered solely by a primary care physician; furthermore, non-psychiatric physicians prescribe approximately 70% of all psychotropic agents in the US.[16] Additionally, depression is an illness that responds best when treated via the care of a personal physician focused on the whole person in an integrated system (i.e., one that includes behavioral health and other partners of the health care team).[16]

As another example, the treatment of obesity is complex and requires the consistent care of a personal physician integrated with a care management team over an extended period of time, in conjunction with behavioral and societal changes. Twenty-nine percent of North Carolina women between ages 18-44 are obese, and 24% are considered overweight.[17] Family physicians have the ability to provide consistent messages, interface with the care management team, and activate resources—not just on behalf of the woman but for the whole family and community.

Family physicians have the potential to participate in partnerships across multiple disciplines. In the May/June 2009 issue of the *North Carolina Medical Journal,* the integrative and successful efforts of Community Care of North Carolina were highlighted.[18] Why not continue to expand this model into the area of women's health, including maternity care, by bringing together family physicians, pediatricians, obstetricians/gynecologists, midwives, maternal care coordinators, behavioral health providers, and home nurses to have a more coordinated system of continuity care? Collaboration around improving maternal and neonatal outcomes has already begun through increasing family physicians' awareness and involvement in the Perinatal Quality Collaborative of North Carolina (PQCNC). Multi-specialty cooperation in creating and implementing evidence-based guidelines and best practices for obstetrics could be enhanced through programs such as the Institute for Healthcare Improvement (IHI) Idealized Design of Perinatal Care[19] and the Interventions to Minimize Preterm and Low Birth Weight Infants through Continuous Improvement Techniques (IMPLICIT) Network.[20] "Enhancing obstetric skills through partnerships of both family medicine and obstetricians/gynecologist residencies with the American Academy of Family Physician Advanced Life Support in Obstetrics (ALSO) course has been successful in several locations in providing an evidence-based simulation workshop used in over 47 countries to train all levels of maternity care providers (medical students and residents, labor and delivery and neonatal nurses, midwives, family physicians, and obstetricians).[21] These are the types of creative collaborations that will be necessary to successfully improve overall outcomes.

The health needs of women in North Carolina are indeed diverse and can be viewed as an overall indicator of our community's health. The unique role of family physicians in caring for this population cannot be overstated. Family physicians are located in HPSA areas throughout the state and are often the only medical provider caring for or supervising care for women in a given community. Their scope of training and practice is broad and comprehensive, covering women at all life stages, from infancy throughout adulthood. Family physicians can fulfill the role of a PCMH providing continuity and coordination of care, and collaboration. Family physicians can impact preconception, prenatal, and postpartum care and are experienced in caring for the chronic conditions which the women in our community face. They also have the unique opportunity to provide "well- family care" by incorporating well-woman care into well-child visits. Family physicians have played, and will continue to play, a vital and unique role in improving the health of this population by providing increased access to services and through ongoing collaboration with other medical specialties and health organizations. **NCMJ**

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REFERENCES

1 National Center for Health Statistics. *Visits to Primary Care Generalist and Specialist Physicians, by Selected Characteristics and Type of Physician: United States, Selected Years 1980–2006.* Health, United States, 2008. Table 95. Centers for Disease Control and Prevention website. http://www.cdc.gov/nchs/data/hus/hus08.pdf. Accessed July 27, 2009.

2 Family medicine program requirements. Accreditation Council for Graduate Medical Education website. http://www.acgme.org/acWebsite/RRC_120/120_prIndex.asp. Accessed July 27, 2009.

3 Cecil G. Sheps Center for Health Services Research. *Annual Profiles: 2007: 2007 Health Professionals—State and County Totals.* University of North Carolina at Chapel Hill. North Carolina Health Professions Data System website. http://www.shepscenter.unc.edu/hp/prof07.htm. Accessed July 27, 2009.

4 Rosenthal TC. The medical home: growing evidence to support a new approach to primary care. *J Am Board Fam Med.* 2008;21(5):427-440.

5 American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. *Joint Principles of the Patient-Centered Medical Home.* American Academy of Pediatrics medical home website. http://www.medicalhomeinfo.org/Joint%20Statement.pdf. Accessed July 30, 2009.

6 World Health Organization. *Core Health Data System—Glossary.* Pan American Health Organization website. http://www.paho.org/English/SHA/glossary.htm. Accessed July 30, 2009.

7 Infant mortality rate (deaths per 1,000 live births), linked files, 2003-2005. State Health Facts. Kaiser Family Foundation website. http://www.statehealthfacts.org/comparemaptable.jsp?ind=47&cat=2&sub=13&sort=a&rgnhl=35. Accessed July 20, 2009.

8 Selected vital statistics for 2007 and 2003-2007: North Carolina. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/vitalstats/volume1/2007/nc.html. Accessed July 27, 2009.

9 Shi L, Macindo J, Starfield B, et al. Primary care, infant mortality, and low birth weight in the states of the USA. *J Epidemiol Community Health.* 2004;58(5):374-380.

10 Unpublished data derived from the North Carolina Medical Board, 2009.

11 *PRAMS Fact Sheet: Unintended Pregnancies, March 2009.* North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/pdf/UnintendedPregnancies.pdf. Accessed July 30, 2009.

12 9.1: Increase the proportion of pregnancies that are intended. Healthy People 2010 website. http://www.healthypeople.gov/document/html/objectives/09-01.htm. Accessed July 27, 2009.

13 Fagan EB, Rodman E, Sorensen EA, Landis S, Colvin GF. A survey of mothers' comfort discussing contraception with infant providers at well-child visits. *South Med J.* 2009;102(3):260-264.

14 Recommendations to improve preconception health and health care—United States. *MMWR Morb Mortal Wkly Rep.* 2006;55(RR06);1-23.

15 2008 BRFSS survey results: North Carolina, healthy days—females. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2008/nc/female/menthlth.html. Accessed July 30, 2009.

16 Strosahl K. Integrating behavioral health and primary care services: the primary mental health care model. In: Blount A, ed. *Integrated Primary Care: The Future of Medical and Mental Health Collaboration.* New York, NY: W. W. Norton & Company; 1998:143.

17 2008 BRFSS survey results: North Carolina, derived variables and risk factors-females, body mass index grouping—underweight, recommended range, overweight and obese. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2008/nc/female/rf1.html. Accessed July 30, 2009.

18 Dobson AL, Hewson DL. Community Care of North Carolina—an enhanced medical home model. *NC Med J.* 2009;70(3):219-224.

19 Cherouny PH, Federico FA, Haraden C, Leavitt GS, Resar R. *Idealized Design of Perinatal Care.* Institute for Healthcare Improvement Series white paper. Cambridge, MA: Institute for Healthcare Improvement; 2005.

20 Bennett IM, Coco A, Anderson J, et al. Improving maternal care with a continuous quality improvement strategy: a report from the Interventions to Minimize Preterm and Low Birth Weight Infants through Continuous Improvement Techniques (IMPLICIT) Network. *J Am Board Fam Med.* 2009;22:380-386.

21 Advanced life support in obstetrics (ALSO). American Academy of Family Physicians website. http://www.aafp.org/online/en/home/cme/aafpcourses/clinicalcourses/also.html. Accessed August 17, 2009.

The Role of Specialists in Providing Preconception Health Care and Guidance to Women with Chronic Medical Conditions

M. Kathryn Menard, MD, MPH; William H. Goodnight, MD, MSCR

At the time pregnancy is recognized, the impact of many chronic medical conditions on the pregnancy may already be determined. Thus, effective reproductive life planning includes early and continuous risk assessment, health promotion, and medical and/or psychosocial intervention during the preconception period. An excellent opportunity for this screening and care occurs in the context of well woman care with a primary care provider or medical specialist. Complex medical, genetic, or reproductive health conditions are optimally addressed in the preconception period to improve pregnancy-related outcomes for the woman and her baby. Ideally, women with chronic medical conditions who are planning pregnancy should seek advice from an obstetric provider with expertise in the care of complicated pregnancies. They should learn what effect, if any, their condition or its treatment may have on pregnancy. Preconception counseling should also address the effect pregnancy may have on the natural history of medical conditions. If a woman chooses to postpone pregnancy, she should learn which contraceptive options are most compatible with her medical condition. Awareness of the reproductive desires of their patients places medical specialists and primary care providers in an optimal position to explore the impact of the patient's condition on a future pregnancy. Maternal fetal medicine specialists and obstetricians specializing in the care of complicated pregnancies are well-suited to provide additional counseling in this circumstance. This article will briefly review some of the most common chronic medical conditions for which preconception consultation with a pregnancy care specialist may be beneficial. Contraceptive strategies are also reviewed, and resources for more detailed information are referenced.

Ideally, women with chronic medical conditions who are planning pregnancy should seek advice from an obstetric provider with expertise in the care of complicated pregnancies.

Table 1 (page 446) highlights key points in preconception care and appropriate contraceptive options for women with selected chronic medical conditions. Contraception recommendations are based on World Health Organization (WHO) recommendations for a condition for which there is no restriction or where the advantages of the method generally outweigh the risks.[1] Methods are not recommended by WHO when potential risks outweigh benefits or where the condition represents an unacceptable health risk for that contraceptive method. Permanent sterilization is usually appropriate for all conditions based on maternal surgical risk.

Chronic hypertension (HTN) affects 3% of women of reproductive age.[2] Pregnancies complicated by chronic HTN may be associated with worsening hypertension, preeclampsia and eclampsia, cardiac decompensation, and renal deterioration. HTN can pose fetal risks that include preterm birth, intrauterine growth restriction, placental abruption, and fetal demise.[3] To predict the potential effect of pregnancy on a woman's health, women with chronic hypertension should be assessed for ventricular hypertrophy, renal disease, and retinopathy prior to pregnancy, as the presence of these complications worsens the prognosis of pregnancy. If there is any evidence of end organ effect, consultation with a maternal fetal medicine specialist prior to pregnancy is warranted. Angiotensin-converting enzymes inhibitors and angiotensin receptor blockers are contraindicated in pregnancy; thus

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Table 1.
Preconception Care and Appropriate Contraceptive Options for Women with Selected Chronic Medical Conditions

Medical Condition	Preconception Points	Contraception
All	■ Folic acid/PNV supplement ■ Achieve normal BMI ■ Update vaccine status/evaluate varicella/rubella immunity ■ MFM consultation for preconception counseling for high risk medical disorders ■ Genetic counselor consult for genetic diseases (PKU, sickle cell, cystic fibrosis)	
Chronic hypertension	■ Single agent, BP goal <150/100 ■ Assessment of baseline renal function ■ Discontinue ACE, ARB ■ Optimal medications: Ca blocker, methyldopa, beta-blocker (labetolol)	CC[a]; IUD; P; B
Dermatology	■ Acne—avoid conception on Isotretinoin ■ Avoid conception one to two years following Etretinate	CC; P; IUD; B
Diabetes	■ Baseline ophthalmology exam, renal function ■ HbgA1c < 6.5 ■ Discontinue ACE/ARB	CC[a]; IUD; B; P
HIV	■ Transmission counseling ■ Low viral load, HARRT after first trimester	CC; P; B; IUD (if no AIDS)
Inherited/acquired thrombophilia	■ Assess need for prophylaxis in pregnancy or postpartum period ■ Conversion from warfarin for chronic anticoagulation ■ Early identification of pregnancy	P; IUD; B
Malignancy	■ Achieve stable remission	IUD; B[b]
Obesity (BMI >30kg/m^2)	■ Diabetes screen ■ Cardiovascular screening/sleep apnea assessment ■ Weight reduction ■ Delay pregnancy one to two years following obesity surgery	CC; IUD; B; P
Phenylketonuria (PKU)	■ Diet with goal phenylalanine < 6mg/dl three months prior to conception	CC; IUD; P; B
Psychiatric disorders	■ Depression—avoid paroxitine, other SSRI preferred ■ Bipolar disorder—avoid carbamezapine/valproic acid; risk of postpartum psychosis	CC; IUD; P; B
Seizure disorder	■ Monotherapy ideal ■ Avoid carbamazepine, valproic acid if able ■ Avoid discontinuation of AED in early pregnancy ■ Folic acid supplement (4mg daily) prior to conception	CC[d]; P; IUD; B
Sickle cell disease	■ Genetic counseling for transmission ■ Baseline renal, pulmonary, cardiac function	CC[a]; P; B
SLE/rheumatologic disorders	■ Risk of PP flare ■ Baseline renal, CV function ■ Review teratogenicity of methotrexate or other medications ■ Achieve pregnancy following remission	IUD[c]; B; P
Structural cardiac lesions/ cardiac disease	■ NYHA > 2; left heart obstruction, prior cardiac event, ejection fraction < 40% high risk for cardiac event in pregnancy ■ Correction of structural lesion prior to conception ■ Baseline echo ■ Conversion from warfarin for chronic anticoagulation	CC[a]; IUD; P; B
Thyroid disorder	■ Euthyroid prior to conception ■ PTU preferred over methimazole ■ Avoid radioactive iodine ablation treatment six months prior to conception	CC; IUD; B; P

a Avoid in presence of chronic renal disease, coronary artery disease or CVS, smoking, age >35, BP >140/90, or BP not evaluable.
b Hormonal contraception possible, avoid in hormonal mediated malignancy.
c Avoid in presence of immunosuppressants.
d Certain anticonvulsants may reduce CC effectiveness.

KEY:
CC – combination estrogen/progesterone contraceptives (oral contraceptives, patch, ring, injectable)
P – progesterone only contraceptives (implantable, injection, progestin only pill)
IUD – intrauterine device (copper, levonorgestrel containing)
B – barrier (condom, diaphragm, cap)

conversion to other antihypertensive agents prior to conception is recommended. Combined hormonal contraceptives (CHC) should be used with caution in women with hypertension. Non-smoking women under age 35 with no evidence of end organ disease may be appropriate candidates for CHC, but they still require close monitoring. The copper intrauterine device (IUD) and progestin-only methods are appropriate for all women with hypertension.

The best example of preconception management of medical conditions directly improving pregnancy outcome is diabetes mellitus. One percent of pregnancies in the US are complicated by pregestational diabetes.[4] The National Ambulatory Medical Care Survey indicated that diabetes control in the preconception period could reduce the risk of pregnancy loss and malformations for approximately 113,000 births per year.[2] Women of reproductive age with diabetes should be counseled about the importance of preconception diabetes control. The health benefits of maximizing glucose control, maintaining optimal weight, following a regular exercise program, and adjusting necessary medication should be reviewed. These women should also be advised of the intense surveillance and monitoring required throughout pregnancy to achieve optimal pregnancy outcome. In the months before pregnancy, women with diabetes should demonstrate as near-normal glycemic control as possible for the purpose of decreasing the rate of congenital anomalies and spontaneous abortion. Those with suboptimal control of their diabetes should be encouraged to use effective birth control. Combined hormonal contraceptives can be used in the absence of vascular disease but should be used with caution if there is nephropathy, neuropathy, or retinopathy because of the theoretical increased risk of arterial thrombosis. The copper IUD or progestin-only methods can be used without restriction. Testing to detect prediabetes and type 2 diabetes in asymptomatic women should be considered in adults who are overweight or obese (BMI ≥ 25 kg/m^2) and who have one or more additional risk factors for diabetes, including a history of gestational diabetes.

Thyroid disease is the second most common endocrine disorder among women of reproductive age. Overt hypothyroidism occurs in 2.5% of pregnancies in the United States. It is associated with preeclampsia, preterm birth, low birth weight, and potential intellectual impairment in the offspring.[3] Uncontrolled hyperthyroidism is also associated with adverse maternal and fetal outcomes. Women with hypo- or hyperthyroidism should be counseled about the risk of these conditions and the importance of achieving optimal medical therapy prior to conception.[5] There are no special considerations about contraceptive methods among women with thyroid disease, unless it is complicated by hypertension.

Seizure disorder affects approximately 1% of the general population and approximately 0.5% of pregnancies.[3] Seizure disorder itself and antiepileptic medications (AEDs) can have serious impacts on pregnancy outcome. Women of reproductive age should be counseled about the risk of increased seizure frequency during pregnancy, the importance of seizure control prior to conception, and the risk of congenital anomalies associated with AEDs.[3] The teratogenic effect of AED therapy is greater with higher medication doses and polytherapy. The patient, her neurologist, and her obstetrical specialist would ideally collaborate in the preconception period with the goals of achieving seizure control—if possible, with monotherapy at the lowest possible AED dose—and insuring adequate (4mg daily) preconception folic acid supplementation. There are special considerations in choosing a contraceptive method for women with seizure disorders. Combined oral contraceptives do not exacerbate seizures; however, the AEDs that induce liver enzymes (e.g., phenytoin, carbamazepine, barbiturates, topiramate, and tiagabine) increase the risk of contraception failure.

While certain medical disorders can impact pregnancy outcome and maternal health during pregnancy, other inherited disorders can have implications for transmission of the disorder to the fetus. Disorders such as Huntington's disease, cystic fibrosis, and sickle cell disease have various patterns of inheritance. Preimplantation and antenatal diagnosis for these disorders is available. Referral to a genetic counselor prior to pregnancy can allow exploration of fetal risks and diagnostic options for potentially inheritable disorders.

With delay in the age of childbearing and improvement in the care of chronic medical disorders, more women with significant chronic diseases will be considering pregnancy. As control of these disorders prior to conception is associated with improved pregnancy outcomes, the role of the specialist and primary care providers will include:

- Inquiring about reproductive life plans.
- Discussing the importance of and options for contraception based on the medical disorder.
- Discussing the implications of the disease and medication on the pregnancy.
- Referring more complex issues to a maternal-fetal medicine specialist for collaborative preconception planning.

With coordination between primary care providers, medical specialists, and maternal-fetal medicine specialists, reproductive health planning can result in reduction of the risks of chronic medical conditions and ensure improved pregnancy outcomes. **NCMJ**

REFERENCES

1 WHO medical eligibility criteria for starting contraceptive methods. World Health Organization website. http://www.infoforhealth.org/pr/j44/j44who.shtml. Accessed October 9, 2009.

2 US Department of Health and Human Services, Health Resources and Service Administration, Maternal and Child Health Bureau. *Women's Health USA 2002.* Rockville, MD: US Dept of Health and Human Services; 2002.

3 Dunlop AL, Jack BW, Bottalico JN. The clinical content of preconception care: women with chronic medical conditions. *Am J Obstet Gynecol.* 2008;199(suppl 6):S310-S327.

4 American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists. Pregestational diabetes mellitus. *Obstet Gynecol.* 2005;105(3):675-685.

5 ACOG Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists. Thyroid disease in pregnancy. *Obstet Gynecol.* 2002;100(2):387-396.

Promoting Healthy Weight in Women:
What the Physician Can Do to Help

Anna Maria Siega-Riz, PhD; Corrine Giannini, RD, LDN

Overweight and obesity in women of childbearing age has grown to an epidemic proportion. The latest data from the National Health and Nutrition Examination Survey (NHANES) from 2005-2006 indicate that 24% and 22.3% of non-pregnant women ages 20-29 and 30-39, respectively, are overweight (body mass index (BMI) 25-29.9 kg/m^2), and 23.8% and 37.7% are obese (BMI ≥ 30 kg/m^2).[1] Of further concern is the percentage of women who fall into the more severe obesity classes II and III, 11.4% and 4.4% respectively, a prevalence that has doubled since NHANES III, which was conducted from 1988-1994. Among women who become pregnant, the shift towards higher pregravid weight also appears to be evident. Data from the Pregnancy Risk Assessment Monitoring System (PRAMS) from nine states has shown that from 1993-1994 13% of women self-reported a BMI > 29 compared to 22% from 2002-2003.[2] Data from North Carolina PRAMS for 2003 indicate that about 26% of women reported a prepregnancy BMI of over 29.[3]

Overweight and obese women not only have the potential health risks associated with adult overweight and obesity such as cardiovascular disease and diabetes but may also suffer reproductive complications as a result of their weight. Such complications include higher rates of cesarean section,[4,5] gestational diabetes mellitus (GDM),[6] preeclampsia,[7] pregnancy-induced hypertension,[8] and postpartum anemia.[9] Of particular interest is the effect of a rapid weight gain. Hedderson and colleagues found a 2.5-fold increased risk for GDM among women who gain 2.3-10.0 kg (5-22 lbs) per year prepregnancy compared to those whose prepregnancy weight remained stable.[10] In a study of temporal changes in weight and risk for adverse pregnancy outcomes, Villamor and Cnattingius found a significant association between interconceptional weight gains of three or more BMI units and risk for GDM (OR 2.09 [95% CI, 1.68-2.61]); preeclampsia (OR 1.78 [95% CI, 1.52-2.08]); and gestational hypertension (OR 1.76 [95% CI, 1.39-2.23]).[11] With regards to infant outcomes, pregravid overweight and obesity has been independently associated with macrosomia,[12-14] certain birth defects,[15,16] infant mortality[17,18] and decreased initiation and duration of breastfeeding.[19,20] It has also been shown that maternal prepregnancy weight has an early and persistent effect on childhood overweight status as well as a dynamic effect on the process of overweight development.[21] Furthermore, a growing literature suggests that early parenting and feeding patterns are risk factors for childhood overweight and obesity. Breastfeeding appears to be protective for obesity, perhaps by reducing the early introduction of solids and other fluids, yet many mothers choose not to breastfeed. Controlling feeding styles may interfere with self-regulation of energy intake and overfeeding, while laissez-faire feeding styles may result in the very early introduction of foods that are high in sugar or fat.[22] Thus, mothers who are the primary caregivers of the family serve as role models and their feeding and shopping practices have important implications for the lives of their children.

Overweight and obese women not only have the potential health risks associated with adult overweight and obesity... but may also suffer reproductive complications as a result of their weight.

There is well-supported evidence to suggest that overweight and obesity in pregnancy carries increased risks for women during gestation as well as risks for the future health

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of the child, or in public health terms, the health of the next generation. These observations compel us to ask the important question of how and when to intervene to prevent overweight and obesity in order to optimize reproductive and individual health for both the mother and child.

Many secular changes in the last 30 years are linked to increasing obesity rates. Particularly, they are changes that have encouraged an increased intake of energy (food) and/or a decreased expenditure of energy (physical activity). In looking at the food part of this equation, we have seen individual or household changes such as more women working outside of the home, an increase in restaurant meals, and a decreased value on growing and cooking food. Environmentally, we have seen drastic changes in our food system such as larger portion sizes, increased availability and lower costs for poor quality food, and more sophisticated food marketing and advertising for highly processed food products. These and many other powerful external influences have added up over time to create an environment that is not supportive of healthful eating.[23]

Overweight women often look to their doctors for weight management advice. Most physicians are aware of the increase in overweight and obesity, recognize it as an important health risk, and have incorporated some initiatives into their practices for addressing overweight in women. Unfortunately, most of these initiatives are unsuccessful. Partly to blame is the current fragmented health care system which does not allow for preventive or continuous care, little to no health insurance reimbursement, and limited time available for weight management counseling. A health care system that supports pre-, inter-, and postconception health[24] will likely make it easier to manage weight in women and is an effort worth advocating and supporting.

Start the Healthy Weight Conversation Early

Weight is not often addressed until a patient is quite overweight or obese, even though preventing weight gain or encouraging a 5-10 pound weight loss is much easier than promoting a substantial weight loss. It is possible this discussion is delayed because overweight can be a difficult topic to address with women. Our culture idealizes thin women, and physicians may appear judgmental when addressing healthy weight with overweight women. Patients, in turn, often feel responsible for and/or ashamed of their weight status. Furthermore, an overweight physician may be even more reluctant to start a conversation about healthy weight.

Fortunately, body mass index can be used to objectively discuss the health risks (including reproductive complications) of overweight and obesity in women.[a] Sharing the BMI measurement with the patient is an easy introduction to a conversation about healthy weight goals.

Provide Weight Gain Guidance During Pregnancy

More women are entering pregnancy overweight, gaining too much weight during pregnancy, and failing to return to pre-pregnancy weight after delivery. Weight gain guidance is typically not shared with prenatal patients and yet pregnancy can be the beginning of long-term obesity for many women. It is critical to inform women of the recommended weight gain ranges recently updated by the Institute of Medicine of the National Academies (IOM).[25] These are 28-40 lbs for underweight women, 25-35 lbs for normal weight women, 15-25 lbs for overweight women, and 11-20 lbs for obese women.[25] Informing women in the earliest prenatal care encounter, monitoring weight gain closely and continuing discussions about healthy weight gain into the postpartum period are also recommended by the new IOM report as important implementation guidelines.

Don't Blame the Overweight Patient

Traditional weight management efforts rely on diet and/or exercise prescriptions and the general expectation for patients to be individually responsible for changing current lifestyle habits to affect their weight status. Patients who cannot adhere to this weight gain guidance are often frustrated and ashamed of their lack of willpower and often feel blame for their perceived personal failure. But the rise in obesity coincides with environmental changes that make it difficult for people to maintain a healthy weight, not a decrease in responsibility and the will power capacity of women. Educating patients about the influence of powerful food system changes, such as the overproduction of unhealthy foods, easy access to low cost high calorie food, and advertising messages that influence the purchase of highly processed convenience and snack foods in lieu of simple, whole foods, helps to shift the blame from the individual to the environment—where it belongs. Patients need to learn about the many existing environmental pressures and distorted food values that support unhealthy choices instead of healthy choices. The widely accepted Social-Ecological Model for Levels of Influence suggests more successful behavior change when levels beyond the individual—public policy, community, organizational, and interpersonal—are also addressed.[26] Educating and empowering women to challenge the current food system has the potential for positively influencing their food choices.[27]

Provide Simple and Consistent Messages

The North Carolina Eat Smart, Move More campaign highlights seven healthy behavior strategies derived from the Centers for Disease Control and Prevention. Many of the

a A quick tool for BMI calculation can be found at: http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/english_bmi_calculator/bmi_calculator.html.

strategies are evidenced-based and can be utilized by physicians to provide to patients. They are simple messages such as "Prepare more meals at home," "Right-size your portions," and "Breastfeed your baby." Many overweight patients can easily identify with the strategies and can adopt those most relevant to them. Furthermore, statewide and national efforts to promote the same messages will assist patient weight management efforts by elevating the importance of the messages and enhancing retention of the messages. Information and materials are easily obtained from the Eat Smart, Move More professional and consumer websites.[28,29] Referral to a dietitian for more extensive nutrition counseling can further tailor messages for patients. Also, adding the recommendation for patients to keep a simple food diary can contribute to two-fold increase in weight loss, as compared to those who don't keep a food diary.[30]

Use Clinic Space to Promote Healthy Weight

Clinicians and managers should take advantage of patient waiting areas and exam rooms to advertise good health. Remove snack vending machines and add healthy weight posters, magazines, patient education materials, a weight scale and BMI chart, community activity sign-up sheets, local walking maps, and patient surveys about community resources. Clinic workspace areas, visible to patients, free of soda cans and fast food wrappers, also contribute to the physician's image as a powerful healthy role model.

Share the Care and Follow-Up

Obviously, physicians are not solely responsible for healthy weight in women. After assessing weight status and communicating health risk, further education is needed concerning environmental influences, behavior change strategies, and the skills necessary to achieve those strategies. Responsibility can then be shared with or transferred to other health care professionals such as dietitians and/or community organizations. Physicians can identify community resources that promote and support healthy lifestyles and refer patients. Community resource examples include skill-building activities such as cooking classes and gardening opportunities; healthy food availability such as local farmers' market locations and seasonal produce lists; and physical activity opportunities such as local parks and recreation program information and walking or trail maps. Additionally, since women often serve as strong supports for one another, developing or referring to group health management models may be promising for women interested in losing weight.[31] Encouraging regular follow-up visits to provide feedback for receptive patients actively engaged in managing their weight is the final step.

As dictated by the socio-ecological model, recommendations are available for promoting environmental change that support individual healthy living such as "Community Strategies and Measurements to Prevent Obesity in the US" from the CDC[32] (see Figure 1, page 452) and the *North Carolina Preconception Health Strategic Plan*.[33] North Carolina also has positive food system initiatives being developed to promote statewide sustainable food policies and community gardening efforts. Furthermore, local North Carolina communities are becoming increasingly involved and are designing programs to overcome healthy lifestyle barriers specific to their region. Physicians that are aware of these initiatives are best equipped to contribute to the challenge of decreasing overweight and obesity in women.

Addressing weight issues specifically for women of childbearing age has been overlooked and deserves more attention. Overweight status in women can negatively affect their health before, during, and after pregnancy, as well as the health of their children. Simple steps that can be incorporated into current practice to enhance weight management efforts include:

- Routinely calculate BMI.
- Be nonjudgmental and start the healthy weight conversation early.
- Provide pregnancy weight gain recommendations to prenatal patients.
- Educate patients about negative environmental food system pressures.
- Provide simple and consistent messages and tools such as a food diary.
- Refer to a dietitian for more extensive nutrition counseling.
- Utilize your clinic setting to promote healthy behaviors.
- Share the care by identifying community resources and appropriate referrals for patients.
- Provide patient follow-up and feedback.

Women who understand both the health risks of obesity and the current inadequacies of the food system can likely encourage advocacy for broad food system change, as they are often gatekeepers for family meals.[34] If physicians contribute to educating and empowering women to manage their weight, they can conceivably influence environmental changes that can have far-reaching health benefits for the entire population. **NCMJ**

Figure 1.
Diet Related Community Strategies to Prevent Obesity

- **Communities should increase availability of healthier food and beverage choices or restrict less healthy foods and beverages in public service venues.**
- **Communities should improve availability of affordable healthier food and beverage choices in public service venues.**
- **Communities should institute smaller portion size options in public service venues.**
- **Communities should improve geographic availability of supermarkets in underserved areas.**
- **Communities should provide incentives to retailers to locate in and/or offer healthier food and beverage choices in underserved areas.**
- **Communities should improve availability of mechanisms for purchasing foods from farms.**
- **Communities should provide incentives for the production, distribution, and procurement of foods from local farms.**
- **Communities should limit advertising of less healthy foods and beverages.**
- **Communities should discourage consumption of sugar-sweetened beverages.**
- **Communities should increase support for breastfeeding.**

REFERENCES

1 Sharma A. Trends in the distribution of Body Mass Index among women of reproductive age. Presentation to: The Institute of Medicine of the National Academies and National Research Council Meeting #4: Implications of Weight Gain for Pregnancy Outcomes; June 5, 2008; Washington, DC.

2 Kim SY, Dietz PM, England L, Morrow B, Callaghan WM. Trends in pre-pregnancy obesity in nine states, 1993-2003. *Obesity.* 2007;15(4):986-993.

3 North Carolina State Center for Health Statistics. Pregnancy Risk Assessment Monitoring System (PRAMS) 2003 data. Internal data run.

4 Vahratian A, Siega-Riz AM, Zhang J, Troendle J, Savitz D. Maternal pre-pregnancy overweight and obesity and the risk of primary cesarean delivery in nulliparous women. *Ann Epidemiol.* 2005;15(7):467-474.

5 Vahratian A, Zhang J, Troendle J, Savitz D, Siega-Riz AM. Maternal pre-pregnancy overweight and obesity and the pattern of labor progression in term nulliparous women. *Obstet Gynecol.* 2004;104(5 pt 1):943-951.

6 Torloni MR, Betrán AP, Horta BL, et al. Prepregnancy BMI and the risk of gestational diabetes: a systematic review of the literature with meta-analysis. *Obes Rev.* 2009;10(2):194-203.

7 Bodnar LM, Catov JM, Klebanoff MA, Ness RB, Roberts JM. Prepregnancy body mass index and the occurrence of severe hypertensive disorders of pregnancy. *Epidemiology.* 2007;18(2):234-239.

8 Samuels-Kalow ME, Funai EF, Buhimschi C, et al. Prepregnancy body mass index, hypertensive disorders of pregnancy, and long-term maternal mortality. *Am J Obstet Gynecol.* 2007;197(5):490.e1-6.

9 Bodnar LM, Scanlon KS, Freedman DS, Siega-Riz Am, Cogswell ME. High prevalence of postpartum anemia among low-income women in the United States. *Am J Obstet Gynecol.* 2001;185(2):438-443.

10 Hedderson MM, Williams MA, Holt VL, Weiss NS, Ferrara A. Body mass index and weight gain prior to pregnancy and risk of gestational diabetes mellitus. *Am J Obstet Gynecol.* 2008;198(4):409.e1-7.

11 Villamor E, Cnattingius S. Interpregnancy weight change and risk of adverse pregnancy outcomes: a population-based study. *Lancet.* 2006;368(9542):1164-1170.

12 Ehrenberg HM, Mercer PM, Catalano P. The influence of obesity and diabetes on the prevalence of macrosomia. *Am J Obstet Gynecol.* 2004;191(3):964-968.

13 Surkan PJ, Hsieh CC, Johansson AL, Dickman PW, Cnattingius S. Reasons for increasing trends in large for gestational age births. *Obstet Gynecol.* 2004;104(4):720-726.

14 Castro LC, Avina RL. Maternal obesity and pregnancy outcomes. *Curr Opin Obstet Gynecol.* 2002;14(6):601-606.

15 Watkins ML, Rasmussen SA, Honein MA, Botto LD, Moore CA. Maternal obesity and risk for birth defects. *Pediatrics.* 2003;111(5):1152-1158.

16 Waller DK, Shaw GM, Rasmussen SA, et al. National Birth Defects Prevention Study. Prepregnancy obesity as a risk factor for structural birth defects. *Arch Pediatr Adolesc Med.* 2007;161(8):745-750.

17 Cnattingius S, Bergstrom R, Lipworth L, Kramer MS. Prepregnancy weight and the risk of adverse pregnancy outcomes. *N Engl J Med.* 1998;338(3):147-152.

18 Chen A, Feresu A, Fernandez C, Rogan WJ. Maternal obesity and the risk of infant death in the United Status. *Epidemiol.* In press. [Epub ahead of print.]

19 Li R, Jewell S, Grummer-Strawn L. Maternal obesity and breast-feeding practices. *Am J Clin Nutr.* 2003;77(4):931-936.

20 Hilson JA, Rasmussen KM, Kjolhede CL. Excessive weight gain during pregnancy is associated with earlier termination of breast-feeding among white women. *J Nutr.* 2006;136(1):140-146.

21 Salsberry PJ, Reagan PB. Dynamics of early childhood overweight. *Pediatrics.* 2005;116(6):1329-1338.

22 Lederman SA, Akabas SR, Moore BJ, et al. Summary of the presentations at the Conference on Preventing Childhood Obesity, December 8, 2003. *Pediatrics.* 2004;114(4):1146-1173.

23 Schwartz MB, Brownell KD. Actions necessary to prevent childhood obesity: creating the climate for change. *J Law Med Ethics.* 2007;35(1):78-89.

24 Johnson K, Posner SF, Biermann J, et al; CDC/ATSDR Preconception Care Work Group; Select Panel on Preconception Care. Recommendations to improve preconception health and health care—United States. A report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. *MMWR Recomm Rep.* 2006;55(RR-6):1-23.
25 Institute of Medicine of the National Academies. *Weight Gain During Pregnancy: Reexamining the Guidelines.* Washington, DC: National Academies Press; 2009.
26 AMCHP/CityMatch Women's Health Partnership. *Promoting Healthy Weight Among Women of Reproductive Age.* Association of Maternal and Child Health Programs website. http://www.amchp.org/publications/WomensHealth/Documents/Healthy%20Weight.pdf. Accessed August 13, 2009.
27 American Dietetic Association Sustainable Food System Task Force. *Healthy Land, Healthy People: Building a Better Understanding of Sustainable Food Systems for Food and Nutrition Professionals.* Chicago, IL: American Dietetic Association; 2007. http://www.hendpg.com/files/Sustainable_Primer.pdf. Accessed August 13, 2009.
28 Eat Smart Move More North Carolina consumer website. http://www.myeatsmartmovemore.com/. Accessed August 13, 2009.
29 Eat Smart Move More North Carolina professional website. http://www.eatsmartmovemorenc.com. Accessed August 13, 2009.
30 Keep a food diary to double weight loss. Published July 8, 2008. RedOrbit website. http://www.redorbit.com/news/health/1467145/keep_a_food_diary_to_double_weight_loss/ Accessed August 13, 2009.
31 Klima C, Norr K, Vonderheid S, Handler A. Introduction of CenteringPregnancy in a public health clinic. *J Midwifery Womens Health.* 2009;54(1):27-34.
32 Khan LK, Sobush K, Keener D, et al; Centers for Disease Control and Prevention. Recommended community strategies and measurements to prevent obesity in the United States. *MMWR Recomm Rep.* 2009;58(RR-7):1-26.
33 Women's Health Branch, North Carolina Division of Public Health. *North Carolina Preconception Health Plan: September 2008-September 2013.* Raleigh, NC: North Carolina Dept of Health and Human Services; 2008. http://whb.ncpublichealth.com/Manuals/PreconceptionHealthStrategicPlan-3-6-09.pdf. Accessed August 14, 2009.
34 Anderson LM, Scrimshaw SC, Fullilove MT, Fielding JE; Task Force on Community Preventive Services. The Community Guide's model for linking the social environment to health. *Am J Prev Med.* 2003;24(3 suppl):12-20.

The Problems No One Wants to See:
Mental Illness and Substance Abuse Among Women of Reproductive Age in North Carolina

Laura Louison, MSW, MSPH; Sherri L. Green, PhD, MSW, LCSW; Sheila Bunch, PhD, MSW, LCSW; Anna Scheyett, PhD, MSW, LCSW

High rates of infant mortality and morbidity persist in North Carolina despite efforts at the state and federal level to improve women's physical health and access to prenatal care in order to promote healthy birth outcomes. While infant mortality and low birth weight rates have declined over the past decade, more focused attention to women's behavioral health, specifically mental illness and substance use disorders, is needed to further close this gap. Women's mental health and substance use are often overlooked as determinants of both preconceptional health and pregnancy outcomes. This is regrettably shortsighted: addiction and mental illness not only pose risks to prenatal development and birth outcomes but also impair women's ability to be safe and sober mothers. Promoting positive birth outcomes requires that health care providers, policymakers, and communities in North Carolina collaborate to create a system of comprehensive care in order to support women's recovery from mental illness and substance abuse.

Prevalence

Though overall rates of having any mental disorder are similar for men and women, the prevalence of specific disorders vary greatly by gender. According to the National Household Survey on Drug Use and Health, in 2007 the prevalence of serious mental illness (defined as a diagnosable mental, behavioral, or emotional disorder with substantial functional impairment) was higher in women, particularly those of reproductive age, than in men: 13.5% in women versus 10% in men for ages 18–25 and 10.1% versus 5.5% for ages 26–49.1 More women, 11.6% versus 7.7%, suffered mood disorders.[1] Substance use disorders are less common among women, with overall prevalence of substance use disorders of 5.7% among women as compared to 12.3% among men.[1]

Mental illness and substance use disorders are associated with significant morbidity, mortality, and disability. One in four individuals visiting a health care provider has at least one mental or behavioral disorder, yet these often go undiagnosed and untreated.[2] In the United States, only about one in four individuals who need substance abuse treatment receive it.[3] Failure to diagnose and treat has serious negative consequences. Mental illnesses are associated with increased risk of cardiovascular disease and diabetes and an increase of high-risk behaviors associated with substance abuse or HIV transmission.[2] Women who abuse substances are at increased risk for a variety of adverse health outcomes, including breast cancer, infertility, mental illness, unintentional injuries, suicide, and intimate partner violence.[4-9] This relationship between mental health, and substance use disorders, and risk behaviors is supported by data from the North Carolina Treatment Outcomes and Program Performance System (NC–TOPPS), a state reporting system that captures service and

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descriptive data for a subset of individuals admitted to mental health and substance abuse treatment programs that receive public funding.[a] Of the NC-TOPPS subset of 25,721 women ages 18 years and older who were admitted to treatment during state fiscal year (SFY) 2008-2009, one-third (33%) reported one or more visits to a hospital emergency department in the three months prior to admission to treatment, and 17% reported having used a needle to inject drugs at some point in their lives. Women in this sample reported high rates of suicidal ideation (33%) or suicide attempts (32%); both were more frequently reported by women with concurrent mental health and substance use disorders (45% and 46% respectively).[b]

Gender is an important factor in both mental illness and substance use disorders and their related consequences. Women may present with different symptoms or patterns, may respond to psychotropic medications differently, and may have different courses of illness as compared to men.[10-12] Women have differing risk factors for mental illnesses based on biology or sociocultural experience, including pregnancy and vulnerability to sexual assault or other traumatic experience. Research suggests that 24% to 58% of women seeking substance abuse treatment have post-traumatic stress disorder (PTSD).[13-15] Histories of domestic violence and sexual abuse are the most common predictors of PTSD for women, and without targeted intervention, women with PTSD are at high risk for relapse and are less likely to complete treatment.[14,16-21] In North Carolina, over half of all women receiving services through the North Carolina Perinatal and Maternal Substance Abuse Initiative reported having experienced domestic violence (55%) and sexual abuse (52%) at some time in their lives.[b,c]

Impact on Pregnancy and Parenting

Substance abuse and mental illness, particularly depression, have significant effects on pregnancy. Postpartum blues occur in up to 85% of women, postpartum depression in 12% to 13%, and postpartum psychosis in up to 0.1%.[10] For women with a mental health disorder, treatment with psychotropic medication during pregnancy is complex and not without risk; poor neonatal adaptability has been found when pregnant women were given selective serotonin reuptake inhibitors (SSRIs) or tricyclic antidepressants (TCAs). A recent study shows a higher risk of preterm birth in both women with untreated depression and women treated with SSRI antidepressants.[22] Medications for bipolar disorder carry risks for serious birth defects, as may benzodiazepines and other anxiolytics.[10,22] Thus, the care of women with a mental illness requiring medication during pregnancy must balance risk to the woman and fetus as a result of untreated symptomatology.

The negative impact of substance use during pregnancy is widely known, yet rates of substance use during pregnancy still continue to be high.[1,23-28] National rates of illicit drug use in pregnant women in 2007 averaged over 5%, and an estimated 11.6% of pregnant women used alcohol.[1] Prenatal alcohol and drug exposure is strongly associated with infant mortality and morbidity, including elevated risk of low birth weight and preterm birth.[23-25] Subsequent care for children exposed to alcohol and drugs in utero has significant financial costs as a result of hospitalizations and early intervention services.[26-28]

Many women in North Carolina's publicly-supported mental health and substance abuse services are mothers. In the NC–TOPPS sample, 49% of women overall reported having children under the age of 18, and 3.1% reported being pregnant. A higher percentage of women admitted to substance abuse treatment in the sample were mothers (61%), and over half of all pregnant women admitted were in substance abuse treatment.[b] Substance abuse treatment utilization is correlated with improved birth outcomes for women in comparison with those who do not attend treatment.[29] Appropriate mental health and substance abuse services for mothers can have positive and long-reaching implications for their children and support families in breaking intergenerational patterns.

Identification of Substance Abuse and Mental Health Problems in Women of Reproductive Age

Women who abuse substances or struggle with mental health disorders face significant social stigma. Fear of hospitalization, legal reprisal, or child protective services involvement often deter women from seeking treatment.[30-31] Health care providers are uniquely positioned to address this fear with patients by serving as compassionate links to mental health and substance abuse treatment.

Because of their ability to assist women by addressing issues of substance use and mental health disorders, obstetrician-gynecologists have an ethical obligation to provide screening for these problems.[23,32] We believe the evidence commands a similar obligation for other providers of women's health services. Existing clinical guidelines for substance abuse and mental health screening pertain chiefly to women who are pregnant. However, women of reproductive age should also be

a The web-based NC-TOPPS system collects data for adults and children ages six years and above who have been formally admitted to a Local Management Entity with a unique identifier and have begun receiving qualifying mental health and/or substance abuse services from a publicly-funded source. Some populations who receive mental health treatment are not reflected in this data. For more information, see http://www.ncdhhs.gov/mhddsas/nc-topps/index.htm.

b S. Green, unpublished data, 2009. Analysis of a subset of NC-TOPPS consumer data from state fiscal year 2007–2008 of women ages 18 and older admitted to substance abuse treatment in North Carolina. Conducted as part of an external evaluation of the North Carolina Perinatal and Maternal Substance Abuse Initiative.

c Based on SFY 2007-2008 annual reports submitted to the NC Division of MH/DD/SAS from 21 providers in the North Carolina Perinatal and Maternal Substance Abuse Initiative.

screened for substance abuse and mood disorders as part of pre- and interconceptional health care.[33] According to data from the Pregnancy Risk Assessment Monitoring System (PRAMS), from 2004 through 2006 approximately 45% of live births in North Carolina were the result of unintended pregnancies.[34] Substance abuse and mental health screening in prenatal care settings alone does not address the needs of women who may not plan to become pregnant and inadvertently delay seeking prenatal care. These women may not seek care from an obstetrician-gynecologist but may utilize primary or other health care services. Substance abuse and mental health screening in primary care settings is therefore essential to promote positive reproductive outcomes for all women.[33]

The American College of Obstetricians and Gynecologists advocates universal screening during pregnancy for substance abuse and mood disorders, ideally using a screening tool validated for use during pregnancy.[23,32] Positive screening results should be addressed individually by the health care provider in a brief educational intervention and appropriate referrals to treatment. Such interventions must respect women's autonomy and be provided in non-punitive environments.[23] A variety of studies document the efficacy of supportive brief interventions and referrals in prenatal care. Women who receive an assessment and brief intervention for alcohol and drug use in health care or social services settings are more likely to report abstinence or reduce their use during pregnancy.[35-38]

The implementation of standardized mental health and substance abuse screening in health care settings remains far from universal. A variety of barriers prevent health care professionals from conducting universal screening and interventions, including time constraints, lack of training, misinformation, and limited community referrals.[30,39,40] Prenatal care screening rates are high in North Carolina, but there is room for improvement. NC PRAMS 2007 data revealed that nearly 80% of women reported that a doctor, nurse, or other health care worker talked with them during a prenatal care visit about how using alcohol (75.3%) or illegal drugs (67.7%) could affect their infants, and over 75% of women received education on postpartum depression as part of prenatal care. It remains unclear whether providers use appropriate instruments for screening, and little is known about screening practices in primary care or hospital settings.[41]

Services for Women in North Carolina

Women of childbearing age who struggle with substance use and mental health disorders require a comprehensive service-delivery system that enhances and sustains recovery. These women generally experience clinical challenges related to parenting, intimate partner violence, social stigma, and lack of familial and community supports, and many have endured lifetimes of trauma and social ills that may predispose them to substance use and mental health disorders. Women require a comprehensive system of care that exemplifies collaborative partnerships and meets women's unique needs. Such a system should emphasize gender-specific and holistic substance abuse and mental health treatment, with social and medical ancillary services including childcare and transportation to increase women's access to treatment.[31] Cultural barriers to access and utilization of services should also be emphasized to reduce health disparities. Receiving gender-specific substance abuse treatment positively impacts women's length of stay in treatment and the likelihood of remaining abstinent after treatment.[17-19,31,38]

Several divisions within the North Carolina Department of Health and Human Services have program initiatives to meet the needs of substance dependent women. The Division of Social Services has recognized the linkages between child welfare and substance abuse with programs such as the Work First/Child Protective Services Substance Abuse Initiative. The Women's Health Branch in the Division of Public Health emphasizes prevention, preconceptual health, and infant mortality reduction initiatives. The majority of the services are provided by the North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (NC MHDDSAS). Block grant requirements made effective March 31, 1993, required states to expend not less than 5% of their 1993 Substance Abuse Prevention and Treatment Block Grants to "increase availability of treatment services designed for pregnant women and women with dependent children."[42] Women in North Carolina who are pregnant and using substances can access gender-specific treatment through the NC MHDDSAS Perinatal and Maternal Substance Abuse Initiative. The Initiative is composed of 21 specialized programs for substance abusing pregnant and parenting women and their children that provide comprehensive gender-specific substance abuse treatment including outpatient and residential services.

Although NC MHDDSAS estimates that there is greater unmet need for treatment among individuals with substance use disorders than individuals with mental illness in the state,[d] gender-specific mental health services in the state have not received similar attention. However, the growing emphasis in North Carolina on dual diagnosis treatment and trauma-informed care, in addition to the development of new programs such as the Perinatal Mood Disorders Inpatient Program at the University of North Carolina Chapel Hill Center for Women's Mood Disorders, offers hope that outcomes will improve for the most vulnerable of women with mental health and substance use disorders and their families.

Supporting healthy families in North Carolina requires state and community recognition that a woman's physical and mental health and the health of her children are inextricably linked. It is our hope that North Carolina will continue to

d S. Clark, operations manager, North Carolina Division of Health and Human Services. Oral communication, August 2009.

promote women's health and strive toward reducing infant mortality and morbidity by supporting women's recovery from mental health and substance use disorders. Such support should include enhanced universal screening for mental health and substance use disorders among women of reproductive age in public and private health care settings and an integrated system of care utilizing evidence-based gender-specific treatment for women who require it. **NCMJ**

REFERENCES

1 Substance Abuse and Mental Health Services Administration. *National Survey on Drug Use and Health.* Rockville, MD: US Dept of Health and Human Services; 2007.
2 Stewart DE, Ashraf IJ, Munce SE. Women's mental health: a silent cause of mortality and morbidity. *Int J Gynaecol Obstet.* 2006;94(3):343-349.
3 World Health Organization. The global burden of disease: substance abuse. World Health Organization website. http://www.who.int/substance_abuse/facts/global_burden/en/index.html. Accessed August 10, 2009.
4 Coker AL, Smith PH, McKeown RE, King MJ. Frequency and correlates of intimate partner violence by type: physical, sexual, and psychological battering. *Am J Pub Health.* 2000;90(4):553-559.
5 McCauley J, Kern DE, Kolodner K, et al. The battering syndrome—prevalence and clinical characteristics of domestic violence in primary-care internal-medicine practices. *Ann Intern Med.* 1995;123(10):737-746.
6 Martin SL, English KT, Clark KA, Cilenti D, Kupper LL. Violence and substance use among North Carolina pregnant women. *Am J Pub Health.* 1996;86(7):991-998.
7 Grodstein F, Goldman MB, Cramer DW. Infertility in women and moderate alcohol use. *Am J Pub Health.* 1994;84(9):1429-1432.
8 Kelly TM, Lynch KG, Donovan JE, Clark DB. Alcohol use disorders and risk factor interactions for adolescent suicidal ideation and attempts. *Suicide Life Threat Behav.* 2002;31(2):181-193.
9 Helzer JE, Pryzbeck TR. The co-occurrence of alcoholism with other psychiatric disorders in the general population and its impact on treatment. *J Stud Alcohol.* 1988;49(3):219-224.
10 Burt V, Stein K. Treatment of women. In: Hales R, Yudofsky R, Gabbard G, eds. *The American Psychiatric Publishing Textbook of Psychiatry.* 5th ed. Washington, DC: American Psychiatric Publishing, Inc.; 2007:1489-1522.
11 Hommer DW, Momenan R, Kaiser E, Rawlings RR. Evidence for a gender-related effect of alcoholism on brain volumes. *Am J Psychiatry.* 2001;158(2):198-204.
12 Greenfield SF. Women and alcohol use disorders. *Harvard Rev Psychiatry.* 2002;10(2):76-85.
13 Dansky B, Saladin M, Brady K, et al. Prevalence of victimization and posttraumatic stress disorder among women with substance use disorders: a comparison of telephone and in-person assessment samples. *Subst Use Misuse.* 1995;30(9):1079-1099.
14 Moylan, PL, Jones HE, Haug NA, Kissin WB, Svikis DS. Clinical and psychosocial characteristics of substance-dependent pregnant women with and without PTSD. *Addict Behav.* 2001;26(3):469-474.
15 Najavits LM, Weiss RD, Shaw SR, Muenz LR. Seeking safety: outcome of a new cognitive-behavioral psychotherapy for women with posttraumatic stress disorder and substance dependence. *J Trauma Stress.* 1998;11(3):437-456.
16 Back SE, Dansky BS, Carroll KM, Foa EB, Brady KT. Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: description of procedures. *J Subst Abuse Treat.* 2001;21(1):35-45.
17 Brown VB, Melchior LA, Panter AT, Slaughter R, Huba GJ. Women's steps of change and entry into drug abuse treatment: a multidimensional Stages of Change model. *J Subst Abuse Treat.* 2000;18(3):231-240.
18 Camp JM, Finkelstein N. Parenting training for women in residential substance abuse treatment. *J Subst Abuse Treat.* 1997;14(5):411-422.
19 Cosden M, Cortez-Ison E. Sexual abuse, parental bonding, social support, and program retention for women in substance abuse treatment. *J Subst Abuse Treat.* 1998;16(2):149-155.
20 Killeen T, Brady KT. Parental stress and child behavioral outcomes following substance abuse residential treatment. *J Subst Abuse Treat.* 2000;19(1):23-29.
21 Palacios WR, Urmann CF, Newel R, Hamilton N. Developing a sociological framework for dually diagnosed women. *J Subst Abuse Treat.* 1999;17(1-2):91-102.
22 Wisner KL, Sit DKY, Hanusa BD, et al. Major depression and antidepressant treatment: impact on pregnancy and neonatal outcomes. *Am J Psychiatry.* 2009;166(5):557-566.
23 American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 422: at-risk drinking and illicit drug use: ethical issues in obstetric and gynecologic practice. *Obstet Gynecol.* 2008;112(6):1449–1460.
24 Dew PC, Guillory VJ, Okah FA, Cai J, Hoff GL. The effect of health compromising behaviors on preterm births. *Matern Child Health J.* 2007;11(3):1092-7875.
25 Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. *Lancet.* 2008;371(9606):75-84.
26 National Abandoned Infants Assistance Resource Center. *Literature Review: Effects of Prenatal Substance Exposure on Infant and Early Childhood Outcomes.* Berkeley, CA: University of California at Berkeley; 2006. http://aia.berkeley.edu/media/pdf/prenatal_substance_exposure_review.pdf. Accessed August 20, 2009.
27 Joyce T, Racine AD, McCalla S, Webeh H. The impact of prenatal exposure to cocaine on newborn costs and length of stay. *Health Serv Res.* 1995;30(2):341-58.
28 Phibbs CS, Bateman DA, Schwartz RM. The neonatal costs of maternal cocaine use. *JAMA.* 1991;266(11):1521-1526.
29 Whiteside-Mansell L, Crone CC, Conners NA. The development and evaluation of an alcohol and drug prevention and treatment program for women and children. *J Subst Abuse Treat.* 1999;16(3):265-275.
30 Herzig K, Huynh D, Gilbert P, Danley DW, Jackson R, Gerbert B. Comparing prenatal providers approaches to four different risks: alcohol, tobacco, drugs, and domestic violence. *Women Health.* 2006;43(3):83-101.
31 Ashley OS, Marsden ME, Brady TM. Effectiveness of substance abuse treatment programming for women: a review. *Am J Drug Alch Abuse.* 2003;29(1):19-53.
32 American College of Obstetricians and Gynecologists Committee on Health Care for Underserved Women. ACOG Committee Opinion No. 343: psychosocial risk factors: perinatal screening and intervention. *Obstet Gynecol.* 2006;108(2):469-477.

33 Johnson K, Posner SF, Biermann J; CDC/ATSDR Preconception Care Work Group; Select Panel on Preconception Care. Recommendations to improve preconception health and health care—United States. A report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. *MMWR Recomm Rep.* 2006;55(RR-6):1-23.
34 North Carolina State Center for Health Statistics. *North Carolina PRAMS Fact Sheet. March 2009. Unintended Pregnancies, 2004-2006 NC Pregnancy Risk Assessment Monitoring System (PRAMS).* Raleigh, NC: North Carolina Dept of Health and Human Services; 2009. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/pdf/UnintendedPregnancies.pdf. March 2009. Accessed August 20, 2009.
35 Chang G, McNamara TK, Orav EJ, Wilkins-Haug L. Brief intervention for prenatal alcohol use: the role of drinking goal selection. *J Subst Abuse Treat.* 2006;31(4):419-424.
36 Handmaker NS, Wilbourne P. Motivational interventions in prenatal clinics. *Alcohol Res Health.* 2002;25(3):219-229.
37 O'Connor MJ, Whaley SE. Brief intervention for alcohol use by pregnant women. *Am J Pub Health.* 2007;97(2):252-258.
38 Goler NC, Armstrong MA, Taillac CJ, Osejo VM. Substance abuse treatment linked with prenatal visits improves perinatal outcomes: a new standard. *J Perinatol.* 2008;28(9):597-603.
39 Diekman St, Floyd RL, Decoufle P, Schulkin J, Ebrahim SH, Sokol RJ. A survey of obstetrician-gynecologists on their patient's alcohol use during pregnancy. *Obstet Gynecol.* 2000;95(5):756-763.
40 Taylor P, Zaichkin J, Pilkey D, Leconte J, Johnson BK, Peterson AC. Prenatal screening for substance use and violence: findings from physician focus groups. *Matern Child Health J.* 2007;11(3):241-247.
41 LaRocco-Cockburn A, Melville J, Bell M, Katon W. Depression screening attitudes and practices among obstetrician-gynecologists. *Obstet Gynecol.* 2003;101(5):892-898.
42 Substance Abuse and Mental Health Services Administration, US Department of Health and Human Services. 45 CFR Part 96: Substance Abuse Prevention and Treatment Block Grants. *Fed Regist.* 1993;58(60):1921-1954.

Pills Are Not Enough:
The Case for Long-Acting Reversible Contraceptives—and How North Carolinians Can Benefit

Amy Bryant, MD; Cheryl L. Kovar, RN, MSN, CNS; Alicia T. Luchowski, MPH

The Problem

Ms. N lost her job and health insurance at the same time and missed a month of birth control pills because she could not afford her prescription. She became pregnant but miscarried after only nine weeks. She was seen in the ER and required a dilation and curettage procedure and a blood transfusion.

Ms. L gave birth to her second child in September and was given a DepoProvera shot that was covered by Medicaid. She wanted to continue using Depo, but her Medicaid coverage expired 60 days after the birth of her child, and she was not able to afford the next shot. Unfortunately, she did not realize that she was eligible for further services. She became pregnant within four months of her last delivery and delivered at term, covered again by Medicaid. She now has three children under the age of five at home, all of whom qualify for Medicaid. She has quit her job because paying for childcare costs more than what she was making as a cashier.

Ms. S is a 17-year-old high school student who was not able to fill her contraceptive patch prescription on time and became pregnant. Though she did not see herself wanting children until after finishing college, her doctor did not offer her an intrauterine device (IUD) because of her age and because she had never before given birth. She decided to have an abortion at 10 weeks so that she could finish high school and start college in the fall.

Ms. F is a 32-year-old who had a gastric bypass procedure two months prior to becoming pregnant. She had irregular periods before her surgery and did not know she could become pregnant so quickly. Her doctor never discussed contraception with her, though the doctor recommended not getting pregnant right away. She elected to have an abortion at 12 weeks because she was worried about the effects her rapid weight loss would have on her pregnancy.

Ms. T is a 40-year-old morbidly obese woman who was taken off her oral contraceptives due to worsening blood pressure. She chose to use condoms as her primary method of birth control but now is nine weeks pregnant and seeking an abortion.

Unfortunately, these scenarios are all too familiar to health care providers across North Carolina. What they all have in common is that each of these cases could have been averted by long-acting, reversible contraception (LARC). Most women spend the majority of their reproductive lives desiring to not get pregnant, so it is important to think of contraceptive methods that address these long-term needs. Long-acting reversible contraception should be considered the first line option for contraception for almost all women.

What Exactly is LARC and Why Aren't More Women Using It?

Long-acting reversible contraception includes two basic contraceptive methods: hormonal implants and intrauterine devices. These methods are safe, long-acting, convenient, and extremely effective. They also have the added benefit of

Long-acting reversible contraception includes two basic contraceptive methods: hormonal implants and intrauterine devices. These methods are safe, long-acting, convenient, and extremely effective.

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requiring only a single act of motivation to provide pregnancy prevention for years at a time. Other contraceptive methods have the disadvantage of requiring long-term daily, monthly, or weekly use, or use with each act of coitus, a burden that often translates into incorrect use or discontinuation, and can result in unintended pregnancies that can be costly to the health system as well as economically and emotionally costly to individuals and families.

There are currently two forms of IUDs on the market—the copper IUD, ParaGard, and the hormonal IUD, Mirena. ParaGard is a nonhormonal method that lasts for 10 years and has a first year failure rate of 0.8%.[1] Mirena contains locally acting levonorgestrel. It lasts for five years and has a failure rate in the first year of 0.2%.[1]

Today's IUDs are extremely safe. Past concerns regarding pelvic inflammatory disease (PID), sexually transmitted infections (STIs), infertility, and difficult insertion have limited the use of IUDs in nulliparous women (women who have never given birth) and adolescents. However, more recent data supports the safety of using both types of IUDs in nulliparous women and adolescents.[2,3] They do not increase the long-term risk of PID, though there is a modest increased risk of PID in the first 20 days after insertion.[4] While condoms protect against STIs, their contraceptive efficacy, with a failure rate of 15% per year with typical use,[1] is much lower than the IUD. Women are encouraged to use condoms in addition to the IUD if they are at risk for STIs.

Implanon is a hormone-releasing single-rod contraceptive implant that is placed subdermally in the upper arm. It contains the progesterone etonogestrel and is effective for three years. Its failure rate is 0.05% in the first year of use.[1]

All three forms of LARC can be used safely by nulliparous women and, unlike combined hormonal methods such as the oral contraceptive pill, the patch, and the ring, LARC methods can be used by women of all ages and with a range of medical problems including hypertension, tobacco use, and obesity.[1,5]

While all of these methods require skilled providers to place them, with adequate training providers can quickly become proficient in their insertion. All three LARC methods are reversible, with a rapid return to fertility after removal.

The US lags behind most developed countries in its use of LARC. In Europe, IUD use is much more common, and is as high as 27% among contraceptive users in Norway, 21% in Sweden, 18% in Denmark, and 17% in France.[6] However, in the US, the use of LARC is less than 2%.[6]

So why aren't more US women using LARC? The challenge of increasing the use of LARC in the US is manifold. First, there is an issue of provider comfort with offering LARC. Since the Dalkon Shield was taken off the market in the 1970s due to several deaths from septic abortion, the IUD fell out of favor among providers in the US until the copper IUD was reintroduced in 1988 and the hormonal IUD was approved in 2001. Despite data from this and other countries attesting to the remarkable safety and efficacy of the current IUDs, many US providers are still wary of these devices and often do not offer them to patients, even if they are aware of their safety.[7]

In addition, many providers who are in a position to offer women contraceptives, such as family practice physicians and pediatricians, may not offer LARC methods because they are not comfortable with inserting them or need to refer to someone who can. It is certainly much easier for a provider to write a prescription for birth control pills than to actually place a device during a busy clinic schedule.

The other challenging area is patient knowledge and attitudes. One study of young women and adolescents found that 60% of the participants had not heard of the IUD. But after a brief, five minute educational intervention, more than half said that they "liked the idea of the IUD" for themselves.[8]

Though there is a lot of room for improvement in the availability and use of LARC, the trend seems to be going in the right direction. Since the advent of Mirena, which included an onslaught of television ads, more women are requesting IUDs from their gynecologists, which can definitely translate to a substantial increase in its use. A Gallup survey in 2003 showed that up to 28% of female obstetrician-gynecologists would choose the IUD for themselves, which can also contribute to a rise in its popularity.[9]

Even though the US lags behind other countries in using LARC, the good news is that LARC use seems to be on the upswing, providing more women with safe, effective, and long-term contraceptive options.

LARC is Now More Available Than Ever

While insurance will cover the cost of LARC in most cases, for women without insurance the upfront cost can be prohibitive, despite its cost-effectiveness over time. Fortunately, in North Carolina the Family Planning Waiver Program, implemented in 2005, provides coverage for LARC for a large number of women of reproductive age.

The Family Planning Waiver Program is a Medicaid demonstration project designed to reduce unintended pregnancies by expanding eligibility for family planning services to men and women at or below 185% of the federal poverty level. Implemented in 2005, this program, known as "Be Smart," gives access to family planning services to men ages 19–60 and women ages 19–55 who otherwise do not qualify for Medicaid services.

Family Planning Waiver services can be provided by ambulatory surgery centers, federally-qualified health centers, nurse practitioners, nurse midwives, physicians, local health departments, rural health clinics, and outpatient hospitals. These services include an annual physical exam, testing and treatment for STIs, elective sterilization, and contraception—including both Mirena and ParaGard. There are no copayments for any of the services, though the services are rigidly limited to family planning, and any medical problems discovered besides STIs are not covered.

The key objectives of the Family Planning Waiver are to reduce the number of unintended and unwanted pregnancies, reduce the demand for abortion, increase the use of more effective methods of contraception, and positively impact the

utilization of and continuation rates for contraceptive use among the target populations.[10] A key strategy for reaching these objectives is to increase the use of LARC. Long-acting reversible contraceptive methods are highly effective and also enjoy higher continuation rates (the number of women still using the method after one year) than all other methods of reversible contraception, at around 80% for both the IUDs and the implant, compared with 42%–68% for other reversible methods.[1]

In North Carolina, 45% of all live births are the result of an unintended pregnancy and 27,000 abortions are performed yearly.[11] The Family Planning Waiver Program has the potential to reduce the number of unintended pregnancies in North Carolina by 8,500. This would avert an estimated 3,400 abortions and 4,100 live births. The estimated cost of providing family planning services is $372 annually per person, compared to $8,753 per pregnancy carried to term for women who are eligible for Medicaid.[12]

The Be Smart Program addresses these concerns and is on target to enroll as many eligible men and women as possible who desire family planning services. Last year in North Carolina, there were an estimated 497,223 potential female enrollees and 415,694 potential male enrollees based on income and other program qualifications.[13] As can be seen by these large numbers, the need for effective contraceptive methods in this population is great.

Demonstration projects supported by the Centers for Medicare and Medicaid Services (CMS) show that the cost effectiveness of this type of family planning program can lead to expansion of coverage in the future. Given the current health care crisis, it is essential to show that government-funded projects can have positive impacts on health outcomes at a reasonable cost. Long-acting reversible contraception provides a textbook example of how a small intervention can be lasting and cost-effective and result in healthier outcomes for women, families, and communities.

ACOG Advocates for LARC

On the national level, the American College of Obstetricians and Gynecologists (ACOG) LARC Program is working with obstetrician-gynecologists and others around the country to increase access to LARC by updating clinical practice recommendations and developing continuing education programs, practice support tools, and patient education materials.[a]

Current clinical recommendations from ACOG support IUD use by nulliparous women, adolescents, and women with a history of ectopic pregnancy.[2,3] In addition, ACOG has found that there is sufficient evidence to support the use of Mirena as a treatment option for idiopathic menorrhagia and to protect against endometrial hyperplasia in women using menopausal hormone therapy.[b,14]

Though most obstetrician–gynecologists have received training in IUD insertion and have positive views regarding their safety and effectiveness, results from a national survey of OB-GYNs published in 2002 found that almost 80% of OB-GYNs reported inserting 10 or fewer devices in the previous year.[15] In addition, patient selection criteria used to identify candidates for IUD use were not consistent with current evidence-based recommendations. No national survey has evaluated current knowledge or practice patterns regarding the single-rod contraceptive implant.

To evaluate the current status of OB-GYNs' knowledge, attitudes, and practice patterns regarding IUDs and the contraceptive implant, ACOG recently fielded a nationally-representative survey of its membership. For those not currently offering LARC to patients, the survey asks why not and also has questions about availability of training, education, or practice support materials or interventions that would change current practice. ACOG's LARC Program will use these survey findings to guide the development of future materials and programs. ACOG will also be surveying residency programs in obstetrics and gynecology to assess the current state of LARC training and education for residents.

The LARC Program is also offering continuing education sessions at ACOG regional and national meetings, including its District IV annual meeting, held this year in Asheville on October 16–18, 2009. These evidence-based presentations address the potential role of LARC in reducing unintended pregnancy rates and provide clinical guidance on LARC provision and management. Presentations will be posted to the LARC Program website for free use by others providing LARC training and education. In addition, the Fellowship in Family Planning offers nationally–renowned family planning experts as Grand Rounds speakers for presentations focused on recent research developments and evidence-based approaches to LARC and other family planning topics. All speaker expenses, including travel costs and honoraria, are covered by the Fellowship in Family Planning.[16]

Patient education also plays an important role in increasing the knowledge and use of LARC, and ACOG currently offers several publications for patients on its Patient Page.[17] In addition, ACOG recently published a flip chart for offices to assist providers during birth control method counseling. The flip chart provides quick reference to each contraceptive method, with an accompanying tear-off pad of information for the patient to keep.[18]

Finally, since systems barriers often present a hurdle for LARC provision even when providers possess the appropriate clinical knowledge and training, ACOG is developing tools to

a These resources are continually posted and updated on the LARC Program website at www.acog.org/goto/larc.

b ACOG's clinical recommendations are available at no cost to members on the ACOG website (http://www.acog.org), and others can request single copies of ACOG documents from the College Resource Center by email at resources (at) acog.org or by calling 202.863.2518. College clinical recommendations are also published and indexed in the journal *Obstetrics & Gynecology*.

assist in coding, reimbursement, and other administrative concerns. For example, the LARC Program is developing a coding guide to help practices seek the appropriate compensation for family planning services.

Recommendations

It is crucial for providers in all specialties that treat women of reproductive age to address the contraceptive needs of patients. Long-acting reversible contraception is the best tool currently available for most women desiring effective, long-term contraception and should routinely be offered as the first option.

Just as the reasons for less than optimal utilization of LARC are complex, the strategies for increasing its use require improved knowledge and awareness on multiple levels:

- Increased enrollment of eligible women and men in the Be Smart Program.
- Increased training of providers—physicians, physician assistants, and nurse practitioners from various disciplines, including pediatricians and family practice physicians—in LARC placement.
- Word of mouth—encouraging patients to tell their friends and family about their satisfaction with LARC.
- Development of an effective referral network to help providers who don't offer LARC refer patients to those who do.
- General provider education on the availability of comprehensive family planning services and LARC through the Be Smart Program.

This multifaceted approach to increasing use and access to LARC can help achieve the potential of LARC to reduce unintended pregnancy and improve health outcomes for women and families. **NCMJ**

REFERENCES

1 Trussell J. Contraceptive efficacy. In: Hatcher RA, Trussell J, Nelson AL, Cates W, Stewart FH, Kowal D, eds. *Contraceptive Technology.* 19th ed. New York, NY: Ardent Media; 2007:747-826.

2 American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 392. Intrauterine device and adolescents. *Obstet Gynecol.* 2007;110(6):1493-1495.

3 American College of Obstetricians and Gynecologists. ACOG practice bulletin. Clinical management guidelines for obstetrician-gynecologists. Number 59, January 2005. Intrauterine device. *Obstet Gynecol.* 2005;105(1):223-232.

4 Grimes D. Intrauterine device and upper-genital-tract infection. *Lancet.* 2000;356(9234):1013-1019.

5 World Health Organization. Medical eligibility criteria for contraceptive use. World Health Organization website. http://www.who.int/reproductivehealth/publications/family_planning/9241562668index/en/index.html. Accessed August 20, 2009.

6 Sonfield A. Popularity disparity: attitudes about the IUD in Europe and the United States. *Guttmacher Policy Review.* 2007;10(4):19-24.

7 Harper CC, Blum M, de Bocanegra HT, et al. Challenges in translating evidence to practice: the provision of intrauterine contraception. *Obstet Gynecol.* 2008;111(6):1359-1369.

8 Whitaker AK, Johnson LM, Harwood B, Chiappetta L, Creinin MD, Gold MA. Adolescent and young adult women's knowledge of and attitudes toward the intrauterine device. *Contraception.* 2008;78(3):211-217.

9 Gallup survey reveals women ob-gyns benefit from "insider knowledge" [press release]. Washington, DC: American College of Obstetricians and Gynecologists; December 9, 2003. http://www.acog.org/from_home/publications/press_releases/nr12-09-03-2.cfm. Accessed August 20, 2009.

10 North Carolina Department of Health and Human Services. *North Carolina Medicaid Special Bulletin: Family Planning Waiver "Be Smart."* Raleigh, NC: North Carolina Dept of Health and Human Services; 2006. http://www.dhhs.state.nc.us/dma/bulletin/FPW.pdf. Accessed September 29, 2009.

11 North Carolina Pregnancy Risk Assessment Monitoring System (PRAMS) 2004-2006. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/data/prams.cfm. Accessed August 20, 2009.

12 Frost JJ, Sonfield A, Gold RB. *Estimating the Impact of Expanding Medicaid Eligibility for Family Planning Services. Occasional Report No. 28.* New York, NY: Guttmacher Institute; 2006.

13 Division of Medical Assistance, North Carolina Department of Health and Human Services; Navigant Consulting Inc. *North Carolina Be Smart Family Planning Waiver: Waiver Year Three Interim Annual Report.* Raleigh, NC: North Carolina Dept of Health and Human Services; 2009.

14 American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 337. Noncontraceptive uses of the levonorgestrel intrauterine system. *Obstet Gynecol.* 2006;107(6):1479-1482.

15 Stanwood NL, Garrett JM, Konrad TR. Obstetrician-gynecologists and the intrauterine device: a survey of attitudes and practice. *Obstet Gynecol.* 2002;99(22):275-280.

16 Grand Rounds speakers available. Fellowship in Family Planning website. http://www.familyplanningfellowship.org/grandrounds.html. Accessed August 20, 2009.

17 Welcome to the ACOG patient page. The American College of Obstetricians and Gynecologists website. http://www.acog.org/publications/patient_education/patientPage.cfm. Accessed August 20, 2009.

18 Birth control flip chart. The American College of Obstetricians and Gynecologists website. http://www.acog.org/bookstore/Birth_Control_Flip_Chart_P648C46.cfm. Accessed August 20, 2009.

Preconceptional Considerations and Counseling for the Infertile Couple

Haywood L. Brown, MD

Approximately 15% to 20% of couples of reproductive age have difficulty conceiving or maintaining a spontaneous pregnancy. In 2002, 1.2 million (2%) women of reproductive age reported having an infertility-related medical appointment within the previous year, and approximately 9% of women ages 18 to 44 reported receiving an infertility service at some point that included advice on infertility and/or testing and services for infertility.[1] Infertility impacts every racial and ethnic group and can cause significant emotional distress in a couple's relationship when an anticipated pregnancy does not occur in the time period in which they expected to start a family.

A period of one year of unprotected intercourse without a spontaneous conception typically defines infertility.[2] There are a number of factors that can lead to infertility. Approximately 20% of infertility is related to male factors. Female factors account for 40%, and 30% can be related to both male and female factors. Unfortunately, in 15% of cases the etiology of infertility cannot be traced to any specific cause.

For healthy reproductive age couples, spontaneous pregnancy is usually achieved within six months of unprotected intercourse during the female's fertile period. For couples less than 30 years of age, failure to achieve spontaneous pregnancy after six cycles of unprotected intercourse is classified as subfertile.[3,4] However, 50% of these couples will become pregnant within the next six cycles on their own. Being patient, eliminating stressors in professional and personal lives, and using timed intercourse and ovulation predictors will likely lead to successful conception for these couples. For the infertile couple, the cumulative probability of spontaneous conception is age-dependent and declines particularly for females in their mid-30s to early 40s.

Infertility...can cause significant emotional distress in a couple's relationship when an anticipated pregnancy does not occur in the time period in which they expected to start a family.

Unlike the typical pregnancy in the US that is unplanned in nearly 50% of couples, the infertile couple has made a conscious decision that they desire pregnancy and, for the most part, are thoroughly invested in optimizing the chances for a successful outcome. However, the financial and emotional burden for evaluation and treatment of the infertile couple is significant. As such, preconceptional counseling about all aspects of preconceptional and pregnancy care, including ramifications and potential outcomes, should be discussed with both partners prior to embarking upon infertility treatment.

The age of the couple (the woman in particular), family history, and past and current history of medical conditions can have a direct impact on pregnancy complications and a healthy pregnancy outcome. The inability to become pregnant spontaneously is associated with many emotions including shame, guilt, anxiety, and depression. Studies suggest that as many as 40% of infertility patients suffer anxiety that may lead to major depression.[5] It is critical that both the woman and her partner understand that these diagnoses can have negative impacts on family life, employment status, household finances, and can increase the severity of any underlying health conditions, such as diabetes or hypertension.

Evaluation

In the process of the infertility evaluation the etiology for the couple's inability to conceive is likely to be revealed. Male factors are usually ruled out early with a normal semen analysis. Many men do not anticipate that the couple's infertility is a problem directly related to them and learning that they have the problem sometimes requires some adjustment and reassurance. The man's past medical, surgical, and social

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history is important. Alcohol and drug use can potentially impact male fertility. If the male has an abnormal semen analysis, options will be discussed and outlined for the couple. An abnormal semen analysis warrants a thorough physical examination and possibly a laboratory investigation to determine the etiology. For example, genetic conditions such as cystic fibrosis can be discovered in the course of the infertility evaluation as a number of men with this condition have a congenital absence of the vas deferens which leads to an absence of sperm in the ejaculate. Abnormal male genitalia should prompt a genetic evaluation for chromosomes to rule out conditions such as Klinefelter's syndrome which is the presence of an additional X chromosome (XXY compared to the normal XY). If the sperm concentration is low (oligospermia) the evaluation could include a hormonal blood test to measure total testosterone and other pituitary hormones. Treatment depends on the etiology of the problem. In cases of low or no sperm, a testicular biopsy might be recommended to determine if sperm is present or being produced. Treatment of infertility as a result of decreased sperm may include in vitro fertilization (IVF) techniques, including a procedure called intracytoplasmic sperm injection (ICSI) where the sperm is injected directly into the egg. This requires significant preparation including harvesting the eggs from the female partner.

The female infertility workup is laborious, expensive, and stressful. The workup should begin with a thorough medical, surgical, and gynecologic history. The menstrual history and pattern of bleeding is important in diagnosis of ovulatory disorders such as polycystic ovary syndrome (PCOS). Approximately 20% of female infertility is related to problems of ovulation, with 70% of ovulatory dysfunction due to PCOS.[6,7] Over-the-counter ovulation prediction kits which monitor the surge in luteinizing hormone (LH) are widely used by couples who are attempting to conceive and can be very useful for women with irregular ovulation. LH levels rise approximately 40 hours before ovulation. A blood test measuring progesterone level in the second half (18-24 days) of the woman's menstrual cycle is an accurate predictor that ovulation has occurred. Ovulation disorders such as PCOS may be treated with drugs such as clomiphene citrate (Clomid), which improves ovulation. Most Clomid-induced ovulation leads to pregnancy within three cycles of administration. The use of gonadotropin injections to enhance ovulation increases the risk for ovarian hyperstimulation and higher order multiple gestations (triplets, quadruplets, etc.).[8] The state of the ovary should be carefully monitored with ultrasound when using gonadotropin injections. Some women with PCOS have insulin resistance as part of the syndrome. These women may be treated with metformin, an oral hypoglycemic agent.

Past history of a sexually transmitted infections (STI) such as Chlamydia *trachomatis* or gonorrhea pelvic infections can lead to tubal damage, scarring, and blockage. Chlamydia has a high prevalence in women less than 24 years of age. If left untreated, chlamydia can lead to tubal damage and subsequent infertility. All women and particularly adolescents should be educated on the potential infertility consequences of STIs and be promptly treated for this condition. Chlamydia testing should be included in the annual gynecologic examination for women under age 24 years.

Testing for tubal blockage is typically done with a hysterosalpingogram (HSG). The test involves injecting contrast media into the uterine cavity and taking an X-ray to determine the internal anatomy of the uterus and spillage of the dye from the tubes. Ultrasound can also be used to determine uterine and tubal anatomy (hysterosonography). Women with proven tubal damage may be best treated with assisted reproduction through IVF and embryo transfer to optimize chances for conception and viable pregnancy.

Endometriosis is also associated with infertility. Endometriosis can lead to adhesions which limit tubal motility or damage and obstruct the fallopian tubes. A history of pelvic pain around the time of the menses or painful intercourse is suspicious for endometriosis in the infertile couple. Endometriosis is confirmed with laparoscopy and can be treated surgically or medically. Infertile women with severe endometriosis are often treated with IVF.

Prepregnancy Counseling for the Infertile Couple

Pregnancy planning for the infertile couple provides a unique opportunity for the clinician to optimize the health of the patient in anticipation of pregnancy. All women should be counseled to take a vitamin that contains at least 400μg of folic acid at least one month prior to conception and to continue the vitamin during critical embryogenesis to decrease the risk for birth defects such as neural tube defects (spina bifida). For women with medical conditions such as diabetes or hypertension, optimization of glucose and/or blood pressure control is crucial before becoming pregnant. Certain medications are contraindicated during pregnancy such as ACE inhibitors for hypertension, and alternative medications should be offered before conception. Overweight and obesity increase the risk for decreased fertility, pregnancy loss, and birth defects. Weight loss is typically recommended prior to undergoing infertility treatment because it improves the chances for conception. Overweight and obesity are not uncommon for women with ovulatory dysfunction from PCOS. Unfortunately, weight problems cannot be corrected overnight and realistically the woman most often will not achieve an optimal weight loss before proceeding with treatment. For some women with PCOS and obesity, the combination of Clomid and Metformin may increase the chances of ovulation and the ability to conceive. The couple must be counseled about the pregnancy risks of overweight and obesity, including gestational diabetes, preeclampsia, and cesarean delivery. Medication history is important especially if the drugs present a risk to the developing embryo and are associated with an increased risk for birth defects.

As mentioned previously, many infertile women become anxious or depressed and might be on medications for these

disorders. They should be reassured that most currently prescribed anti-anxiety medications are safe during conception, embryogenesis, pregnancy, and breastfeeding. Women with a history of anxiety and depression are at greater risk for postpartum depression disorders and should not discontinue medications unless recommended by their clinician. The risk of depression disorders increases if pregnancy complications, such as a preterm birth, occur.

Older women should also make sure they have age-appropriate screenings, such as mammography if age 40 or older, before proceeding with pregnancy. Women over 35 years should receive genetic counseling to discuss risk of fetal chromosomal abnormalities. Couples should be screened for hereditary genetic disorders such as cystic fibrosis, Tay Sachs, and sickle cell disease depending on racial/ethnic prevalence of these conditions.

All ovulation enhancing drugs increase the risk for multiple gestations as do assisted reproductive techniques including IVF with embryo transfer. The couple must be made aware that a multiple gestation is associated with pregnancy loss, preterm delivery, and an increased risk for obstetric and medical complications such as diabetes, hypertension, and cesarean delivery. They must be prepared to decrease physical activity or be off work with a multiple gestation if the pregnancy becomes complicated by preterm labor or cervical shortening. This may further tax an already limited family budget that has been challenged by the expenses of the infertility treatment. In most instances, IVF is not covered by insurance, and each IVF cycle costs several thousand dollars (approximately $13,000 including medications). Success rates for IVF for women under 35 year are approximately 30%-35% per cycle, and success rates decline with maternal age and underlying causes of infertility. For example, women older than 40 years have IVF success rates of only 6%-10% per cycle. Women in their early to mid-40s seeking pregnancy may not be able to produce sufficient eggs through ovulation induction as the reserve of eggs has been depleted. These women will likely require donor eggs that are fertilized by the partner's sperm and the embryos transferred to the uterus. IVF with donor eggs costs on average approximately $20,000 per cycle, including medications.

Conclusions

The number of couples seeking infertility services has increased over the past decade. For some, the impetus is impatience that pregnancy has not occurred within the time of their personal expectations. For others, a true cause for infertility exists and can be overcome in most instances with etiology-appropriate treatment. Depending on history and age of the couple it is important to time the investigation somewhere between a period of subfertility (six months of trying) to infertility (one year of trying) to avoid the potential for undertreatment, when significant factors are apparent, or overtreatment that can lead to unnecessary expense.[9] Earlier evaluation and treatment may be justified after six months in women over 35 years. The workup and treatment for infertility can lead to distress for both the woman and the man. They must view their desire to become parents as a team effort and must support each other throughout the process. Certainly decreasing stress and optimizing personal health increases the chances of success for infertility treatment, healthy conception, and pregnancy outcome. With most techniques for ovulation induction and IVF the risk for multiple births is increased, and the couple should recognize this as a potential complication of treatment. Improvement in drug dosing and monitoring decreases the risk for higher order multiple gestation, which in turn increases the risk for pregnancy loss. Selective reduction for multiple gestation is an option, depending on the beliefs and desires of the couple.

Unfortunately, for some couples a pregnancy is not possible in spite of exhausting all methods of infertility treatment. These couples should be counseled toward adoption options to fulfill their goal of parenthood. **NCMJ**

REFERENCES

1 Centers for Disease Control and Prevention. *Birth: Final Data for 2002.* National Vital Statistics Reports. 2003;52(10).
2 Evers JL. Female subinfertility. *Lancet.* 2002;360(9327):151-159.
3 Habbema JDF, Collins J, Leridon H, Evers JLH, Lunenfeld B, te Velde ER. Towards less confusing terminology in reproductive medicine: a proposal. *Hum Reprod.* 2004;19(7):1497-1501.
4 Gnoth C, Frank-Herman P, Freundl G, Godehardt D, Godehardt E. Time to pregnancy: results of the German prospective study and impact on the management of infertility. *Hum Reprod.* 2003;18(9):1959-1966.
5 Chen, TH, Chang, SP, Tsai, CF, Juang, KD. Prevalence of depressive and anxiety disorders in an assisted reproductive technique clinic. *Hum Reprod.* 2004;19(10):2313-2318.
6 American College of Obstetricians and Gynecologists. Management of infertility caused by ovulatory dysfunction. ACOG Practice Bulletin Number 34. February 2002.
7 Knochenhauer ES, Key TJ, Kashar-Miller M, Waggoner W, Boots LR, Azziz R. Prevalence of the polycystic ovary syndrome in unselected black and white women of the southeastern United States: a prospective study. *J Clin Endocrinol Metab.* 1998;83(9):3078–3082.
8 Homburg R, Levy T, Ben-Rafael Z. A comparative study of conventional regimen with chronic low-dose administration of follicle-stimulating hormone for anovulation associated with polycystic ovary syndrome. *Fertil Steril.* 1995;63(4):729-733.
8 Brosens I, Gordts S, Valkenburg M, Puttemans P, Campo R, Gordts S. Investigation of the infertile couple: when is the appropriate time to explore female infertility? *Hum Reprod.* 2005;20(10):2672-2674.

Taking a Lead Role in Preconception Health Promotion in Eastern North Carolina

Alvina Long Valentin, RN, MPH; Amy Hattem, MAEd, LCCE; Shelby Weeks, MHS

Eastern North Carolina, which makes up Perinatal Care Region VI (PCR VI), experiences a disproportionate share of the state's poor maternal and infant health outcomes. In 2008, women in this region had the highest infant mortality rates in the state (11.4 deaths per 1000 live births vs. 8.2 for the state as a whole).[1] The minority infant mortality rate was also higher than the rest of the state, 17.5 vs. 13.5, and the same held true for white infant mortality, 7.9 vs. 6.0. The teen pregnancy rate for PCR VI is also higher than all the other regions and higher than the state rate, 73.8 pregnancies per 1,000 teens vs. 63.0. In addition, the women in this region had high rates (14%) of short birth intervals, defined as six months between birth and the next conception, and high rates of unintended pregnancy (54%), for pregnancies resulting in live births.

Eastern North Carolina…experiences a disproportionate share of the state's poor maternal and infant health outcomes.

In this article we provide three examples of programs intended to reduce these rates and which incorporate preconception health in different areas—social marketing and training, worksite wellness, and case management. These projects are currently working with men and women of childbearing age in eastern North Carolina to improve their health and the health of their children.

Project Component 1: Preconception Health and Social Marketing and Training: North Carolina's First Time Motherhood/New Parent Initiative

North Carolina's First Time Motherhood/New Parent Initiative is funded by the US Health Resources and Services Administration's (HRSA) Maternal and Child Health Bureau. The priority population for this initiative is men and women ages 15–29 who may be disproportionately affected by adverse pregnancy outcomes with a focus on racial and ethnic minorities. The project area includes six northeastern counties: Edgecombe, Gates, Halifax, Hertford, Nash, and Northampton. The partnering agencies on this initiative include the Division of Public Health's Women's Health Branch, the North Carolina Healthy Start Foundation, the North Carolina Family Health Resource Line, the University of North Carolina at Chapel Hill Center for Maternal and Infant Health, March of Dimes, the Folic Acid Council, six local health departments, the state WIC program, the Center for Health and Healing, and the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill.

The grant activities include a social marketing campaign which includes radio and TV advertisements and other promotional materials that encourage families to have a reproductive life plan. In a reproductive life plan, men and women consider whether or not they want to have children, the timing and spacing of their pregnancies, and how they will prevent a pregnancy until they are ready. It also includes setting goals to improve their personal health so that they will have a better chance to have a healthy baby. This message of reproductive life planning is incorporated with the promotion of the North Carolina Family Health Resource Line, the state's Title V hotline that provides information on maternal and child health services, in addition to family planning and primary care services.

This social marketing message, *Are You Ready? What's Your Plan?* is integrated into existing programs that currently provide

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services to men and women of childbearing age. This integration is done through preconception health training sessions on three different levels—health care provider, faith-based community, and community outreach worker.

The *Are You Ready? What's Your Plan?* social marketing campaign was launched in June 2009 and ran for four weeks. Public service announcements were aired in the six county project area on five different radio stations. A TV advertisement was also aired on 15 different cable network channels during the same four-week period. In that month, over 80 health care providers from local health departments and private agencies participated in training sessions that covered reproductive life planning, the Medicaid Family Planning Waiver, folic acid, cultural competency, and health literacy. Simultaneously, UNC Chapel Hill's Center for Maternal and Infant Health updated its www.everywomannc.org website to enhance preconception health resources available to patients and providers, including the current national preconception health provider curriculum and all the materials used in these health care provider training sessions.

The health departments in the project region utilized project funding to update their waiting areas and make them more welcoming for men. They have also purchased educational materials and equipment to promote reproductive life planning and preconception health. Other promotional items, including educational brochures and health journals promoting reproductive life planning, have been developed and updated as part of this grant initiative. Some of these items will be used in the faith-based and community outreach worker training which will take place this fall and will cover regular screenings and check-ups, healthy living, stress, depression, domestic violence, and reproductive life planning.

The statewide North Carolina Family Health Resource Line staff has been actively promoting the Family Planning Medicaid Waiver, family planning services, and primary care services to all Health Check/Health Choice callers in addition to callers who inquire specifically about these services. The staff is actively tracking call data and paying specific attention to calls from the eastern North Carolina project area for tracking purposes.

The project's advisory committee, made up of 25 members including consumers and representatives of local partnering agencies, provides input into project plans and activities on a regular basis. A separate faith-based advisory committee, made up of members of different congregations in the project area and partnering organizations, was formed to develop the faith-based curriculum and coordinate the faith-based training efforts. The key to the success of this project has been the widespread participation of many communities in the project area. Over 70 members of these communities, ages 15–29, have participated in surveys and focus group testing for different project materials at high schools, community colleges, and community organizations.

The first year grant activities are currently being evaluated on an individual and population-level. The goal of the project is to reach the majority of the 50,280 men and women ages 15–29 who live in the six county project area. It is the hope that these men and women will begin to integrate the message about reproductive life planning and preconception health into their lives and take steps to live healthier lives and have healthier babies.

The evaluation will focus special attention on tracking changes in awareness, knowledge, service utilization, and health status indicators related to reproductive life planning and preconception health. New funding can be used to support the replication of these grant activities throughout the state. All of the grant products will be available online for use and adaptation by individuals and organizations to promote preconception health.

Project Component 2: Preconception Health and Worksite Wellness: Pitt Infant Mortality Prevention Advisory Council

The Pitt Infant Mortality Prevention Advisory Council (PIMPAC) was founded in 1990 to address Pitt County's high infant mortality rates, which have historically surpassed the state's rates. The 90-member group is a collaborative effort among the Pitt County Health Department, Pitt County Memorial Hospital, Brody School of Medicine, East Carolina University, Pitt County schools, local human service and nonprofit agencies, businesses, media, community groups, and consumers. PIMPAC meets quarterly to review programs, services, and strategies designed to help improve Pitt County's birth outcomes.

Since its origin, PIMPAC has received numerous grants to support initiatives that link women and children with family planning, prenatal, and child health services. From 2003-2006, PIMPAC received funding from the March of Dimes to support an infant mortality community awareness campaign, with a focus on prematurity prevention and preconception health promotion. The decision to implement this campaign among employees of local fast food restaurants, department stores, and industries was based on data previously collected from client interviews and client medical records. These businesses employ a large number of individuals of childbearing age.

PIMPAC members engaged in active dialogue with the management of these businesses to discuss Pitt County's infant mortality problem and the relationship between planned pregnancies and potential reductions of employee health insurance costs and employee absenteeism, in addition to improvements in birth outcomes for employee's children. Twelve businesses partnered with PIMPAC, and council members conducted on-site presentations and health fairs on preconception health for their employees during breaks, lunch hours, and staff meetings. Approximately 900 employees were reached through this project.

In 2008, PIMPAC implemented a more comprehensive awareness campaign providing opportunities for men and women of childbearing age to attend a series of presentations that focused solely on preconception health issues. The March of Dimes funded this campaign for Pitt County participants of the national Support and Training Result in Valuable

Employment (STRIVE) program, a job-training program designed to help individuals prepare to enter the workforce and develop self-sufficiency skills. Monthly preconception health presentations were conducted for participants of STRIVE and are now part of their required training schedule in Pitt County.

This campaign also involved the Convergys Corporation, a customer contact center located in Greenville, North Carolina, that employs over 300 individuals, the majority of whom are women of childbearing age. After a two-day program kick off at Convergys to explain the reproductive life planning concept, employees registered to attend a series of preconception health sessions. Each session was then conducted three to five times over an eight-week period.

Topics for both the STRIVE and Convergys programs included: physical activity and health; nutrition, including adequate fruit and vegetable consumption; multivitamins and folic acid; family genetic history; drugs, alcohol, and tobacco; the North Carolina Family Planning Medicaid Waiver; stress management; condom education; and sexually transmitted disease prevention

Gym bags, personalized with the preconception health message "Taking Care of Me, Planning For My Future," were distributed to 145 Convergys employees and 60 STRIVE members for their participation in the training sessions. These gym bags were selected to help promote the importance of physical activity and weight management as a component of reproductive life planning. Following the campaigns, employees who were in need of additional information contacted PIMPAC representatives and enrolled in health care services as needed. Local businesses have also requested additional on-site programming and services for their employees. PIMPAC continues to conduct programming for local businesses and implemented a preconception health awareness campaign for employees of DSM Pharmaceuticals/DSM Dyneema in the fall of 2009.

The evaluations completed by participants in the worksite preconception health awareness program in 2008 showed that 100% of participants learned new information regarding reproductive health and the majority plan to either make some behavior change or encourage a friend or family member to make a behavior change that will improve their current health status. These behavior changes include taking multivitamins with folic acid, increasing physical activity, incorporating more fruits and vegetables in their diet, and decreasing risk behaviors related to tobacco, alcohol, and illicit drugs. They also include implementing stress management strategies, increasing condom use, and seeking health services.

The partnership formed between PIMPAC and the local business community has provided numerous opportunities to reach families of childbearing age who are not linked with a medical home and who are not aware that their current lifestyles affect the health of their future children. The increased level of awareness among business leaders has empowered them to join PIMPAC's ongoing mission to comprehensively address the problem of infant mortality in Pitt County and may have contributed to the county's 32% decline in the overall infant mortality rate since 1990 (based upon five-year averages).

Project Component 3: Preconception Health and Case Management: North Carolina Healthy Start Eastern and Northeastern Baby Love Plus Programs

The Eastern Baby Love Plus (BLP) program in North Carolina was established in seven eastern counties (Bertie, Edgecombe, Greene, Martin, Pitt, Tyrrell, and Washington) in 1997. The Northeastern Baby Love Plus program was established in five northeastern counties (Gates, Halifax, Hertford, Nash, and Northampton) in 1999. These counties were chosen because of their high rates of infant mortality and perinatal health disparities in the state. These programs are two of 102 projects supported by a Healthy Start Eliminating Disparities in Perinatal Health grant awarded by HRSA's Maternal and Child Health Bureau (MCHB). The goal of these programs is to reduce infant mortality and eliminate perinatal health disparities by improving the health of mothers and infants, with a specific focus on African American and American Indian communities.

The BLP program supports interventions provided by local health departments to women of childbearing age and their families who are at risk of future poor birth outcomes and short interconceptional periods. Services include outreach and recruitment by community health advocates (CHAs) to identify and enroll pregnant and postpartum women into perinatal health services. The CHAs also provide health promotion and education to program participants and community members.

Care coordination and supportive counseling are provided by family care coordinators to assist program participants in addressing interconceptional health care needs, including linking women and children to medical homes. These interventions have addressed barriers and enhanced coordination within local perinatal systems of care, promoted healthy pregnancies, and brought critically needed resources to this section of the state.

A critical element to the success of the BLP program is the commitment and involvement of community members and program participants. Two effective strategies have been employed to engage these key stakeholders—hiring consumer advocates and establishing regional consortiums. First, consumer advocates (one in each program region) conduct outreach, recruitment, and education in an effort to engage and promote consumer involvement. Consumers are the voice of BLP. Each consumer advocate serves as a conduit to the consumers. The consumer advocates live in the respective region, are aware of the needs of local community, and are adept in communicating the consumers' concerns to the regional consortiums.

Secondly, the BLP program has active regional consortiums that function as the planning, coordinating, and networking body for the program. Each consortium develops policies, implements activities, and makes decisions about program

implementation. Consortium members include program participants, health department representatives, community and faith-based organizations, and other community members. These members work together to mobilize policy change and support community leaders as they address infant mortality, women's health, and community issues.

Presently, BLP is engaged in a three year Interconceptional Care Learning Collaborative Initiative, spearheaded by the MCHB. Each BLP region, in collaboration with program participants, local and regional program staff, and other key stakeholders, is preparing to pilot a short-term change project. Each project will address one of six interconceptional care core concept areas: interconceptional care case management; interconceptional care risk screening; family planning and reproductive health; primary care linkages; maternal depression; and healthy weight.

Upon completion of the intensive "plan, study, act, and do" action period, each region will review and eventually institutionalize the changes that were piloted. This process will be repeated three times between 2009 and 2011. The overall goal of this initiative is to enhance service quality and increase the retention rate of participants enrolled during Baby Love Plus's two-year interconceptional care services.

The heart of the North Carolina BLP program is the belief that the community, guided by consumers, community members, and organizations from various sectors, can best design and implement services in their community. The Eastern BLP and Northeastern BLP programs are currently providing services to over 1,000 women. In a typical year, community health advocates make over 53,000 individual contacts in priority communities, delivering messages about services and support. They also make almost 4,000 presentations to business, civic, church, and social groups annually. They make almost 12,000 referrals for at-risk families to essential services that will improve their chances for a healthy birth outcome. The Baby Love Plus program provides almost 3,000 transportation vouchers to 1,100 women to help increase access to medical services for the participants and their children. In a typical year, family care coordinators provide case management services to 300 high-risk postpartum women.

The Baby Love Plus program has resulted in reductions in disparities in both use of services as well as improving outcomes in such areas as infant mortality when the pre-program period, 1995-1999, is compared to 2002-2006, after the program was fully implemented. The minority infant mortality rate in the 14-county service region dropped by 9.5%, along with a more than 10.5% reduction in the disparity rate for whites and minorities.[2] These results are significant because North Carolina's overall infant mortality disparity rate increased during the same time period.

In addition, the rates of neonatal death have improved for minorities in the Baby Love Plus counties, resulting in a 13.6% decrease in overall disparity during 2002–2006. There has also been an improvement in the percentage of women who enrolled early in prenatal care in the Baby Love Plus regions, with a 42.9% disparity reduction during this same time period.

There are two other Healthy Start Programs in North Carolina, the Triad Baby Love Plus program and UNC Pembroke's Healthy Start Corps. These programs are based on a similar model and have also been successful in improving perinatal health outcomes.

North Carolina's infant mortality rate has declined by 35% from 1988–2008. Infant mortality is a complex issue and many programs have contributed to its' decline. A key program in these efforts has been the highly successful prenatal case management program, Baby Love. Baby Love services were enhanced by Baby Love Plus services starting in 1997 in 14 eastern, northeastern, and triad region counties. It is anticipated that the funding for the Baby Love Plus program will continue and possibly be expanded to other areas of the state.

Since many men and women of childbearing age are in the workforce, programs like PIMPAC's worksite preconception health programs will continue to reach this population. Businesses are beginning to sustain these programs by providing internal financial and programmatic support. PIMPAC is seeking funding to expand these worksite preconception health programs to new businesses in Pitt County in the future. The First Time Motherhood/New Parent Initiative is beginning its second year of activities and HRSA's Maternal Child Health Bureau plans to offer continued funding of state preconception health initiatives in the future.

Many women in North Carolina are entering pregnancy with risk factors that affect their health and the health of their babies. These include overweight and obesity, high blood pressure, and diabetes. They have risk behaviors of tobacco, alcohol, and illicit drug use. In addition many suffer from poor mental health and are uninsured, impeding access to needed health services. The high rate of unplanned pregnancies in North Carolina (40%) also contributes to medical problems for both women and their infants.

Many programs, such as the three highlighted above, are promising best practices that can improve the health of women before, between, and beyond pregnancy, bringing the goal of healthy children and healthy families within closer reach. **NCMJ**

REFERENCES

1 North Carolina State Center for Health Statistics. North Carolina vital statistics: 2008 infant mortality statistics for North Carolina. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/deaths/ims/2008/. Accessed October 5, 2009.

2 DeClerque J. *NC Healthy Start: The Ultimate Stimulus Package: Making Investments that Bring Returns.* Chapel Hill, NC: Sheps Center for Health Services Research; 2009.

Highlights from the North Carolina Preconception Health Strategic Plan

Anna Bess Brown, MPH

In June 2006 the North Carolina Folic Acid Council, the North Carolina Chapter of the March of Dimes, and the UNC Center for Maternal and Infant Health created an inventory of preconception health activities in North Carolina. The resulting booklet, *Looking Back Moving Forward: North Carolina's Path to Healthier Mothers and Babies*,[1] was developed in response to a recommendation from the US Centers for Disease Control and Prevention (CDC)[2] and included action steps for the state. The booklet was officially released on March 14, 2007 by a leadership team that included the North Carolina Chapter of the March of Dimes, the North Carolina Folic Acid Campaign, the University of North Carolina Center for Maternal and Infant Health, and the North Carolina Division of Public Health.

The task for the team was to spearhead a collaborative process for developing North Carolina's preconception health strategic plan. The team organized a series of statewide "think tank" meetings between March 2007 and June 2008 and invited individuals and agencies to discuss preconception health and create a state plan. The team invited a broad spectrum of representatives from agencies including the Department of Public Instruction, local health departments, public and private universities, community-based organizations, nonprofit agencies, and consumers from around the state. Their goal was to engage representatives with a wide array of experience to take ownership of the next steps in preconception health. The Center for Maternal and Child Health offered its website (http://www.everywomannc.org) to post minutes from think tank meetings, to collect feedback and ideas, and to relay messages back to the larger community.

More than 80 individuals from agencies around the state participated in think tank meetings and identified the following themes and areas as action steps for preconception health: social marketing and health promotion for consumers; clinical practice; public health and community; public policy and finance; and data and research.

Through the think tank process, the following guiding principles emerged in creating a preconception health plan for North Carolina women:

1. Utilize a collaborative planning, implementation, and evaluation process that includes a large and diverse group of partners across North Carolina.
2. Infuse community development and consumer leadership into each step of the plan.
3. Prioritize programs with the potential to address health disparities.
4. Consider women's health needs and related wellness recommendations within the context of their family and communities.
5. Focus on the whole woman, not only on her reproductive capacity.
6. Avoid messages that imply that certain women should or should not become mothers.
7. Address the gap between "knowing" and "doing" by bridging the transition from information to behavior change.

The goals of the Plan are to:

1. Develop partnerships and work collaboratively to integrate preconception health into existing programs and services, as well as to design new interventions.
2. Advocate for change at programmatic and policy levels to create an environment that promotes the health and well-being of women of reproductive age.
3. Promote and support preconception health-related research, surveillance, and evaluation to monitor progress and build a strong evidence base for interventions.
4. Focus resources on partnerships, programs, and services that address disparities in women's health.

Over the course of one year, a series of four additional think tank meetings occurred to collect ideas to understand how preconception fits into existing work and to develop the components of the plan. Participants examined data on health issues that impact birth outcomes and identified priority areas of focus including pregnancy intendedness, obesity and related conditions, substance abuse, and mental health. Focusing on these areas may improve a woman's health, affect her ability to conceive, and impact her baby's health outcome. Participants also agreed to prioritize collaborative research on preconception-focused topics, policy development, and access to care.

In January 2008 two work groups—Pregnancy Intendedness and Women and Overweight/Obesity and Related Conditions (WOW)—began meeting each month to identify strategies, objectives, and potential partners. In November 2008 the *Preconception Health Strategic Plan* was completed in booklet format and made available online.[3]

The Plan has three sections; the background, the Plan's framework, and the Plan's goals and strategies to achieve the goal. The Plan's broad goal is to increase preconception awareness among women and men. Goals also include increasing awareness of the importance of healthy weight and healthy eating during the reproductive years, particularly the benefits of increased fruit and vegetable consumption. Additional goals are to increase awareness of the importance of reproductive life planning; to promote among health care providers and community health workers the practice of assessing, counseling, and referring for preconception health issues, including reproductive life planning and healthy weight; to increase the overall ability of health care providers

to counsel, prescribe, and refer patients for appropriate and high-quality family planning methods, particularly for women with chronic conditions; and to improve communication with and successful outcomes for patients, community health workers, and providers of different ethnic and cultural backgrounds. Other goals are to increase access to care for high-risk women who have had a previous high-risk pregnancy or poor birth outcome or who have a chronic medical condition, particularly among women of minority populations; to decrease barriers in private and public health care systems that impede pregnancy planning and spacing; to ensure availability of safe and effective family-planning methods for women with chronic conditions through both public and private health care systems and programs; and to increase utilization of primary health care services by women of reproductive age. Lastly, the Plan incorporates a goal to increase workplace, economic, and social support for pregnancy, childbirth, and breastfeeding.

The two work groups restructured to form four work groups which continue to meet to address pregnancy intendedness and healthy weight within the context of four main goals identified by the strategic plan:

- Increase consumer and community awareness about preconception health.
- Ensure quality preconception care and practice among health care providers and community outreach workers.
- Expand access and affordability of preconception care.
- Advocate for environmental and policy changes that support preconception health.

The work groups have completed several projects thus far, including:

- Development of a reproductive life planning tool for consumers which includes pregnancy planning tips and referral sources.
- Development and administration of a telephone/email survey of approximately 50 health care providers to gather information on preferred preconception topics, tools, and learning opportunities in preconception health.
- Development of a maternity leave checklist, "Journey through Pregnancy: A Checklist for State Employees," which includes benefits, health tips, and resources for employed women who are planning for pregnancy and maternity leave.
- Facilitation of the addition of an intranet-based pregnancy planning resource from the March of Dimes and Healthy Babies, Healthy Business for the State Health Plan website
- Promotion of body mass index (BMI) assessment and healthy weight guidance in family planning and maternity clinics.
- Promotion of appropriate gestational weight gain through training and materials provided for regional nurse consultants, local health department practitioners, and others.

On the policy side, members of the leadership team and workgroups have been instrumental in introducing Senate Bill 243 and House Bill 480 which authorize the North Carolina Division of Medical Assistance to apply for a waiver that would cover care for low-income women who have had a previous high-risk birth. The bills have passed health committees in the Senate and in the House but have not been voted on in either chamber. In addition, the intendedness work group is collaborating with the Health Resources and Services Administration grant team and the Division of Public Health on marketing reproductive life planning.

A major force in this effort, the North Carolina Folic Acid Campaign, is adding preconception health messages to their message to take a multivitamin daily. The Campaign has begun with the topic of healthy weight since there is a natural link between vitamins, healthy weight, and nutrition; and health care providers have requested information and tools to help them work with their patients to achieve healthy weight.

The leadership team and many involved partners have learned that a collaborative process such as this one takes time. The time and the number of people and ideas involved have made it a comprehensive, thoughtful plan. We invite you to join us in this work to improve the health of women and infants in our state. You may join any of these efforts by contacting Anna Bess Brown, March of Dimes North Carolina Chapter abrown (at) marchofdimes.com or Alvina Long Valentin at alvina.long (at) ncmail.net.

The vision of the North Carolina Preconception Health Strategic Plan is to improve the health of women of childbearing age in North Carolina. Through a collaborative focus on women's wellness, North Carolina will improve the quality of life for women as well as the health of infants.

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REFERENCES

1 UNC Center for Maternal and Infant Health. *Looking Back Moving Forward: North Carolina's Path to Healthier Women and Babies.* Raleigh, NC: North Carolina Folic Acid Council and the North Carolina Chapter of the March of Dimes; 2007. http://www.mombaby.org/PDF/Preconception Healthcare.pdf. Accessed August 25, 2009.

2 Johnson K, Posner SF, Biermann J, et al. Recommendations to improve preconception health and health care—United States. *MMWR.* 2006;55(RR06):1-23.

3 Women's Health Branch, North Carolina Division of Public Health. *North Carolina Preconception Health Plan: September 2008-September 2013.* Raleigh, NC: North Carolina Dept of Health and Human Services; 2008. http://whb.ncpublichealth.com/Manuals/Preconception HealthStrategicPlan-3-6-09.pdf. Accessed August 24, 2009.

Reaching Women and Health Care Providers with Women's Wellness Messages:
The North Carolina Folic Acid Campaign as a Model

Amy Mullenix, MSW, MSPH

Folic acid supplementation is at the top of the list of many preconception health counseling recommendations intended to improve birth outcomes and women's health before pregnancy. Folic acid deficiency is one of the preconception risk factors identified by the US Centers for Disease Control and Prevention's seminal recommendations to improve preconception health and health care.[1] Women are encouraged to start taking a multivitamin or folic acid supplement several months before attempting pregnancy. Health care providers are advised to counsel *all* women of childbearing age to consume 400 mcg of folic acid daily as nearly half of all pregnancies are unintended.[2] Because of the strong evidence to support its use and benefits, folic acid supplementation is often cited as a prime example of how improved women's wellness before conception can positively impact birth outcomes.[3] Entire public health campaigns have been devoted to the promotion of folic acid, and these campaigns offer important lessons about how to reach women and health care providers to promote women's health and wellness.

The North Carolina Folic Acid Campaign has been working for a decade to make sure both consumers and health care providers are aware of the benefits of folic acid. Our state has historically high rates of neural tube defects (NTDs), up to 70% of which can be prevented if women of childbearing age take adequate amounts of folic acid prior to pregnancy.[4] Working with the March of Dimes, the North Carolina Birth Defects Monitoring Program, and other partners, the Campaign developed a comprehensive, multifaceted preconception health campaign to promote folic acid consumption. The Campaign has contributed to a nearly 40% decline in NTD prevalence in North Carolina between 1995 and 1996 (9.95 per 10,000 live births) and 2004 and 2005 (6.05 per 10,000 live births), according to the North Carolina Birth Defects Monitoring Program.[5] By comparison, the national NTD rate declined by 23%-26% in the years after fortification of the US food supply beginning in 1998.[4,6] There is renewed attention being paid to improving the health of women prior to conception as a way to improve birth outcomes and reduce chronic disease burden. This interest provides an opportunity to recount how the North Carolina Folic Acid Campaign has achieved its success and apply the lessons learned to other public health campaigns.

The Campaign has several components: a social marketing media campaign, outreach to consumers using a lay health education program, an extensive health care provider education program, a multivitamin distribution program (detailed by Morgan and colleagues elsewhere in this issue of the *Journal*), and a Latino-focused campaign dedicated to this subpopulation of women who are most at risk for NTDs.

Because of the strong evidence to support its use and benefits, folic acid supplementation is often cited as a prime example of how improved women's wellness before conception can positively impact birth outcomes.

The North Carolina Folic Acid Campaign differentiated itself from traditional public health campaigns by its early decision to use social marketing to develop the consumer components of the Campaign. Social marketing theory suggests that health messages be developed according to how they will best be received by consumers, rather than by how health professionals wish to deliver them.[7] For example, traditional folic acid messages encourage women to take folic acid every day to prevent NTDs in future pregnancies. Unfortunately, this

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message has not been well-received by most women and is less effective for influencing behavior (one notable exception is a small subgroup of women who seek preconception information and counseling before attempting pregnancy). A more effective message that has been employed by the Campaign is embodied by the tagline of the Campaign: *Multivitamins—Take Them for Life*. This strategy encourages young women to develop the habit of taking a multivitamin to improve their personal health and wellness rather than only to prevent birth defects. Although this method remains somewhat controversial, it appears to have contributed to a significant decline in NTDs in North Carolina. All English-language campaign materials and media for consumers in the North Carolina campaign reflect this social marketing framework. In addition to raising awareness about folic acid, educational materials and media also increase consumer demand for wellness information. If women are asking health care providers about folic acid and other preconception topics, this can decrease the pressure placed on health care providers to initiate wellness conversations about multiple topics.

Social marketing theory also suggests that the "one size fits all" strategy of most health campaigns is ineffective; a better approach is to segment the audience by demographic factors such as age, geographic region, or race/ethnicity and then attempt to reach them using health messages designed for them.[7] For this reason the Folic Acid Campaign has used a regional approach, modifying programs in different geographical regions of the state with regional coordinators. The Campaign has also focused extensively on 18-24 year old women by designing materials and programs specifically for that age group. A final example is the Latino component of the Folic Acid Campaign, which employed its own social marketing analysis to develop messages and materials. The result is a completely different campaign and message for Spanish-speakers, emphasizing family (vs. individual) behavior, images that include babies and men (vs. only women), and more information about NTDs than the English-language campaign.

To reach health care providers and encourage them to talk with their patients about the importance of folic acid, the Campaign visits private health care provider offices to provide folic acid education (similar to the strategy used by pharmaceutical representatives). In this "Office Champion" program, health educators (called regional coordinators) train health care providers to talk to their female patients about taking multivitamins during their childbearing years. The program provides in-office training and the appointment of a folic acid "office champion" (usually a nurse) who volunteers to promote the folic acid message in the provider's office. Office champions then remind fellow clinicians to speak with patients about folic acid and coordinate the distribution of educational materials for patients. Regional coordinators maintain contact with office champions to share new research and folic acid materials, providing a personal connection between the Campaign and local health providers. Reminder items such as toothpaste tube squeezers and lip balm are also used to help patients remember to take a daily multivitamin; posters and lapel pins help remind health care providers to talk with their patients about the importance of folic acid.

The Office Champion training provides an opportunity to examine how preconception health counseling is currently being provided in a given practice and to clarify preconception counseling roles. For example, folic acid campaign staff members routinely work with practices to improve intake forms, ensuring that the forms are used as a tool to remind staff to discuss folic acid at every available opportunity, not just at annual exams or preconception visits. This sets the stage for clinicians to provide preconception health counseling that is "opportunistic" rather than viewed as a separate visit.[8] Because preconception health counseling has not traditionally been viewed as a billable service, it is important for practices to consciously determine how they can disseminate this important information to patients in ways that do not drastically alter their existing practice structures.

More than 500 private and public practices have received training in this program since 2003. A recent evaluation demonstrated significant gains in provider knowledge and increased provider counseling about folic acid after participation in the program. The Office Champion program increased the proportion of providers who reported discussing multivitamins with at least half of all female patients of childbearing age from 51% to 69% at annual exams and from 36% to 55% at other types of routine visits. The program also increased provider knowledge about the recommended dose of daily folic acid for women of childbearing age from 53% before the in-service to 73% three months post intervention. For this study, providers were defined broadly to include anyone in the clinical location who could reasonably be expected to counsel women about the importance of folic acid, including physicians, medical assistants, physician assistants, certified nursing assistants, registered nurses, nurse practitioners, and health educators.

There is a dearth of evidence about how to effectively engage and train health care providers to incorporate preconception wellness messages into their daily practice. With additional funding, the North Carolina Folic Acid Campaign's Office Champion program could be expanded (or replicated) to promote additional women's wellness messages. The incorporation of preconception health messages into existing health campaigns is one of the primary recommendations of the *North Carolina State Preconception Health Strategic Plan*.[9] Emerging evidence from a CDC-sponsored preconception health bundling study suggests consumers can easily digest three to five compatible health messages simultaneously.[a]

a K. King, professor and department head, Grady School of Journalism and Mass Communications, The University of Georgia. Oral communication, October 2007.

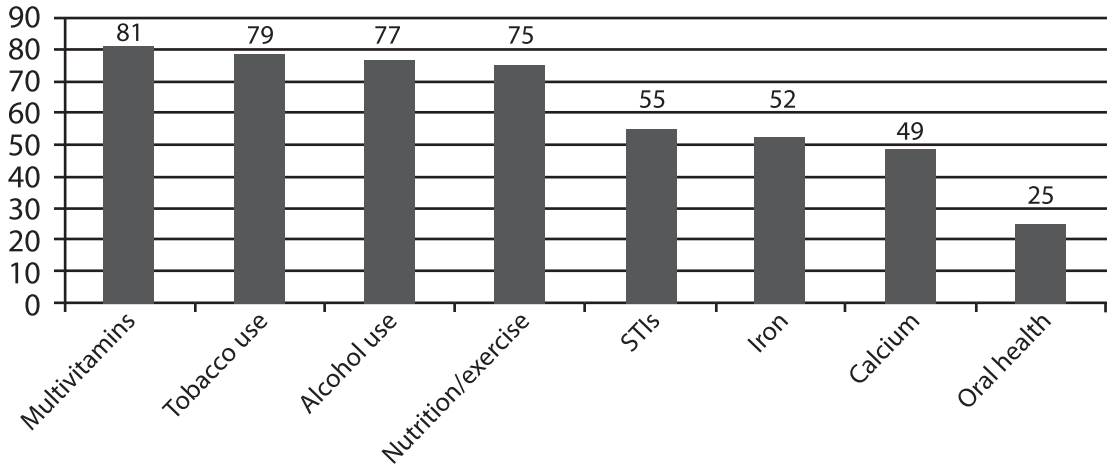
Several important lessons from the Office Champion program can be applied to other women's wellness campaigns. First, preconception health counseling can be successfully integrated into the routine care already being provided by clinical staff rather than provided independently. Our evaluation showed that women who an expressed interest in becoming pregnant were provided preconception counseling even outside of a separate "preconception" visit. Providers reported providing preconception counseling for these women about folic acid, tobacco and alcohol use, nutrition and exercise, and other topics. (See Figure 1). However, because almost half of all pregnancies in North Carolina are unintended,[10] there are still missed opportunities to provide preconception counseling to all women, not just those who report actively planning a pregnancy. Every non-emergent health care visit with a woman of childbearing age should be viewed as a preconception (or interconception) health visit by all members of the clinical team.

Another important lesson of the Folic Acid Campaign is that health care provider counseling about preconception health topics relies on several factors: increased consciousness about the importance of the health of women during the childbearing years and its role in the development of chronic diseases and birth outcomes, active dialogue about preconception health counseling roles within practices, improved billing mechanisms, and increased consumer demand. We must address as many of these factors as possible if we wish to significantly improve preconception health counseling among providers in North Carolina.

To build on its success as a multifaceted preconception health campaign, the North Carolina Folic Acid Campaign, in partnership with the March of Dimes, will soon expand its messages, transforming itself into a statewide preconception health campaign. This will allow the Campaign to use its extensive social marketing expertise and existing relationships with hundreds of providers, lay health educators, and public health professionals around the state to launch a more comprehensive campaign. The Campaign will offer training to health care providers about other women's wellness topics and expand the consumer campaign by partnering with subject experts in other women's wellness areas. The first step will be to offer a healthy weight training for health care providers using the Office Champion model. Although many consumer materials are already in place, North Carolina health care providers requested training about how to talk with their patients about nutrition and exercise in a recent survey. A core component of the training will be helping practices incorporate body mass index (BMI) assessment and discussions about healthy weight into routine care for women.

Based on the outcomes of the Folic Acid Campaign and the relationships we have developed with health care providers around the state, the Campaign and March of Dimes are uniquely positioned to launch a broader preconception health campaign. We are actively seeking research partners, provider practices that would like to participate in our (free) training, and funding. The momentum has tipped in favor of promoting women's wellness throughout the lifespan as a way to improve birth outcomes and prevent chronic disease. We hope to continue our contributions to this movement and improve the health of women and infants in North Carolina. **NCMJ**

Figure 1.
Percent of Health Care Providers in Private Practice in North Carolina who Reported Discussing the Following Preconception Health Topics when Female Patients Expressed Interest in Becoming Pregnant (N=273)



Source: Office Champion program survey, March of Dimes, 2009.

REFERENCES

1 Johnson K, Posner SF, Biermann J, et al. Recommendations to improve preconception health and health care: United States: a report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. *MMWR Morb Mortal Weekly Rep.* 2006;55:1-23.

2 US Preventive Services Task Force. Folic acid for the prevention of neural tube defects: US Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2009;150(9):626-631.

3 Moos MK, Dunlop AL, Jack BW, et al. Healthier women, healthier reproductive outcomes: recommendations for the routine care of all women of reproductive age. *Am J Obstet Gynecol.* 2008;199(6)(suppl SB):S280-S289.

4 Mersereau P, Kilker K, Carter H, et al. Spina bifida and anencephaly before and after folic acid mandate, United States, 1995-1996 and 1999-2000. *MMWR Surveill Summ.* 2004;53(17):362-365.

5 Mullenix A, Stock J, Meyer R, Major J, Morgan L. Prevalence of neural tube defects in North Carolina, 1995/1996 to 2004/2005. Presented at: The National Birth Defects Prevention Network Annual Meeting; February 2008; Washington, DC.

6 Mathews TJ, Honein MA, Erickson JD. Spina bifida and anencephaly prevalence—United States, 1991-2001. *MMWR Morb Mortal Weekly Rep.* 2002;51(RR-13);9-11.

7 Lefebvre RC, Flora JA. Social marketing and public health intervention. *Health Educ Behav.* 1988;15(3):299-315.

8 Moos MK. Preconception health promotion: opportunities abound. *Matern Child Health J.* 2002;6(2):71-73.

9 Women's Health Branch, North Carolina Division of Public Health. *North Carolina Preconception Health Strategic Plan: September 2008-September 2013.* Raleigh, NC: North Carolina Dept of Health and Human Services; 2008.

10 North Carolina State Center for Health Statistics. *Unintended Pregnancies: 2004–2006 NC Pregnancy Risk Assessment Monitoring System (PRAMS) Fact Sheet.* Published March 2009. Accessed October 6, 2009. http://www.schs.state.nc.us/SCHS/pdf/UnintendedPregnancies.pdf.

Improving the Health of Working Women:
Aligning Workplace Structures to Reflect the Value of Women's Labor

Paige Hall Smith, PhD, MSPH; Irene Tessaro, MSN, DrPH

The lack of societal response to the needs of working women, especially mothers, has resulted in systematic gender-based inequities in labor force opportunities, salary, and benefits that negatively impact the physical, psychological, social, and financial well-being of women and their families. Since women now comprise 45% of the total US labor force, and economists are predicting both an aging and shrinking labor force through 2050,[1] reducing the workplace-workforce mismatch through polices and programs that better meet the needs of women workers makes sense from both health and economic perspectives. This paper outlines policies in several areas that could help reduce this mismatch and improve women's health, including policies on health insurance, pay equity, paid sick leave, family leave, workplace breastfeeding support, sexual harassment, and healthy work environment.

...reducing the workplace-workforce mismatch through polices and programs that better meet the needs of women workers makes sense from both health and economic perspectives.

A 2003 national conference on "Workplace-Workforce Mismatch: Work, Family, Health and Wellbeing," sponsored by the National Institute of Child Health and Human Development, and the Alfred P. Sloan Foundation, concluded that "it is evident that a structural workplace/workforce mismatch exists in which the workplace itself no longer fits the needs of increasing numbers of workers."[2] The force behind this mismatch is the feminization of the labor force and the lack of societal response to the needs of working mothers who continue to carry primary responsibility for both childcare and domestic work.[3] Today, 45% of the American workforce is female, and over 75% of women ages 25-54 are employed. From 1975 to 2001 the participation of mothers in the labor force has risen from 54% to 73%.[1]

Opportunities and Constraints

These changing patterns of women's employment have resulted in new opportunities, as well as new constraints, for women and their families and employers. Women and their families benefit from women's increased access to income, health insurance, and retirement income. Employers benefit from a larger and more diverse workforce. In addition, employment can lead to women's improved social status and esteem. Unfortunately, however, the potential benefits associated with women's work are often undermined by the continuing organization of work and society around an outmoded model of the ideal worker: a company man committed to meeting the demands of his employer who is supported by a wife who takes care of the children and the household.[4,5] Today, this model reflects only 20% of all families.[4]

This obsolete model of family dynamics is the motivator of a variety of systematic forces that create gender-based job stresses that negatively affect the physical, psychological, social, and financial well-being of women and their families.[2] These include continuing segregation of scores of women to low control, low paid, often part-time employment with inflexible work conditions and little if any access to health insurance. Twice as many women (26%) as men (13%) work part-time.[6] Low income and part-time jobs have unstable income, unstable working conditions that often include shift rotation, and lack of access to paid sick leave or a

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retirement plan. This leaves women more vulnerable than men to emergencies, economic downturns, and the needs of sick children.[7-9]

At the opposite end are women professionals who work long hours, generally with inflexible work conditions and little opportunity for part-time work with benefits. Both groups lack access to high quality, affordable childcare, and most families allocate a large proportion of their income to childcare, after school care, summer camp, and elder care.[2] In North Carolina the cost of full-time care for an infant in a childcare center as a percent of median income is 12% for a married couple and 38% for a single mother.[10]

Workplace Polices

There are numerous actions that policymakers and employers can take to reduce the workplace-worksite mismatch and improve the health of workers. Below we examine areas where legislative and policy actions could improve women's health.

Pay Equity

Women workers of all ages have made considerable strides in earnings relative to men in the last 20 years. Yet women still make only 77 cents for every dollar earned by a man, with the median income of men being $42,261 and women only $32,515.[11] The disparity is even greater for minority women. On average, in North Carolina in 2007, white non-Hispanic women working full-time year-round earned 78%, African American women earned 63%, and Hispanic women earned 48% of what white non-Hispanic men working full-time year-round earned. This gap exists at all educational levels and across occupational categories.[12] The Lilly Ledbetter Fair Pay Act of 2009,[13] recently signed into law, strengthens protections against pay discrimination by requiring employers to prove that gender disparities in pay are job-related; by prohibiting employer retaliation against employees who inquire about, discuss, or disclose their own wage or that of another employee; and by increasing penalties against discriminatory employers.

Sick Leave

The Healthy Families/Healthy Workplaces Act,[14] currently under consideration by the North Carolina legislature, would set minimum standards for paid sick leave for both small and large employers. Importantly, this bill would allow women to use paid sick leave to seek care for the psychological, physical, or legal effects of domestic violence, sexual assault, or stalking. A similar bill at the federal level is the Healthy Families Act,[15] which would set minimum standards for both full- and part-time workers.

Health Insurance

Women are more likely than men to need regular health care throughout their lifetimes, particularly because their reproductive health and pregnancy needs require them to interact regularly with the health care system.[16] Yet women have less access than men to employer-sponsored health insurance because of part-time and low-paid work.[17] Workers earning less than $20,000 are often not eligible for health insurance coverage, even with large employers and full-time work.[11,17] Because there are few sources of affordable coverage outside the employer-based system, most workers without employer-based coverage are uninsured.[17] Even with health insurance, women have difficulty affording health care services and paying premiums and have higher out-of-pocket health care expenses than men.[18] Women need workplace health insurance to include part-time workers and/or the availability of an option to purchase affordable, comprehensive insurance outside the workplace. Denial of health coverage based on preexisting conditions, which affects many women (e.g., breast cancer survivors), and the practice of charging women more than men for the same health benefit policies also need to be changed.[6]

Family Leave

The United States is one of only two developed countries to offer no paid parental leave.[19] The minimum standard set by the Family and Medical Leave Act of 1993 (FMLA)[20] requires employers of 50 or more employees to provide all full-time employees 12 weeks of *unpaid* leave. However, due largely to the exclusion of smaller employers and part-time workers, about 40% of workers are not covered by FMLA and even more cannot afford to take unpaid leave.[19] Employers have failed to fill the gaps: only 25% of US employers offer fully-paid maternity-related leave of any duration, and 20% offer no maternity-related leave of any kind.[19] The absence of maternity leave leads many women to leave the workforce or reduce their work hours, thus paying a penalty in income and future retirement.[19]

The Federal Employees Parental Leave Act of 2009,[21] currently before Congress, would allow federal employees to substitute four weeks of *paid* leave, as well as any accrued annual or sick leave, for the 12 weeks of *unpaid* leave. The bill's authors argue that "employees must save up their leave time in the years leading up to having a child. Asking employees to cobble together accrued leave makes it difficult for relatively new employees or those who experience health problems to save up enough time for parental leave. Even the best-prepared new parents face difficult choices when child care needs arise; many are forced to choose between their child and their paycheck."[21] Although this bill would only cover federal workers, this argument applies to all workers and the bill's passage would allow the federal government to serve as an example of "better practices." The Family and Medical Leave Enhancement Act of 2009,[22] also before Congress, would amend the FMLA to include employers with 25 or more employees and would allow these employees to take off some time to attend their child's school or community-sponsored activities.

Breastfeeding in the Workplace

The complicated relationship between women's employment and breastfeeding has not improved over the decades: working has little if any impact on women starting

breastfeeding but is a critical factor affecting shortened duration.[23] In order to successfully breastfeed or pump human milk at work, women need some control over their environment and their time, money for pumps or access to their child, and institutional support. Recently the Maternal Child Health Bureau and Office on Women's Health in the Health Resources and Services Administration of the US Department of Health and Human Services created the evidence-based *Business Case for Breastfeeding*,[24] a toolkit and training program to help employers implement breastfeeding promotion programs. The toolkit educates employers on the benefits of both breastfeeding and workplace lactation programs which include reducing health care costs, retaining valued employees, improving staff productivity, and enhancing company image.

The Breastfeeding Promotion Act,[25] currently under consideration in Congress, would bring breastfeeding mothers under the protection of the 1964 Civil Rights Act, set standards for breast pump manufacturers, and require employers with over 50 employees to provide a private space and unpaid time off during the workday for mothers to express milk, provide for tax incentives for employers that establish private lactation areas, and provide tax credits for nursing mothers. According to Representative Carolyn Maloney (D-NY), who introduced this bill, the act "recognizes both scientific fact and the way Americans live now: human milk is the best nutrient for new babies—and most mothers have to go back to work during a child's first year, when breastfeeding is most important."[26]

Sexual Harassment

A recent large-scale longitudinal study examining workplace sexual harassment found that women who hold supervisory positions are more likely to be sexually harassed at work than other women.[27] This study found that nearly 50% of women supervisors, and one-third of women who do not supervise others, reported sexual harassment in the workplace. Unfortunately, the health consequences of sexual harassment are under-researched, but there is a growing literature suggesting that it can lead to the range of physical and emotional problems associated with other forms of gender-based violence, including pain, gastrointestinal disorders, irritable bowel syndrome, sleep disruption, post-traumatic stress disorder, and generalized anxiety.[28,29] Employers must show that they have provided periodic sexual harassment training in order to raise a defense or avoid punitive damages in sexual harassment lawsuits. The North Carolina Administrative Code requires all state agencies to develop a plan on unlawful workplace harassment that includes training for state employees.[30]

Healthier Work Environments

Stressful work, potentially harmful work, and unhealthy lifestyles combine to create unhealthy work environments. The rate of stress-related illnesses for workers is nearly twice as high for women compared to men.[31] Women of reproductive age are also exposed to (or consume) substances that can have adverse effects on pregnancy outcomes, leading to pregnancy loss, infant death, birth defects, or other complications for mothers and infants.[32] In addition, the health consequences and health care costs associated with smoking and obesity are well-established. These health conditions affect all workers and employers through lost time and lowered productivity by sick employees, in addition to loss of trained workers through disability. Policies that create a healthier environment within the workplace and promote preventive measures can be beneficial for all workers. This would be especially valuable for low-wage women workers who are more likely than men to forgo preventive health services because of cost.[18]

In 2008 the North Carolina Office of State Personnel adopted a Worksite Wellness Policy that requires all state agencies to develop worksite wellness plans that address physical activity, tobacco use cessation, healthy eating, and stress management.[33] For several years researchers from the University of North Carolina at Chapel Hill partnered with manufacturing companies in rural North Carolina to implement "Health Works for Women." In this program, women formed worksite health promotion support networks that provided peer education and other healthy workplace and community activities such as health screenings, health fairs, and walking groups. A program evaluation showed significant increases in the amount of fruits and vegetables the women ate and in their participation in exercises to improve strength and flexibility.[34]

The view of women's health from the lens of the workplace makes clear that women's health is strongly related to the value that society places on women both as workers and as mothers. The continuation of systematic gender-based inequities in labor force opportunities, salary and benefits, and the continued resistance of workplaces to provide and governments to require even minimal paid maternity leave and health insurance for part-time workers reinforces the continuing inferior status of women, especially mothers, in the workplace. Given that women now comprise 45% of the total US labor force and economists are predicting both an aging and shrinking labor force through 2050,[1] reducing the workplace-workforce mismatch through polices and programs that better meet the needs of women and reflects the value of women's labor makes sense from both a health and economic perspective. **NCMJ**

REFERENCES

1 Toosi M. A new look at long-term labor force projections to 2050. *Monthly Labor Review*. US Bureau of Labor Statistics, US Department of Labor. November 2006.
2 Christensen, KE. Foreward. In Bianchi SM, Casper LM, King RB, eds. *Work, Family, Health, and Well-Being.* Mahway, NJ: Lawrence Erlbaum Associates; 2005; ix-xii.
3 Bianchi SM, Casper LM, King RB. Complex connections: a multidisciplinary look at work, family, health, and well-being research. In Bianchi SM, Casper LM, King RB, eds. *Work, Family, Health, and Well-Being.* Mahway, NJ: Lawrence Erlbaum Associates; 2005:1-20.
4 Williams J. *Unbending Gender: Why Family and Work Conflict and What To Do About It.* New York, NY: Oxford University Press; 2000.
5 Fletcher J. Gender perspectives on work and personal life research. In Bianchi SM, Casper LM, King RB, eds. *Work, Family, Health, and Well-Being.* Mahway, NJ: Lawrence Erlbaum Associates; 2005; 325-338.
6 Majority Staff of the United States Congress Joint Economic Committee. *Comprehensive Health Care Reform: An Essential Prescription for Women.* Washington, DC: US Congress Joint Economic Committee; 2009.
7 Perry-Jenkins M. Work in the working class: challenges facing families. In Bianchi SM, Casper LM, King RB, eds. *Work, Family, Health, and Well-Being.* Mahway, NJ: Lawrence Erlbaum Associates; 2005:453-472.
8 Henley JR, Lambert S. Non-standard work and child-care needs of low-income parents. In Bianchi SM, Casper LM, King RB, eds. *Family, Health, and Well-Being.* Mahway, NJ: Lawrence Erlbaum Associates; 2005:473-493.
9 Burten LM, Lein L, and Kolak A. Health and mother's employment in low-income families. In Bianchi SM, Casper LM, King RB, eds. *Work, Family, Health, and Well-Being.* Mahway, NJ: Lawrence Erlbaum Associates; 2005:493-510.
10 North Carolina Child Care Resource and Referral Network. *2009 Child Care in the State of North Carolina.* The National Association of Child Care Resource & Referral Agencies website. http://www.naccrra.org/randd/data/docs/NC.pdf. Accessed August 16, 2009.
11 DeNavas-Walt C, Proctor BD, Smith J. *Income, Poverty, and Health Insurance Coverage in the United States: 2006.* US Census Bureau, Current Population Reports. Washington, DC: US Government Printing Office; 2007:60-233.
12 National Women's Law Center. *Falling Short in Every State: The Wage Gap and Harsh Economic Realities for Women Persist.* Washington, DC: National Women's Law Center; 2009.
13 Public Law 111-2.
14 SB 535/HB 117.
15 HR 2406/S 1152.
16 Lambrew JM. *Diagnosing Disparities in Health Insurance for Women: A Prescription for Change.* New York, NY: The Commonwealth Fund; 2001.
17 Glied S, Jack K, Rachlin J. Women's health insurance coverage 1980-2005. *Womens Health Issues.* 2008;18(1):17-16.
18 Patchia EM, Waxman J. *Women and Health Coverage: The Affordability Gap.* New York, NY: The Commonwealth Fund; 2007.
19 Ray R, Cornick JC, Schmitt J. *Parental Leave Policies in 21 Countries.* Washington DC: Center for Economic and Policy Research; 2008. Rev 2009.
20 Public Law 103-3.
21 HR 262/S 354.
22 HR 824.
23 Thulier D, Mercer J. Variables associated with breastfeeding duration. *J Obstet Gynecol Neonatal Nurs.* 2009;38(3):259-268.
24 Office on Women's Health, US Department of Health and Human Services. The business case for breastfeeding: steps for creating a breastfeeding friendly worksite. The National Women's Health Information Center website. http://www.womenshealth.gov/breastfeeding/programs/business-case/. Accessed August 16, 2009.
25 HR 2819/S 1244.
26 Nursing moms help Rep. Maloney, Sen. Merkley introduce 'Breastfeeding Promotion Act' [press release]. New York, NY: Representative Carolyn B. Maloney website; June 11, 2009. http://maloney.house.gov/index.php?option=com_content&task=view&id=1862&Itemid=61. Accessed August 16, 2009.
27 McLaughlin H, Ugge C, Blacksone A. A longitudinal analysis of gender, power, and sexual harassment in young adulthood. Paper presented at: the American Sociological Association Annual Meetings; August 8, 2009; San Francisco, CA.
28 Lenhart S. *Clinical Aspects of Sexual Harassment and Gender Discrimination: Psychological Consequences and Treatment Interventions.* New York, NY: Brunner-Routledge; 2004.
29 Coker AL, Smith PH, Bethea L, Remsburg MJ, McKeown E. Physical health consequences of physical and psychological intimate partner violence. *Arch Fam Med.* 2000;9(5):451-45.
30 25 N.C.A.C. 1J1101.
31 National Institute for Occupational Safety and Health. *Worker Health Chartbook, 2004.* Centers for Disease Control and Prevention website. http://www.cdc.gov/niosh/docs/2004. Accessed August 17, 2009.
32 Phillips KE, Flood G. Employer approaches to preconception care. *Womens Health Issues.* 2008:18(suppl 6):S36-40.
33 North Carolina Office of State Personnel. *State Personnel Manual, Section 8, Workplace Environment and Health.* NC Office of State Personnel website. http://www.osp.state.nc.us/manuals/manual99/Worksite%20Wellness%20Policy.pdf. Revised July 27, 2009. Accessed August 19, 2009.
34 Campbell MK, Tessaro I, DeVellis B, et al. Effects of a tailored health promotion program for female blue-collar workers: health works for women. *Prev Med.* 2002;43(3):313-23.

Resources for Women's Health

Lindsey E. Haynes

The Center for Women's Health Research at UNC

Founded in 2000, the nonprofit Center for Women's Health Research is part of the University of North Carolina School of Medicine and provides exemplary research services to women's health investigators in the areas of preventive care, screening, symptoms, early diagnosis, delivery of services, and health disparities. The Center's mission is exemplified through its **CORE** activities:

- **C***atalyzing interdisciplinary and inter-institutional research.*
- **O***utreach to the community by promoting awareness of women's health issues.*
- **R***esearch coordinated with partners in priority areas such as preterm birth, gynecologic cancers, obesity and associated conditions, mental health, and substance abuse.*
- **E***ducation of the next generation of women's health researchers.*

During the past year, the Center coordinated more than 20 new and continuing research proposals and projects, including studies and clinical trials examining oral health and pregnancy, infertility, preterm birth, gynecologic health, menopause, and contraception. Collaborative research efforts include an inter-institutional study by the University of North Carolina at Chapel Hill, East Carolina University, and the Eastern North Carolina Baby Love Project on disparities in maternal health and child development in rural North Carolina; a multi-site network focused on issues in maternal/fetal medicine; and a multi-site contract to examine the pathogenesis of preeclampsia and gestational diabetes. The Center also coordinates two National Institute of Health-funded fellowships for obstetrician/gynecologists.

Increasing community awareness of women's health issues is a major part of the Center's mission. Every two years, the Center produces the North Carolina Women's Health Report Card with grades given based on improvements or declines in various indicators of women's health—chronic disease, preventive health, reproductive health, and minority health disparities. This year, three new areas of health data are available: breastfeeding, North Carolina's American Indian women, and regional data. The Report Card is distributed throughout North Carolina to health care providers, government officials, agencies, and individuals for use in targeting health disparities and health care needs of local communities.

http://www.cwhr.unc.edu

Eat Smart, Move More

Eat Smart, Move More consists of statewide partners dedicated to increasing opportunities for individuals to eat healthy and exercise more. Their mission is to "reverse the rising tide of obesity and chronic disease among North Carolinians by helping them eat smart, move more, and achieve a healthy weight." Their website offers a plethora of resources for families, health care professionals, advocates, and community leaders including programs and tools for eating smart and moving more, statewide plans to prevent obesity and chronic illnesses, funding opportunities for communities, recent news on nutrition and exercise, obesity facts and statistics, physical activity and nutrition data resources, individuals' success stories, guides to healthy behaviors, press-related tools and sample materials, and evidence-based practices for obesity prevention. In addition, readers can sign up for free monthly newsletters on how to eat smart and move more in the community.

http://www.eatsmartmovemorenc.com

March of Dimes

March of Dimes is a nonprofit organization dedicated to "improving the health of babies by preventing birth defects, premature births, and infant mortality." Through research, community support, and education, March of Dimes carries out their mission across the nation. The national website offers vital information for both patients and providers. Women can follow a "News Moms Need" blog for moms and moms-to-be, visit the online Pregnancy and Newborn Health Education Center which offers video and audio clips on pregnancy and postpartum care, and watch interactive flash programs on understanding newborns. There is a new section that focuses on preconception health with a variety of tools and resources for couples who are considering having a baby. It also provides pregnancy tips of the day, a question and answer page, and a "Just for Dad" section. For providers, the March of Dimes website includes medical references, online modules for continuing education credits, information on research funding, awards and grants, screening tools, and free access to the Perinatal Data Center. The PeriStats website includes national, state, and local infant health data. Providers can create graphs or maps using recent data and also view quick facts or state summaries. The North Carolina chapter of the March of Dimes is linked to the national site and contains information about local activities and resources.

http://www.marchofdimes.com

The National Preconception Curriculum and Resource Guide for Clinicians

The Before, Between, and Beyond Pregnancy website is a resource guide for clinicians developed by the Centers for Disease Control and Prevention's Select Panel on Preconceptional Care in partnership with the University of North Carolina's Center for Maternal and Infant Health and the Albert Einstein College of Medicine. The site includes continuing education modules for clinicians; state resources, including links to exemplary state plans for preconception and interconception care; provider resources with descriptions and links to North Carolina prevention programs; key articles about specific high risk conditions in patients; practice support toolkits; and up-to-date news on preconception health and health care, including clinical guideline alerts, emerging public policy initiatives, and possible funding opportunities.

http://www.beforeandbeyond.org

National Women's Health Resource Center

Founded in 1988, the National Women's Health Resource Center (NWHRC) is a nonprofit organization committed to "providing women in-depth, objective, physician-approved information on a broad range of women's health issues." Women can search over 100 topics in NWHRC's online health library, read topic-specific columns, sign up for free e-newsletters, and download specialty booklets and handouts on healthy living. The site also includes quick links to a new mom blog, health guides, and a search for a health clinic or organization near you. NWHRC includes a "Small Steps" webpage that offers advice on "small steps to a healthier you" where women can browse topics such as diet and nutrition, fitness, managing stress, beauty, and alternative medicine. Creative tips such as skipping soda and replacing it with strawberry-mint water are just one of their easy alternatives to healthier living. On the "Health Topics A-Z" page, women can find information on topics ranging from acupuncture to cervical cancer to recommended vaccines. NWHRC also offers an up-to-date newsroom that posts the latest news in women's health.

http://www.healthywomen.org

North Carolina Be Smart Family Planning

Overseen by the North Carolina Department of Health and Human Services, the Be Smart Family Planning program was created to "reduce unintended pregnancies and improve the well-being of children and families in North Carolina." The program offers free family planning and birth control services for women ages 19–55 and men ages 19–60 who are not pregnant or sterilized, have an income at or below 185% of the federal poverty level, and are not currently on Medicaid. Additional services include pregnancy tests, family planning lab tests, HIV testing, Pap smears, limited screening and treatment for some STDs, and referrals to other programs or services. Family planning services are provided at private medical clinics, local health departments, federally qualified health centers, rural health clinics, and Planned Parenthood health centers.

http://www.dhhs.state.nc.us/dma/medicaid/familyplanning.htm

North Carolina Folic Acid Campaign

The North Carolina Folic Acid Campaign (NCFAC) is a statewide program that aims to reduce neural tube defects in newborns by encouraging women of reproductive age to take a daily multivitamin containing 400 mcg of folic acid. Through their educational and media campaigns, NCFAC hopes to raise awareness about the importance of folic acid consumption among the general public, health care professionals, and community organizations. On their website, NCFAC has information for women about taking multivitamins, such as which ones to choose and what the benefits are from taking them. The website also includes separate pages for women and health care providers. Women can discover tips to keep healthy for their age group, and look up information on pregnancy health and pregnancy planning. On the health care providers site, providers can find information on how to start the conversation about taking multivitamins and the importance of folic acid with their female patients. NCFAC also provides links to current recommendations for vitamin consumption and access to free patient materials and resources.

http://www.getfolic.com

NC Healthcare Help

NC Healthcare Help is a website developed by the North Carolina Institute of Medicine with funding from the Blue Cross and Blue Shield of North Carolina Foundation and the Duke Endowment's CareShare initiative. The website connects patients to free or reduced cost health care services using a database with over 300 provider locations across the state. On the website, patients can search for health care providers by location, hours of operation, insurance accepted, and services provided (such as dental, behavioral health, or specialty care). The website includes a resources page that provides links to other health care-related websites such as obtaining health insurance, adopting a healthier lifestyle, improving the community's safety net system, and accessing reports on North Carolina's safety net system and the uninsured. Patients can also view service definitions to help them better understand health care terminology. In addition to resources for patients, safety net providers can also ask questions about an organization's listing, change a listing, upload new information, and submit website suggestions.

http://www.nchealthcarehelp.org

NC Healthy Start Foundation

Established in 1990, the North Carolina Healthy Start Foundation is a nonprofit organization whose mission is to reduce infant mortality and to improve the health of women and children in North Carolina. To help pursue their mission and goals, the Foundation uses various activities such as community grants, public education campaigns, materials development, training and technical assistance to other organizations, and advocacy. The Foundation also has a website that is useful for both the general public and health care professionals. For the public, the site offers information on women's health, becoming pregnant, what to do during pregnancy, caring for infants, obtaining health insurance for children, introduction to medical homes, and a link to the NC Family Health Resource Line. For professionals, the Foundation offers free educational materials for topics such as pregnancy, community education, NC Health Choice, and Spanish language materials. In addition, the site also provides links to other health programs and services in North Carolina, access to free multimedia public campaigns, and the option to sign up for a free newsletter.

http://www.nchealthystart.org

North Carolina Perinatal Association

With a mission of "improving perinatal health for childbearing families throughout the state," the North Carolina Perinatal Association was created in 1985. This nonprofit organization includes a coalition of physicians, nurses, social workers, and childbirth educators working together in North Carolina. The Association offers educational opportunities for providers interested in learning more about obstetrical and neonatal care in both community and hospital settings. On the Association's website, providers can view a calendar of events page and find a program or class offered in one of the Association's six geographical regions. The site also includes a resource page which provides links to various topics such as maternal health, training and certification courses, breastfeeding, and evidence-based practices. Providers interested in becoming members of this organization can find membership information directly on the website.

http://www.ncperinatalassociation.org

Preconception Health at EveryWomanNC

The mombaby.org website was created in 2005 by the University of North Carolina at Chapel Hill Center for Maternal and Infant Health to improve the health of women and infants in North Carolina. The site offers a "Preconception Health" section for women interested in good health and who want to have children at some point during their lives. Women can access online health assessment tools such as the Becoming a Parent Preconception Checklist and the How Healthy Are You? interactive quiz. The site also offers statistics on the health of women in North Carolina and resources for women on issues such as healthy weight, healthy relationships, smoking cessation, access to health care services, contraception and much more. The "Take Action" section of the site has information about a variety of projects and programs underway, in North Carolina and beyond, that focus on improving the health of women.

http://www.everywomannc.org

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On their websites, tobacco companies encourage people to quit smoking.
In 2006, a court found that tobacco companies manipulate nicotine levels to keep smokers addicted.
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Using Master Settlement Agreement Funds to Reduce Prenatal/Postpartum Smoking in North Carolina: *You Quit, Two Quit*

Vandana Shah; Candice Justice; Barbara Moeykens

The North Carolina Health and Wellness Trust Fund Commission (HWTF) was established by the North Carolina General Assembly in May 2000 to receive 25% of the state's share of the Tobacco Master Settlement Agreement in order to address the health needs of vulnerable and underserved populations in North Carolina. The HWTF addresses its statutory mission by investing in programs and establishing partnerships that focus on critical health needs in four major areas: youth tobacco use, obesity, health disparities, and access to medications. Governed by an 18-member commission of health care experts drawn from a variety of professions, the HWTF has embarked on these four major initiatives, all designed to reduce the economic and human suffering from preventable diseases.

To date, the Health and Wellness Trust Fund has awarded over 250 grants that build capacity in local communities to prevent and treat chronic health issues. These local grantees make up the infrastructure that has enabled each of the Health and Wellness Trust Fund's preventive initiatives to reach its overall goals. To enhance the impact of local grant infrastructure and to have a more sustainable impact statewide, the HWTF also designs and implements mass media campaigns and works to effect policy change at the local and state levels. Independent evaluations of its grant programs are conducted on an ongoing basis to measure and increase the effectiveness of all these strategies.

Although North Carolina's infant mortality rate has decreased dramatically in recent years, it still remains well above the national average. In 2008 North Carolina ranked 44th in the nation with 8.2 deaths per 1,000 births compared to the national rate of 6.8 deaths per 1,000 births.[1] According to the State Center for Health Statistics, three of the top four causes of infant death in North Carolina are directly associated with either maternal smoking during pregnancy and/or infant exposure to tobacco smoke after birth.[2] Analysis of the North Carolina Pregnancy Risk Assessment Monitoring System (PRAMS) found that 24.6% of women reported smoking before pregnancy, 13.8% during pregnancy, and 20.3% after pregnancy. And, of those who smoked before pregnancy and quit during pregnancy, roughly half began smoking again by the time they completed the PRAMS survey three to six months postpartum.[3] If it were possible to eliminate smoking entirely during pregnancy, the infant mortality rate for the state would drop an estimated 10% to 20%, with the most improvement coming in underserved and disadvantaged communities where women are more likely to smoke while pregnant.[4]

You Quit, Two Quit Program Development

In order to address this problem, the North Carolina Health and Wellness Trust Fund awarded a three-year grant to the University of North Carolina at Chapel Hill's Center for Maternal and Infant Health to implement the *You Quit, Two Quit* program. The program utilizes statewide education and outreach to health care providers to make smoking cessation services and resources available to prenatal and postpartum women. Research shows that a brief 5-15 minute counseling intervention delivered by a trained health care provider, coupled with educational and policy interventions, can double or even triple the success of smoking cessation among pregnant and postpartum women.[5]

The overall goal of *You Quit, Two Quit* is to decrease maternal and infant morbidity and mortality by reducing tobacco use among pregnant and postpartum women. The program ensures that there is a comprehensive system in place to screen and treat pregnant and postpartum women for tobacco use, with a particular emphasis on low-income women.

Effective July 1, 2005, North Carolina mandated that all health department maternity clinics provide smoking cessation counseling and resources for women who identified themselves as smokers; however, there is often little or no funding to provide these services. Participation in the *You Quit, Two Quit*

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pilot project was solicited from health departments across the state in order to develop effective screening and cessation services. The Columbus, Davidson, Richmond, and Wilkes County health departments were chosen as the four pilot sites based on the following criteria:

- Geographic location, including a mix of population densities.
- High rates of pregnant smokers.
- The health department must offer obstetric/prenatal care, family planning services, and well child care.
- Health director/medical director exhibited strong leadership and had a clear commitment to implementing the project.

In establishing comprehensive systems to screen and treat pregnant and postpartum women, *You Quit, Two Quit* employed a four-pronged approach including:

1. Providing effective training to health care providers who screen and treat pregnant and postpartum women.
2. Expanding outreach and training to providers who typically don't provide cessation counseling such as Women, Infant, and Children (WIC) clinics, maternity care coordinators, and family planning programs.
3. Extending smoking cessation counseling services and opportunities to women 12 months postpartum to prevent relapse of smoking after the birth of the baby.
4. Providing education and outreach to health care providers across the state.

The pilot projects were also encouraged to collaborate with local and private prenatal clinics, pediatric practices, family medicine providers, and regional delivery hospitals to ensure continuity in smoking cessation opportunities.

You Quit, Two Quit Program Implementation

You Quit, Two Quit was launched on January 29, 2009. Health care professionals from across the state were invited to a kick-off workshop featuring speakers who provided training on how to comprehensively address the issue by utilizing proven, best practice strategies. Project coordinators, as well as all health care providers and health department employees in the pilot sites who work directly with women, received additional training and began implementing the program in their health departments in February, 2009. The program encourages health care providers in the health departments to screen all pregnant women and mothers of infants up to one year of age using a structured questionnaire, and then to document their answers on a "Five A's" Intervention Record (FAIR form) that remains in the chart. This visual cue reminds other public health professionals who come in contact with the patient to continue to ask about smoking status and to offer smoking cessation resources.

By April 30, 2009, the four sites had exceeded initial expectations by screening 1,169 pregnant women and 1,384 new mothers using the FAIR form. Smokers receive the evidence-based "Five A's" smoking cessation counseling intervention consisting of **asking** about her smoking status using a structured question, **advising** the women to quit, **assessing** her willingness to quit, **assisting** the women with devising a plan for quitting, and **arranging** for follow-up to ensure they are adhering to their quit plan and to provide continued support. They also receive the North Carolina Healthy Start Foundation's "If You Smoke and Are Pregnant" booklet, which is a guide to quitting smoking with content developed by national experts in tobacco cessation among pregnant women. Those who indicate that they are ready to quit within the next 30 days are given a *You Quit, Two Quit* incentive tote bag consisting of items such as a water bottle, a onesie for the baby, and a pedometer. Mothers who are trying to remain tobacco-free or quit after delivery also receive the incentive, a booklet entitled "A Guide to Help New Mothers Stay Smoke-Free" (developed for the *You Quit, Two Quit* project), and the North Carolina Healthy Start Foundation's "Oh Baby" booklet, which encourages parents to keep the baby free from secondhand smoke exposure.

All providers in the pilot sites have been trained to proactively refer women to QuitlineNC, a confidential smoking cessation phone service that has a specific protocol for pregnant women. QuitlineNC is funded by the Health and Wellness Trust Fund and is available free of charge to all North Carolinians.

Another important component of the *You Quit, Two Quit* project is statewide outreach and education to health care providers in order to heighten their awareness of the need for screening pregnant and postpartum patients and to provide them with the appropriate resources they need to assist patients in quitting tobacco. This was accomplished through a variety of ways, including the development of a *You Quit, Two Quit* website (www.youquittwoquit.com) that includes a section for health professionals, as well as sections for pregnant and postpartum women. The HWTF also sent a mailing to over 1,000 obstetrics providers urging them to adopt tobacco screening and treatment policies for their practices and providing them with evidence-based resources to assist them in accomplishing this task. As with pilot site health care providers, they were encouraged to add the inquiry about tobacco use status as a "fifth vital sign" and use a visible cue in the patient's chart if the person smokes. The HWTF used the "Five A's" protocol to develop pocket guides that could be readily accessible as a means of facilitating the brief intervention to patients who smoke, which were also included in the mailing. In order to help providers feel more comfortable in delivering this intervention, the "Five A's" pocket guides even included scripted lines that the providers could use when talking with the patient.

The mailing also included a postcard to raise awareness of the *You Quit, Two Quit* website and to provide the new CPT billing codes providers can use to be reimbursed for providing smoking cessation counseling to their patients. On January 1, 2009, Medicaid began to reimburse physicians, nurse practitioners, certified nurse midwives, and allied health professionals for providing smoking cessation counseling. Many health care

providers previously cited a lack of reimbursement for smoking cessation as a barrier to providing the counseling; the new codes are expected to encourage them to offer this service.

Lastly, health care providers received resources to encourage the use of QuitlineNC, including brochures promoting the service, fax referral forms, and a "prescription pad" to prescribe QuitlineNC to patients who are interested in quitting. The "Five A's" counseling intervention and quitline cessation services double an individual's chance of successfully quitting. (Visit http://www.quitlinenc.com to view the brochure and other resources for medical professionals.)

Upon completion of the three-year grant period, the *You Quit, Two Quit* project is expected to have established four effective, sustainable, community-based smoking cessation projects that can be adopted and easily replicated by other health departments across the state. For more information on this program, as well as other initiatives funded by the North Carolina Health and Wellness Trust Fund, visit http://www.healthwellnc.com. **NCMJ**

The NC Health and Wellness Trust Fund makes North Carolina stronger, both physically and economically, by funding programs that promote preventive health. Created by the General Assembly in 2000 to allocate a portion of North Carolina's share of the National Tobacco Settlement, the HWTF has invested $199 million to support preventive health initiatives and $102 million to fund prescription drug assistance programs. For more information, please visit http://www.healthwellnc.com.

REFERENCES

1 North Carolina Healthy Start Foundation. Infant mortality in North Carolina. North Carolina Healthy Start Foundation website. www.nchealthystart.org/infant_mortality/index.htm. Accessed 21, Aug, 2009.

2 Melvin CL, Malek SH. Making a difference in infant survival: evidence-based actions to reduce tobacco exposure during pregnancy and infancy in North Carolina. *NC Med J.* 2004;65(3):164-166.

3 Avery M, Stallings W. *Tobacco Use Among Pregnant Women in North Carolina: Predictors of Smoking Cessation During Pregnancy.* SCHS Studies No. 138. Raleigh, NC: North Carolina State Center for Health Statistics; 2003. http://www.schs.state.nc.us/SCHS/pdf/SCHS138.pdf. Accessed September 29, 2009.

4 Rosenberg DC, Buescher PA. *The Association of Maternal Smoking with Infant Mortality and Low Birth Weight in North Carolina, 1999.* SCHS Studies No. 135. Raleigh, NC: North Carolina State Center for Health Statistics; 2002. http://www.schs.state.nc.us/SCHS/pdf/SCHS-135.pdf. Accessed September 29, 2009.

5 Boschert S. Use 'five A's' in smoking cessation counseling: brief interventions make big difference. Findarticles.com website. http://findarticles.com/p/articles/mi_m0CYD/is_2_39/ai_113138548/. Published January 15, 2004. Accessed October 12, 2009.

Editor's Note: *Running the Numbers*

This issue we'd like to welcome a new section editor for the *North Carolina Medical Journal*. Robert E. Meyer, PhD, MPH, director of the North Carolina Birth Defects Monitoring Program at the North Carolina State Center for Health Statistics will assume the role of section editor of *Running the Numbers*, a regular department of the *Journal* that reviews key statistics describing the health and health care of North Carolinians. Dr. Meyer has been the head of the North Carolina Birth Defects Monitoring System at the State Center for Health Statistics where he has authored multiple "Statistical Briefs" issued by the Center. Dr. Meyer has also contributed original articles to the *Journal*. He graduated with a BA from UNC Charlotte, an MPH from the University of Tennessee, Knoxville, and holds a PhD in epidemiology from the University of South Carolina. In addition to his work at the State Center, Dr. Meyer is also an adjunct professor in the UNC Chapel Hill Gillings School of Global Public Health, Department of Maternal and Child Health.

At this time, the *Journal* would also like to extend our greatest thanks and appreciation to Paul A. Buescher, PhD, the section editor and main contributor to the *Running the Numbers* department since its inception. Now retired, Dr. Buescher worked for almost 30 years at the State Center for Health Statistics, and was the director of the Center from 2005-2009. In addition, he was a research fellow at the Cecil G. Sheps Center for Health Services Research and an adjunct professor in the Department of Maternal and Child Health at UNC Chapel Hill Gillings School of Global Public Health. In 2004 Dr. Buescher was the recipient of the National Maternal and Child Health Epidemiology Award for Effective Practice at the State Level. All of us here at the *North Carolina Medical Journal* thank him for his leadership and dedication to the *Running the Numbers* department over the past decade and wish him the best of luck during his retirement. We hope he continues to find success in all his future endeavors.

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North Carolina MEDICAL JOURNAL

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

Body Mass Index Among North Carolina Women of Reproductive Age

Women who are overweight or obese face a number of potential health risks including increased risk for type II diabetes, cardiovascular disease and stroke, certain cancers such as breast and colon cancer, various pregnancy complications, and adverse infant outcomes.[1-8] Obesity is defined as having a body mass index (BMI) > 30, as calculated by the formula:

BMI = weight in kilograms / height in meters^2 or
BMI = (weight in pounds x 703) / height in inches^2

Rates of obesity have increased over the last generation in the US, probably due to a combination of increasing intakes of high fat, processed foods and a concomitant decline in physical activity. The Healthy People 2010 (HP 2010) target is to reduce the obesity rate in adults to 15%.

The North Carolina State Center for Health Statistics maintains two ongoing, population-based surveys which track our state's progress toward reaching the HP 2010 goals for obesity—the Pregnancy Risk Assessment Monitoring System (PRAMS) and the Behavioral Risk Factor Surveillance System (BRFSS). The target population for the PRAMS survey is women who have recently given birth, while BRFSS surveys a representative sample of all North Carolina adults age 18 and older, irrespective of pregnancy status. Both PRAMS and BRFSS questionnaires contain questions regarding the respondent's height and weight in order to calculate BMI. It is possible to compare the BMI results for these surveys by restricting the BRFSS sample to women of reproductive age and then either stratifying or weighting the sample in order to obtain a more comparable age distribution for the two groups.

Table 1 shows the estimated percentage of obese women in North Carolina in four age groups based on BRFSS data for 2005-2007. More than 25% of all women ages 18-44 reported a BMI > 30.

Table 1.
Percentage of Reported Obesity Among Women of Reproductive Age (18-44)
North Carolina Behavioral Risk Factor Surveillance System, 2005-2007

	Number	Percent	95% CI
Total	**2,529**	**25.9**	**24.8, 27.2**
Age (years)			
18-19	32	14.3	9.3, 21.4
20-24	172	22.1	18.6, 26.1
25-34	904	27.3	25.4, 29.2
35-44	1421	28.2	26.6, 29.8

Use caution in interpreting cell sizes less than 50.

95% CI = 95% Confidence Interval

The percentages shown are weighted percentages, designed to reflect the entire population of North Carolina women in a given age group.

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Additionally, the rate of obesity increases as women's ages increase; women ages 35-44 had twice the obesity rate compared to women ages 18-19 (28.2% vs 14.3%).

A similar pattern of increasing rates of obesity with increasing age was also apparent from the PRAMS data (see Table 2). Consistent with the BRFSS survey, obesity rates were highest among older mothers compared to their younger counterparts. Overall, about 24% of PRAMS respondents reported a BMI > 30. The overall percentage of obese women was somewhat lower in the PRAMS data compared to BRFSS, primarily because women who become pregnant are, on average, younger than the general population of women of reproductive age.

Table 2.
Percentage of Reported Obesity Among Women Before Pregnancy
North Carolina Pregnancy Risk Assessment Monitoring System, 2005-2007

	Number	Percent	95% CI
Total	**945**	**24.2**	**22.5, 26.0**
Age (years)			
< 20	70	16.2	12.0, 21.4
20-24	198	22.5	19.1, 26.2
25-34	523	26.5	24.1, 29.1
≥ 35	154	25.8	21.4, 30.7
Race/Ethnicity			
White/non-Latina	509	22.0	20.0, 24.2
Black/non-Latina	314	31.2	27.3, 35.5
Latina	87	24.4	19.3, 30.2
Education			
< High School	140	23.6	19.4, 28.3
High School	295	26.7	23.4, 30.3
> High School	508	23.1	20.9, 25.4
Family Income			
< $15,000	271	27.7	24.1, 31.6
$15,000-$24,999	170	31.1	26.3, 36.4
$25,000-$49,999	206	27.8	23.9, 32.0
≥ $50,000	243	18.4	15.9, 21.1
Medicaid Recipient			
No	403	20.3	18.2, 22.7
Yes	542	27.9	25.3, 30.6

The percentages shown are weighted percentages, designed to reflect the entire population of North Carolina women having a live birth.

Number = Number of respondents, 95% CI = 95% Confidence Interval

Table 2 also shows PRAMS obesity rates according to various demographics. Non-Latino black women have a higher obesity rate than either non-Latino whites or Latino women. The sample size was too small to characterize obesity in the other race/ethnicity groups. Obesity rates did not differ greatly by maternal education, but there was considerable variation according to income and Medicaid status. Women with family income > $50,000 were substantially less likely to be obese compared to women with lower incomes. Consistent with this pattern, women who were enrolled in Medicaid were much more likely to be obese than women not in Medicaid.

The results from the North Carolina PRAMS and BRFSS surveys indicate that about one in four women of childbearing age in North Carolina is obese, a percentage far above the HP 2010 target of 15%. With the exception of women in their teens and those in the highest income level, none of the demographic groups examined came close to meeting the HP 2010 goal.

As discussed in the commentary by Siega-Riz and Giannini in this issue of the *Journal*,[9] the obesity epidemic has emerged as a consequence of our changing environment and culture over the past generation and addressing the problem will require changes at many levels, including efforts by physicians, schools, and communities. As Siega-Riz and Giannini observe, women have considerable influence over the planning of family meals, and focusing educational efforts towards women with messages about the importance of a healthy diet and lifestyle is a good starting point for improving the health of all North Carolinians.

REFERENCES

1 Diaz VA, Mainous AG, Koopman RJ, Carek PJ, Geesey ME. Race and diet in the overweight: association with cardiovascular risk in a nationally representative sample. *Nutrition.* 2005;21(6):718-725.
2 Shai I, Jiang R, Manson JE, et al. Ethnicity, obesity, and risk of type 2 diabetes in women: a 20-year follow-up study. *Diabetes Care.* 2006;29(7):1585-1590.
3 Pierdomenico SD. Body mass index and risk of future hypertension in women. *Am J Hypertension.* 2008;21(6):599.
4 Rexrode KM, Hennekens CH, Willett WC, et al. A prospective study of body mass index, weight change, and risk of stroke in women. *JAMA.* 1997;277(19):1539-1545.
5 Ning Y, Wang L, Giovannucci EL. A quantitative analysis of body mass index and colorectal cancer: findings from 56 observational studies. *Obesity Rev.* June 15, 2009. [Epub ahead of print]
6 Huang Z, Hankinson SE, Colditz GA, et al. Dual effects of weight and weight gain on breast cancer risk. *JAMA.* 1997;278(17):1407-1411.
7 Schrauwers C, Dekker G. Maternal and perinatal outcome in obese pregnant patients. *J Matern Fetal Neonatal Med.* 2009;22(3):218-226.
8 Waller DK, Shaw GM, Rasmussen SA, et al. Prepregnancy obesity as a risk factor for structural birth defects. *Arch Pediatr Adolesc Med.* 2007;161(8):745-750.
9 Siega-Riz AM, Giannini C. Promoting healthy weight in women: what the physician can do to help. *NC Med J.* 2009;70(5):449-453.

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State Center for Health Statistics, North Carolina Division of Public Health

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Spotlight on the Safety Net

A Community Collaboration
Kimberly Alexander-Bratcher, MPH

Alamance County Health Department

The Alamance County Health Department is an accredited local health department that is implementing best practices and providing innovative programs to women across the reproductive health continuum. The leadership and staff of the department feel that emphasizing programs designed to provide services and support to women from adolescence through the reproductive years are among the organization's strengths. This *Spotlight on the Safety Net* describes the Alamance Teen Outreach Program (TOP), the Targeted Infant Mortality Reduction Grant (TIMR), and the women's health, mental health, and maternity services that are provided in the department.

The Alamance County Health Department has a unique partnership with the Alamance-Burlington School System and the Alamance County Juvenile Crime Prevention Council that supports adolescent health through implementation of the Teen Outreach Program. The Teen Outreach Program is a developmental intervention that attempts to help adolescents understand and evaluate their life options and helps them to develop a positive self-image, effective life management skills, and achievable goals, all of which are important in addressing preconceptional health issues among adolescent girls. The program is based on the notion that a heightened awareness of their family planning and reproductive options, increased knowledge about those options, and enhanced and diverse experiences with various life options will lead to a more positive outcomes including reducing unplanned teen pregnancy. The program is offered to high risk students in middle schools in the county. According to the *Alamance County Health Assessment 2007*,[a] the county averaged one teenage pregnancy per day in 2006. From the inception of the TOP program in 2003 to October 2007, less than 2% of participants have a reported pregnancy.[b] Since its inception in 2003, TOP has served 1,683 diverse participants (40% white, 30% African American, 21% Latino, 6% multiracial, 3% other; 50% male and 50% female). TOP has been recognized both locally and with the GlaxoSmithKline Child Health Recognition Award.

In 2007, the Alamance County Health Department was awarded $147,000 from the North Carolina Division of Public Health to carry out infant mortality reduction activities. Using the Targeted Infant Mortality Reduction Grant funds, the health department created the **H**ealth **E**ducation for **Y**ou, **Ladies** program (HEY Ladies). HEY Ladies addresses health behaviors prior to pregnancy by providing one-on-one health education through motivational interviewing. Motivational interviewing is a client-centered method for enhancing intrinsic motivation for change among clients. This approach recognizes that change must come from the client, not the counselor, and explores reasons for the behavior, desire for change, level of confidence for change, and resolution of ambivalence toward the behavior. In the program's first two years, over 900 sessions have focused on nutrition, physical activity, smoking cessation, multivitamin use, contraception, and pregnancy planning. The health educator provides health behavior counseling, educational materials, follow-up, and referrals, if appropriate.

The Women's Health Clinic in the Alamance County Health Department offers family planning services, pregnancy tests, physical exams, Pap tests, STI screening and treatment, IUD clinics, and colposcopy to clients. Nurses and clinicians work as a team to provide efficient and thorough reproductive health services including education and counseling. Multiple changes have been made in clinic systems to ensure timely access for patients requesting birth control. Appointments are made available the same day whenever possible. The overall goals are to reduce unplanned pregnancies and optimize health prior to both planned and unplanned pregnancies. The clinic coordinates with other providers in mental health, health education, and wrap-around care to provide clients with needed resources and services.

a Available at http://www.alamance-nc.com/fileadmin/alamance/Health/docs/CommunityAssessment2007sm.pdf
b Rosters for TOP participants were compared with school rosters to determine the percentage of participant pregnancies.

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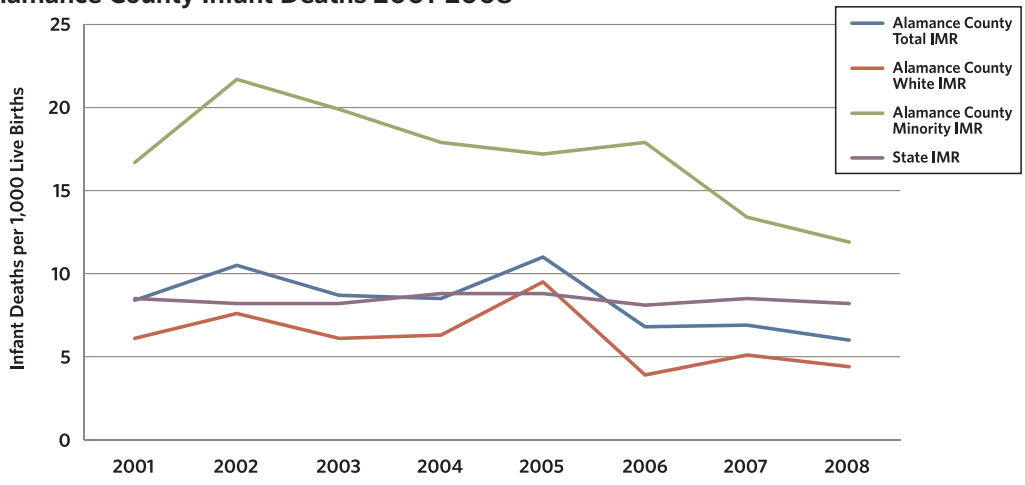
The Mental Health Program at the Alamance County Health Department was established in April 2007 through a community health grant to address the comprehensive health needs of patients. In the department's maternity clinic, a licensed clinical social worker assists clients in dealing with stress and mental health issues during a particularly vulnerable period of time in a woman's life. The social worker serves clients who are working on both long- and short-term mental health concerns and has seen many clients successfully address these concerns, repair relationships, and heal from difficult life circumstances. An interpreter is available to assist the social worker with Spanish-speaking clients. Patient feedback reports that both English- and Spanish-speaking clients have a great sense of relief from discussing their mental health issues with their medical provider as well as the social worker who may give them an opportunity to explore issues in greater depth. The mental health program continues to strive towards the goal of "reattaching the head to the body" by providing positive collaboration between physical and mental health care. The program has established itself as an essential part of the overall clinical services provided through the health department.

The Alamance County Health Department continues to seek evidence-based approaches to improving the care and health of clients. One example is the newly implemented CenteringPregnancy prenatal care program. CenteringPregnancy alters prenatal care by bringing women out of individual exam rooms and into groups for their care. Women have their initial obstetrics visit in a traditional setting and then are invited to join 10-12 other women with similar due dates in meeting together regularly for prenatal care, health education, and social support. Women monitor their own health, review provider assessments of their progress, and are offered refreshments and time to socialize. Afterwards, participants gather for provider-facilitated group discussions regarding various prenatal topics. The Maternity Program offers a comprehensive package of services for pregnant women from conception to the immediate postpartum period. The all-female program staff includes two physicians, two certified nurse midwives, and one certified physician assistant.

From preconception through motherhood, the Alamance County Health Department is initiating innovative programs and using best practices to serve the mental and physical health care needs of women. As a result of these programs, the minority infant mortality rate for the county has fallen (see Figure 1). While the Alamance County Health Department cannot take all the credit, the organization is certainly making a great contribution to the women of Alamance County.

Figure 1.
Alamance County Infant Deaths 2001-2008



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Addenda and Corrections to July/August 2009 Issue

Addenda for Taylor R, Benton C, Buckner A, Jones R, Schneider A. Mission Hospital's Code Stroke Team: implications for an aging population. *NC Med J.* 2009;70(4):301-306. **Use of data agreement:** "This Get With The Guidelines℠ (GWTG) Aggregate Data report was generated using the OutcomeTM PMT® system. Copy or distribution of the GWTG Aggregate Data is prohibited without the prior written consent of the American Heart Association and Outcome Sciences, Inc. (Outcome)."

Correction: In the July/August 2009 Tarheel Footprints in Health Care, it was erroneously stated that National Spinning Co. Inc. closed its Washington, North Carolina plant in 1993. In fact, National Spinning continues to have 200 employees in the Washington location and 800 employees in five other North Carolina locations. We apologize for the error.

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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 fifth installment of this series starts on page 404 of this issue of the *Journal*.

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